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BOOK OF ABSTRACTS

11TH MEETING OF YOUNG RESEARCHERS
UNIVERSITY OF PORTO

U.PORTO

ijur'18

11ª EDIÇÃO

**ENCONTRO DE INVESTIGAÇÃO JOVEM
UNIVERSIDADE DO PORTO**

7. 8. 9 DE FEVEREIRO DE 2018
FACULDADE DE MEDICINA DA U.PORTO

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WEDNESDAY, 7 th		THURSDAY, 8 th		FRIDAY, 9 th	
08:00	08:30	REGISTRATION		REGISTRATION	
08:30	09:00	REGISTRATION		REGISTRATION	
09:00	10:30	PARALLEL ORAL SESSIONS I A0- Biological Sciences I A1- Chemistry I A2- Psychology & Sciences of Education I A3- Arts A4- Sport Sciences I	PARALLEL ORAL SESSIONS V A0- Biological Sciences III A1- Chemistry III A2- Psychology & Sciences of Education III A3- Agro Food I A4- Architecture I	PARALLEL ORAL SESSIONS IX A1- Biological Sciences V A2- Psychology & Sciences of Education V A3- Engineering III A4- Architecture II	
10:30	11:30	Opening POSTER VIEWING & Coffee Break	POSTER VIEWING & Coffee Break	POSTER VIEWING & Coffee Break	
11:30	13:00	PARALLEL ORAL SESSIONS II A0- Biological Sciences II A1- Chemistry II A2- Psychology & Sciences of Education II A4- Sport Sciences II	PARALLEL ORAL SESSIONS VI A0- Biological Sciences IV A1- Chemistry IV A2- Psychology & Sciences of Education IV A3- Agro Food II	PARALLEL ORAL SESSIONS X A1- Health Sciences V A2- Agro Food III A3- Engineering IV A4- Architecture III	
13:00	14:30	Lunch Break		Lunch Break	
14:30	16:00	PARALLEL ORAL SESSIONS III A0- Health Sciences I A1- Environment I A2- Social & Human Sciences: Literary Studies A3- Economics and Society: Regional, sectoral and structural aspects A4- Criminology	PARALLEL ORAL SESSIONS VII A0- Health Sciences III A2- Social and Human Sciences: History A3- Engineering I A4- Maths		
16:00	17:00	POSTER VIEWING & Coffee Break		POSTER VIEWING & Coffee Break	
17:00	18:30	PARALLEL ORAL SESSIONS IV A0- Health Sciences II A1- Environment II A2- Social & Human Sciences: Communication and Culture A3- Marketing, Finance and Labour Market A4- Law	PARALLEL ORAL SESSIONS VIII A0- Health Sciences IV A2- Social and Human Sciences: Language Sciences A3- Engineering II A4- Maths & Physics		

FOREWORD

Há iniciativas que não sofrem a usura do tempo, permanecendo pertinentes, virtuosas e inovadoras mesmo quando ultrapassam uma dezena de edições. É manifestamente o caso do IJUP – Encontro de Investigação Jovem da U.Porto, que à 11.ª edição mantém atuais não só as suas premissas e objetivos mas também o próprio modelo organizativo.

Trata-se de facto de um evento científico pleno de virtualidades, desde logo porque dá aos estudantes da U.Porto a possibilidade de apresentarem e debaterem os seus projetos de investigação emergidos num ambiente eminentemente científico. O IJUP representa para muitos jovens a oportunidade de revelarem publicamente os resultados dos seus projetos, de treinarem a apresentação de comunicações científicas, de discutirem questões epistemológicas e metodológicas, de potenciarem novas investigações nas suas áreas de estudo e de partilharem conhecimento numa lógica interdisciplinar.

Sabemos bem que, com o grau de sofisticação e competitividade científica atual, é fundamental que os estudantes ganhem competências de comunicação, problematização, debate e divulgação científica. Para tanto, necessitam de ter experiências como as que o IJUP proporciona, em tudo semelhante às de um congresso científico, onde os investigadores se submetem ao escrutínio dos seus pares e procuram, a partir das sinergias geradas no evento, novas linhas de investigação para os seus projetos.

Conscientes disto mesmo, os estudantes da U.Porto têm, desde 2008, demonstrado grande interesse pelo IJUP, com a participação a rondar, a cada edição, o milhar de inscritos e as apresentações (orais e em poster) a andarem na ordem do meio milhar. Números que se repetiram na 11.ª edição do IJUP, o que revela um interesse constante da nossa comunidade estudantil por este encontro de jovens investigadores.

Resta-me tão-só agradecer a todos os que colaboraram na organização do IJUP'18, em especial à Sra. Vice-Reitora para a I&D, Profª Maria João Ramos, que superiormente coordena o evento, ao seu staff de apoio e aos docentes da comissão científica responsável pela análise dos projetos. Impõe-se também um agradecimento às empresas e instituições que apoiaram o IJUP'18, destacando-se neste particular o Santander Universidades.

Por fim, quero saudar os estudantes que, de forma empenhada e competente, apresentaram os seus projetos científicos no IJUP'18. A todos desejo as maiores felicidades académicas e pessoais.

Sebastião Feyo de Azevedo

Reitor da Universidade do Porto



U.PORTO

ORAL SESSIONS



- 14269 | Atomic spectrometry techniques in the multi-element analysis of wines: the case of Vinhos Verdes

Gonçalves, D., Faculdade de Farmácia, Portugal

Almeida, A., Faculdade de Farmácia, Portugal

Pinto, E., Faculdade de Farmácia, Portugal

Wine is an alcoholic beverage of excellence, widely consumed worldwide and of great social and economic importance. The European Union is the world's largest producer of wines and a leader in the export of wine products. In Portugal, wine is one of the highest production agricultural products. In particular, wine with the denomination of origin Vinho Verde, exclusively produced in the region of Vinhos Verdes, in the northwest of Portugal, is a highly differentiated wine and its exportation has been increasing a lot over the last years. Given the economic importance of this product for this region, the certification of the geographical origin of Vinho Verde is a crucial factor in the preservation of its commercial value.

The elemental composition of wine reflects the natural conditions of the soil and climate of the region where it is produced. Thus, this is an excellent indicator of its geographical origin.

The present communication aims to perform a bibliographical review on the elemental composition of wine and the techniques usually applied to carry out this type of analysis. Among the different analytical techniques currently available, atomic spectrometry techniques assumes particular relevance due to their versatility, high sample throughput, sensitivity and affordability and thus will be presented here.

- **14305 | How illocutionary acts and the FTA management can impact sales lead generation Through business-to-business communication.**

Sousa, José Miguel, Faculdade de Economia, Portugal

Lead generation is a challenge B2B focused companies face nowadays.

The following study is part of an on-going research thesis under development by a FEP student.

The main goal is to discover how the careful and methodical manipulation of written text can help sales teams improve their email communication with their target audience.

The relevance of the subject comes from the possibility of increasing the productivity of sales departments through the sheer power of speech analysis knowledge, without having to spend additional company resources.

The linguistic aspects we will analyse are the illocutionary acts (Searle, 1969) and the face threatening Acts (Goffman, 1967).

I intend to measure the impact of those through the analysis of the "persuasion level" of an email.

We can say that an email's persuasion level is defined by its ability to produce a reaction on the reader (usually requested on its textual conclusion).

- **13901 | Impact of scaffolding on children's life narratives: Narrative interaction analysis manual**

Almeida, Márcia, Faculdade de Psicologia e Ciências da Educação, Portugal

The present investigation intends to contribute to the analysis of the process of co-construction of life narratives, the quality of interaction and the impact of the scaffolding on narrative coherence. The study focuses on interviewer-child dyads and adopts as presumptions the complexity of the construction of life narratives in childhood and that the dialog of an adult with a child facilitates the activation of autobiography memories and promotes discursive productivity. The main objectives consisted in the elaboration of a manual for the codification of co-constructed life narratives and analysis on the impact of the interviewer's scaffolding on the narrative productivity of children with different ages. The system of categories and the rules for codification of the manual were developed in the context of an Portuguese-German cooperation. After validation through an interjudge agreement, the manual was applied to the life narratives of 30 children, 16 girls and 14 boys, with ages between 6 and 12 years, gathered through the Life Narrative Interview for children (LNIC). Regarding the scaffolding processes, they were found to be successful in most of the situations, helping children produce narrative elements that didn't emerge, with similar frequency, in a spontaneous way, while scaffolding failures, where the children didn't respond to the requests of the interviewer, were even less frequent. The existence of significant differences between successful scaffolding, failures of scaffolding and spontaneous production of narrative elements, show that the children were kept in their zone of proximal development. In developmental terms it was shown that the narrative productivity of the child, the emergence of complex narrative content, and as well the success of scaffolding, are directly, positively, and significantly associated with age. The results obtained and the high interdyad differentiation mirror the efficacy of the developed manual.

- **13887 | Mediation in the 2015 Civil Procedure Code: Family conflicts**
RIBEIRO, Isabella, Universidade Federal de Uberlândia, Brazil

The aim of this study was to analyze mediation as a manner in solving familiar conflicts, and its practical consequences for people involved in litigio as well, according to the 2015 Civil Procedure Code. We used the deductive history method, which is composed by research and deduction from hypothesis, building a logical reasoning. Mediation as a consensual method in solving conflicts comprehend distinct techniques from traditional judicial process; and familiar conflicts involve sensitive issues regarding affective and consanguineous bonds, that must be kept during the conflict resolution. Therefore, this study evaluated the possibility of using dialogue and comprehension among people's aiming. Those processes come from approaches of the historical context do family law, from the human organization into societies, from creation of justice standards; from familiar conflicts; as well as from the historical context and from the concept, regulation and execution of mediation according to 2015 Civil Procedure Code.

- **13922 | SER, ESTAR AND FICAR IN CONSTRUCTIONS WITH THE PAST PARTICIPLE AND WITH ADJECTIVES IN EUROPEAN PORTUGUESE**

Rebouças, Rute., Faculdade de Letras, Portugal

European Portuguese, unlike many other languages, including some Romances languages, besides having the verbs *ser* (to be) and *estar* (to be) that present different behaviors in constructions with the past participle and with adjectives, has also a verb often used in resultative constructions, the verb *ficar*. This special verb has a dual function, that is, on the one hand it is a main verb and means "to remain in a place" but, on the other hand, this verb can function as an auxiliary (cf. Carvalho, 1984), having, in these constructions, the meaning of a change of situation and its resultative state. With the objective of finding regularities in the construction of this verb with participles and adjectives, a corpus was made from a selection of examples taken from the CETEM público which we analysed. Grounded on this analysis, we present some conclusions based on the articulation between the data analysis and the theoretical framework used (cf. Duarte and Oliveira, 2010, Raposo et al., 2013).

So, *ficar* can combine with adjectives and, in this case, it is a copulative verb whereas, when combined with a participle, it works like an auxiliary verb. In this last construction, it only admits telic events, as they have a culmination and a possible resultative state. This verb, differently from other languages with apparently similar verbs like Spanish (*quedarse*), exhibits a participial construction with a resultative interpretation.

REFERENCES

- Carvalho, J. G. H. 1984. Ficar em casa/Ficar pálido: Gramaticalização e valores aspetuais. Separata da "Coleção Linguística, 1", Coimbra.
- Duarte, I and Oliveira, F. 2010. Participípios resultativos. Textos seleccionados do XXV Encontro Nacional da Associação Portuguesa de Linguística. Porto: APL, 397-408.
- Raposo, E. et al. 2013. Gramática do Português. Vol. I. Lisboa: Fundação Calouste Gulbenkian

- **14124 | The impact of the curricular reform in the evaluation of Surgical Propaedeutics I**

Leite, AR, Faculdade de Medicina, Portugal

Angélico, A, Faculdade de Medicina, Portugal

Alvarenga, JM, Faculdade de Medicina, Portugal

Martins, M, Faculdade de Medicina, Portugal

Donga, MR, Faculdade de Medicina, Portugal

Severo, M, Faculdade de Medicina, Portugal

The curricular reform of the Master's Degree in Medicine (MIM) of the Faculty of Medicine of the University of Porto (FMUP) took place in the academic year 2013/2014, with changes in the organization and evaluation of the curricular units. In MIM clinical cycle, there was a transition from a modular teaching regime to a horizontal one. This modification may have caused significant changes in exam quality and student performance. Thus, the purpose of this article is to evaluate the effect of this change in the parameters mentioned above, in the curricular units of Surgery and Surgical Propaedeutics I.

We obtained the exam results from the students of the first block of Surgery (academic year 2015/2016) and from the students of the normal period of Surgery Propaedeutics (academic year 2016/2017). Statistical and quality analysis of the exams were performed, as well as the comparison between the two by t-test for independent samples.

In the exam realized before the curricular reform, the mean of the classifications was 11.290. The difficulty index was 0.652 and the discrimination index was 0.177. The test reliability, measured with Cronbach's alpha, was 0.678. However, in the exam realized after the reform, the mean of the classifications was 10.030, the difficulty index was 0.751, the discrimination index was 0.184 and, finally, the Cronbach's alpha was 0.808.

The results we got evaluate both the change in the curricular reform and in the typology of the exam. As a result of the new curricular reform, the exam turned out to be easier, more discriminative, even though the values were outside the recommended interval. Thus, we recommend a reevaluation of the exam structure and suggest that a new study which evaluates directly the change in curricular plan without the influence of the difference in typology of the questions should be taken.

- **13872 | "Call the [puluícia]": on the progressive vowel harmony in portuguese**
Sousa e Silva, Carlos, Faculdade de Letras, Portugal

Up to the present, although regressive vowel harmony has been shown as a very productive phenomenon, especially with regard to the description of the verbal system, progressive harmony was, if not impossible, at least rare (Mateus & Andrade: 2000).

However, this is an active process in some dialects of the portuguese language, namely by speakers from Madeira (Segura da Cruz & Saramago: 1999), in the post-diphthongation of /l/ in stressed syllable, as a syllabic weight mechanism. The resulting harmony can be checked in realizations such as [ij], [uj] and [ɨj], as one or both harmony processes are active at the same time. The whole analysis of this phenomenon will be made in the light of the Element Phonology (Backley: 2011), a non-stream phonological theory, in spite of being a very fruitful for describing vowel phenomena (Brandão de Carvalho: 1993 e Veloso: 2012).

In this presentation we will use a corpus of madeirian dialects collected both by the autor and the dialectal archive of the University of Porto and we will 1) define vowel harmony as a phonological process; 2) explain the causes of the diphtongalization; 3) show in the light of Element Phonology, but also autosegmental and lexical phonology, how this progress works in the analysed dialects, suggesting an underlying phonological representation.

- 14055 | "Eat well and live better" - Development and validation of a personalized instruction manual for home feeding in patients with dysphagia

Ferreira, Juliana, Faculdade de Medicina, Portugal

Figueiredo-Braga, Margarida, Faculdade de Medicina, Portugal

Introduction: Dysphagia can be a serious health threat due to the risk of aspiration pneumonia and other complications, responsible for increasing the number of hospital readmissions in severe situations. Health professionals need to prepare patients and family members to change eating habits after discharge to improve clinical recovery and prevent malnutrition, dehydration, respiratory complications and reduced quality of life. In order to guarantee variability and safety in food, it is necessary to implement procedures regarding food consistency and preparation of meals. The use of booklets has been particularly effective in this effort, especially when used in a personalized way. Clear and simple language, diagrams, images and an adequate text source facilitate the understanding of information.

Objective: To develop and validate a booklet for patients with dysphagia and caregivers with the purpose of providing clear, specific and individualized instructions on feeding.

Methods: A manual was developed based on the literature review. A panel of experts in dysphagia and clinical communication performed a content and form analysis through open-ended questions complemented with a focus group with patients and caregivers.

Results: The data collected was incorporated in a new version of the manual. The manual contains an introduction about dysphagia, signs and symptoms and possible complications. A personalized area permits to include specific suggestions and individualized options on food consistency, solid food confectionery standards and postures.

Discussion and Conclusions: A pilot study is ongoing in a group of patients with post-stroke dysphagia recently discharged from the hospital. Adherence to the food routine, user satisfaction and quality of life will be evaluated.

- **13880 | "História Go": Contribution of the mobile devices for the teaching learning on school trips**

Monteiro, Tamara, Faculdade de Letras, Portugal

Towards a 'thrilling' social and technologic evolution, feature of the 21st century society, the educative systems need to focus themselves on the development of skills and values appropriated to the continuous challenges of these times. Even so, the school system has to rethink and change the of teaching-learning methods as far as those are outdated and, especially, lagged off the reality of today's students (2017).

Study visits as a strategy of the teaching-learning process allow a "better [...] understanding and interpretation of the historical knowledge, [as well as] the ability of reading and interpreting what surrounds them" (Barca, 2012). Therefore what happens is an effective and meaningful learning through a lived and constructive experience, connecting theory with historic events practice. Moreover, the association something so motivating as the ICT to this whole process seems to be the best way to make History teaching more eye-catching and solid.

With this study we want to show the benefits of the ICT in the process of the teaching-learning of this subject, specifically having study visits as a source of learning and finally the use of a mobile app as a support of these activities. We made out an app named História Go with the purpose of it being an Oporto's Historical guide for two 12nd grade classes.

According to the obtained results, the application of the ICT, specifically with the mobile devices, on study visits mean an advantage because they allow students to be responsible for their own knowledge acquisition through a constructive learning, thus motivating them for the historical contents. Despite that, it allows students to search for their historical awareness once they have direct contact with sources of knowledge, like local heritage, developing an exclusive identity of themselves and, most of all, the sense of belonging to a community.

Keywords: History, Study Visits, ICT, Mobile Applications, Oporto.

- **13882 | (Absence of) Sexual Assistance in Portugal**

Pinho, Ana R., Faculdade de Psicologia e Ciências da Educação, Portugal

Nogueira, Conceição, Faculdade de Psicologia e Ciências da Educação, Portugal

Sexual assistants are trained individuals who provide sexual services to clients with disabilities. The lack of knowledge of professionals specialized in the sexual services of people with disabilities, as well as the scarcity of scientific literature in Portugal regarding the search for commercial sex by this group, prompted the present investigation.

In order to understand if training is a useful measure to be taken into account for improving the living conditions of those involved, open interviews were used to explore sex worker's experiences working with clients with disabilities. Thirteen interviews were analyzed using the thematic analysis method, resulting in four themes. The themes are as follow: sex workers, clients, search for sex work and treatment.

The main conclusions provide evidence of the use of commercial sex by people with disabilities who seek in this service sexual and emotional satisfaction. Certain specificities, such as the non-normative body, the need for more time or the search for practices that privilege touch and communication tend to be experienced with feelings of embarrassment on the part of professionals. This may be the reason why, sometimes, there is an increase in the prices charged to this group of customers. Based on the experiences and obstacles sex workers observe when working with people with disabilities measures were pointed out to improve the current situation, which highlights the need for training to serve this group of clients, as well as legalization of sex work.

- 14040 | (Re)Building the Heritage of Douro's architectural landscapes. The case study of Caldas do Moledo.

Dias, A. Filipa, Faculdade de Arquitectura, Portugal

Calix, Teresa, Faculdade de Arquitectura, Portugal

Garrido, Carla, Faculdade de Arquitectura, Portugal

Douro always impressed by its vineyards and the river; the cold winters and warm summers; the villages unified by the schist but also the people that fought for the evolution of the Region. The present study thrives from a need of a review concerning ways of thinking about the Douro's architectural landscapes, finding within the Architecture and Urbanism a work method based on the analysis of social, cultural and economic dynamics. (...)tourism continues to be among the foremost vehicle for cultural exchange [1]. However the ever-growing tourism in Portugal has created situations that endanger the patrimony and cultural heritage of the Douro Region. An urgent reflection and intervention is required, one that goes beyond superficial relations and image recreation of what Douro means produced by the "fast-tourism". The aim is to present a work method that brings together rigorous and schematics drawings complemented by theoretical research on the topic. The case study, Caldas do Moledo became a natural choice to exemplify the premises of this research due to its geographic position and relationship with one of the most iconic personas of the Douro, a "Ferreirinha". Caldas do Moledo is now only a memory of what was once the entrance gate to the heart of the Wine Region. It's an example to historical, architectural and urbanism analysis. Identifying issues and intrinsic values of the region in study will help define a strategy that hopefully inspires the requalification of other forgotten places that were once the reflection of what is Douro. In summary, this research intends to demonstrate that rebuilding Douro's architecture landscapes is to comprehend and preserve the cultural heritage of the Douro Region but most important to take advantage of its present qualities to truly create a Continuing Cultural Landscape [2]

[1] Managing Tourism at Places of Heritage Significance; México; 1999; p.1

[2] Alto Douro Vinhateiro classification as World Heritage.

- **14180 | (Un)finished Architecture**
Livramento, João R. A., Faculdade de Arquitectura, Portugal

The following work arose from a problem experienced in my homeland Cape Verde, in which some houses are not built to completion but the parts that have been concluded are being used. Most of these houses are not completed in one phase because the economic resources collected for that purpose run out and the parts that are not finished are put on standby pending for more resources for their conclusion. Most of the time this does not happen, so they remain unfinished. Several problems arise from this situation: in the house itself, whose structure is exposed to inclement weather conditions and can cause damage to it; and also in the language of the city that has been building an unfinished urban construction. This work intends to study and analyse these constructions, and one hopes to be able to answer some questions, such as: How to design and integrate a building in an unfinished construction? How to design in order to prevent further unfinished constructions? To help answer these questions, some situations have been identified, apparently unfinished but which are not; they are designed and constructed that way for a purpose. I called them (un)finished. (Un)finished Interrupted are constructions in which some element is designed to be interrupted, which has a symbolic, poetic, aesthetic character or a particular situation that the project wants to express; (Un)finished Incremental are buildings that are designed to be built in phases to avoid unfinished constructions; (Un)finished Chameleon is a situation conceived to design buildings that are intended to be completed in one phase but which are going to fit in in an unfinished urban construction. This situation has the purpose of adapting a finished construction, in the unfinished, thereby trying to answer the first question.

This research is being made within the master thesis: (In)acabado, developed in the context of Master's Degree in Architecture, at FAUP, 2017/2018, under the supervision of Professor Marta Rocha



(Un)finished

- **13886 | A Hopeless Case: Study on Solitude**

Hamivka, Andriana, Faculdade de Letras, Portugal

There is no hope, the story offers no confronting final moral; 'A Painful Case' by James Joyce is a story of wastefulness, lost opportunities and incurable solitude. All its depth, owing to the most intrinsic human feelings and experiences - love and death -, is transmitted through the eyes of James Duffy. Being as ambiguous as all mankind, he enjoys and is trapped in the exile, both physic and psychological, he had made himself: 'wished to live as far as possible from the city of which he was a citizen'. He is a social outcast with no friend. His biggest fear is to 'submit himself to the criticism of an obtuse middle class', whose company he refuses consciously and cold-bloodedly. Even his house or bookshelves mirrors his inner state, being plain and in meticulous order. His cyclical routine suggests the idea of paralysis. His defeat comes, though, from his attempt to channelize and categorise emotion as well.

'Painful' is the case of a man emotionally dead - and dead of his own volition; eventually, his personality and character pushes himself into a relentless tragedy. Moreover, the real death becomes part of his life, and a tragic epiphany has place. Mr. Duffy is a figure of pity and terror: he had missed the sense of intimacy, he put to death the person who offered herself to him, because of his style of living, he will be unremembered when he dies; but now, something even worse is happening to him - he is absolutely alone.

However, there is another interpretation. We can see the end happily as its protagonist gets what he has always wanted - a life absent from desire, vulnerability, and responsibility, and instead of self-incriminating utterances for less well-off people, we are presenting self-congratulatory thoughts. 'He felt that he was alone' may be his victorious self-empowerment of restored myth of the lone, self-satisfied figure who continues the same while others are breaking under similar circumstances and dying; he is in total control and unique.

- **14190 | A Leader Experiencing Unemployment - A Case Study**

Azevedo, Marisa, Faculdade de Psicologia e Ciências da Educação, Portugal

Unemployment has become an increasingly common experience. Due to deep changes in the job market, structural unemployment will remain substantial, even though macroeconomic policies may account for some variation in the unemployment rate. In this context, a traditionally secure group - the leaders - have become exposed to the hardship of unemployment. Underlying this new reality might be the record number and frequency of takeovers and mergers (Grey, 2013) along with organizational flattening. This case-study aims to explore and describe the unemployment experience of a person who held a leadership position as a leader at his former job. Data was collected through a semi-structured interview, logbook entries, and an electronic interview. The subject's unemployment experience was analyzed through the following angles: levels of deprivation from the benefits of employment, latent and manifest; feelings associated with unemployment; and stigmatization of the unemployed person. Results suggest that the experience of unemployment is mediated by factors such as the circumstances in which the individual loses his job, his or her current life stage, or the resources at his or her disposal. The interplay between these factors may, therefore, produce an idiosyncratic unemployment experience.

Key-words: unemployment, leadership, jobs, employment, work, labour, leader, deprivation, stigmatization, benefits of employment.

- **14293 | A Preliminary Study on Mesh Networks and IoT**

Barros, Filipa S., Faculdade de Engenharia, Portugal

Sousa, Luís M., Faculdade de Engenharia, Portugal

Dias, João P., Faculdade de Engenharia, Portugal

Ferreira, Hugo S., Faculdade de Engenharia, Portugal

Internet of Things (IoT) is a cutting-edge paradigm originating from the advances in information and communication technologies, towards a worldwide network of inter-connected heterogeneous entities. From this context an old area of networks as emerged again being that the concept of mesh networks. In such topology each node relays data for the network.

These nodes collaborate in the dissemination of data by either wired or wireless networks.

For a broad range of low-data-rate, low-power IoT applications mesh networking is coming forth as an alluring option for it has the purpose of enabling connected devices to communicate with each other not leaning on dedicated hub services or computers.

Being inexpensive this solution thus provides a straightforward approach when building a network of connected devices.

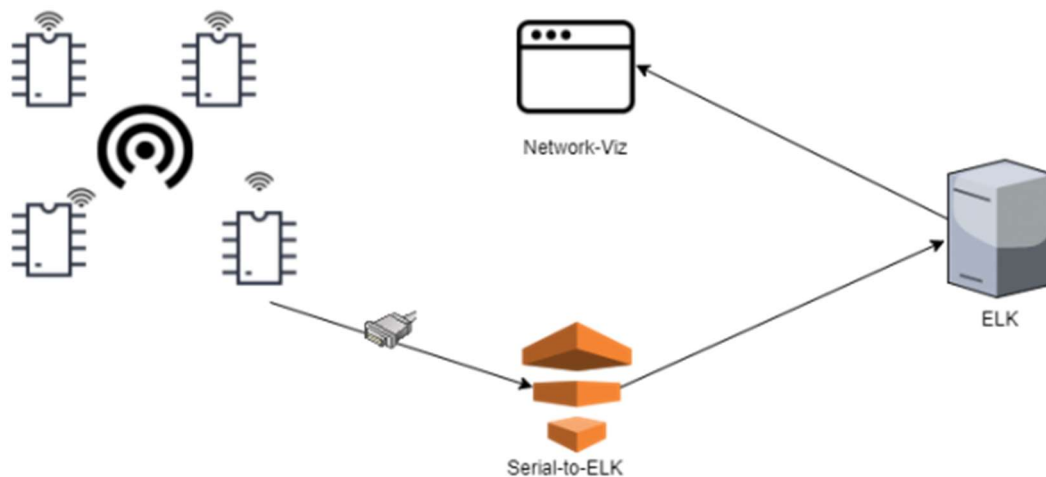
Our case study consisted of connecting five ESP8266 relying on communication through end-to-end MQTT queues. These ESP8266 were to collect different types of data through their sensors and to act, through their relayed actuators, upon that same data.

Two approaches were considered for this implementation relying both in open source libraries. The first one was ESP8266MQTTMesh being that problems emerged from its deployment.

The second one was painlessMesh and it worked as expected for being able to easily extract information on how the network was structured and changed during its life-cycle, thus meaning we could visualize the network and the messages going through it.

With this mesh as a functional proof of concept a visualization system was developed using Elasticsearch and Kibana as well as an elemental web application with the sole purpose of providing visualization of quasi-real-time of the network mesh behavior.

The feasibility of use of mesh networks in IoT scenarios like smart houses was demonstrated. However, there is still space for exploring large-scale test scenarios.



Overview schematic of the system architecture.

- 14077 | “Off With their Heads”: The Subversion of the Female Role in Lewis Carroll’s *Alice’s Adventures in Wonderland*
Cerqueira, Tânia, Faculdade de Letras, Portugal

In 1865, Lewis Carroll published *Alice’s Adventures in Wonderland*, a novel that follows the journey of a girl that falls through a rabbit hole into Wonderland, a whimsical and bizarre world. *Alice’s Adventures in Wonderland* is Carroll’s representation of nineteenth-century Victorian England, where the author not only satirizes the British society’s culture, for example, the British tea-drinking tradition through the mad tea-party hosted by the March Hare and the Hatter "where it is always tea time" and the opium use through the Caterpillar who smokes from a hookah, but also subverts the image of the idealized Victorian female that the art and literature of the time popularized, the image of a submissive and domesticated wife, mother and daughter. In this paper, written as a part of the course studies in English Culture, I will focus on the female characters represented in Lewis Carroll’s fantastic upside-down world - Alice, the Cook, the Duchess and the Queen of Hearts - and discuss how the female role in Wonderland is subverted - how the conception of the Angel in the House is replaced by impetuous and aggressive females that are far from the expected embodiment of gentleness, submission and lovingly mothers.

- 14032 | “Pastry and the sense of taste – a medium of and for Architectural Thinking. An analysis on the common grounds of architecture and food.”
Pinto, Ana S., Faculdade de Arquitectura, Portugal

Pastry chef Carême once said "The most noble of all arts is architecture, and its greatest manifestation the art of the pastry chef"¹. My current research focuses on analyzing and bringing to light this link between food - specially pastry - and architecture, exploring simultaneously the realms of taste and its philosophical connotations and proposing a gastro-architectonical way of thought.

Architecture and pastry have long been related, and through works such as "Le Pâtissier Pittoresque" by Carême also, one can observe how ingredients such as sugar used to be mobilized in architectural mimesis through pastry production. Food would reproduce architectural constructions, whether with the aim of consumption or solely as embellishment.

But as one creates a bridge between the process of food ingredients' manipulation and the one of building materials' transformation, one cannot avoid but think that the repercussions of food experience in the mouth and body can also be translated into architectural phenomena. Shape, colour and texture could act as catalysers of taste, and architectural coherence could be perceived through food composition.

In my research, taste stands above sight and hearing. It is the only sense in which the body fully integrates the perceived object, achieving the most complete dialogue. I do not propose the creation of buildings to be eaten - as in the 18th century -, but alternatively, an architecture conceived to be tasted by the mouth in the mind. John Ruskin, on visiting Saint Marcus Square in Venice once wrote: "(...) there is the strong instinct (...) a sort of instinct like that for eating and drinking - I should like to draw (...) all this Verona stone by stone, to eat it all up into my mind (...)"².

Master thesis carried out within the supervision of Professor Marta Rocha.

1 HORWITZ, J.; SINGLEY, P. (2004). Eating Architecture. (p.1). Cambridge: The MIT Press.

2 EVANS, J. (1970). John Ruskin. (p.183). N.I.: Haskell House Publishers.

- **13928 | Action and Rationality in Donald Davidson.**

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In this article, we will describe what the author Donald Davidson understands by action and rationality. We will see the problem of mental events causing physical events and how the author introduces his theory of anomalous monism. This implies explaining the difference between what Davidson understands as a physical event and a mental event, and how one can identify them in an attempt to rationalize action. The rationality encompasses ways of explaining both the mental and the physical in distinct descriptive ways, but which somehow meeting in the unity of the subject.

- **14222 | Additive Fabrication in Architecture. The “TriArch” project.**
Carvalho, João, Faculdade de Arquitectura, Portugal
Sousa, José Pedro, Faculdade de Arquitectura + DFL/CEAU, Portugal

This presentation features the research in-progress on "Additive Fabrication in Architecture", which has been developed in the context of Master in Architecture dissertation at FAUP, under the supervision of Prof. José Pedro Sousa, and in collaboration with the DFL research group of CEAU/FAUP.

Inspired by what is happening in other areas, like aerospace, product design, medicine or fashion, additive fabrication technologies can be disruptive regarding the design and construction in architecture. To investigate it, the research work is structured in four main parts. The first one sets the technological principles and its evolution; the second, investigates the introduction of additive fabrication in architecture; and the last part discusses a series of case studies to explain different levels of application in contemporary architecture.

After summarizing the theoretical context, the communication describes a practical experiment to test the potentials of additive fabrication in architecture. The "TriArch" is a 1:1 scale non-standard structure with a three legs vault configuration. It is made out of 106 different polished iron plates of 1mm thickness, which are connected in space through 144 different nodes. While the plates were individually laser cut, the nodes used 3D printing in ABS to afford such extreme design customization. This additive fabrication process proved its flexibility and sustainability by avoiding molds and material waste. The TriArch was installed and exhibited in public during the CONCRETA 2017 construction fair in Porto, and got very positive feedbacks from the audience. In future, this research will explore more practical experiments to test other architectural challenges with additive fabrication.

Acknowledgments:

The TriArch was a collaborative project developed at the DFL, Digital Fabrication Laboratory (CEAU/FAUP) with Prof. J. P. Sousa (coordinator), P. Varela (computational design), the author (3D printing) and R. Santos (laser cut).



“TriArch” project - fabrication, nodes, and final structure.

- **13968 | Adenosine receptors in mesenteric arteries: evidence for a nuclear location**

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Background: Adenosine is a ubiquitously produced purine nucleoside that plays a central role in several physiological/pathophysiological conditions, functioning as a signaling molecule eliciting responses through four adenosine receptors (ARs), A1, A2A, A2B and A3. ARs belong to the diverse family of G-protein-coupled receptors (GPCR), and so far, they are thought to be solely expressed at the cell surface. Growing evidence supports the presence of many functional GPCRs on intracellular membranes, particularly in the nuclear envelope.

Objective: The aim of this work is to investigate the cellular distribution of ARs in mesenteric adventitia rodent arteries.

Methods: Laser Scanning Confocal Microscopy (LSCM) will be used to acquire z-stacks images for each AR subtype. Image analysis will be carried out using the software Fiji-ImageJ. Subcellular fractioning was carried out to obtain mesenteric extracts from nuclei, cytosol and membranes. Western blot analysis is also being proceed.

Results and Discussion: All ARs were detected in mesenteric arteries (densities were compared between subtypes). Results also reveal that ARs are present in nerve and glia cells. In order to better understand the subcellular distribution pattern of ARs analysis of images obtained with DAPI, a nuclei marker, and individual A1, A2A or A3 receptor selective antibody immunoreactivities, revealed an overlay pattern compatible with the presence of these AR subtypes in the nuclei. Therefore, these data are in agreement with the presence of some ARs at the nuclei similarly to what have been reported to other GPCRs (such as bradykinin, AT1, ETA receptors) challenging the interpretation, taken so far, for the effects ascribed to adenosine receptor agonists/antagonists.

Acknowledgements: FCT through project UID/QUI/50006/2013 - POCI/01/0145/FEDER/007265 with financial support from FCT/MEC through national funds and co-financed by FEDER, under the Partnership Agreement PT2020.

- **14133 | Advances in the Conceptualization and Measurement of Gottfredson & Hirschi's (1990) Self-Control Construct**

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Since the publication of the General Theory of Crime, numerous studies, spanning multiple research areas, such as psychology and criminology, have stressed a complexity underlying both the conceptualization and measurement of the self-control construct. Through a multi-methodology approach, the present study aims to explore the self-control concept as well as its distinct associations with similar concepts, such as impulsivity, sensation-seeking, risk propensity and decision-making processes. Also, we sought to comprehend what contributes to the explanation of self-control, peer and self-reported delinquency. 94 college students completed psychometric measures whilst some of them also completed three laboratory neurocognitive tasks (BART; IGT; Go/No-Go). Results suggest conceptual validity between self-control psychometric measures despite most psychometric and laboratory measures not being statistically significant correlated. Results suggest social desirability might have an influence in the reported levels of self-control. Finally both impulsivity and sensation-seeking predict self-reported delinquency, with the former also predicting self-control. As far as our knowledge is concerned, this is the first study that uses laboratory measures, whilst considering The General Theory of Crime's view of self-control in the study of crime, deviance, and antisocial lifestyles. Future research directions will be discussed.

- **14143 | Aerobiology of Cupressaceae and effects of atmospheric pollutants (O₃ and NO₂) on its pollen**

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Plants belonging to Cupressaceae are used for ornamental purposes in gardens and parks of the cities and produce pollen that can cause respiratory allergies. In urban areas it has been referred that atmospheric pollution can increase pollen allergenicity.

The aim of this research was to study the aerobiology of Cupressaceae and the effects of gaseous pollutants (O₃ and NO₂) in the pollen fertility and allergenicity.

Airborne pollen monitoring was continuously performed from 2013 to 2017, using a 7-day Hirst-type volumetric trap set on the roof of the Faculty of Sciences in Porto. Pollen samples, collected from the strobili, were exposed to O₃ and NO₂ in an environmental chamber with temperature and relative humidity controlled and sunlight simulated. The pollen was fumigated for 6h to the hour-limit value concentration, for each gas, acceptable for human health protection in Europe (Directive 2008/50/EC). Its effects on pollen viability and allergenicity were investigated. Pollen viability was determined by FDA test and the results compared. Pollen total soluble proteins were quantified colorimetrically and the polypeptide profiles were determined by SDS-PAGE and the allergenicity was assessed by ELISA and Western blot.

Cupressaceae pollen is mainly present in the atmosphere during December until March, with the maximum airborne concentration usually found during February. A decrease in the viability of exposed pollen in contrast to non-exposed was observed. Changes in total soluble proteins and patient sera IgE reactivity were observed.

Acknowledgments: National Funds through FCT - Foundation for Science and Technology in the project 3599 - PTDC/ATP-EAM/0817/2014. Institute of Earth Sciences (ICT) funds, under contract with FCT and FEDER through the Operational Program Competitiveness Factors - COMPETE (UID/GEO/04683/2013 (POCI-01-0145-FEDER-007690)).

- **14178 | Almond (*Prunus dulcis*) shells as source of bioactive compounds**

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Almond, as other nuts, are recommended to be consumed in a daily basis due to its health and wellbeing related properties. To answer to consumers demand the production of almonds has increased worldwide. Therefore, high amounts of almonds by-products are generated. According to sustainability issues and circular economy concept it is of utmost importance to find innovative applications of such by-products.

The aim of this work was to develop and optimize a sustainable extraction process to recover the phenolic compounds as a valorization approach. The samples used were almond shells (*Prunus dulcis* (Mill.) D. A. Webb) from Trás-os-Montes (Portugal).

The tested process conditions were: mass to volume ratio, temperature, extraction time by stirring (1h and 2h) and maceration (12h and 24h) in a total of 30 assays. The total phenolics and flavonoids compounds were determined by spectrophotometric methods. Antioxidant activity was evaluated by FRAP and DPPH● inhibition assays.

Data showed that the highest amounts of antioxidant compounds extracted were obtained with maceration during 24h at 80 °C.

The greatest advantage of this process is the recovery of bioactive compounds from almond shells using only water as extracting solvent. It is foreseen that the obtained extracts may have potential application in several industries such as food, cosmetics and pharmaceutical.

- **14033 | Alternative Economy: Street Fairs in the city of Porto**

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The Alternatives Economies are a recent theme, which has been growing frantically in recent years. This development was driven by the context of crisis that we lived in the last decade, where we sought new, alternative solutions. Thus, new economic activities have emerged, which are alternatives to the so-called "traditional" capitalist economy.

Throughout this project several quantitative and qualitative methodologies were approached, as for example: statistical analysis, empirical research, research and fieldwork, structured interviews.

Firstly, the aim was to describe what the alternative economies and their aspects are. After this theoretical exposition, we selected a case study: the fairs and street markets in the city of Porto. The objectives in this case study were: characterize the fairs and street markets, their offer, understand their dynamics and the characteristics and opinions of those who sell, attend and organize them.

Analyzed all the results, it was verified that the oldest forms of alternative economy in our city, the fairs, have been renewed, although some maintain their essence, presenting a new look, attracting more heterogeneous audiences. It was also concluded that they mark a strong presence, with a considerable number of fairs occurring throughout the year, either regular or punctual.

We understand also that their dynamic was influenced by the crisis that started in 2008 which allowed a significant increase of new fairs. The tourism has also an important influence in the growth of these street fairs.

Generally, the fairs are frequented by the residents of the city of Porto but we also conclude that the large percentage of the clients are from the surrounding municipalities. Among the people who sell and buy in these street fairs there is a strong heterogeneity in their socio-economic characteristics.

We also understand that these street fairs have what can be considered "good conditions" and the clients and sellers are satisfied with them.

- 13964 | An electronic nose distinguishes extra-virgin from virgin-refined olive oil – a proof of concept study

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The use of electronic nose in the food industry is an emerging technology. Olive oil, a cornerstone of the Mediterranean diet, is a complex product present in the market under several denominations. 'Extra-virgin' (EVOO) refers to unrefined while 'olive oil' commonly contains a blend of virgin and refined olive oil (VOO). It has been hypothesized that the beneficial effect of the Mediterranean diet could be due to the presence of compounds in extra virgin olive oil, such as volatiles, which are mainly responsible for the aroma of EVOO, and phenolics which affect the taste and the oxidative stability of the EVOO.

Adulteration of 'extra-virgin' has become a concern and certification and quality control a demand. Therefore, we hypothesized that an electronic nose may discriminate between 'extra-virgin' and 'virgin-refined' olive oil.

Olive oil volatiles from the same Portuguese brand were examined with a Cyranose 320 (Smith Detections, Pasadena, CA). Data acquisition after five minutes heating at 40°C of ten 3mL samples, of each EVOO and VOO, was performed. The resulting data were analyzed using principal component reduction. The primary endpoint was cross-validated accuracy, defined as the percentage of samples correctly classified using the leave-one-out method. The cross-validated accuracy of the eNose in identifying EVOO was 85.0%.

These preliminary data indicate that EVOO has a distinct exhaled VOC profile that can be detected with eNose technology. Further studies should address also different brands and its relation with consumer's choice.

- **14064 | Analysis of secondary metabolism of marine bacteria for anti-obesogenic natural compounds.**

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Obesity and metabolic diseases are a global health threat, with 600 million adults and 100 million children diagnosed as obese. Obesity increases the likelihood of various diseases and conditions like cardiovascular diseases, type 2 diabetes, sleep apnea, cancer, osteoarthritis and depression. Unfortunately, a lack of an efficient and safe pharmacological approach to treat obesity still exists. Therefore, novel compounds must be found.

Novel bioactive molecules are frequently found in underexplored environments, like marine habitats. Many marine animals have already proven to be reservoirs for such molecules. Evidences points to a microbial origin of these bioactive molecules present in the communities that colonize such animals. Thus, our main goal was to screen marine bacteria for the capacity of production of anti-obesogenic compounds, using zebrafish larvae (*Danio rerio*) as an in vivo model for anti-obesity bioactivity.

Over the course of this work, several *Actinobacteria* and *Gammaproteobacteria* bacteria, previously isolated from marine sponges off the coast of Portugal, were screened. These were chosen by the presence of known clusters of genes for secondary metabolites.

The anti-obesity assay showed that extracts, from one *Gammaproteobacteria*, *Pseudovibrio* sp. (B02 61), and one *Actinobacteria*, *Microbacterium* sp. (B02 79) were able to induce the reduction of lipid accumulation in zebrafish larvae.

This work demonstrated the bioactive potential of marine bacteria and is the starting point for exploring the anti-obesity potential found.

- **14085 | Antimicrobial coatings for use in silicone catheters**

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Catheters are medical devices which are prone to infection, and this is one of the most prevalent issues in the hospital setting. Silicone peritoneal dialysis catheters are no exception, having an associated morbidity and death in up to 10% of patients.

Graphene-based materials (GBM) are considered antimicrobial, and can readily act and kill bacteria when immobilized in coatings. However, most of the work that combines GBMs and silicone is directed towards improving its physical characteristics, but not its microbicidal properties.

This work aims to investigate the antibacterial properties of GBM-coated silicone. The effect of GBM exposure and oxidation in the antibacterial activity of the coating was investigated. For this purpose, two distinct coating strategies - dip and spray coating - were tested to achieve the exposure of the GBM at the surface.

The presence of silicone in coatings was found to be necessary to immobilize the GBM on the surface. In general, spray coating exposed higher amounts of GBM at the surface and more homogeneously than dip coating, but the latter provided a better adhesion of the GBM to the surface, despite not inducing changes in surface wettability.

Dip coating with non-oxidized GBM presented around 50% of bacterial death while samples coated with oxidized GBM increased this percentage to 80%. Spray coating samples induced higher bacterial adhesion and less percentage of dead bacteria than dip coating samples. Nevertheless, coating with oxidized GBM still resulted in 75% of bacterial death for the best condition. As such it was possible to conclude that the coatings with oxidized GBM induce more bacterial death, independently of the coating strategy.

Globally, this work demonstrates the potential use of GBM coatings in silicone for application in peritoneal dialysis catheters with improved antimicrobial properties.

- **14292 | Architecture and fashion: Spaces**

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This project appears as an attempt to research the links between architecture and fashion. Beginning with a brief contextualization of the historical evolution of each one of them, from the list of several works, whether of architecture or fashion while trying to do a formal analogy, so to speak, between the two.

Secondly, it is intended to identify the numerous possible relationships between the two disciplines and their respective objects: buildings and clothing, through characterization, comparison and interconnection between the two worlds. Including fashion production by architects such as the Smithson's and Zaha Hadid.

Then fashion places appear, from shops (space, showcase, exhibitors) to catwalks, to fashion shows, museums and confection ateliers. Therefore what is the best way to study the connection between these two than from the physical spaces where fashion happens?

And analyzing cases like the relationship of architects, for example Koolhaas and Studio KO, with great haute couture brands, for example Prada and Yves Saint Laurent / Balmain.

Finally, the means of communication, such as telecommunications and the growing transformation of society, have altered the way we experience time and space, consequently affecting the way architecture and fashion are lived. Therefore it is necessary to make an analysis in a way that shows how the advertising and media also affect the relationships between architecture and fashion.

It is thus intended with this project to show how the spaces of fashion and the links between architecture and fashion were, are and will be changed and at the same time how this two worlds (architecture and fashion) convey the spirit of its contemporary society.

- 13933 | Aspects of the demonstratives in European Portuguese: Deixis and Anaphora

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ABSTRACT. This research paper focus on the analysis of anaphoric chains in constructions with the demonstratives *este/ esse/ aquele* , and it fits into the unit course of Projeto which is included in the Language Sciences undergraduate degree. For the data collection, two written corpora (CETEMPúblico and Corpus de Referência do Português Contemporâneo) were used. The main objectives of this work are to verify the difference of meaning between *este* and *esse*, to analyze the anaphoric contexts in which *aquele* appears, to observe to what extent verbal time influences the demonstrative use and, finally, to make a brief presentation of the definite article and to understand to what extent the definite article establishes a relation with the demonstratives. This study has allowed us to understand the use of the demonstrative pronouns *este* and *esse*, in anaphoric chains. It is important to emphasize that these demonstrative pronouns behave differently when they are perceived deictically or anaphorically. Another topic developed within this project was based on the influence of verb tenses when using the demonstrative pronouns *este* and *esse*. Although this appears to be of relevant importance, the results did not reveal any significant information. It should also be noted that *aquele* was analyzed separately; because of its semantic characteristics, it was not possible to find enough examples about it. Using examples taken from corpora regarding *este* and *esse*, it was possible to verify that the predominant verb tense is the present tense. The result may not be significant, given its small extension; however, it could give us clues about what is currently happening in the field of the demonstrative pronouns.

KEY-WORDS. Demonstrative system, Anaphoric Chains, Definite article.

- **13973 | Assessing the impact of Leishmania infection on host cell migration**

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Leishmaniasis are a set of human diseases caused by protozoan Leishmania parasites that threaten around 350 millions in (sub-)tropical and Mediterranean areas. Leishmania are transmitted to the skin of mammalian hosts by the bite of an insect, and can either remain in the inoculation site or disseminate to remote tissues. Leishmania phylogeny is one of the factors determining parasite dissemination. This project I was working in deals with the premise that Leishmania, being obligatory intracellular parasites, can either promote or repress disease metastization by manipulating migration of their host phagocytic cells. To test our hypothesis, we have analyzed the impact that different Leishmania species have on the migratory behavior of phagocytes [specifically, dendritic cells (DCs) and macrophages (MOs)] resorting to 2D and 3D migration assays. Our preliminary data suggested that infection by Leishmania affects the migratory behavior of both DCs and MOs. DCs seemed to respond to infection by *L. amazonensis* by increasing their directed movement towards a specific chemokine (CCL21), while *L. infantum* and *L. major* apparently do not influence cell movement. As for MOs, infection by *L. major* and *L. amazonensis* apparently sustains their migration towards a chemoattractant, whereas *L. infantum* seems to induce their directed movement. Future studies will substantiate the relevance of these findings and further explore whether and how diverse Leishmania species (with different metastatic outcomes) differentially influence phagocyte locomotion.

- **14130 | Assessment Methods in Anatomy – Comparing Traditional Approach and Computer-based Assessment**

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Introduction: Recently, the increase in the number of medical students and the ever-escalating workload of academic staff in anatomy education jeopardized the traditional assessment methods. In this context, Computer-based assessment (CBA) in anatomy, might become an alternative to the time, material and staff-consuming nature of traditional pen-and-paper assessment system.

Aim: The aim of this study is to understand the impact of such shift in the assessment method and study students' preferences about it.

Methods and Materials: Second-year medical students attending a Clinical Anatomy course were randomized by clusters in two groups. The pen-and-paper group attended two sessions, each consisting of a traditional sectional anatomy steeplechase followed by a theoretical examination, while the computer group was involved in two similar sessions conducted in a computerized environment. At the end of each of the computer sessions, students in this group filled an anonymous questionnaire about their opinions towards CBA.

Results: In the first session, pen-and-paper group students scored significantly better than computer-group students in both the steeplechase (mean \pm standard deviation: 66.00 \pm 14.15% vs. 43.50 \pm 19.10%; $P < 0.001$) and the theoretical examination (52.50 \pm 12.70% vs. 39.00 \pm 21.10%; $P < 0.001$). In the second session, no statistically significant differences were found for both the steeplechase (59.50 \pm 17.30% vs. 54.50 \pm 17.00%; $P = 0.085$) and the theoretical examination (57.50 \pm 13.70% vs. 54.00 \pm 14.30%; $P = 0.161$). Besides, an inter-session improvement in students' perceptions towards CBA was registered.

Conclusion: After a familiarization period, CBA might be a performance equivalent and student accepted alternative to clinical anatomy pen-and-paper theoretical and practical examinations. Considering the satisfaction levels towards CBA of the studied sample, this assessment method offers a calm and user-friendly environment for work.

- **13957 | Assessment of synthetic cannabinoids' effects on neuronal differentiation in a neuroblastoma cell model**

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Synthetic cannabinoids (SCBs) represent a group of new psychoactive substances that bind and activate at least one cannabinoid receptor, with stronger potency than tetrahydrocannabinol (THC), the main psychoactive substance of cannabis sativa. The use of SCB by pregnant women or women in reproductive age is of major concern due to the potential onset of neurodevelopment disorders in the offspring.

In this work, we aimed to investigate if in vitro neuronal differentiation may be affected by SCBs. The neurotoxicity of several SCBs was firstly determined in a neuroblastoma cell model (NG108-15 cells) after incubation with the SCBs at a concentration range of 1pM – 100µM. Different parameters were analyzed, including metabolic activity (MTT reduction), lysosomal degradation (Neutral Red inclusion), cell membrane integrity (LDH release) and mitochondrial membrane potential (TMRE staining). Neuronal differentiation was induced with forskolin and retinoic acid, and SCBs were added once (at day 0) or every 24h for 3 days (3 additions), at biologically relevant concentrations (< 1µM). Number and length of newly formed neurites were counted at day 3 and differentiation ratios calculated as the number of neurites formed per total number of cells. Results showed that none of the SCBs reduced cell viability up to a concentration of 100 µM. Moreover, increased mitochondrial membrane potential was observed following a 24 h incubation with the SCBs. The SCBs seemed to promote neuronal differentiation, as indicated by the higher differentiation ratios in the presence of SCBs, compared to a negative control (cells with differentiation factors alone). No significant differences were observed between different number of SCB additions.

Overall, exposure to SCBs seemed to increase neuronal cells' differentiation, with results suggesting a possible mitochondrial involvement. However, clarification of the pathways involved demands further investigation.

- **14308 | Associations and associativism in the 30 years of Educational Sciences in the University of Porto**

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The recognition of the importance of the role played in the Portuguese society by a large number of associations, and the awareness of its educational dimensions, resulting from the involvement and participation of many thousands of people, has led to the association being an important field of study for Educational Science.

Being this is an area of study of educational sciences it is present in many subjects throughout the last 30 years, in which the study of associative movement takes a central place in the classes, with the collaboration of numerous associations in the processes of formation of many students. There are several academic works (of degree, masters and doctorate) about those associations that we find relevant to compile, systematize and analyze the knowledge that was produced, in this scope, in FPCEUP.

This research project has the following objectives: Identification of undergraduate and master's studies works carried out within the scope of subjects of the Educational Sciences in FPCEUP and of the master's and doctoral theses defended at FPCEUP that focus on associations; identify the associations that have collaborated in the training of FPCEUP students; analyze the master's and doctoral theses taking into consideration a reflection on the "role of associative movement as an object of the educational"; writing an article within the scope of the project.

Until the moment it was constructed a detailed database with all the works in study. Those were collected by searching in the online databases of the university and by searching in the personal archives of the professors of this faculty. The database included the following items: author(s), supervisor, title, year, degree, field, abstract (when existing), key-words, methodology and association in study. The process of identification of the works is slow due to the lack of an archive with all of them, nonetheless, with the help of the professors we can construct all the database.

- **13900 | Biochemical oxygen demand of several antipsychotic drugs: manual or automatic assessment**

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In last few years, the consumption of the antipsychotic (AP) drugs has seen a huge increase [1] and the search for methods for assessing the contamination load of these drugs is mandatory. The present work is aimed to assess the biochemical oxygen demand levels after 5-days (BOD5) of several antipsychotic drugs, both typical and atypical types. BOD determination is an empirical test in which standardized laboratory procedures used to determine the relative oxygen requirements of wastewaters, effluents and polluted waters [2].

It is aimed the evaluation of the BOD5 levels for the biochemical oxidation of several AP drugs by performing the reference Winkler method, and by applying an automatic system based on sequential injection analysis (SIA).

Concerning the results obtained by the Winkler method and those furnished by the SIA system, they showed good compliance, being the % BOD5 obtained in SIA system/BOD5 obtained in Winkler method not less than 95%. The SIA methodology is capable of operating as a screening method, being also more environmentally friendly, and cost-effective.

Moreover, it was calculated the percentage of degradation of this pharmaceuticals through the theoretical oxygen demand (ThOD) and the results are between 12% and 26% of degradation in accordance to the low biodegradability presented by organic compounds with unsaturated bonds and benzene rings. The studies presented open promising perspectives to improve the effectiveness of pharmaceutical residues treatment processes, by assessing BOD5 values at influent and effluent streams.

References:

[1] INFARMED, Psicofármacos: Evolução do consumo em Portugal Continental (2000 – 2012).

[2] Standard Methods for the Examination of Water and Wastewater, 20th edition.

Acknowledgements

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- **14241 | Biomass evaluation and macroalgae assemblages' composition of Belinho-Mar rocky shore**

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Macroalgae are organisms that live attached to the substrate, belonging to 3 groups: Rhodophyta, Phaeophyceae and Chlorophyta. They are important primary producers and provide habitat to several organisms. They are also of great economic importance giving compounds for food, industry and medicine.

This work aims to evaluate the seasonal variation of the available biomass of 5 target species as well as the composition of the Belinho-Mar macroalgae assemblages. The target species are *C. crispus*, *M. stellatus*, *O. pinnatifida*, *C. acicularis* and *Codium spp.*, selected for their abundance on the North Portuguese coast and potential commercial value. Secondly, temporal variation from 2010/11 to 2017/18 will be investigated by comparisons with previously collected data.

The study area is Belinho-Mar (Esposende), rocky shore located within the Parque Natural do Litoral Norte. Sampling was conducted monthly started from April 2017 and will end in January 2018. Sampling quadrats of 50x50 cm was the method used for data collecting. Two areas of the shore were considered and in each one haphazardly sampled 24 quadrats: 12 in the lower intertidal and 12 in the medium/high intertidal. Data collection consisted of recording the percentage coverage of all species found within the quadrat. For each of the two seasons to be compared (Spring/Summer; Autumn/Winter), the samples were collected in 3 different dates to obtain replicates that make up a temporal representative sampling allowing seasonal analysis.

Preliminary results showed a decrease in the number of macroalgae recorded in the Autumn/Winter months. July and August showed high percentage values of cover of the target species and *O. pinnatifida* had the highest values. In the end of the study it is intended to describe the biomass seasonal changes of the target species to ascertain if its harvest will be sustainable and, if so, which would be the best time of the year to perform it.

- **14123 | Blind Source Separation - State of the Art**

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Blind source separation (BSS) refers to the problem of recovering the original source signals from a mixture. BSS is an active subject of research mainly because of the increasing number of applications that can take advantage of it, like voice recognition systems and hearing aid technology. There is a wide range of methods for performing BSS, each with certain restraints and advantages.

This work presents a systematic review of the state-of-the-art of the main branches of research in the area as well as their limitations. It is also discussed how prior knowledge about the sources, its number, the recording process and environment as well as the expectations about the number of signals that should be generated can influence the choice of the most beneficial algorithm. It is also presented an analysis of the evaluation metrics used for BSS methods and how the lack of a standard set of metrics is possibly delaying the convergence of the research community towards the most promising branch.

- **13878 | Bullying phenomenon among Portuguese adolescents**

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To explore the phenomenon of bullying among school-going adolescents by assessing the prevalence, describing the most frequent tactics used according to gender; and by identifying social, behavioural and well-being characteristics.

A cross-sectional study was conducted in public schools of Porto, Portugal, during the 2014/2015 academic year. The sample included 2623 adolescents from the 7th to 12th grade. Information was collected through self-administered and anonymously questionnaires assessing social and demographic characteristics, school life, and emotional well-being and bullying experiences. The Ethics approval was obtained.

Girls were more frequently victims-only of bullying compared with boys (15.1% vs. 13.5%). However, boys tend to be more frequently involved as aggressors-only and as victim-aggressor (11.3% vs. 5.9%). Of those involved as both victim and aggressor, the prevalence was 13.3% and 10.2% for boys and girls, respectively. Gender differences were observed in the use of bullying tactics, while boys reported more frequently the use of direct tactics, girls reported the use of indirect tactics. Adolescents involved in bullying were likely to present negative well-being related feelings. Thinking about or considering, or planning for suicide was strongly associated with bullying involvement as simultaneously aggressor-victim in both genders. Bullying involvement is strongly related with other violent problems as cyberbullying and physical fighting, and may also undermine adolescents' perspectives about their future. Also, adolescents tend to disclose more frequently their bullying experiences to peers and less frequently to adults as parents or school staff.

Bullying is a common problem among school-going adolescents and it is related with negative well-being feelings. Effective strategies should be defined and implemented to prevent bullying and also to support adolescents involved in these behaviours.

- **13972 | Chalcone Derivatives: Synthesis and Antitumor Activity Evaluation**
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The promising biological activities of natural chalcones have prompted the development of several synthetic approaches to obtain chalcone derivatives. Additionally, the presence of an α,β -unsaturated ketone moiety make these compounds useful intermediates for synthesis of heterocyclic derivatives, namely isoxazoles and pyrazoles[1].

In the continuity of the work carried out in our research group concerning new antitumor small molecules, a small library of structurally related chalcones was synthesized by Claisen Schmidt condensation. In addition, isoxazole and pyrazole derivatives were obtained through molecular modification of the α,β -unsaturated carbonyl system.

All compounds were evaluated for their antiproliferative activity in three human tumor cell lines (A375-C5, MCF-7 and NCI-H460), by the sulforhodamine B assay. *In vitro* screening results showed that some compounds have potent antiproliferative activity on human tumor cell lines. For some of the most potent compounds, the effect on mitosis was evaluated in NCI-H460 cell line.

References:

1. Albuquerque, H.; *et al.*, *Current Organic Chemistry* 2014, 18 (21), 2750-2775.

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- 14000 | Characterisation of *Solanum lycopersicum* L. type 2 metallothioneins-encoding gene subfamily expression

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Some heavy metals are highly reactive and consequently can be toxic to living cells when present at high levels. Metallothioneins (MT) are small cysteine-rich metal chelators proteins that participate in the transport, sequestration and homeostasis of metals. In plants, there are four MT types: 1, 2, 3 and 4, which differ in their Cys-residues distribution and preferred expression profiles. This study aimed to analyze the MT2 subfamily gene expression in *Solanum lycopersicum* L. in shoots and roots of plants grown under optimal conditions. Based on the NCBI database, five MT2-encoding sequences were retrieved: MT2a, MT2b, MT2c, MT2d and MT2e. Specificity of the designed primers was firstly tested using genomic DNA. MT2a, c, d and e amplified sequences were sequenced and locally compared to those retrieved from NCBI and the obtained results indicate that all primers sets pair at different exons, except for MT2a and MT2b. Specific RT-PCRs were then performed in order to verify the expression of the different MT2 family gene members. Preliminary results showed that MT2a and MT2e were expressed in shoots and roots. The remaining MT2 gene members' expression evaluation is currently under process.

- 13967 | Characterisation of the GS multigene family in tomato plants in response to Diclofenac

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The increasing presence of pharmaceuticals in the environment has been a concerning issue over the years. Diclofenac (DFC) is an extremely used non-steroidal anti-inflammatory drug over the world that is not entirely removed in wastewater treatment processes and, so it reaches all ecosystems and could be a serious threat to all organisms, including plants. Nitrogen (N) is the major essential macronutrient for plant growth and its assimilation into organic forms is assured by glutamine synthetase (GS). GS has two major isoenzymes, a cytosolic (GS1) and a plastidic (GS2), which are encoded by a small nuclear gene family. Since the effects of DFC on plants, in particular on N metabolism, are poorly studied, this study aims to understand the influence of DFC on GS multigene family expression of *Solanum lycopersicum* L cv. Micro Tom., one of the most important agronomical species worldwide. To do so, tomato plants were treated with 1 mgL⁻¹ DFC for 5 weeks and, for each GS-encoding gene, specific primers were designed, and a semi-quantitative RT-PCR in both shoots and roots was performed. Preliminary results showed that there were no changes in *GS1a* expression between control and plants exposed to DFC. Also, data showed that DFC enhanced *GS1b* expression in shoots and roots, while it repressed *GS1c* expression. Finally, *GS2* expression diminished in shoots and increased in roots. These results seem to point an overall increased GS expression induced by DFC. In continuation, this study will be supplemented with RT-qPCR, western-blot and GS activity analysis.

- **14012 | Characterization of a double knock-out mutant for CK6CKX7 (CYTOKININ OXIDASE/DEHYDROGENASE) in the development of Arabidopsis thaliana (L.) Heynh**
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Seeds are essential for human's diet, so there's always the need to understand the regulating factors involved in sexual plant reproduction.

Phytohormones are compounds produced by plants, which modulate crucial processes for their development. Cytokinins (CKs) are one of the phytohormones involved in many processes of plant growth and development. Recent studies showed that CK has a role in ovule development; in plants that are defective in the production or perception of CK, the formation of the ovule is compromised and/or the number of ovules is reduced.

CK levels vary according to the plant stages of development, the stages of the cell cycle, and in response to environmental stimuli. These levels are regulated by many processes. One of them is irreversible degradation performed by cytokinin oxidase/dehydrogenase (CKX). It regulates the levels of active forms of CK and their distribution in plant tissues.

SEEDSTICK (STK) is a transcription factor, a MADSbox factor that determines ovule identity, seed development and abscission. Recent analysis identified CKX6/7 as STK targets. Understanding the role of these enzymes during seed development and the involvement of STK in their regulation, would help to uncover the crosstalk between STK and CK.

This study focused on the enzymes CKX6/7 and the respective genes, analyzing their involvement in ovule and seed formation. Double mutants for the genes *CKX6/7* were characterized: seeds were counted in each siliqua and GUS histochemical detection activity was carried out to verify the location of the expression of the gene *CKX7* in ovules and seeds.

The results showed that mutant plants for these genes exhibited less seeds and a higher percentage of seeds without embryos. The histochemical detection revealed CKX7 activity in synergid cells, the embryo sac cells involved in pollen tube attractio

- **14018 | Characterization of a novel drug resistant acute myeloid leukemia cell line**

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Cancer drug resistance is a major drawback in cancer treatment, limiting its success. Thus, it is important to determine and understand the possible causes of drug resistance to a certain drug. To achieve this goal, models to study drug resistance -namely pairs of drug resistant (DR) vs drug sensitive (DS) counterpart cell lines- are needed.

We aimed to create a DR cell line from a DS acute myeloid leukemia parental cell line, as well as to characterize the resistant counterpart cell line regarding the mechanisms of drug resistance.

The resistant cell line -HL60-734 VR- was established by treating the sensitive HL60 cell line with increasing concentrations of doxorubicin during several months. The resistance to doxorubicin was confirmed by performing dose-response curve. In addition, we tested the resistance of these cells to other three drugs. We verified if drug resistance was dependent on continuous drug treatments, by removing them and verifying if cells maintained a DR phenotype. Finally, we studied the expression of some proteins known to be related to drug resistance mechanisms.

We confirmed that the HL60-734 VR cell line is resistant to doxorubicin, when compared to the parental HL60 cell line, maintaining this phenotype upon drug treatment removal. This cell line was also resistant to the other drugs studied, therefore presenting a multidrug resistant phenotype. Additionally, the resistant cells did not express the drug efflux pumps P-gp or BCRP, neither alterations in the studied proteins involved in apoptosis. Nevertheless, resistant cells showed increased expression of a DNA repair protein and of proteins involved in drug metabolism.

Current work is aiming to confirm the relevance of the identified alterations in protein expression, by treating cells with known inhibitors of these proteins. In addition, future work will analyze and compare the cell cycle profile of HL60 and HL60-734 VR cell lines, and study the influx of doxorubicin by the DR cells.

- 14071 | Chemotherapy-induced neuropathic pain: How does a cytostatic drug interfere with pain transmission and modulation at the spinal cord?

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Chemotherapy-induced neuropathy (CIN) is one of the most common side effects of chemotherapeutic drugs used for cancer treatment. It is now known that cytostatics induce alterations at the peripheral nervous system but the effects at the central nervous system remain unknown. Here we studied the effects of the cytostatic paclitaxel on the development of nociceptive and aversive behaviors, noxious-evoked activation of spinal dorsal horn neurons and on descending noradrenergic modulation, which is the main spinal nociceptive inhibitory system. Male Wistar rats were injected with paclitaxel (2.0 mg/Kg) or the vehicle solution DMSO four alternate days. Nociceptive and aversive behaviors were assessed by the von Frey and conditioned place aversion tests, respectively. Noxious-evoked activation of spinal dorsal horn neurons was detected at one month after CIN by evaluating the expression of c-fos upon cold stimulation. To study the descending noradrenergic pain modulation, we assessed the effects of the α 2-adrenoreceptor (AR) agonist clonidine at 1 and 10 μ g, given intrathecally, on the von Frey and cold plate tests. We further assessed the expression of the α 2-AR and dopamine-beta-hydroxylase (DBH), a noradrenaline biosynthetic enzyme expressed in noradrenergic fibers at the spinal dorsal horn.

Paclitaxel induced mechano-allodynia and aversive behavior. It also increased the expression of c-fos and DBH while unaffected the α 2-AR expression. Clonidine induced antinociception at both doses with more pronounced effects in paclitaxel-treated animals.

Paclitaxel-treated animals showed neuropathic like-behaviors and increased spinal neuronal activation. It remains to ascertain if DHB upregulation results in increased spinal noradrenaline levels, but the increase of α 2-AR antinociceptive potency in paclitaxel-treated animals suggests the recruitment of descending inhibition probably as a buffer to increased spinal sensitization.

- 14108 | Chiral recognition of xanthone derivatives on human serum albumin stationary phase: effect of chromatographic conditions.

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Human serum albumin chiral stationary phase (HSA-CSP) demonstrated to exhibit broad chiral recognition and enantioselectivity for a variety of classes of analytes due to multiple binding sites [1].

Herein, enantiomers of thirteen among thirty-one xanthone derivatives synthesized “in house” were separated by liquid chromatography on HSA-CSP. The enantioseparation was explored using different mobile phases, under reversed-phase elution mode. Chromatographic conditions such as mobile phase pH, buffer type and ionic strength, type and content of organic modifiers and temperature were optimized for separation of enantiomers. Very high enantioselectivity and resolution were obtained with α and RS ranging from 1.55 to 8.16 and from 1.81 to 6.41, respectively.

This study will contribute to expand the applications of HSA-CSP on the separation of new class of chiral compounds, as well as for future studies concerning a better understanding of chiral recognition involved in enantioselectivity.

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[1] J. Haginaka, Chromatographic Separations and Analysis: Protein and Glycoprotein Stationary Phases, Comprehensive Chirality, 2012, Vol.8, 153-176

- **13912 | Chiral stationary phases based on amylose and cellulose derivatives**

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The development of chiral stationary phases (CSPs) for liquid chromatography (LC) brought a new breath to enantioseparation processes and, nowadays, several types of CSPs are available for the resolution of racemates [1]. Polysaccharide-based CSPs are one of the most versatile and widely used, both for analytical and preparative applications, especially those comprising phenylcarbamates of amylose and cellulose [2]. These CSPs proved to have excellent chiral recognition abilities being able to resolve several classes of racemates [3].

Herein, the preparation and characterization of two polysaccharide-based CSPs using 3,5-dimethylphenylcarbamates of amylose and cellulose as chiral selectors is described.

The synthesis of these chiral selectors was achieved through the derivatization of amylose and cellulose with 3,5-dimethylphenylisocyanate to provide the corresponding carbamates. After that, the chiral selectors were coated onto aminopropyl silica to provide ADMPC and CDMPC CSPs, respectively. Finally, both CSPs were packed into LC stainless-steel columns, and their enantioresolution performance was evaluated using several commercial racemates and chiral derivatives of xanthenes synthesized *in house*. As expected, high enantioselectivity and resolution were obtained.

This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT and ERDF, in the framework of the programme PT2020, the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599 – Promover a Produção Científica e Desenvolvimento Tecnológico e a Constituição de Redes Temáticas (3599-PPCDT)), and Chiral_Drugs_CESPU_2017.

[1] Chen, X.; Yamamoto, C.; Okamoto, Y. *Pure Appl. Chem.* 2007, 79 (9), 1561-1573.

[2] Matlin, S. A.; Tiritan, M. E.; Crawford, A. J.; Cass, Q. B.; Boyd, D. R. *Chirality* 1994, 6 (2), 135-140.

[3] Ribeiro, J.; Tiritan, M.; Pinto, M.; Fernandes, C. *Symmetry* 2017, 9 (9), 190, 1-28.

- **14088 | Choosing White Collar Crime: An Analysis of the Decision-Making Process**
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White-collar crime is a poorly understood problem and one of the most consequential crime type, with far-reaching costs beyond the pure financial realm. Compared with our knowledge of street crime, our understanding of the causes of white-collar crime remains relatively meager, despite of our aware of the increase number of crimes involving managers, and other highly respected, responsible for large organizations. The common answer to the recent wave of corporative scandals, with which society tends to agree, has been more punitive formal sanctions and an increase in convictions. However, there is an emerging and increasing skepticism about its deterrent effect on future illegal corporate conduct. In fact, studies have been demonstrating that the threat of formal sanctions can be ineffective, at least alone, and more attention should be paid to the role of informal sanctions and how the decision to engage in corporate crime is shaped by the relationship between individual and contextual factors. The need to have a clear and informed position on this issue, how to prevent it and control it, leads us to deepen the reasons underlying this type of offense and to analyze the effectiveness of alternative deterrent measures, that doesn't rely on a strict criminalization model based on punishment, moving towards more empirical studies.

This presentation aims to discuss one of the most important theories that explains this kind of offences and to present an empirical research work, already in motion, based on the rational choice model of corporate crime developed by Paternoster and Simpson (1996), explaining its hypothesis, methods and the expected outcomes. My purpose is to analyze and understand the decision-making process, how the perceived costs and benefits of this crime, morality, contextual characteristics of the organization and individual characteristics, shape and influence the intention to commit such acts.

- **13890 | Clues for the early prenatal diagnosis of osteochondrodysplasias: difficult but not impossible**

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Skeletal dysplasias or osteochondrodysplasias (OD) are a heterogeneous group of more than 350 diseases of genetic etiology affecting bone and cartilage. They show diversity in their form of inheritance, natural history, treatment and prognosis. Most of these conditions are distinctly noticeable, however, their conspicuousness is not as evident in the prenatal period showing great phenotypic and clinical variations that make diagnosis based on ultrasound alone particularly challenging. An early distinction between lethal and non-lethal forms is therefore of great importance as it allows timely counselling of parents and risk calculation for future gestations.

This investigation reviews the key markers that allow for the early diagnosis of the main types of skeletal dysplasias (achondroplasia, thanatophoric dysplasia, osteogenesis imperfecta and achondrogenesis). A systematic regional approach is described exemplifying the diagnostic protocol that allowed for early diagnosis in our cases. Ultrasonographic, genetic and molecular characteristics are considered alongside with postmortem evaluation. We conclude that if the appropriate protocol is followed and the various characteristics are evaluated in a systematic form it is possible to achieve an early diagnosis of the condition and thus minimize both fetal and maternal pain.

- **14116 | Cohousing: design strategies and scales of living together**

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The following paper is a research project that took place at FAUP under the supervision of Professor Marta Rocha. The focus of this investigation turned to the design mechanisms adopted in the configuration of the common and the private domestic spaces in Cohousing.

Nowadays, there are a diversity of family structures due to different factors such as economic crises, single-parent families, late independence of young adults, precarious situation of many unemployed, etc. Given this, the life of each person is no longer linear and may undergo unforeseen changes more frequently, influencing their way of dwelling. In this sense, Cohousing emerges as an alternative response by rethinking on existing conventional housing that often turns out to be too rigid and inadequate to this different ways of living of today.

In the absence of a more detailed and comparative work on designing building solutions of this nature, this work, reconciling the intrinsic scope of this subject with the field of project design and architecture, establishes a 'new insight' of contemporary Cohousing communities. Through the redesign of 12 international case studies built between 2003 and 2015, it was possible to identify, by the analyses of their drawing peculiarities and similarities, different design strategies according to common patterns of how the spatial, formal and social results are achieved and shaped by this shared form of living.

These strategies highlighted a new operative way of thinking about the design of Cohousing projects: the scale of cohabitation as space matter, resulting in the presentation of four gradual levels of cohabitation intensities delivered by the combination of specific elements and architectural tools that creates a higher or lower intensity of living together. A close relationship between inhabitant - inhabit - habitat transmitted by the architectural drawing and a new instrument to the conciliation of familiar and private life with the common living spaces.



From design strategies towards scales of living together.

- **14126 | Coincidence-anticipation in volleyball female and male players: stimulus direction effect**

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The study of coincidence-anticipation (CA) allows significant contributions to the understanding of human learning and performance, because it expresses a highly valued competence in different fields of human activity, particularly in sport.

Variables such as direction of stimulus have been thoroughly investigated in the CA literature. (Coker,2003, 2005; Payne, 1988). The aim of the present study, was to analyze the effect of direction of stimulus in coincidence-anticipation, of female and male cadets in volleyball. Our sample comprised 29 individuals, of whom 17 were female and 12 were male, aged 14 to 15 years old. The instrument used to evaluate coincidence-anticipation was the Bassin Anticipation Timer, at a constant speed of 12mph. The direction of the stimulus varied from right to the left (RL) and from left to right (LR). A 2x2 (gender, stimulus direction) Anova with repeated measures on the last factor was performed for each error (AE, CE, VE) and the level of significance was set at $p \leq 0,05$. Results revealed a non-statistical difference for stimulus direction and for gender. These findings are discussed in the framework of sports specificities.

Key-words: coincidence-anticipation; gender; stimulus approach; volleyball

- **14214 | Comparing two different Laser Powder Bed Fusion systems: microstructure, hardness and influence of heat treatment on the parts built**
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The Additive Manufacturing (AM) is revolutionizing the way of manufacturing metal parts. AM allows the production of near net shape parts/components with several advantages comparing with conventional manufacturing processes: geometrical freedom, production flexibility, efficient use of materials and materials versatility. AM has seven categories of process; Powder Bed Fusion is one of this categories which enable the manufacturing of metal parts. One of the most known processes of PBF is the laser powder bed fusion (LPBF), where a laser selectively fuses regions of a powder bed, layer by layer according with a digital data. On the last five years, the LPBF has emerged and in this moment there are several machines/systems available in the market. However, there is still a need for researching and developing the manufacturing process. Metal parts made by LPBF are commonly heat treated due to the fine microstructures and non-equilibrium structures, which in turns affect the mechanical properties. A comparative study was made in two metal parts manufactured by two different PBF systems. The metal parts had the same design and were made of the same material: Maraging Steel (17-4PH). The parts as built were assessed through: Optical Microscopy (OM), Scanning Electron Microscopy/Energy Dispersive Spectroscopy (SEM/EDS) and Vickers hardness test. In order to enhance final properties of metal parts, four different heat treatments were evaluated. The characterization of the heat treated parts were studied using: OM and Vickers hardness test. When comparing both systems, there were observed differences between the parts, especially in porosity and hardness. From the heat treatments performed it was concluded that a solubilization followed by an aging improves the hardness of the parts manufactured by both LPBF systems. However, the final properties and the optimization of heat treatments are influenced by the microstructure as built.

- **14173 | Constraining dark energy from the redshift drift.**

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The redshift is fundamental to our understanding of how the Universe evolves, and plays a crucial role in restricting cosmological models and their parameters.

Instruments like the E-ELT will give us, for the first time ever, the ability to measure how the redshift of objects following the Hubble flow changes with time. This observable, known as the redshift drift, will further constrain cosmological models. Based on estimates for the sensitivity of the E-ELT, we studied how its redshift drift measurements can constrain several cosmological parameters and break existing degeneracies between them, in an effort to understand the impact of this new instrument. In other words, we tried to predict its scientific value.

- **13944 | CONSUMER PROTECTION IN LIGHT OF COLLABORATIVE CONSUMPTION**

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Expressions such as collaborative economy, collaborative consumption or sharing economy are, nowadays, becoming increasingly popular. They translate a phenomenon that, based on the technological and digital possibilities of the 21st century, has introduced new business models in everyday life, redefining the consumption and sharing of goods.

However, the regulatory response that should be given to this phenomenon is uncertain.

It is questioned how this new reality should be regulated, taking in account all the interests involved and its rapid growth and change.

One of the most important issues in the collaborative consumption discussion is consumer protection (if it exists and if it is appropriate).

In our analysis, first, it's necessary to distinguish a relationship of consumption from other contractual relations in which a consumer appears to intervene.

Secondly, it is necessary to investigate the pertinence of the current legislation, considering its effective application.

We will conclude that the existing legislation, although applicable, is insufficient and needs to be adapted to the specificities inherent of the contractual relations and the platforms that support the collaborative economy, pointing out the main issues that need to be resolved in order to build an adequate and efficient regime.

- **14199 | Cork and Digital Production Technologies: New possibilities for using cork in Ephemeral Architecture**

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The present communication summarizes the research on "Cork and Digital Technologies: Possibilities of application in Ephemeral Architecture", developed as a Master in Architecture dissertation at FAUP under the supervision of Prof. José Pedro Sousa and in collaboration with the DFL, a research group of CEAU/FAUP.

This work is structured in four main parts. The first introduces cork as a natural and sustainable material and exposes the advantage of its intrinsic, performative and aesthetic characteristics and its great potential for out of the box applications. The second part revolves around how digital technologies are interfering in the design and materialization of architectural projects, and dedicates a special attention to its impact in the geometric and material features of cork. The third part discusses the concept of ephemeral architecture and argues about the interest of using cork to address such programmatic challenge. Finally, motivated by the previous theoretical background of the thesis, the fourth part presents and illustrates a practical experiment on the design and fabrication of an ephemeral architectural module built with cork. This module is called HEXA-SHED and explores advanced digital technologies like parametric design and robotic fabrication.

As a conclusion, this project envisioned a field of opportunity for digital innovation in ephemeral architecture using cork. The result is the HEXA-SHED project, which demonstrates a design and fabrication methodology for an adaptive and customized architectural solution. As proof of concept, a real scale detail was fabricated using an industrial robot at the DFL, and was presented in public during the last CONCRETA 2017.

Acknowledgments

The author would like to thank Amorim Isolamentos for providing the material for conducting this thesis. All practical experiments were conducted in the facilities of the DFL, Digital Fabrication Laboratory (CEAU/FAUP).



HEXA-SHED: Parametric prototypes, Robotic fabrication and Real scale detail

- **14153 | Creating introspective atmospheres: water as an architectural element**
Francisco, Ana, Faculdade de Arquitectura, Portugal
Casal Ribeiro, Helder, Faculdade de Arquitectura, Portugal

This research aims to study the presence of water in internal spaces and question its architectural meaning by identifying its properties and different capabilities in interpreting and molding atmospheres of introspection, reflection and creativity.

In today's increasingly accelerated world where the frantic pace and excessive amount of information that fulfills our senses, takes up a big part of our daily routine, we need to conquer some pauses that will allow us to get out of this accelerated rhythm, by escaping to spaces, which will receive us in their essence, providing moments of peace, meditation and connection with ourselves. In this endeavor water comes up as a natural resource that, for its characteristics and multisensorial properties, is capable of generating these kinds of atmospheres.

Water appeals to our five senses: its capacity of reflection to work as a mirror, the shine it emanates when illuminated, the sound it creates when in motion; simultaneously, water also appeals to our touch and to our taste, for its essentiality to all life forms, providing us pleasure due to the fulfilment of our vital needs; finally, water appeals to our smell because it's a means through which olfactory stimulus can be achieved.

This versatility permits us to work with water and to introduce it into the architectural narrative of internal spaces in very distinctive ways, exploring different meanings and atmospheres. We intend, through the analysis of two specific study cases, Alhambra and Thermal Baths in Vals by Peter Zumthor, to deepen the understanding of water as a preponderant element in the definition of quality spaces, i.e. to study its presence as an architectural constitutive element.

This research is currently underway within the master thesis integrated on Master's Degree in Architecture, at FAUP, 2017/2018, under the supervision of Helder Casal Ribeiro.

- **13898 | Crise da representação: repetição enquanto diferença em**
Pereira, José Pedro, Faculdade de Letras, Portugal

In this presentation, I will focus on the way the use of repetition inevitably entails a mark of difference in Samuel Beckett's third and final book of his Three Novels: *The Unnamable*. My take on the way Beckett perceives the concept of repetition in this particular novel is that it is fundamentally impossible to represent something without adding anything new to it, thus being equally impossible to create closed systems of knowledge and interpretation. In doing so, I will trace the importance that Beckett's work had in the subsequent development of post-structuralist theory, which main focus was the dissolution of stable and closed structures. To corroborate my point, I shall employ the use of Jacques Derrida's and Gilles Deleuze's theories regarding repetition and difference. In doing so, I will make a reading of the multilayered voice found in the narrative, and analyze the way difference through repetition enables him/it to deconstruct the systematic concepts that are imposed to him, more specifically: time, identity and language. I will end by demonstrating how this voice describes a process where the subject will progressively abandon everything that is extrinsic to him. This is a great example of the development of what Deleuze calls "becoming imperceptible".

Through this approach, I will evince how the narrative's voice will embrace chaos rather than trying to give an order to it. To build my argument, I will employ concepts such as "différance", "body without organs" and "becoming". Ultimately, I aim to show that Beckett represents the 'system' or 'structure' as representatives of vagueness, but he still maintains some hope in the use of repetition and difference as a means of representing the world and the subject.

- 14002 | Current and future constraints on extended Bekenstein-type models for varying fine-structure constant

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There is a growing interest in astrophysical tests of the stability of dimensionless fundamental couplings, such as the fine-structure constant, as an optimal probe of new physics. The imminent arrival of the ESPRESSO spectrograph will soon enable significant gains in the precision and accuracy of these tests and widen the range of theoretical models which can be tightly constrained. Here we illustrate this by studying proposed extensions of the Bekenstein-type models for the evolution of the fine-structure constant which allow different couplings of the scalar field to both dark matter and dark energy. We use a combination of current astrophysical and local laboratory data (from tests with atomic clocks) to show that these couplings are constrained to parts per million level, with the constraints being dominated by the atomic clocks. We also quantify the expected improvements from ESPRESSO and other future spectrographs, and briefly discuss possible observational strategies, showing that these facilities can improve current constraints by more than an order of magnitude.

- **14250 | Cyclosporine A- loaded solid lipid nanoparticles for topical application**

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Cyclosporine is a common immunosuppressant used to treat many dermatological diseases. However, its high molecular weight, hydrophobicity and low permeability through biological barriers such as skin, makes it difficult to use more frequently as a valid option for topical treatment. In an attempt to enhance the drug delivery of cyclosporine through the skin barrier, it was prepared a formulation of solid lipid nanoparticles (SLN). Their wide variety of characteristics make them great candidates to reach the goal of a controlled site-specific drug delivery.

Softisan-based SLN, stabilized with Tween 80 were prepared by hot homogenization followed by ultrasonication method. Softisan is a non-animal derived semisolid lanolin substitute with high water-binding capacity and good adhesion to the skin. It is widely use in cosmetic industry and has great potential to be use in the preparation of SLN particles used in skin delivery systems.

The formulations were characterized by their size and zeta potential using the dynamic light scattering and cyclosporine encapsulation rate was calculated uv/vis spectrophotometry. Fourier-transform infrared spectroscopy (FTIR) analysis verified the presence of cyclosporine within the Softisan SLN. A storage stability test was also carried to evaluate the behavior of the particles over time with respect to size, zeta potential and drug content. In vitro drug release assay was conducted in conditions that mimicked skin to ascertain the amount of drug that can be released from the particles. The results show that this particles may present advantages in skin delivery of cyclosporine A.

Acknowledgments

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia and Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013. SCL thanks Operação NORTE-01-0145-FEDER-000011 for her Investigator contract

- **13946 | Degree Achievements - A comparative study between European Portuguese and English**

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The *Degree Achievements* (DA) have already been studied by several authors, among them Abusch (1986), Dowty (1979) and Kennedy and Levin (2008). Despite the several studies already carried out, there is still not a consensus about them, not even about their definition. These constructs are projected by verbs that derive from adjectives. They present several peculiarities, among which we distinguish the ambiguity between the telic and atelic readings and the scalar character of these structures.

The aim of the present study is to compare DA in European Portuguese and English, particularly regarding the telicity topic. The distinction between open-scale DA and closed-scale DA, present in both languages, will be explained in the second section of the paper, where we also make a brief introduction to some of the literature produced on this subject, mentioning the main authors that served as a basis for our work, as well as some fundamental concepts for the complete understanding of the study, especially those related to the aspectual typology of Moens (1987). The following section, dedicated to the presentation of the data, includes the explanation of the way in which the examples were collected and the actual presentation of the data, for both Portuguese and English. The examples were manipulated, by combining them with "*in x time*" and "*for x time*", which are the main tests used to distinguish a process (atelic) from a culminated process (telic), in order to analyze and compare the behavior of the studied DAs, which allowed us to make a contrast between both languages. The end of the section includes a brief synthesis of the similarities and differences between the two languages. In section 4 we analyze the data, in contrast with the theoretical proposals. We finish the study with some final considerations (section 5).

- **13991 | Determination of Bisphenol A, S and F in meat canned and their effect on human endometrial stromal cell proliferation and viability**

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Bisphenol-A (BPA) is one of the most abundant synthetic chemicals in the world, widely used in plastics, including toys and other baby products, food and beverage packages, thermal paper, and many others industrial and household products. Concerns about its endocrine disruptive, with an estrogenic-like activity, have led to its gradual ban, mainly in products targeting children, such as baby bottles. BPA is being substituted by other bisphenols, like bisphenol F (BPF) and bisphenol S (BPS) whose similarity could translate in the same or worst health effects.

In this study we aimed to identify and quantify BPA, BPS and BPF in canned food, like pâtés, sausages and pre-made meat meals. For that, we optimized a GC-MS method previously developed by Cunha et al. (1). Since bisphenols are well-known endocrine disruptors that may impair human reproductive health and fertility, we also aimed to investigate their effects on endometrial stromal cells turnover. Therefore, their effects on proliferation and viability of a telomerase-immortalized human endometrial stromal cell line (St-T1b), after 24 h and 48 h of treatment, using Sulforhodamine B and MTT assays (2), respectively, were evaluated.

In the canned packages (30 samples), it was observed that BPA was the most prevalent bisphenol, being detected in all samples, in different levels. BPF and BPS were also detected in some of the samples, although with lower levels. Contrary to what was expected these compounds did not affect the viability and proliferation of the endometrial cells.

Bisphenols are present in our everyday diet and may negatively impair reproductive health, although additional investigation must be enrolled, mainly regarding BPS and BPF disruptive activities.

1. Cunha SC, Cunha C, Ferreira AR, Fernandes JO., *Anal. Bioanal. Chem.* 2012; 2453-63

2. Samalecos A, Reimann K, Wittmann S et al., *Reproduct. Biol. Endocrin.*: 2009; 7-76

- **13981 | Development and characterization of a knock-down RNAi line for fasciclin-like arabinogalactan protein 5 (FLA5) in *Arabidopsis thaliana***

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Pereira, Ana Marta, Università degli Studi di Milano, Italy

Coimbra, Sílvia, Faculdade de Ciências, Portugal

The fasciclin-like arabinogalactan proteins (FLAs) are a subclass of 21 members that belong to the arabinogalactan protein (AGP) family in *Arabidopsis thaliana*. FLAs are a heterogeneous group characterized by having one or two fasciclin-like domains and one or two AGP-like glycosylated regions in their polypeptide core. They are widely distributed in various cells and tissues and are implicated in plant growth and development, yet only few FLA genes in *Arabidopsis* have been identified and functionally characterized.

This study is focused on fasciclin-like arabinogalactan protein 5 (FLA5). FLA5 has 2 pro-rich domains flanking a fasciclin domain and a glycosylphosphatidylinositol (GPI) anchor. FLA5 is a target of the transcription factor SEEDSTICK, which regulates the development of the ovule and the seed (Mizzotti *et al.*, 2014). Since seeds are essential units for plant propagation and the first step in their development is the formation of ovules, it is very important to study the genes involved in the reproductive process.

Therefore, to increase our knowledge about the role of FLA5, the objective of the present work was to obtain a *fla5 knock-down* line by RNA interference.

Mizzotti C, Ezquer I, Paolo D, Rueda-Romero P, Guerra RF, et al. (2014) SEEDSTICK is a Master Regulator of Development and Metabolism in the Arabidopsis Seed Coat. PLoS Genet 10(12): e1004856. doi:10.1371/journal.pgen.1004856.

- **14196 | Development and characterization of pH sensitive fucoidan-chitosan nanoparticles for oral delivery of methotrexate**

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Sea reconnaissance as a source of bio compounds has a positive impact on the development of new drug delivery systems (DDS) due to their biodegradable and biocompatible characteristics. Marine polysaccharides have been used as matrix for the spread of DDS since they improve drug's efficacy and ensure its safety by controlling the rate, time and local of its release.

In this study, fucoidan (a sulfated polysaccharide extracted from brown seaweed) and chitosan (a polysaccharide derived from chitin) were explored for the development of polymeric carriers. Our main objective was to develop pH sensitive carriers using a simple ionic-gelation method through a probe-type ultrasonication method at room temperature. Methotrexate is a chemotherapy agent and immune system suppressant with toxic side effects, short half-life in the bloodstream, and low bioavailability due to its poor water solubility and permeability. Chitosan (LMW <10,000 Da) and fucoidan (MW 50,000-190,000 Da) were mixed at a ratio of 5 to 1 (5F1C) and 5F1C nanocarriers containing MTX were prepared by adding 0,90 mg of drug to the polymers mixture. The characterization of the nanocarriers included the following parameters: encapsulation efficacy (%) and size, polydispersity index and zeta potential which was performed under the conditions that mimic the pH variation throughout the gastrointestinal tract. The obtained results show that fucoidan/chitosan (5F1C) nanoparticles are pH sensitive and have encapsulation efficacy rates of approximately 96% for MTX.

Acknowledgments:

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- **13937 | Development of a bioreactor for surface disinfection with ultraviolet radiation**

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The presence of biofilms on industrial surfaces can cause negative impacts, particularly economic and health problems. Chlorine is the disinfectant most commonly used. However, its corrosive properties and the production of toxic disinfection by-product when in the presence of organic substances proposes that novel strategies for effective biofilm control are required. Ultraviolet (UV) radiation is an environmentally friendly and not toxic alternative, requiring further understanding on its biofilm control potential. Therefore, the present study aimed the development of a system for disinfection of surfaces with UV radiation. The apparatus of disinfection system was a batch reactor with a rotating cylinder. Planktonic cells and biofilms of *Escherichia coli* were exposed to UV radiation for different times (30 s, 1.5, 5 and 30 min) and the number of colony-forming units (CFU) was assessed. The results showed that UV was highly effective in CFU reduction of planktonic cells. No CFU were detected, even for the lowest exposure time. For biofilms, 30 s and 1.5 min caused 1.0 and 3.3 log CFU/cm² reductions. At 5 min exposure time no CFU were detected. In conclusion, the system developed with UV radiation was effective not only for the disinfection of planktonic cells but also against biofilms.

- **14219 | Development of a database of speech stimuli in Portuguese and Mandarin Chinese for a talker identification task**

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Talker identification performance in experimental tasks is affected by language-related factors, as it is usually more accurate in the native language than in unknown languages (e.g., [1]). To adequately specify language-related accuracy patterns, those tasks must take into account cross-language equivalence in basic acoustic characteristics that could act as confounding factors. The adequate development and selection of vocal stimuli plays, therefore, an important role in the study of vocal identity recognition across different languages. For that purpose, we developed a database of 522 Portuguese (native language) and 352 Mandarin Chinese (unknown language) speech stimuli. These two sets were derived from a group of 28 Portuguese pseudo-sentences (i.e., "sentences" with no meaning) and 20 Mandarin Chinese sentences, recorded by male native speakers of each language (five Portuguese and six Mandarin Chinese speakers). The pseudo-sentences in the native language were originally constructed for our database, while the sentences in the unknown language were retrieved from an existing repository. The process of construction and selection of the stimuli for a talker identification task will be described. The resulting set of speech stimuli offers a new tool for research in talker identification and voice processing in the Portuguese and Mandarin Chinese languages, that is also valuable for cross-cultural comparisons.

References:

[1] Goggin, J. P., Thompson, C. P., Strube, G., & Simental, L. R. (1991). The role of language familiarity in voice identification. *Memory & Cognition*, 19(5), 448-458. doi:10.3758/BF03199567

- **14296 | Development of a georeferenced library of native microbial consortia for bioremediation of oil spills**

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Oil spills are one of the most hazardous accidents to coastal environments and traditional clean-up methods are not suitable for ecological restoration. Bioremediation can be a cost-effective treatment to accelerate the removal of oil spills from contaminated environments by, for instance, increasing microbial populations capable of degrading petroleum compounds.

The use of native microbial consortia for bioremediation of oil spills, based on their higher potential to survive and thus more effectively degrade the oil petroleum compounds, but also avoiding environmental issues derived from the introduction of non-native organisms, can be a sound alternative to the use of chemical additives. However, there is a need to develop concepts and methodologies in order to allow the use of native cooperative consortia with high ability to degrade petroleum compounds as an effective tool to clean affected natural marine areas. Therefore, the aim of this study is to produce a georeferenced library of native microbial consortia with capacity to degrade petroleum compounds.

Marine water samples were collected along the NW coast of the Iberian Peninsula. Three microcosms replicates were assembled, for each site, with petroleum, marine water and nutrients and kept under orbital agitation, in the dark, for 15 days. The obtained microbial enriched consortia will be identified and characterized at the taxonomic and functional level using genomic and metagenomic next generation sequencing technology (NGS), and their biodegradative potential will be evaluated in laboratory microcosm experiments. The selected native microbial consortia with an intrinsic capacity to degrade petroleum compounds will be preserved in a georeferenced library that will be available for future upscaling production and implementation of bioremediation technologies to the specific geographic regions from which the native consortia have been obtained.

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- 13935 | Development of a web platform for telerehabilitation after hip replacement surgery

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After a hip replacement surgery or arthroplasty, rehabilitation plays a key role in the recovery and maintenance of the wellbeing of the patient. Nowadays, telemedicine and e-Health systems are used in order to help both physicians and physiotherapists to allow a better management and accompaniment of their patients. In addition, the patients can perform exercises and/or learn about their condition remotely and without having to spend time in displacements. This project proposes a web platform for physiotherapists and patients, in which they can perform a remote monitoring and complete a therapeutic program, respectively. The patient's movements are recorded through the Kinect camera and are assessed in real-time by machine learning algorithms.

- **14181 | Development of an anti-adhesive coating based on a bacterial extracellular polymer**

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Medical devices are widely used in modern medicine. However, these devices are susceptible to bacterial contamination that may originate infection. Most device-related infections are caused by biofilms that are difficult to eradicate representing a high human and economic burden [1]. Conventional treatments apply antibiotics or biocides that have insufficient activity, are toxic and may promote bacterial resistance. Therefore, new biotechnologies that prevent biofilm formation represent a promising way to fight infection establishment [2]. The use of natural polymers to produce antibiofilm coatings is a new trend in biomedical research. Here, a marine cyanobacterial extracellular polymer with an anionic and hydrophilic character [3], is being explored for the development of an anti-adhesive coating. The application of such coating in for e.g. catheters will prevent bacterial adhesion, the formation of biofilms and the consequent infection in patients exhibiting several comorbidities. For this purpose, the bacterial culture was grown in optimized conditions, and the polymer was isolated and extracted following a simplified and improved protocol. After polymer processing, the coating was produced by spincoating and characterized by water contact angle measurements and ellipsometry. The coating anti-adhesive performance was evaluated against *Staphylococcus epidermidis* in the absence and presence of human plasma proteins, revealing always a low bacterial adhesion profile. Moreover, to assess the coating thrombogenicity, a platelet adhesion and activation assay was performed in the presence of human plasma proteins. The results obtained showed a very low platelet adhesion and non-activation. The coating non-cytotoxicity was also demonstrated according to ISO10993-5, using L929 fibroblast cell line.

[1] del Pozo & Patel 2007 Clin Pharmacol Ther 82:204-9

[2] Costa et al. 2011 Acta Biomater 7:1431-40

[3] Pereira et al. 2009 FEMS Microbiol Rev 33:917-41

- **14312 | Development of bioremediation technologies based on deep sea microorganisms**

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Petroleum hydrocarbons in crude oils, such as those released in the past into marine ecosystems, for example, by the Exxon Valdez, BP Deepwater Horizon, and Prestige spills, are natural products derived from aquatic algae laid down between 180 and 85 million years ago. Crude oils, composed mostly of diverse aliphatic and aromatic hydrocarbons, resins, hopanes, polar molecules and PAH's regularly escape into the environment from underground reservoirs. Because petroleum hydrocarbons occur naturally in all marine environments, there has been time for numerous diverse microorganisms to evolve the capability of utilizing hydrocarbons as sources of carbon and energy for growth. Thus, this project aims to exploit deep sea microbial resources for developing novel processes based on microbial biotechnology that can address bioremediation of polluted environments. To do so, bacterial strains were isolated from sediment samples collected in the Portuguese continental platform, and cultivated in the laboratory to test their ability to degrade petroleum hydrocarbons (HC). In this process, samples were incubated for 15 days, in triplicate, in 100 mL flasks with 10 mL Bushnell - Haas broth (BH) medium supplemented with NaCl (2%) and 50µL of crude oil. The density of HC degrading microorganisms was assessed at the beginning and at the end of the experiment, using the Most Probable Number (MPN) method. For that, samples were incubated in 96 well-plate for 15 days at room temperature in the presence of crude oil and BH medium. In addition, at the end of experiment, different culture media (PCA, Marine Agar, Bushnell-Haas, SYP-SW) were used to isolate bacterial strains. The isolated strain will be identified by sequencing techniques after DNA extraction and amplification, and their potential to degrade crude oil will be tested. The strains with higher degradative potential will be tested for their ability to produce molecules with biotechnological application, namely biosurfactants.

- **14056 | Development of fluorescent carbon dots: application in glucose sensing**

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Carbon dots are fluorescent carbonaceous nanoparticles usually with dimensions less than 10 nm [1-4]. They possess very attractive analytic properties, such as water-solubility, high photostability, high fluorescence quantum yield, biocompatibility, low toxicity and are easy to functionalize [1-4]. These unique properties have led to promising applications in optical sensing of several analytes of interest, as biomolecules, metal ions and free radicals [1-4].

Such assays are based on changes of emission intensity of the sensor when in contact with the target analyte, even though fluorescence intensity can be affected by a variety of factors, which can lead to interferences in the measurements [1,4].

On an ongoing project, different kinds of carbon dots are being produced and tested to detect if there are any changes on the carbon dot fluorescence in the presence of different amounts of glucose. If this work yields functional carbon dots based glucose sensors, then we obtain a simple, rapid and low-cost pathway to glucose determination.

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[1] B.B. Campos, R.C. Cáceres, T.J. Badosz, J.J. Jiménez, E.R. Castellón, J.C.G. Esteves da Silva, M. Algarra, *Carbon* 106 (2016) 171.

[2] E.F.C. Simões, J.M.M. Leitão, J.C.G. Esteves da Silva, *Anal. Chim. Acta* 960 (2017) 117.

[3] E.F.C. Simões, J.M.M. Leitão, J.C.G. Esteves da Silva, *Microchim. Acta* 183 (2016) 1769.

[4] B.B. Campos, R.C. Cáceres, T.J. Badosz, J.J. Jiménez, E.R. Castellón, J.C.G. Esteves da Silva, M. Algarra, *Sens. Actuator B-Chem.* 239 (2017) 553.

- **14068 | Development of novel upconversion nanosensors**

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The process of upconversion (UC) has been extensively studied in the past few years and has proven to be a successful method for generating visible light from NIR radiation. UC is a non-linear optical process by which excitation of lower electronic levels with low energy radiation (NIR light) results in higher energy emission (visible or UV light) at higher electronic levels, and can therefore be ascribed as an anti-Stokes mechanism. This process requires the absorption of two or more photons to provide the sufficient energy for the UC emission to occur.[1]

The use of optical nanocarbon-based upconversion sensor has the potential for high sensitivity, selectivity and reproducibility. The use of infrared up conversion excitation greatly decreases the background fluorescence of the method, which leads to an optimum signal-to-noise ratio for use in complex biological samples. Infrared excitation also leads to minimal photodamage and to better deep tissue penetration. [2]

In the present work we developed a nanocarbon-based upconversion sensor for future analytical applications.

[1] Joubert MF. Photon avalanche upconversion in rare earth laser materials. *Opt Mater.* 1999; 11:181-203.

[2] A. Kumar, S.P. Tiwari, K. Kumar, V.K. Rai, *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy*, 167 (2016), 134.

- **14210 | Developmental precursors of callous-unemotional traits**

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The constellation of affective, interpersonal, self-referential and behavioral traits associated with the construct of psychopathy have proven to be important for designating a distinct group of antisocial adults. Research has shown that incarcerated adults who also show psychopathic traits show a more severe and violent pattern of antisocial behavior. Callous unemotional traits are prominent in most conceptualizations of psychopathy in adults. To date, most research on psychopathic traits has been conducted in adult samples, especially in incarcerated adults. These individuals often have a long history of antisocial behavior beginning in childhood and may have specific personality traits as children. We rely on the assumption that if we could identify early manifestations of psychopathic traits it could be possible to design interventions that are more effective for children at risk as personality and behavior tends to be more changeable in childhood. The study of the precursors of psychopathic traits earlier in development, and their interaction with environmental processes, should allow us to analyze the protective factors that can enhance the adjustment of individuals who are at risk of developing persistent deviant behavior.

Thus, the present study, will attempt to define meaningful subgroups of antisocial and aggressive youth, focusing on the manifestation of sub-clinical psychopathic traits. Its main objective is the creation of a scale that can operationalize the developmental precursors of callous unemotional traits in children aged 2 to 5.

- 14235 | Diversity and bioactive potential of endophytic Actinobacteria isolated from the seaweed *Laminaria ochroleuca*

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Diseases such as cancer or multi-resistant bacterial infections constitute serious problems that require urgent treatments. The discovery of new bioactive compounds may provide novel molecules to fight these diseases, being nature still the major source for seeking them. Actinobacteria are recognized as unrivalled producers of bioactive compounds with pharmaceutical and industrial interest, yet there are still many habitats that are unexplored as to the diversity and bioactive potential of these microorganisms, such as marine ecosystems. This study aimed to isolate endophytic actinobacteria from the seaweed *Laminaria ochroleuca*, collected in a beach in the north Portuguese coast, and to investigate their potential to produce bioactive compounds. To isolate the community of endophytic actinobacteria, samples of the seaweed were surface sterilized and plated in three selective culture media. A total of 93 bacterial strains were obtained and identified by 16S rDNA sequencing. Eighty-seven of them were found to belong to the phylum Actinobacteria, the majority (86%) being identified as *Streptomyces*, and the remaining belonging to the phyla Firmicutes and Proteobacteria. All actinobacterial isolates are currently being screened for their antimicrobial activity against several pathogenic strains and anticancer activity in various cancer cell lines. According to the results obtained in these screenings, future studies will be carried out to investigate in more detail the structure of potential bioactive compounds.

- **14271 | Drivers of amphibian phylogenetic diversity and phylogenetic endemism in the Iberian Peninsula**

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Many standard conservation approaches use species as fundamental units of biodiversity and assume that their distributions are static in both time and space. However, it has long been recognized that accounting for evolutionary processes that maintain genetic diversity and adaptive potential is of major importance for conservation planning and management. To properly address these evolutionary processes in conservation planning, it is necessary to understand the historical processes correlated to present biodiversity patterns. Several hypotheses have been formulated to explain spatial diversity patterns, including mid-domain effects, water-energy availability, climate stability and heterogeneity and historical climatic refugia. Yet, the general efficiency of these drivers as surrogates for conservation remains unclear.

Our work aims at identifying potential mechanisms correlated with the spatial distribution of the diversity of Iberian amphibians at inter- and intra-specific levels. Specifically, we aim to: map inter- and intra-specific phylogenetic diversity; identify hotspots of phylogenetic diversity and endemism; and, lastly, test the previously hypothesized environmental and climatic variables to explain current spatial patterns of biodiversity.

To achieve these goals, there will be three main tasks: T1. identify and map spatial patterns of phylogenetic diversity and endemism for Iberian amphibians, both at inter- and intra-specific levels; T2. compile spatial data on different geographic and environmental variables; T3. test the ability of the variables to explain current spatial patterns of phylogenetic diversity and phylogenetic endemism.

Results will provide useful information to improve conservation planning and management as it will better current understanding of the underlying causes of spatial biodiversity patterns at different evolutionary scales, as well as predictions of the impacts of future climate change on those patterns.

- 14154 | Drought stress impact on the oxidative status of 'Cobrançosa' adult trees: how these olive cultivar cope with climate change

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The production and quality of olive trees is extremely relevant to the Portuguese economy, being the olive oil one of the main products consumed and exported by the country. Olive oil has multiple uses from gastronomic purposes to cosmetic products. In the last year, we have dealt with extremely atypical weather conditions, such as severe drought, which affect the yield of table olives and their quality. With this investigation, we aimed at understanding at the biochemical and physiological levels the main problems created by the climate change on olive fruits and leaves development, and also how the quality of the products can be affected. To do so, we used olive fruits and leaves from drought and hydrated regimes from orchards in Trás-os-Montes, Portugal. Fruits and leaves were treated, to comparatively assess the oxidative status of the samples. Membrane stability was evaluated by measuring malondialdehyde (MDA) and putatively related with cell membrane permeability (CMS). Leaves of drought regime present higher values of reactive oxygen species (H₂O₂ and O₂⁻), which is evidenced by a higher membrane instability in comparison to the hydrated regime. The analysis through MDA also showed higher values from the leaves in the drought regime.

keywords: Reactive oxygen species, Malondialdehyde, olive orchard, table olive

- **14242 | Dynamics of zooplankton communities in Alqueva reservoir**

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The construction of the Alqueva Dam led to the creation of the Albufeira do Alqueva, the largest artificial lake in the Iberian Peninsula. Despite its large size and importance in the surrounding ecosystems and economy, the dynamics and communities of this lake largely remain unmonitored. However, some problems with eutrophication were detected. Zooplankton is one of the most widely used bioindicators of water quality, especially in reservoirs. This group of pelagic organisms represents a pivotal, intermediate level in the food web, by feeding off of phytoplankton and being predated by fish. Hence, they have a big impact controlling the amount of nutrients available in any given aquatic system. This study intends to analyse its abundance and dynamics in the Alqueva reservoir, as a way to characterize its current state.

Sampling by pumping was performed in nine different sites across the lake during a full year, in order to study the spatial distribution as well as seasonality. Samples were then analysed in the laboratory to determine several physicochemical parameters as well as the richness and abundance of the present zooplankton community.

Currently, only the samples from February to August have been analysed, showcasing a consistent richness of the same six taxa appearing throughout all nine sampling sites throughout the year. However, their abundance and presence changed over time. Copepod nauplii and cyclopoids were the most numerous and dominant species overall; however, in certain months and sites this dominance changed to other species like *Daphnia longispina*, *Bosmina longirostris* or *Diaphanosoma mongolianum*. A strong seasonality in abundance was observed, with summer samples displaying a higher zooplankton abundance than winter samples. A spatial gradient was observed, with samples closer to the dam presenting higher zooplankton abundance.

- **13983 | EARNINGS MANAGEMENT USING CLASSIFICATION SHIFTING OF EXTRAORDINARY ITEMS**

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This study investigates whether managers shift core expenses to extraordinary items to manage earnings in Egypt. The study measures classification shifting through a methodology similar to McVay (2006) by modeling core earnings, expected core earnings, unexpected core earnings, and the unexpected change in core earnings. Data are obtained through listed firms on Egyptian Stock Exchange. The evidence is consistent with the research hypothesis that managers use classification shifting of income statement items to increase core earnings. This tool of earnings management does not change bottom-line earnings of income statements.

Keywords: earnings management; classification shifting; core earnings; extraordinary items

- **14134 | Ecological evaluation at an eucalyptus allotment of Santa Justa's mountain through its flora and fauna edaphic characterization**

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In the last decades, Portugal suffered a lot of changes in its soil use and vegetation type. intensive plantations became common for the extraction of its products specially cellulose for paper production. This switch in the way soil is used may have influenced changes in the biotic communities. This study pretends to make the characterization of the soil ecological status through the evaluation of the fauna and flora in an intensive production area that is going to be reconverted.

Six different sampling areas were identified in a total area of 40 ha: A - area with cut and inoculated by fungus, B - adults eucalyptus area, C - rocky area, D - eucalyptus sprouts, E - eucalyptus reference area, F - area with . In each area the study was conducted to achieve the soil seed bank, the soil physical and chemical characterization (pH, organic matter, electrical conductivity, water holding capacity) and the soil arthropods diversity.

Seed bank germination in laboratory was conducted in chambers with controlled conditions to understand the species that will keep growing in the area. In places like this it is essential to understand the flora diversity including the presence of invasive species as it is known that they exists in Santa Justa' surroundings.

Soil arthropods diversity have been considered as good representatives of the ecological conditions due to their rapid generation time and ease of sampling. With the usage of pitfall traps it is expected to get a significant characterization of the edaphic community in the different sampling areas.

With the combination of all of the parameters described above, it is expected to get a significant characterization of this area that allows the comparison with other similar studies so the ecological situation is understood. The results of this project can also be used as an instrument of decision support for further local interventions.

- 14097 | Effect of O₃ and NO₂ atmospheric pollutants in the allergenicity of *Quercus robur* L. pollen

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The plantation of trees in city avenues, street-walks and in public parks is increasing, which can have great allergenic impact upon the health of the residents. Also, the interaction between air pollutants and airborne pollen has been suggested to increase pollen allergenicity potential.

Therefore, the aim of our study was to assess the effects of two atmospheric pollutants (O₃, NO₂ and a mixture of O₃ + NO₂) on the protein content and allergenic properties of *Quercus robur* L. pollen.

The pollen was collected in the green area of FCUP, during the 2017 flowering period. The catkins were randomly collected from all quadrants of the tree in different branches. After separation of extraneous materials, the anthers were dried, gently crushed and thus the pollen released was passed through different grades of sieves to obtain pure pollen.

Pollen samples were exposed, in vitro, to concentrations of O₃ and/or NO₂ within the limit value for the human health protection in Europe (Directive 2008/50/EC), for 6h in an environmental chamber. In this chamber the sun light was simulated and the temperature and relative humidity were continuously measured, as well as the pollutant gas concentration.

In this communication the main results of this research will be presented, with focus on the observable differences between the non-exposed pollen and those pollen samples exposed to one and both air pollutants. The discussion will be based on the soluble protein content, the allergenic properties using patient sera sensitized to pollen.

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- **14212 | Effect of school days on the affluence to paediatric emergency on subgroups regarding scholar level.**

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There are no recent studies regarding the impact of school days on the affluence to the paediatric emergencies. Hence, this research aim is to describe the clinical burden of school days in the orthopaedic paediatric emergency.

A retrospective observational study was performed, between January 1st 2014 and December 31st 2016, among orthopaedic paediatric patients of emergency care of Hospital de São João, in Oporto. Patients were aged between 3 and 17 years old and they were all discharge by an orthopaedic physician.

The population of the study was grouped by the following scholar levels: pre-school (3 to 5 years old), 1st cycle (6 to 9 years old), 2nd cycle (10 and 11 years old), 3rd cycle (12 to 14 years old), and high school (15 to 17 years old). Regarding this, we calculated the affluence to the orthopaedic physician by calculating the prevalences ratio (PR) between days of school and the holiday days on each scholar level. The two different periods include weekends.

There were 167519 patients that had been discharged from the paediatrics emergencies by an orthopaedic physician. For each scholar level the prevalences ratio were 1,17 on pre-scholar, 1,27 on 1st cycle, 1,48 on 2nd cycle, 1,65 on 3rd cycle and 1,40 on high school.

The supposed impact of school days on the affluence to the orthopaedics paediatric emergency was confirmed by the prevalences ratio that was statically significant for each group.

- **13885 | Effects of a self-training program on shooting performance and kinematics in young basketball players**

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The purpose of the current study was to investigate the effects of a self-training program on shooting performance and kinematics of young basketball players.

Fourteen male basketball players aged 16.57 ± 0.51 , divided in control group (CG, $n=7$) and experimental group (EG, $n=7$), were assessed on free-throw (FT), 2-point (2P) and 3-point (3P) shooting performance and on the ball release parameters [release height (RH), release angle (RA), release speed (RS) and trajectory variability (TV)].

During the subsequent 5-weeks, the EG accomplished a shooting training program that included 600 shots per week. Both groups kept up their regular basketball practice. At the end of the 5-weeks period the two groups were assessed once again in the previous set of variables.

The results show that the EG significantly increased their shooting performance from $31.43 \pm 9.60\%$ to $54.29 \pm 8.10\%$ on 3P ($p < 0.01$) and from $69.54 \pm 14.60\%$ to $79.53 \pm 10.45\%$ on FT ($p < 0.05$). Moreover, a significant decrease in 3P ball RA from $52.39 \pm 4.38^\circ$ to $50.23 \pm 3.56^\circ$ ($p < 0.05$) and a significant increase in FT ball RH from $2.13 \pm 0.10\text{m}$ to $2.15 \pm 0.11\text{m}$ ($p < 0.05$) were observed in the EG, while the CG significantly increased the 2P ball RS from $7.10 \pm 0.34\text{m/s}$ to $7.39 \pm 0.15\text{m/s}$ ($p < 0.05$).

In conclusion, self-shooting basketball practice, in addition to formal practice, significantly improves shooting performance of young basketball players. In contrast, the reduced changes on shooting kinematics caused by the self-training program are most likely a consequence of the absence of external feedback during training process.

- **14078 | Effects of O₃, NO₂ and SO₂ in *Dactylis glomerata* pollen**

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Pollen can be modified by the increasing environmental pollution which can lead to a rising trend in pollen-induced respiratory allergies.

The aim of this work was to study the viability, protein profile and allergenicity of *Dactylis glomerata* pollen after exposure to O₃, NO₂, SO₂ and a mixture of O₃ and NO₂.

In this study, pollen collected in 2017 was exposed to the pollutants in an environmental chamber with temperature and relative humidity controlled and artificial sunlight. Each sample of pollen was exposed during 6h to the hour-limit concentration acceptable for human health protection in Europe (Directive 2008/50/EC).

After exposing the pollen to the gases, viability tests (FDA) was performed. Protein extraction was made and total protein content was determined colorimetrically by the Bradford method. The antigenic and allergenic properties were analysed by SDS-PAGE and immunological techniques (Western blot and ELISA) using patients' sera.

Pollen viability significantly decreased after exposure to the gaseous pollutants. Also a significant increasing trend in the total protein content in the exposed samples comparatively with the control one, but the SDS-PAGE protein profiles did not show differences. The patient sera tests revealed differences in immunoglobulin E (IgE)-binding reactivity, suggesting alterations in the antigenic characteristics of the studied pollen.

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- **14160 | Effects of Zn high levels supplementation to *Solanum lycopersicum* cv. Micro-Tom plants**

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The heavy metal (HM) and essential micronutrient zinc (Zn) is very important for plant physiology including the attenuation of HM-induced oxidative stress. Conversely, exposure to very high levels of Zn can be toxic. In this work, the toxicity effects of Zn on tomato plants (cv. Micro-Tom) were studied, where biometry tests (plants' size and fresh weight measurements), quantification of Zn, oxidative state evaluation, biochemical analysis of antioxidant and N-assimilation enzymes were performed. Ten days-old seedlings were grown in vermiculite:perlite (2:1) and watered with Hoagland solution (HS) under the following conditions: C - control; +0.87 mM ZnSO₄ (T1) for 6 weeks; +0.87 mM ZnSO₄ for the first 3 weeks and then +3.5 mM for the remaining treatment period (T2); and treated with HS for the first 3 weeks, followed by +3.5 mM ZnSO₄ (T3). The plants' biometry analysis for all the Zn concentrations tested revealed no changes in shoot size and fresh weight with all treatments. The Zn levels in tissues significantly increased with all Zn treatments: 16.1- (T1), 23.8- (T2) and 21.8-fold (T3) in shoots, and by 7.4- (T1), 9.4- (T2) and 9.1-fold (T3) in roots. Fruits accumulated much less Zn than shoots and roots, but presented an increased accumulation of 1.75- (T1), 2.35- (T2) and 1.95-fold (T3). The reactive oxygen species oO_2 - significantly decreased in shoots and remained unchanged in roots for all treatments, except for a significant decrease with T3. Also, SOD activity significantly increased in shoots from T2, but decreased with T3. H₂O₂ significantly decreased in roots and increased in shoots. Lipid peroxidation levels significantly increased in shoots and decreased in roots with T3. Glutamine synthetase' activity significantly increased in shoots and decreased in roots. In summary, tomato Micro-Tom cultivar plants seem to have the ability to tolerate high levels of Zn. Although Zn had no negative impact on plants' growth, affected the plants' metabolism.

- **13955 | Elderberry anthocyanins: an important bioactive resource to support therapeutic approaches for Parkinson disease**

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It is well-known that neurodegenerative events occurring in Parkinson's disease are associated with mitochondrial dysfunction and altered redox state of cells. Thus, the objective of the present work is to evaluate the potential of elderberry anthocyanins (*Sambucus nigra*L.) to support a multi-target therapeutic strategy to modulate these interlinked brain pathological events. HPLC-DAD analysis revealed the phenolic profile of aqueous elderberry extract and of its anthocyanin-enriched fraction, indicating that cyanidin-3-*O*-sambubioside, cyanidin-3-*O*-glucoside and their 5-*O*-glucosides derivatives are the most representative compounds. Both extracts exhibit strong antioxidant activity, as revealed by DPPH, nitric oxide and superoxide radicals scavenging activity. Cyclic voltammetry showed that elderberry extracts have a reversible redox behavior within a redox potential range in which mitochondria redox chain operates, which is ensured by anthocyanins. Despite the water solubility of elderberry anthocyanins, fluorescence studies with two membrane probes showed that they are also incorporated by the lipid bilayer of brain mitochondrial membranes. Bioenergetic studies indicated that anthocyanins-enriched fraction does not affect the respiration of healthy brain mitochondria, but is able to overcome complex I inhibition induced by rotenone, promoting the oxidation of NADH and deliver of electrons to ubiquinone or complex III in the inner-mitochondrial membrane. Thus, elderberry anthocyanins have potential to support a multi-target approach to modulate the altered redox state of brain cells and mitochondrial dysfunction underlying Parkinson's disease.

This work received financial support from National Funds (FCT/MEC) through project UID/QUI/50006/2013, co-financed by FEDER through COMPETE, under the Partnership Agreement PT2020, and from NORTE 2020, under the PORTUGAL 2020 Partnership Agreement, through ERDF (NORTE-01-0145-FEDER-000024).

- **14169 | Estimation of mutation rates at Y-STRs**

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The properties of the Y chromosome make it extremely informative for forensic application. Short tandem repeats (STRs) have been the most commonly employed type of Y-polymorphisms, particularly due to their high levels of diversity. Y-STR typing is especially useful when DNA from two or more males is mixed, when there is a low amount of male DNA compared to the female DNA in a mixture, or in the so-called deficiency cases in which the alleged father is not available for testing. Because it lacks a homologous chromosome, the Y chromosome does not recombine in most of its extension. Thus, it is the only chromosome that enables the exact knowledge of which parental allele resulted in which filial one. Since Y-STRs are biologically and analytically like autosomal STRs, knowledge obtained through the study of Y-polymorphisms can be transferred to autosomal (or X-chromosomal) ones.

In this work, we studied mutation rates of Y-STRs by analyzing father-son duos in a bi-allele framework. Allele and bi-allele mutation rates were computed by proportioning the number of Mendelian incompatibilities between father-son duos, for each pair of paternal and filial alleles. The number of repeat gains and losses, in an intra-marker approach, is not in equilibrium. Indeed, alleles do not mutate uniformly, tending to mutate to longer alleles if they are shorter than the modal allele, and to shorter ones if they are longer. Alleles within the same marker have distinct mutation rates, in some cases the respective confidence intervals do not intersect. However, to improve statistical confidence on mutation rate estimates it is peremptory to collect as many complete haplotypic data as possible. Notwithstanding, the method of proportion will hardly become an immaculate method to estimate mutation rates, even for the Y chromosome, regardless the number of observations. Thus, the development of a mathematical model to infer mutation rates is required, even when Y transmission is considered.

- **14009 | Evaluation of a Novel Mouse Model of Pancreatic Neuroendocrine Tumors**

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Pancreatic neuroendocrine tumors (PNETs) are rare but clinically challenging neoplasms in which the genetic background was poorly understood until a few years ago. MEN1 was reported as the most commonly mutated gene in both hereditary and sporadic tumors. With the advent of whole-exome sequencing, new insights on the genetics basis of the disease were achieved with the report of two novel frequently mutated genes in about 40% of PNETs: DAXX and ATRX. Such results prompted us to develop a new mouse model of disease with conditional ATRX deletion in the beta cells of the endocrine pancreas using the RIP-Cre/LoxP recombination system. To evaluate this novel mouse model of disease the objectives were to characterize the study population, evaluate histologically the mice pancreas, characterize the endocrine cell population and the tumors that arose in the sample. Genotype evaluation allowed us to distribute the 161 mice in 3 different groups: 63 controls, 59 heterozygous and 39 homozygous mice. 141 animals were found with prominent inflammation of both of the exocrine and endocrine tissues. Although no significant differences were found regarding genotype, inflammation and pancreatic lesions progressed significantly with age. Hyperplasia of the pancreatic islets also arose as a prominent finding: the median of endocrine fraction was observed to be highly increased for both the control (8.7%) and flox groups (8.1%), progressing significantly with mice aging. The remaining 20 animals developed pancreatic tumors with a poorly differentiated phenotype and a highly proliferative index. The lack of staining for the conventional neuroendocrine lineage markers might reflect a poorly differentiation of a neuroendocrine carcinoma. Further studies are now required to address this hypothesis or to demonstrate another tumor origin. The role of hyperplasia will also be thoroughly evaluated as a possible step in PNET tumorigenesis.

- **14117 | Evaluation of ecosystems' conditions in "Serras do Porto" through remote sensed data and GIS analysis**

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The eucalyptus is the most common exotic species in Portugal forests and the concern about their effects in ecosystems is growing. Forests are dynamic, complex and multidimensional ecosystems. Geographical Information Systems (GIS) provide useful tools and are commonly used in forest management. GIS allows the manipulation, analysis, and generation of considerable amounts of environmental information. This information can be used for evaluation of ecosystems' conditions and for decision making.

The study case of this project is the municipal lands included in "Serras do Porto" and Valongo's Nature 2000 network. For decades this area was extensively explored with plantations of eucalyptus in order to produce cellulose for paper industry. Due to the characteristics of the area and its extension (40 hectares) the use of GIS became the most viable alternative to characterize it. The combination of GIS tools and remote sensing (RS) data allows the characterization of terrain relief, namely the analysis of: altimetry, hypsometry, hydrography, and the creation of a Digital Elevation Model (DEM).

The geographic information was obtained through different GIS open source applications integrated in QGIS open source software and Sentinel Application Platform (SNAP) open source RS software. Through a Sentinel 2A image, the Land Use Land Cover (LULC) map and the Normalized Difference Vegetation Index (NDVI) map were obtained. The LULC map obtained was validated through field points collected in the study area with a GPS Trimble receptor. Combining the field samples with the outputs from SNAP software, several maps were obtained in QGIS software such as slope and orientation maps, groundwater vulnerability, erosion risk, and forest fire risk map. Furthermore, it is possible to obtain other type of geographic information such as burned areas, fauna and flora, species richness and orthophotomaps. This information allowed to characterize the study case and provide useful analysis.

- 14017 | Exploitation and environmental recovery of Bled El Hedba deposit
"Algerian Case Study"

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The phosphorus mineral is essential to life, it is essential for plant and animal nutrition. This nonmetal element is generally found in nature as phosphate deposits. These minerals are extracted and separated from the others with which they are mixed in the ore deposits. The phosphorus is a key element in agriculture with which NPK fertilizers are produced. Algeria is the 3rd country in the world for phosphate reserves and its exploitation is the third most important, after petroleum and gas sectors. Under this context, Algeria expects to extract phosphate from Bled El Hedba deposit in order to increase its annual production to 20 million tons in the horizon of 2020.

Therefore in the sense of creating sustainability in mining exploitation, the main purpose of this work is to verify the possibility of carrying out both processes, extraction and environmental recovery, simultaneously.

The first step was to define the ultimate pit limit, the second step was to determine the extraction phases and to plan the production scheduling of the mine.

In terms of results for this project, they were likely near to the reality of the mining practice where the management of the volumes removed was difficult to deal with. The problem of the waste management and environmental recovery was solved in this case by using an external dump in the first phase of phosphate exploitation and while advancing in exploitation doing a transition into the internal dumping.

The realization of this proposal cannot take place without considering the tailing generated by the processing plant, once the surface phosphate extraction generates a big amount of wastes but they are not sufficient to refill the pit.

- **14278 | Exploring the role of oxidative protein modifications in trophoblast function**

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Redox status imbalance plays a role in deficient placentation and the development of pregnancy-related complications (e.g. preeclampsia or gestational diabetes). We have previously observed a positive and significant correlation between carbonylated albumin in the placental bed and maternal age. In this work we aimed to evaluate whether *in vitro* carbonylated albumin interferes with extravillous trophoblast function.

HTR-8SV neo cell line (HTR) was acquired from ATCC and grown with RPMI 1640 supplemented with 5% FBS and antibiotics. Albumin expression and secretion in HTR cells was evaluated by western blotting using a human-specific antibody. Albumin was carbonylated *in vitro* using hydrogen peroxide alone (H₂O₂) or a combination of hydrogen peroxide and copper sulfate (H₂O₂+CuSO₄), followed by extensive dialysis and western blotting to confirm its carbonylation. HST-8SV neo extravillous trophoblasts were treated with carbonylated/non-carbonylated albumin and cell viability and motility were evaluated by neutral red assay and *in vitro* scratch assay, respectively. A P value less than 0.05 was assumed to denote significant difference.

Evaluation of albumin expression by western blotting showed that HTR cells produce and secrete albumin. Albumin incubation with 1M H₂O₂ and 0.1M H₂O₂+ 0.05mMCuSO₄ increased its carbonylation. However, H₂O₂+CuSO₄ promoted intense protein degradation and was not used further in this study. Non-toxic concentrations of carbonylated albumin impaired trophoblast motility.

Albumin oxidative modifications appears to interfere with trophoblast ability to invade and thus transform the maternal placental site.

- 14025 | Exploring the secondary metabolite potential of Planctomycetes from marine and freshwater environments

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Antibiotic resistance is a major problem, placed on the priority list of the World Health Organization. Dangerous bacterial infections are becoming increasingly more difficult to treat, reflecting the urgency to find new compounds. As old sources are overmined, novel producers of antimicrobials and secondary metabolites have to be identified. One example is the bacterial phylum *Planctomycetes*, which belongs to the PVC super-phylum. They possess large genomes, complex life cycles and can colonize most habitats, as for instance the biofilm of certain marine organisms, such as macroalgae. These characteristics along with their already demonstrated genetic potential in secondary metabolite production make them promising candidates for the discovery of new drugs. Therefore, we intended to explore the secondary metabolite potential of several strains of marine and freshwater *Planctomycetes*, the majority of them isolated from the complex and competitive biofilm of macroalgae. We focused on possible antimicrobials against different target organisms. Various antimicrobial screening assays and several culturing and extractions preparation protocols were performed. Bioactivity against *Bacillus subtilis* and *Micrococcus luteus* was observed for extracts obtained from different *Planctomycetes* species, *Rhodopirellula baltica*, *Rhodopirellula rubra*, *Aquisphaera giovannonii* and *Rubinisphaera brasiliensis*, following an extraction protocol with ethyl acetate as solvent. Assays that evaluated anti-*Chlamydia trachomatis* activity by *Planctomycetes* metabolites showed promising results, but additional studies are needed. Our work confirmed the capacity of *Planctomycetes* to produce antimicrobial metabolites effective against Gram positive bacteria as well as possible against the intracellular pathogen *Chlamydia trachomatis*.

- **14135 | Expression and Intend: pursuing Rui Pimentel's work process**

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The present research aims to acknowledge Rui Pimentel's work, more specifically, his role in deepening the design process in Porto between the 1940s and 1960s, an experimental period in the portuguese modern architectural scene.

In the context of the third generation's battle for modern architecture, it is important to underline the country lived a dictatorial regime, with all its restrictions and restraints, but also, recognize EBAP's endeavour to free their academic studies and programmes from official 'Estado Novo' affirmation.

It's with this generation that we encounter various activist, Rui Pimentel included, that battled in defence of an ideological modern architecture, alongside F. Távora, Mário Bonito, Arménio Losa, Cassiano Barbosa, among others.

Towards the end of 1940's, collective housing was one of the main research themes guided by central European architectural experimentation set on: objectivity, utility and functionality.

Rui Pimentel's design process, informed by "Existenzminimum" experimentation, explored these settings through formal depuration and the deepening of the new forms of collective dwelling, adopting compositional concepts and spatial associations. The asymmetric and rhythmic compositions, inspired by neoplastic notions, reinforced his design principles, which explored material's plastic and chromatic value regulated by a rigorous geometric draft. A clear architectural language, based on Le Corbusier's principles, guided Rui Pimentel's work process and design themes resulting in built modern manifestos imbedded in Porto's urban fabric.

The following research is related to an on-going Master Thesis in Architecture, supervised by Professor Hélder Casal Ribeiro.

- **14315 | Expression of GLUT1 and GLUT4 in right ventricle in Pulmonary Arterial Hypertension – Effects of chronic treatment with NRG1**

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Neuregulin-1 (NRG1) has been shown to play beneficial effects on Pulmonary Arterial Hypertension (PAH) and right ventricle (RV) hypertrophy, has also been associated with the regulation of glucose metabolism. In this study we investigated the correlation between disease markers and the GLUT1 and 4 expressions in RV, in an animal model of PAH. We also evaluated the effect of chronic treatment with NRG1 on GLUT1 and 4 expression in the RV of animals with PAH.

Wistar rats randomly received 60mg/kg of monocrotaline (MCT) or vehicle. After 14 days, they were randomly treated with rhNRG1 (40µg/kg/day) or vehicle. The study resulted in 4 groups: control (CTRL); CTRL+rhNRG1; MCT and MCT+rhNRG1. Between the 21st and 24th days after MCT administration, hemodynamic studies and sample collection were performed. Only significant results (mean±SEM, p<0.05) are given.

We found that the decrease in ejection fraction correlates with increased GLUT1 expression (p=0.0005) and decrease in GLUT4 expression (p=0.0167) in RV. We also observed that increased GLUT1 expression correlates with increased hypoxia-inducible factor 1-alpha expression (p<0.0001). The decrease in GLUT4 expression was shown to correlate with increased brain natriuretic peptide (p=0.0032) and endothelin-1 (p=0.0006) expression, two markers of cardiac overload and hypertrophy. GLUT1 expression increased in the RV of MCT group (4.13±0.49AU) compared to the CTRL group (1.00±0.19AU), but in the MCT+rhNRG1 group these values were completely reverted (1.66±0.31AU). GLUT4 increased in all groups of animals treated with rhNRG1 (CTRL+rhNRG1=1.41±0.09AU and MCT+NRG1=1.48±0.18AU vs. CTRL=1.00±0.16AU and MCT=0.75± 0.02AU).

The expression of GLUT1 and 4 correlate with parameters of cardiac function and with disease markers and chronic treatment with rhNRG1 attenuates the changes in GLUTs induced by PAH. Thus, the therapeutic effects of rhNRG1 in PAH might be due in part to the regulation of GLUT1 and 4 expression.

- **14251 | Facilitating reflections on gamete donation in higher education: World Café with health students**

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Education on ethical issues in reproductive health is essential to inform, raise awareness and provide skills to help health students participating in health governance and governance for health. However, issues related with gamete donation are sparsely addressed at medical schools. Aiming to facilitate reflection on gamete donation among university health students, a World Café was developed with students from the Master and PhD program in Public Health at University of Porto, in November 2017, focused on gamete donor recruitment strategies to address the shortage of available sperm and oocytes to satisfy demand in the National Health Service. Twenty-three students were invited to discuss their perspectives around three tables, heterogeneous by study cycle and gender. Data was recorded, transcribed and thematically analyzed.

Preliminary findings on the strategies to increase donor recruitment included: to turn gamete donation visible by promoting public debate; redefining compensation according to personal expenses; rethinking anonymity (although not consensual, the double track alternative was proposed); and the expansion of the restrictive donor selection criteria. Students also highlighted the need to develop educational campaigns and training courses targeted to health professionals and potential donors approached at universities or healthcare centres. These strategies should include information about the risks and the rights of all stakeholders involved, avoiding stigmatization of recipients. The use of available institutional and personal resources (e.g. hospital information display systems, mobile health units, personal testimonials and social networks) should be promoted, as well as infertility prevention measures and adoption.

This study emphasized the need for a public debate on gamete donor recruitment strategies in Portugal, calling the attention for the importance of governmental and educational initiatives in this field.

- 13965 | Fama-French Models Application to the analysis of FTSE4GOOD, MSCI ESG and STOXX ESG Indices: Do SRI Indices have biases?

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We apply Fama-French models to the analysis of Socially Responsible Investment Indices from FTSE4GOOD, MSCI ESG and STOXX ESG Series. We also apply novel approaches to the analysis of such indices, such as adjusting for industry effects, applying a GMM-System framework and comparing between crisis and non-crisis periods. Most literature on Socially Responsible Investment has been focused on analysing Funds rather than Indices. However, there's an increasing amount of evidence that questions their suitability to act as a proxy for this type of Investment, namely failures in keeping ethical standards. Moreover, the lack of application of Fama-French models to SRI Indices leaves room for a more detailed analysis of what biases these Indices may have and their consequences for risk-adjusted performance. Overall, SRI Indices provide a very similar risk-adjusted performance as their conventional benchmarks and tend to be biased towards loser stocks. We also detected the presence of industry effects. During crises, there's a non-statistically significant increase in performance and SRI Indices tend to be less risky and more exposed to Value Companies. However, overall, there are multiple differences between indices both at the country and at the Series level which highlights the importance of analysing multiple sources of SRI to obtain more representative results. Global Indices tend to have higher risk than regional Indices and FTSE4GOOD Indices tend to be more biased towards large companies with weak profitability profiles while indices from other series tend to show a small cap bias and no pattern in terms of profitability exposure.

- 14277 | Feeding inhibition tests as a tool for seston quality evaluation in reservoirs: salinization impact

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Ecosystem environmental disturbance impacts in all levels of the trophic web and the entire ecosystem can be affected. Therefore, it is essential to better understand how different biotic and abiotic factors can cause significant impacts on the ecosystems. Salinity of lentic freshwater ecosystems, due to environmental changes, is an issue that is rising concern, especially on those situated at coastal zones. These alterations affect the water quality and, consequently, the composition and diversity of the aquatic communities (phytoplankton, zooplankton and ictiofauna). This study aims to: i) assess the seston quality of two lentic freshwater ecosystems subjects to different anthropic pressures (Crestuma reservoir and Vela lake) and ii) evaluate possible effects of increasing salinity on the food performance of *Daphnia magna* (standard species in aquatic ecotoxicology). Feeding inhibition tests was the methodology used for this evaluation and are performed according to previous studies. In order to evaluate the seston quality filtered and unfiltered water from the field were used as treatments. Preliminary results showed a significant feed inhibition of *Daphnia magna* when exposed to the filtered water from Vela lake and Crestuma reservoir, indicating nutritional quality of the seston from both sites. Additionally, products from the seston, as toxins, can remain on the filtered water and potentially cause feed inhibition. In the assay with water salinity, the feeding of *D. magna* was also inhibited between the control treatment and the salinity concentrations tested (1.0 to 4.5 g/L NaCl).

- **13989 | Fighting marine macrofouling: synthesis and in vivo evaluation of new antifoulants**

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In the search for new antifouling solutions to combat marine biofouling, many laboratories had relied heavily on bioassays with microfoulers (bacteria, fungi, or microalgae), which led to the discovery of effective antimicrofouling compounds, that were later found to be ineffective against macrofoulers. In order to develop effective antifoulants that could prevent the growth of the most problematic fouling organisms, a series of sulfated polyphenols were synthesized in LQOF and screened for *in vivo* antifouling activity against the settlement of *Mytilus galloprovincialis* larvae [1]. The aim of this work was to synthesize derivatives from a previous found hit compound in order to obtain some insights on structure-antifouling activity relationship (SAAR). Antifouling activity was preliminary evaluated for 11 derivatives at 50 µM. Five compounds showed $\geq 50\%$ of settlement inhibition and were selected to pursue to complementary dose-response studies.

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References:

[1] Almeida J.R.; Correia-da-Silva M.; Sousa E.; Antunes J.; Pinto M.; Vasconcelos V.; Cunha I. Sci. Rep. 2017, 42424.

- **14232 | First generation students' education pathways and equality of opportunities: an exploratory study at the University of Porto**
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This research was developed in Educational Sciences graduation at FPCEU.Porto in the course of Research Methodologies: qualitative research laboratory. It is expected the development of competences related with research design and methodologies, but also of reflection and critical thinking. With this in mind the class, as this is a class collaborative and collective project, decided to better understand first generation students' experiences attending several courses at the U.Porto. The research question was: How first generations students at the U.Porto organise and reflect about their decision making process related to their educational pathways towards Higher Education? The literature shows that these students have a lower-income as well as more constrains in academic adaptation (Jehangir, 2010).

Besides quantitative secondary data analysis on figures and distribution of first generation students, a qualitative study was developed in 5 faculties. The data was collected by doing participant-observation and writing fieldnotes (n=25) and by interviewing 30 first generation students (3rd year). The semi structured interviews script was constructed to gather information about their background, their expectations prior to the university, the decision-making process, and struggles when organising their pathways and their belonging and adaptation to Higher Education. Results are pointing to a diversity of navigation processes starting at the beginning of the secondary education. These students live their academic life carrying out their families' expectations, and combining a social class habitus with the academic values.

Jehangir, R. (2008). In their own words: Voices of first generation students in a multi- cultural learning community. *Opportunity Matters: A Journal of Research Inform- ing Educational Opportunity Practice and Programs*, 1(1), 22-31

- **13975 | First survey of glyphosate and other pesticide residues in human urine in Oporto, Portugal**

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Chronic pesticide exposure is responsible for many growing health concerns in both industrialized and developing world. Indeed, occupational exposure to glyphosate has been associated with Non-Hodgkin's lymphoma. [1]

The aim of this work was to assess the prevalence of several pesticides widely used in Portugal, namely glyphosate, alachlor, captan, chlorpyrifos, chlorpyrifos-methyl, cyprodinil, deltamethrin, lindane, malathion and parathion-methyl in urine samples of the Portuguese population living in Oporto. It was the first study carried out in Portugal analysing the presence of urinary glyphosate and its main metabolite, AMPA (aminomethylphosphonic acid).

For the determination of the pesticide residues two different gas-chromatography mass spectrometry methods using selected ion monitoring mode were used. For the fast and reliable extraction of alachlor, captan, chlorpyrifos, chlorpyrifos-methyl, cyprodinil, deltamethrin, lindane, malathion and parathion-methyl, sample preparation was based in a DLLME procedure using carbon tetrachloride as extractor solvent and acetone as dispersive solvent. This procedure provided good linearity (12.5 - 250 µg/L), acceptable yields and good repeatability values in the same range. The quantification of glyphosate and AMPA was achieved according to a recently proposed method [2], where the derivatization of the compounds with trifluoroacetic anhydride followed the evaporation to dryness of the sample.

In this survey, 42 samples collected in Oporto Hospital Centre were analysed for all the pesticide residues in study, having one sample tested positive for glyphosate (18.5 µg/L) and other for deltamethrin (LOD (3 µg/L) < Sample level < LOQ (12.5 µg/L)). The levels found highlight the importance of the monitorization of these compounds in biological matrices.

1. Schinasi, L., Leon M.E. (2014). Int. J. Env. R. Pub. Health, 11(4), 4449-4527;

2. Conrad A, Schroter-Kermani C, Hoppe HW, et al (2017) Int. J. Hyg. Env. Health 220.

- **14140 | From Laboratory to Pool: Time of reaction rate in block starts. Study of swimmers of different echelons**

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There are three types of Reaction Time (RT): simple, choice and discrimination. The most characteristic RT in swimming is the simple RT, since to get a good start of the block, it is necessary to react quickly to all stimuli. The aim of the present study, was to investigate how RT varies as a function of the auditory stimulus in swimmers of different scales and what their effect at the moment of departure, verifying if there are significant differences in the recorded time between the children and the masters, making future investigations possible impact on swimmers' performance. The study want to evaluate the effect of the step in the RT in the matches of the block, in swimmers with different ages, to compare the RT between the pedal preference (PP and PNP) and to correlate the RT obtained with the Nelson rule with the times of the national tests. Our sample comprised 13 individuals, of whom 7 were masters athletes and 6 were infant athletes, aged 12 to 13 years old and 25 to 55 years old. The instrument used to evaluate RT was the Nelson Reaction Timer, model RT-2. To this study, we used the simple auditory stimulus (whistle sound), with swimmers reacting powerfully to the stimulus in the ruler. The level of significance was set at $p \leq 0,05$. Results revealed a non-statistical difference between the levels in the pedal preference level (PP and PNP), as well as the level of motor asymmetry. When correlating the TR values obtained by the Nelson test with the official TR, it was also verified that there were no significant differences.

Keywords: reaction time; swimming; masters; children;

- 13918 | FROM MEMORY TO IMAGINATION, HOW MANY STEPS IT GOES. A Theory which attempts to understand how reality, Memory and Imagination work in the Drawing Practice.

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Talking about Imagination implies talking about Memory and, by consequence, perceived Reality. Is it true? If it is, how does that happen? What is the process? What are its variables?

With a list of authors that goes from the greek philosophy — with Plato and Aristotle —, through others as Leonardo da Vinci, Emmanuel Kant, Wassily Kandinksjy, Sartre, Bruno Munari —, until nowadays — with Edward S. Casey, Michael Heaney, Alan White, Frederica Goffi —, it is attempted an understanding of the process that leads Memory towards Imagination. Thus, this study assumes the assumption and affirmation that the second is a consequence of the first. It's defended a Theory of Vehicles of Transformation of the three states: *reality*, Memory and Imagination.

While in the first part there is an historic path through the definition of the states, in the second part it's presented a conclusion of the first, by referring explicitly which are the Vehicles of Transformation of each state and how they work:

*reality** — perception; sensation; emotion; visual culture; Memory (and its vehicles); Imagination (and its vehicles);

Memory — *reality* (and its vehicles); Drawing; *Habitus*; Cosmogony; Imagination; memorized (precedent memories);

Imagination — *reality* (and its vehicles); Memory (and its vehicles); imagined (precedent acts of imagination).

In the third part, it's presented an explanation of the form of the continuous movement of the Theory, by exploring the relations between all the Vehicles and states.

Ultimately, Drawing appears as exposed memory of the perceived and, or, the imagined, either by consequence or by addition. That makes Drawing the maximum example of physical exteriorization of the Theory. Despite that, Drawing does not communicate this process explicitly, although it presents it — this article has that mission.

**reality* is referring to: perceived Real. “Real” is referring to the pure Real, not perceived.

- **14224 | From monastic form to spaces for new communities - Proposal for architectural intervention in the Monastery of São Martinho de Mancelos**

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Using São Martinho de Mancelos Monastery as a starting point, we analysed a set of territorial, social, historical and architectural documentation in order to understand the contemporaneity of monastic complexes as architectural spaces. We sought to understand how these spaces could re-establish their primary character as territorial focal points and religious and cultural centres, with the ability to support the sick and the elderly.

We used the monastic complex of Mancelos, Amarante, as an object of study in an attempt to find in it the answers to our questions.

We researched and analysed the relevant documentation on the subject, carried out a dimensional and photographic survey and also directly approached the community that uses this space to try to understand their expectations. This cross-sectional study method allowed us to record our experience of this process through drawing.

In this way, it was possible to develop a plan for the regeneration of the monastic complex with a careful consideration of the existing, in its physical but also immaterial aspects, and to apply our theoretical and practical design principles for the monastery as an architectural element, in an exercise between materiality and abstraction.

- **13980 | Gender (A)symmetries: Successes and barriers in professional discourses**
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The construction of social gender categories generates expectations that can influence career choices, life opportunities and even personalities, all of which are produced from a familiar social imaginary (Santos, 2007a; Santos, 2007b). In this sense, society expects men and women to behave differently and to assume distinct social roles (Nogueira & Saavedra, 2007). Success, traditionally viewed as professional accomplishments, extends to other life spheres (Costa, 2010), especially when gender conceptions are considered. Thus, gender contributes to the existence of different views about success (Lee et al., 2006), and may tell us more about the asymmetries, present on social and professional contexts, between men and women.

In order to gain insight about the way gender concepts influence men and women perceptions of professional success, nine semi-structured interviews were conducted (4 women and 5 men). The discourses of the participants were submitted to thematic analysis (Braun & Clarke, 2006), resulting in the construction of three main themes and seven sub-themes, with the following structure: the theme The Basis of Success is divided into sub-themes: Me and The Others; the theme Sex/Gender Linearity includes two subtopics: Man and Woman; lastly, the theme Gendered Professional Barriers encompasses three subtopics: Woman's Profile, Man's Profile and Gendered Occupations. Gender asymmetries cross all the elements of the analysis.

The main conclusions underline how the participants' discursive practices convey the inflexibility underlying gender constructions, minimizing its complexity to a simple connection between biological sex notions and prescriptive social roles. These practices punish women and femininity, especially their career development. From these conclusions were reflected some practical implications. Suggestions for future research and the study's limitations are also addressed.

- **14270 | GLUT-1 related microRNAs and Glycolysis in Clear Cell Renal Cell Carcinoma**

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Introduction: Cancer cells' metabolism is disrupted since they have a higher need of energy, reductive power and intermediates that can be precursors for biosynthesis. The metabolic switch that makes cancer cell metabolize glucose through aerobic glycolysis instead of oxidative phosphorylation is called Warburg Effect. This happens in renal cell carcinoma (RCC), which is the kidney most lethal cancer. RCC carcinogenesis is related to VHL loss and HIF activation, which leads to the genes transcription activation, including GLUT-1. GLUT-1 regulation can occur by microRNAs (miRNAs) - small non-coding RNAs that are responsible for post-transcriptional gene expression regulation. The study aim was to study the GLUT-1-related miR-144 and miR-186 and their potential as glycolysis biomarkers in RCC.

Methods: One normal renal proximal epithelial tubular cell line (HKC-8) and two RCC cell lines (786-O and FG-2) were used. MiRNAs levels were quantified in the cells (intracellularly) and in the respective medium (extracellularly) and was accompanied by the quantification of GLUT-1 levels by quantitative real-time PCR.

Results: A decrease of miR-144 intracellular levels was observed in 786-O when compared with HKC-8 ($p=0.028$), being not detected in the HKC-8 medium, but presenting higher extracellular levels in 786-O and FG-2 ($p<0.001$). A miR-186 intracellular levels decrease occur in 786-O ($p=0.010$) and FG-2 ($p=0.005$) when compared with HKC-8. This miRNA also presented higher extracellular levels in the three lines. These alterations were accompanied by an increase of GLUT-1 levels in tumor cells. After a glucose stimulus, miR-186 increased in HKC-8 (intra- and extracellularly) and 786-O (extracellularly) cells. In FG-2 both miRNAs extracellular levels increase. This stimulus also led to an increase in GLUT-1 levels in HKC-8 and FG-2.

Conclusion: MiR-144 and miR-186 deregulation appears to be responsible for an upregulation of GLUT-1's, being glycolysis potential biomarkers.

- **14041 | Going mad - Greed in Steinbeck's The Pearl**

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Human beings' judgment is easily corrupted, even if their first intentions were good. Greed poisons Man's reasoning, erasing the smallest trace of a good deed, or intentions. How easy is it for an individual who never enjoyed any sort of wealth or social status to forget what is correct? For someone who was always discriminated because money and material goods were scarce, the opportunity to help their families should be interpreted as a gift, a stroke of luck. However, more often than it should, it is easy to get lost in the glamorous sea of possibilities and forget the values that made people who they are.

Look at the example of Kino, who would give everything to save his infant son after a scorpion bit the baby's shoulder. The discovery of "The Pearl of the World" seemed like destiny decided to intervene at the right time. Even though it is beautiful and big, the pearl is an inanimate object unable to control Kino's thoughts and actions. Once a modest man and father, Kino finds his own mind troubled with the desire to fulfil the plan he had traced for his family at any cost, even at cost of his family's happiness.

John Steinbeck's *The Pearl*, published in 1947, depicts Kino's destructive journey in search of better life for his family, despite the constant signs of evil and misfortune. This presentation intends on exposing the stages of Kino's descent into madness as well as the easiness to which an individual might forget the so-called "good values" in favour of material goods and power.

- **13895 | HDA19 regulated AGPs involvement in pollen-pistil interactions**

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The reproductive process leading to seed formation in flowering plants is a complex mechanism, involving a series of signaling pathways with abundant well described players such as the Arabinogalactan Proteins, AGPs. AGPs are hydroxyproline-rich proteins containing a high proportion of sugars, widely distributed in the plant kingdom and ubiquitously present in land plants [1]. These molecules have long been suggested to play important roles in sexual plant reproduction [2]. In the present work we propose to study the roles of a particular subgroup of related AGPs: AGP25, AGP26 and AGP27.

The RNA sequencing technique revealed a deregulation of AGPs in *histone deacetylase 19 (hda19)* mutant plants, namely the particular AGPs in study. Histone modifications, including acetylation, play a major role in epigenetic regulation of gene expression [3]. HDA19 has already been shown to play an important role in reproductive tissues [4]. Some AGPs are known to act as cell fate/identity markers, which might correlate with rapid changes in the histone code.

Previous studies have shown the importance of AGP25 and AGP27 in plant reproduction. Hence, to increase our knowledge about the role of these group of AGPs, in this work it was intended to create and analyse an *agp26* knock-down plant line by RNA interference and further study its possible regulation by HDA19.

References:

1-Showater AM (2001) Arabinogalactan-proteins: structure, expression and function. Cellular and Molecular Life Sciences, 58:1399-1417.

2-Pereira AM, Lopes AL, Coimbra S (2016) Arabinogalactan Proteins as Interactors along the Crosstalk between the Pollen Tube and the Female Tissues. Frontiers in Plant Science.7:1895.

3-Luo M *et al.*, (2012) HD2 proteins interact with RPD3-type histone deacetylases. Plant Signaling & Behavior, 7:6, 608-610;

4-Schmid M *et al.*, (2005) A gene expression map of *Arabidopsis thaliana* development. Nature Genetics, 37:501-506.

- **14262 | Heart rate variability and baroreflex in patients with severe brain injury**
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The autonomic nervous system (ANS) exerts rigorous control over essential functions of our body. Patients with severe acute brain injury (ABI) may have ANS dysfunction which may aggravate critical illness [1] and the study of heart rate variability (HRV) is one of the methods to study this autonomic dysfunction. In the last decade, several innovative methodologies have been proposed to describe and evaluate the HRV dynamics with the objective of risk assessment, e.g. ARFIMA-GARCH model and time-frequency analysis [2-4, and ref. therein]. Use of tilt-table in early rehabilitation of these patients contributes to neuronal recovery although introducing new challenges e.g. orthostatic intolerance [5].

The aim of this work is to analyze HRV and baroreflex as tools to evaluate the ANS dysfunction in intensive care patients with ABI. In particular, it is intended to associate cerebral multimodal neuromonitoring with HRV and baroreflex and to contribute to the improvement of the knowledge of ANS dysfunction in postural change of intensive care patients with brain injury.

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[1]Lavinio A et al, "Cerebrovascular reactivity and autonomic drive following traumatic brain injury" *Acta Neurochirurgica Supplement*, 102, 3-7, 2008

[2]Kamath M et al (eds) "Heart Rate Variability (HRV) Signal Analysis: Clinical Applications" CRC Press, 2013

[3]Mazzeo A et al "Heart rate variability: a diagnostic and prognostic tool in anesthesia and intensive care" *Acta Anaesthesiologica Scandinavica*, 55(7), 797-811, 2011

[4]Almeida R et al "ARFIMA-GARCH Modeling of HRV: Clinical Application in Acute Brain Injury" in Barbieri, R. et al (eds) "Complexity and Nonlinearity in Cardiovascular Signals", Springer International Publishing, 451-468, 2017

[5]Riberholt C et al "Impaired Cerebral Autoregulation during Head Up Tilt in Patients with Severe Brain Injury" *PLOS ONE*, 11(5), e0154831, 2016

- **13994 | Hidrogeology of thermal waters. A case study in Portugal**

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The main purpose of this work was to investigate the cause(s) of the loss of sulfur observed in one of the existing groundwater wells in Termas da Fonte Santa, county of Almeida, region of Guarda. It was carried out a characterization of the thermal waters, in particular the alkaline sulfur ones, in which the waters of the wells under analysis are inserted.

Then, the area under study was characterized from a geographical, geomorphological and geological-structural point of view. After some brief historical considerations about these wells, it was undertaken a survey of the characteristics of the aquifer. The existing wells in the area were described, in particular the FS2 and AQ1 ones, as well as the hydrochemistry of the respective waters.

A multiplicity of statistical treatments was carried out to investigate the problem of the loss of sulfur at the FS2 well. It was given particular emphasis to the application of the Principal Component Analysis (PCA), as a data processing method which, in the multivariate statistics scope, seeks a multidimensional understanding of the phenomenon under study, being analysed the eventual relation of all hydrochemical variables in the general behavior of the considered hydrogeological system.

With this study it was possible to recognize the vital importance of such relevant aspects as the efficient isolation of the wells, the consideration of the fracturing state of the surrounding massifs or the influence of the region's climate on the proper functioning of the well.

- **14102 | Histology as a tool to assess the effects of engineered nanoparticles**

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The aim of this work was to evaluate the potential of histology as a biomarker of effect for studies with engineered nanoparticles in the aquatic environment. With this purpose two sequential acute bioassays with nickel oxide nanoparticles using as biological model aquatic snails (*Physa acuta*) were performed. Snails subjected to concentrations corresponding to NOEC (no observed effect concentration) and LOEC (lowest observed effect concentration) were histologically processed and histological changes scored with a semi-quantitative method based on the extension of the lesions. The average of the extension of histological changes were calculated for each affected organ/tissue. Evident histological changes were found in the ganglia nervous tissues, foot, hermaphroditic gland and glands from the foregut. A generalized inflammatory response was also observed. The results clearly indicate that several snails' organs/tissues were affected by nickel oxide nanoparticles, even in sublethal concentrations. All histopathological effects were observed at NOEC and LOEC and the extension of the lesions was dose dependent in most of the cases. Furthermore, the interpretation of the histopathological phenomena provides evidence that the contamination route for nickel oxide nanoparticles in *Physa acuta* were mainly via contact. In this regard, the use of histology demonstrated to be a good tool as a biomarker and the aquatic gastropod *Physa acuta* a promising biological model.

- **14007 | Human Population Atlas Review. A comprehensive analysis of the impacts of overpopulation.**

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The current human global population is estimated to be around 7.6 billion, with an annual net gain increase of 83 million. It took until 1800 A.D for humanity to reach 1 billion in number and in the last 200 years, humanity's rising numbers and consumption patterns have wreaked havoc all over the biosphere, creating the Anthropocene, an epoch that embodies the far-reaching impacts of Homo sapiens on the planet, such as species extinction; massive urbanization and transportation networks; pollution that exceeds planetary boundaries, disruption of ecosystems through overfishing, deforestation and agricultural transformation; anthropogenic climate change; waste such as plastic and chemicals that are now found in every corner of the planet; mining of minerals and materials for technology and the use of fossil fuels to maintain human civilization running. This work also focuses on the socio-economic components, as it demonstrates the relation between fertility reduction and economic progress, empowerment and education of women through access to family planning and reproductive health; the morality and ethics of procreation as well as population management practices, with hard questions such as, "Do we have a right to more than one child?", "Is a restrictive immigration policy based on environmental degradation ethically justifiable?" "Are coercion methods ever vindicated in their use?" "Is religion and culture to blame for the population predicament?" "Can humanity maintain the level of comfort it has grown accustomed to in a finite planet?" being discussed. Human overpopulation needs to be tackled and discussed effectively among not just ecologists but economists, earth scientists, bioethicists, policymakers, public health experts, religious authorities, conservationists, activists and civil society. The objective is to create a platform for all fields to converge under one common goal and show that the reduction of our numbers can be achieved through humane solutions

- **13947 | Hybrid bifunctional graphene materials as new nanocatalysts for the removal of emerging pollutants**

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The pollution associated with wastewaters is linked to serious environmental problems to which a solution is needed, which motivated research in catalysts capable of removing and degrading many harmful organic pollutants. Graphene and other carbon nanomaterials have shown great potential as catalysts for a huge set of applications, including the removal of drugs and dyes, which make them suitable to complete that task. In this work, we have explored the first steps to design functionalized graphene materials for application as eco-sustainable magnetic nanocatalysts for the removal and degradation of organic dyes from aqueous systems.

Magnetic ferrite nanoparticles (MFe_2O_4 , $M(II) = Mn, Co, Cu$) were synthesized through an aqueous coprecipitation method and characterized by XRD and VSM/SQUID, which confirmed their superparamagnetic properties and showed values of up to 63.7 emu/g for their saturation magnetization.

N-doped graphene samples were prepared through a mechanochemical method and later exposed to thermal treatment. The obtained materials were characterized by XRD and XPS and later tested in the absorption of organic dyes from aqueous media, which confirmed the inclusion of nitrogen within the graphene lattice and guaranteed the adsorption of 67.5% of methyl orange in 90 min.

N-doped graphene samples were then functionalized with the magnetic ferrite nanoparticles. The characterization of the resulting bifunctional nanomaterials indicated the success of the immobilization process and confirmed their magnetic properties. The first catalytic trials were promising on the path to prepare hybrid nanocatalysts capable of removing and degrading organic pollutants from wastewater.

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- 14028 | Hybrid Nanomaterials for the Production of Intelligent Textiles with Energy Storage Properties

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Since the last decades, due to the exponential development of mobile electronic devices and intelligent technologies (Fig. 1), a growth and optimization of energy storage technologies has been occurring namely on supercapacitors. This technology is starting to be applied in textiles for Sports, Health and Military. Nanotechnology has been increasingly required for the production of textile supercapacitors (SCs), in order to increase the storage durability and preserve the fabrics flexibility and lightness.¹ One of the current challenges is the design of new textile SCs with shorter charging times and higher storage capacity.

This work focused on the preparation of hybrid nanomaterials consisting on doped carbon nanomaterials functionalized with manganese oxides, their incorporation on textile substrates and manufacture of textile SCs. The hybrids were successfully prepared as confirmed by XRD, FTIR and SEM-EDS, with the parent manganese oxide nanoparticles presenting ~12.6 nm diameter and a regular morphology of long needles or 17.3 nm with an aggregated morphology.

The hybrids were then incorporated on cotton substrates, allowing the fabrication of fabric electrodes for the production of textile SCs. From the evaluation of the manufactured symmetrical and asymmetric textile SCs by electrochemical techniques it was checked that the asymmetric hybrid@fabric//doped-nanocarbon@fabric SC showed the highest specific capacity, energy density and power density values and a behavior of hybrid SC with occurrence of oxidation-reduction reactions.

These SC-type energy storage devices are a revolutionary promise for the technological world.

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[1] K. Jost *et al.*, *J. Mater. Chem. A*, 2, 10776, 2014.



Fig. 1 - Electronic devices development

- **14049 | Identification of regulatory kinases of the yeast mitochondrial VDAC1/Por1p**

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The voltage-dependent anion channel (VDAC) is a conserved ion channel located on the outer mitochondrial membrane. VDAC display two states: an open state that allows the passage of anions (e.g. ATP and NADH); and a closed state, associated with an exchange in channel selectivity allowing the passage of cations. Closure of VDAC results in a reduced exchange of metabolites essential for respiration, decreasing energy production and cell growth, and increasing mitochondrial oxidative stress and apoptosis execution. In mammalian cells, VDAC opening probability can be regulated by post-translational modifications such as phosphorylation. In yeast, though VDAC1/Por1p is known to be phosphorylated in several sites, the role of this modification and the regulatory kinases are unknown. Therefore, the aim of this study is to identify Por1p regulatory kinases, determine the phosphorylation sites on Por1p and evaluate its impact on mitochondrial function and cellular physiology.

To identify Por1p regulatory kinases, selected kinase-deleted mutants (based on kinase function or mitochondrial location) were screened for alterations in Por1p phosphorylation by 2D SDS-PAGE followed by immunoblot using an antibody against Por1p. Two strains among these, lacking Hog1p and Rim15p, exhibited a shift in Por1p isoelectric point compatible with lack of phosphorylation, suggesting these kinases may be Por1p regulators. In accordance, through the evaluation of phenotypes such as growth in respiratory substrates, oxygen consumption and resistance to heat or H₂O₂, it was observed that Hog1p and Rim15p interact genetically with Por1p. Further work is ongoing to confirm these kinases as direct Por1p regulators.

Identification of the first Por1p regulatory kinases in yeast will be an important advance on the understanding of the regulation of Por1p/mitochondrial function by metabolic signalling pathways.

- **13997 | Identification of woods based on microscopic images**

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The goal of this project is to develop a software to identify wood's species from microscopic images. This work is currently being developed in the context of a master's dissertation on Mathematical Engineering during the current academic year (2017/2018).

As a first step, a database of images was constructed with the help of the Biology Department at FCUP. Initially a small subset of images was obtained by digitizing the book "Anatomy of European Woods". After that, images were collected from external databases in order to have a wider dataset to work with. Also with the help of the Biology Department, the process of decision and interpretation of the images was conceived.

In terms of computer vision, the algorithms were developed in order to detect the information needed for the identification of the woods. This includes growth rings, pores, fibers, rays, etc., which were detected using image processing techniques (image segmentation, morphological operations, spatial filters, among others).

As a next step, the classification of the data obtained is necessary to relate the image of wood with a species name.

- 14245 | Impact of defatting techniques on sensorial and nutritional properties of two cricket species

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The expected demand for food and animal-derived protein will require environment-friendly novel food sources with high nutritional value. Insects may be one of such food sources. However, there are still some obstacles to overcome in order to implement insects as a food choice in the West, such as consumer acceptance which makes it essential to improve the sensory properties of products incorporating insects.

The nutritional analysis of the cricket species (*Acheta domesticus* and *Grylloides sigillatus*) included the determination of their content in dry matter (DM), crude ash, crude protein, crude fat, crude fiber and minerals. This nutritional analysis of the crickets confirmed their high protein content (ca. 65% DM) as well as micronutrients P, Cu, Fe and Zn.

Lipid extractions were performed with the Soxhlet method, with five different organic solvents being tested (petroleum ether, diethyl ether, hexane, acetone and ethanol, with ethanol being the solvent who extracted the most lipids (results confirmed by Folch method).

Moreover, the sensorial impact of defatting was evaluated with the elaboration of cereal and dry fruits bars with incorporation of both whole ground and defatted crickets. On the sensory analysis performed, CATA checklists were utilized to evaluate sensory characteristics (texture, appearance, odor and flavor) while acceptance and Food Action Rating Scale were evaluated with hedonic scale of nine points. The results indicate that insect defatting improved their sensory properties given that bars incorporating defatted insects had similar evaluations to the control bar (without incorporation of insects) while bars incorporating whole ground insects had negative evaluations on acceptance and willingness to eat and were associated with negative sensory characteristics on CATA tests. The nutritional content of the bars was also evaluated with the bars incorporating insects having a higher protein content than the control bar.

- **13917 | In vitro cardiotoxicity of 3,4-methylenedioxymethamphetamine (MDMA, ecstasy) combined with benzylpiperazine (BZP) in hyperthermia**

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The classical stimulant MDMA (ecstasy) has been abused for decades. A number of newer designer drugs, such as BZP, have recently entered illicit markets. Cardiac toxicity is an ominous complication of both drugs, which may be further aggravated by their combination and the rise in body temperature induced by both stimulants. Accordingly, severe or even fatal intoxications involving this association have been reported.

We here sought to assess the cardiotoxic mixture effects of BZP and MDMA, in conditions that mimic the hyperthermia following the intake of these drugs. MDMA and BZP were combined at a 8:2 ratio, respectively (based on concentrations found in human blood). H9c2 cardiomyocytes were exposed to the individual drugs or their combinations, both at 37 °C and 40.5 °C. After 24h, viability was recorded by the MTT assay and mixture expectations were calculated using independent action and concentration addition models. Changes in lysosomal integrity, intracellular glutathione (GSH/GSSG), ATP, reactive species (ROS/RNS), and mitochondrial membrane potential ($\Delta\Psi_m$) were also evaluated.

MDMA (EC₅₀ 1.74 mM at 37 °C and 1.17 mM at 40.5 °C) was more toxic than BZP (EC₅₀ 2.72 mM at 37 °C and 1.93 mM at 40.5 °C). Toxicities predicted by both models were coincident and accurately predicted mixture effects. Increased ROS/RNS and GSSG, depletion of GSH and ATP, decreased lysosomal uptake, and mitochondrial depolarization were involved in the observed cardiotoxicity. The observed additive cardiotoxicity is worrisome and, in a clinical perspective, may significantly deteriorate the health of abusers.

- **13961 | Influence of irrigation on the yield and quality of cv. Touriga Franca in The Douro Region**

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The Douro Region is characterized by a typically mediterranean climate, with high temperatures and irregular precipitation throughout the year. Although the vineyard is resistant to great periods of drought, the scarcity of water can affect the production and quality of the wines produced and so, it is important to study the effect of irrigation.

The experimental trial, was carried out at Quinta da Cabreira, property of Quinta do Crasto, S.A., located in the Douro Superior sub-region, characterized by extremely hot summers and very low and irregular precipitation. Four irrigation modalities were established, in three blocks, based on the percentage of Cultural Evapotranspiration (ETc), which included: R0, the control, the non-irrigated modality; R25 irrigated with 25% ETc; R50 with 50% ETc and R75 with 75% ETc, cv. Touriga Franca, grafted in 110R.

In terms of results, they are more significant in quantitative than in qualitative parameters. Regarding the number of bunches per vine, as well as in the potential fertility index, the results were higher in the R75 modality, with significant differences between this and R0. On the other hand, irrigation also had repercussions in the Foliar Area, with statistically significant differences between R0 and R75 for Total Leaf Area. In terms of ecophysiological parameters, the pre-dawn and daily leaf water potential was lower in R0 than at R50 and R75.

In terms of yield components, it was observed a higher number of clusters in R75 modality and a smaller amount in R0 modality, and the berry weight was also affected by the amount of water applied, with the berry of R0 with a lower weight than R50 and R75. In spite of the different results in berry weight, there was no difference in concentration of the various quality components tested either during maturation or harvesting.

Positive income effects were shown in the modalities with higher irrigation allocations, particularly in R50 and R75.

- **14022 | Initial teacher training and the International Undergraduate Program of Brazil: the UFOPA-UAlg project**

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This paper discusses the academic mobility experience - Programa de Licenciaturas Internacionais - PLI, of seven students of the Bachelor Degree in the Portuguese Language, from the Federal University Western of Pará, at the University of the Algarve, in Portugal, which took place from 2013 to 2015. I sought to describe the contributions of the project to the initial teacher training by analyzing the program's edicts and other documents related to it, and a survey conducted with the project participants. The results show that the program not only engaged the students in qualified teacher training but also allowed them to acquire knowledge and gather experience that broadened their vision of and relation to the world.

Keywords: mobility; teacher training; UFOPA; UAlg; PLI.

- 14070 | Insights about the molecular control of seed dormancy/germination: R-loops regulate transcription at *DOG1* locus

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DOG1 gene is the master-regulator of seed dormancy in *A. thaliana*. *DOG1* transcripts are alternatively spliced and alternatively polyadenylated leading to the production of several isoforms. Moreover, *DOG1* is regulated in *cis* by its antisense transcript called *asDOG1*. R-loops are RNA/DNA hybrids co-transcriptionally formed by the annealing between an RNA nascent transcript and its complementary DNA template strand, and they regulate gene expression in eukaryotes through a delightful diversity of mechanisms. For instance, they have been linked to changes in nucleosome occupancy, binding of chromatin remodeling complexes, DNA methylation, various histone marks, transcription elongation and termination, and lncRNAs function. The recent genome mapping of R-loops in the *Arabidopsis* genome revealed the formation of two R-loops within the *DOG1* locus, one in each sense and antisense strand. In this work different approaches were used to determine the effect of a chemical that leads to increased R-loops formation on *DOG1* and *asDOG1* expression. The preliminary results show that *DOG1* sense and antisense transcripts are affected in treated plants. Moreover, removal of antisense makes *DOG1* sense insensitive to the R-loops inducing chemical. This reveals that the R-loops-mediated function is dependent on the antisense transcription. Very few is known about the roles of R-loops in regulating gene expression in plants, and their function was only unveiled before for one locus in *Arabidopsis*. Our results show the putative existence of functional R-loops within the *DOG1* locus acting in the regulation of sense and antisense transcription. Furthermore, this regulation through R-loops adds a novel layer to the complex control of seed dormancy/germination.

- **14238 | Integration of planning algorithms in Webots – a robot simulation tool**

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Planning is an important research area in Artificial Intelligence providing intelligent agents with the ability to devise a strategy to achieve a set of goals in a simulated environment. The definition of a planning problem involves the description of start and goal states in a modeled world and the representation of actions with their preconditions and effects. The rational agent[1] acts by applying techniques for efficiently searching the space of possible plans.

Our project, using Webots[2], a professional and educational robot simulator, and its C++ API, approaches a set of problems pertaining to entity capacity for environmental awareness and action. Making use of computer vision with built-in camera for landmark detection and object recognition, infra red emitters and photo sensors, gripper arms and wheel motion, our entity is able to interact with and move autonomously in a modeled world.

By feeding a robot a set of predicates `robot(RoomX)`, `door(RoomX,RoomY)`, a Domain Model is defined, and actions `pickup(B1,RoomX)`, `drop(B1,RoomY)` describe a planning problem to solve. This input and autonomy enables planning algorithms to be applied and, to compute all needed operations that lead to a solution. Resulting actions are simulated in 3D real time[2].

Further work will include planning algorithms, such as partial order planning[4].

Acknowledgments

Licensed software[2] funded within the framework "MEA" (Melhoria do Ensino e Aprendizagem)[3] by University of Porto.

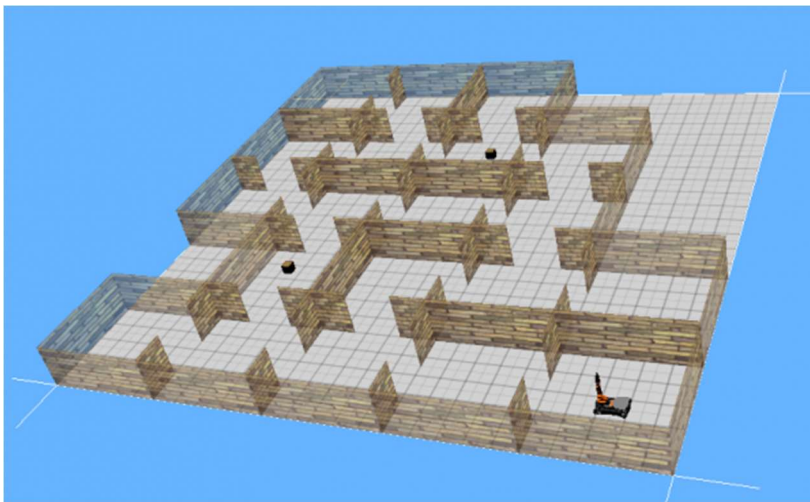
References

[1] Stuart Russel, Peter Norvig, Artificial Intelligence: A modern approach 3rd Ed chpt 2 pp. 34-46

[2] <https://www.cyberbotics.com/webots.php>

[3] <https://inovacaopedagogica.up.pt/excelencia-pedagogica/projetos/>

[4] D. Weld "An Introduction to Least Commitment Planning", AI Magazine, 15(4), pages 27-61, 1994.



world model

- **14072 | Investigation of freeze-drying as a method to produce pharmaceutical forms with improved solubility**

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Freeze-drying is a multistep operation that is used to dry by freezing a wet material followed by solvent sublimation by applying low pressure to the system [1]. Freeze-drying has been primarily used to prepare amorphous substances, however if the glass transition temperature of the amorphous material is at or below ambient temperature, the material will crystallize.

Pharmaceutical cocrystals and co-amorphous have recently been studied as new forms to improve the solubility of pharmaceutical active ingredients (API's). The low solubility of an API is an enormous problem in the pharmaceutical industry and a bottleneck in the development of new APIs. Low solubility leads to unfavorable bioavailability that can affect other physiological properties [2]. Co-amorphous formulations consisting of two low molecular weight components (an API and an excipient) have gained interest. These formulations have shown to stabilize the amorphous form due to the intermolecular interactions between the two molecules [3]. Nevertheless, cocrystals are still preferred due to the intrinsic characteristics of the crystalline form (stability, processability, etc.).

In this work, freeze-drying was used as a technique to produce cocrystals and co-amorphous forms of an API that exhibits low solubility. Chlorpropamide, a drug used to treat diabetes mellitus type 2, was chosen as a model drug. Four coformers were used, p-aminobenzoic acid, D-mannitol, citric acid, and tromethamine. Five ratios API:coformer were studied (3:1, 2:1, 1:1, 1:2, 1:3). The final products were characterized by differential scanning calorimetry, near and mid infrared spectroscopy. Further studies include the characterization by X-ray powder diffraction and solubility studies.

References:

[1] Douroumis, D. et al., *Adv. Drug Del. Rev.*, 117 (2017) 178-195.

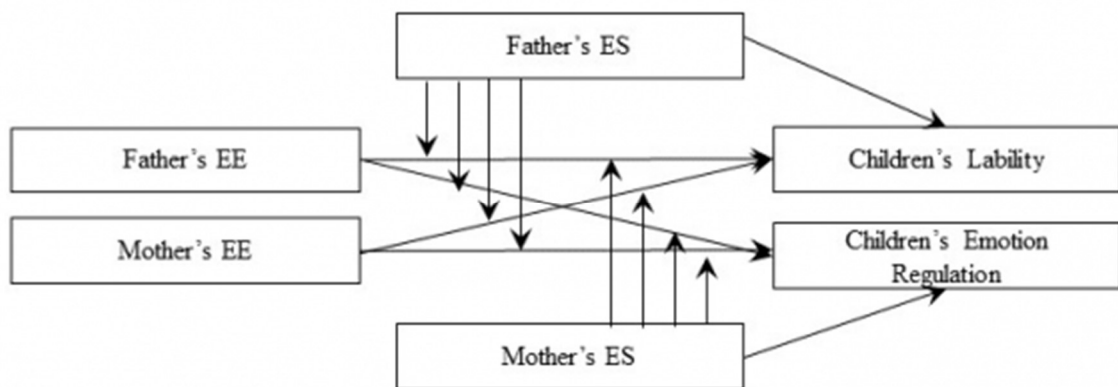
[2] Sarraguça, M., et al., *J. Pharm. Sci.*, 104 (2015) 4099-4108

[3] Korhonen, O., et al., *Expert Opin. Drug Del.*, 14 (2017) 551-569

- 13941 | Is emotion suppression adaptive? Linking parental work-related emotional exhaustion with emotion regulation in children

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Work-related emotional exhaustion (EE) has a negative impact in family functioning, both within the married couple as for children’s developmental outcomes. Until now, few studies have focused the specific association between parental work-related EE and children’s emotion regulation (ER) and lability (La). The present study is a cross-sectional study that utilizes Structure Equation Modeling (SEM), with Maximum-Likelihood Estimation method in a sample of 146 dual-earner couples with pre-school children. Our results indicate that: a) mother’s and father’s EE related negatively with children’s ER and positively with La and b) mother’s ES related positively with children’s La. As for the moderating effects, it was found that: a) when mothers’ ES is high, EE has no effect in children’s La; b) when mothers’ ES levels are low, mothers’ EE is associated with significantly higher levels of children’s La and c) higher levels of fathers’ ES result in higher levels of La, in the presence of mothers’ EE. These findings support the idea that parental work-related EE is linked to children’s ER, which underlines the need for the implementation of parent support policies in the work environment, that insure not only the workers’ well-being as that of their families. The moderating effect found for ES in the relation between mothers’ EE and children’s La, suggests that the utilization of ES in this specific situation lessens the negative effect of mother’s EE on children’s self-regulation. This result emphasizes the need to further analyze the objectives associated with the strategic use of ES in social relationships, and even more so within the couple dyad.



Conceptual model of the proposed direct and indirect relations between parental EE, parental ES, children’s lability and children’s emotion regulation

- 14152 | Is there horizontal transfer of BCR-ABL and drug resistance mediated by extracellular vesicles released by BCR-ABL+ cells resistant to Imatinib mesylate?

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The BCR-ABL1, a fusion gene derived from the t(9;22) translocation, codes for a constitutively active tyrosine kinase (TK), which is present in virtually all patients with Chronic Myeloid Leukemia (CML). The gold standard treatment for CML is the use of TK inhibitors, such as the imatinib mesylate (STI571). However, resistance to these drugs often arises, mostly due to point mutations in the BCR-ABL1 kinase domain. Interestingly, it has been shown that in some cases drug resistance might be horizontally transferred from drug resistant (DR) to drug sensitive (DS) cells, in a process mediated by extracellular vesicles (EVs).

The main aims of this work were to verify if: i) EVs released by BCR-ABL+ cells carry BCR-ABL1 in their cargo and ii) DS cells acquire resistance to STI571 following incubation with EVs shed by cells with resistance to this drug.

A pair of CML counterpart cell lines was used, the KBM5 cells (DS to STI571) and KBM5-STI cells (DR to STI571 due to a BCR-ABL1 mutation). EVs were isolated by ultracentrifugation and characterized by several techniques, such as Dynamic Light Scattering and Transmission Electron Microscopy. BCR-ABL1 protein levels were analyzed by Western Blot and mRNA levels by qRT-PCR. DS cells were co-cultured with EVs from DR cells. The resazurin assay was used to determine response to STI571.

We confirmed the distinct response of the two cell lines to STI571. In addition, the successful isolation of the EVs was proved due to the presence of EVs markers, with no evidence of cellular contaminants, and since the size was between 10-1000nm. Regarding the BCR-ABL1 content, obtained results suggested that there is selective packaging of this oncoprotein into the EVs. Moreover, the BCR-ABL1 mRNA was also detected in the cargo of those EVs. Nonetheless, under the conditions tested, the EVs released by DR cells did not modify the response of DS recipient cells to STI571. Ongoing work will clarify the biological significance of these results.

- **13958 | Júlio de Matos and psychiatry in Portugal: results of a historical approach**
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This is the conclusion of our project developed in the scope of master's degree in contemporary history in the University of Porto, about Júlio de Matos (1856-1926) and his work in the promotion and implementation of doctrines and practices in the field of mental pathology in Portugal.

Four important parts composed this work. First, we seek to know the main philosophical, scientific and political guidelines in matosiano thought, which determined the character of the author's scientific approach to social environment of his time. In the second part, *The madness examination*, we try to understand how these guidelines have influenced the alienist and his diagnosis on critical approach to some of the problems of his time, moment where we believe to have demonstrated the gradual process of psychiatrization that Júlio de Matos will make of the Portuguese society in the end of century. In the third part, *Prevent and Treat*, we underline the intersection of medical-scientific thought of the author with the knowledge derived from his hospital practice, as doctor and director of Conde Ferreira's Hospital, where he remained from 1882 to 1911, where the alienist sought to implement politics for prevention and treatment of mental alienation. In the fourth part, *Anti-psychiatry in Portugal?*, we mentioned some cases that have a huge media impact at the beginning of the 20th century, in which some individuals discredited the madness diagnostic subscribed by Júlio de Matos and the psychiatric knowledge spread by the alienist.

- **13914 | JUSTIFYING THE CONTRIBUTION OF RAINER FORST TO AN IDEA OF JUSTICE**

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Our presentation is a critical review of the work of Rainer Forst, a German philosopher who brought us an unprecedented work concerning the problem of tolerance and the foundation and legitimacy of Law. We have selected the analysis of the writings entitled "The Limits of Toleration" and "Foundations of a Theory of Multicultural Justice". From what the Author presents, we will share answers and criticize solutions. In fact, analyzing the theme of tolerance allows us to test the conception of Justice in one of the most fractured areas in which the Philosophy of Law presents itself. By appearing a simplicity that it does not have, the author's thesis ends up assuming itself in contrast to the long debate between naturalists and positivists. The denial of an authoritarian source at the origin of the rights; the vehement criticism of a concept of permissive tolerance; the imposition of reciprocity and generality as essential beacons of the limits of tolerance; the consideration of the person as an autonomous moral being, active and passive subject of a right of justification; in short, the entire Forstian construction comes, after all, as a root to an entirely new idea of justice. An idea that is based on the consideration that there are pretensions that, though not correspondent with our values, our aspirations and / or the principles by which we guide our life, cannot, after all, be rejected. And that is truth... either for reasons of legal justice, either for imperatives of equality, or for attempts at social inclusion. In short, what Forst intends to demonstrate is that institutions governing individuals and the living in community must be justified on the basis of norms which a person cannot reject, in general and reciprocally. However, even if the reasoning seems of an undeniable completeness, there are problems that Forst does not solve: asymmetries of information; patriotism and nationalism; incomprehension. We will briefly mention them.

- **14302 | Juvenile delinquency inter spatium et tempus: the role of community and routine activities - pilot data from an ongoing descriptive and interpretative study**
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Under life-course approaches to community influences on behavior, we look at an empirically neglected topic: relationships between neighbourhoods, individual routines and deviant behaviors in adolescence. To this end we adapt the "space-time budget" method. Beyond description and towards interpretation, this extension gives it a qualitative sense by incorporating phenomenology. This study aims to: develop space-time budget to capture subjective routine experiences from "the-inside" of individuals; describe adolescent's routines; and understand how deviant acts are incorporated in the adolescents narratives regarding their routines and their community. We present preliminary data from a pilot sample of six teens from low SES urban areas.

Our approach formed two layers: quantitative and qualitative. In the former, the results show that the adolescents sampled spent very little time under unstructured and unsupervised circumstances with peers and abstained from antisocial behaviors at days sampled, being consistent with extant literature. However, none of the routine dimensions had relationships with risky events. In the latter, findings demonstrate that temporal experience of daily activities is based upon the degree of pleasure and commitment. Both are maximized in unstructured activities with peers, motivating them to join. The organization of time within this activities that youngsters reported puts the very concept of "unstructured socializing" in shaky grounds. This activities serve proper functions to them, like the normative enlargement, allowing the unleash of violence in a tolerated zone, but intern regulatory mechanisms are put in play. These teens were seldom involved in antisocial conduct. Notwithstanding, they maintain an orientation that legitimates it in certain conditions, the same orientation with which they give meaning to self-reported past violence. An attitude deviated from conventional beliefs. This exploratory findings are discussed.

- **14213 | Landscape changes at Chernobyl**

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Thirty years ago, the Chernobyl nuclear accident changed the lives of many people, when one of the nuclear reactors exploded during a safety test. The explosion released huge amounts of radioactive materials like caesium, strontium, and plutonium into the atmosphere. High doses of radiation cause severe damage to the DNA of living beings, with direct impact on the changes suffered by the environment, either by causing instant death or by altering the fitness of the local fauna and flora. But what about the indirect changes caused by the alteration of land use? As people were evacuated, the land was left abandoned. To better understand these changes, our objective is to analyse how changes in land cover have affected the landscape in the Chernobyl Exclusion Zone years after the accident, comparing with its previous state and rightly after the accident. Through supervised land cover classifications and NDVI measurements, we hope to understand how the environment evolved, by using publicly available Landsat satellite imagery and training areas collected on the field. We expect that highly contaminated areas will show lower NDVI values if compared with cleaner areas of the same habitat type. Overall higher NDVI values are expected as years pass, which could be related to changes of habitat type and possible adaptation.

- **13970 | Laser Vaginal Rejuvenation in Incontinent Women using the Finite Element Method**

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Urinary incontinence (UI), according to the International Continence Society (ICS) and the International Association of Urogynecology (IUGA), is defined as the complaint of involuntary leakage of urine. This pelvic floor dysfunction (PFD) is one of the most common pathology, which can be associated with inadequate biomechanical properties of the supportive structures such as muscles, ligaments or pelvic fascia, greatly affecting the quality of life of many women, with a prevalence rate over 40% and a total of 135,000 surgeries each year in the United States. Normally, the IU are related to the weakness or direct injuries of the pelvic floor muscle (PFM) associated with different risk factors, such as the age, vaginal delivery, obesity, hormonal changes, among others.

In order to contradict this pelvic dysfunction, several surgical and non-surgical techniques have been explored and made available over time. In recent years, there has been a strong demand for a safe, long-term non-invasive therapeutic that can effectively treat the deeper layers of the vaginal mucosa besides the epithelium. More recently, the laser procedures (thermal therapy) have been used in the treatment of the stress IU (SUI). In the known preliminary studies of the application of this technique, the clinical results were satisfactory, allowing the reduction of symptoms in women with SUI.

In that sense, the aim of the present study was to understand how the thermal procedure affects the displacements of the muscle, using the computational models. For this propose, the passive behavior during Valsalva maneuver was performed, applying different hyperelastic constitutive model, namely Neo-Hookean and Mooney-Rivlin.

- **14193 | Liquid biopsy: a game changer in the management of lung cancer patients**

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Lung cancer is the leading cause of cancer-related deaths worldwide, accounting for more than 1.5 million deaths per year. Many of these tumors harbor genetic alterations and are eligible for targeted therapy, however, following a positive initial response, patients develop resistance mechanisms. The genetic analysis of the tumor is usually performed through tissue biopsy that, besides being an invasive procedure, may not be representative of the genomic landscape. In order to overcome these limitations, the liquid biopsy approach has gained critical relevance because it allows access to tumor DNA in a non-invasive manner. The tumor-specific (somatic) mutations can act as biomarkers for disease progression, development of resistance mutations and early detection of recurrence.

The aim of this work is to develop a strategy to monitor the course of lung cancer through the evaluation of cell free DNA (cfDNA).

Plasma samples from 200 stage IIIb/IV lung adenocarcinoma patients were obtained at different stages of disease and used for cfDNA isolation and analysis with the OncoPrint Lung cfDNA Assay. Paired tumor samples were collected at diagnosis and disease progression and were analyzed using the Ion AmpliSeq Colon and Lung Cancer Panel. The Ion S5 system was used for sample sequencing and results were validated by QuantStudio 3D Digital PCR.

We showed that tumor derived genetic variants could be identified in the plasma with a cfDNA input of 5ng, with a sensitivity of 81,5%. Using a gene panel, we detected variants in less commonly mutated genes such as BRAF which could guide the treatment and/or influence the prognosis. The tracking of these mutations was used to evaluate response to therapy, including the expansion of resistance mechanisms or disease progression, which could be detected 2 months prior any clinical signs.

Liquid biopsy strategy provides a non-invasive therapy monitoring of cancer patients, feasible to be implemented in clinical practice.

- **13978 | Long-term unemployment: The Emotional Experience of Qualified Professionals**

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Unemployment is one of the main social problems of contemporary societies. When the unemployment situation continues over time and becomes long lasting, the difficulties in reintegrating into the labor market are increased, even in qualified individuals. In this context, this study characterizes the emotional experience of qualified professionals who face long-term unemployment. The present study follows a qualitative approach and data were obtained through ten semi-structured interviews, carried out to a group of qualified participants who were in a situation of long-term unemployment. The data from the interviews assist in characterizing the participants' personal experiences, the coping strategies used, such as the emotional experience of this period and the main individual's projections for the future of these professionals. The results revealed that gender, age and time of unemployment are factors that may difficult reintegration into the labor market, while the support from family or close friends tend to mitigate the effects of unemployment. In addition, emotions during unemployment ranged from peace to sadness. The main losses are economic, the lack of social status and the withdrawal of dreams and projects.

- **14043 | Macro-system and fear of crime in intimate relations: contributions to a multilevel analysis in the Brazilian context.**

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The theme of (in)security and fear of crime has been target of a fruitful scientific production since the second half of the 20th century. In the same direction and simultaneously the literature related to domestic violence and its types - namely Intimate Partner Violence (IPV), was also developed. In an effort to integrate these concepts and using data from the first Brazilian national victimization survey, this study aims to understand - from the female perspective - how fear of violence in intimate relations manifests when both individual and contextual-macro variables are present, trying to fill a gap on the traditional literature on fear of crime and IPV, in particular. In this way, this work will integrate the above concepts (fear of crime and IPV) through an ecological perspective. The statistical analysis will be conducted by aggregating data at the level of the 27 Brazilian's Federative Units and the analytical models integrate the following variables: **outcome variable:** fear of intimate partner violence. **Individual-level variables:** marital status; income; religion; education; ethnicity. **Macro-level variables:** Gross Domestic Product (GPD); imprisonment, homicides and victimization rates; income *per capita*; Gini coefficient; Human Developmental Index (HDI) ; illiteracy; infant mortality. Thus, the present study, considering that crime produces its effects far beyond the relationship between 'victim and aggressor', their consequences and also their risk factors, will integrate a complex relationship with the social environment and the contexts in which human experiences and behaviors takes place. Preliminary results and further details of the research will be presented on the event.

- **14287 | Magnetic nanostructures for biotechnological applications**

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Magnetic nanostructures have been widely studied due to its potential applicability into several research fields such as data storage, sensing and biomedical applications. Focusing on the biomedical aspect, few new approaches on cancer therapy are deserving of mention: magnetic fluid hyperthermia (MFH), drug targeting and magneto-mechanically induced cell death.

The scope of this work, integrated in a master thesis, is to develop one subset of biocompatible magnetic nanostructures that exhibit a spin-vortex state. A description of its fabrication methods will be followed by a morphological, structural and magnetic characterization, relating this nanostructures with its biotechnological applications. Moreover, the magnetic behavior was supported by micromagnetic simulations.

- **14223 | Manipulation of the enzymatic ATP breakdown and of ADP-sensitive P2Y receptors activation may ameliorate neuromuscular fading in autoimmune myasthenia gravis**

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ATP released from firing motor nerve endings controls the release of acetylcholine either by directly activating P2 purinoceptors (P2R) or by acting indirectly through P1 receptors activated by adenosine resulting from its catabolism by NTPDases[1]. In this study, we aimed at evaluating the neuromodulatory role of P2YR in an experimental animal model of Myasthenia gravis (EAMG)[2]. Three-min application of ATP (1 μ M), in order to avoid its conversion into adenosine, decreased [3H]ACh release from stimulated phrenic nerve-hemidiaphragm preparations of control and EAMG rats by $21\pm 13\%$ (n=4) and $31\pm 6\%$ (n=5), respectively. The non-hydrolysable ATP analogue, $\beta\gamma$ -imidoATP (100 μ M), failed to modify the evoked [3H]ACh release, thus suggesting that ATP has to be dephosphorylated into ADP in order to inhibit transmitter release. Selective inactivation of ADP-sensitive P2Y1R and P2Y13R with MRS 2179 (300 nM) and MRS 2211 (10 μ M), respectively, prevented the inhibitory effect of ATP (1 μ M) on evoked [3H]ACh release in both animal groups. On the contrary, blockade of the P2Y12R with AR-C66096 (100 nM) further increased ATP (1 μ M)-induced inhibition of evoked [3H]ACh release to $45\pm 7\%$ (n=4) in EAMG rats, suggesting that the P2Y12R is partially counteracting transmitter release inhibition due to P2Y1R and/or P2Y13R in myasthenics. Data indicate that downmodulation of transmitter release caused by ATP requires its fast enzymatic breakdown by NTPDases into ADP leading to activation of ADP-sensitive P2YR. Given that this mechanism seems to be exaggerated in myasthenic animals one may hypothesize that inhibition of the enzymatic breakdown of ATP into ADP and/or the selective manipulation of ADP-sensitive P2YR activation may be valuable strategies to ameliorate neuromuscular transmission depression in Myasthenia gravis.

[1]Correia-de-Sá et al., 1996, J. Neurophysiol. 76: 3910-19; [2] Oliveira et al., 2015, Mediators Inflamm. ID 460610.

- 14020 | **MCL1 expression is regulated by alternative polyadenylation in human T cells**

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Alternative polyadenylation (APA) plays a major role in the regulation of gene expression. 3' untranslated region-APA (3'UTR-APA) is responsible for generating mRNA isoforms with different 3'UTR lengths, which influences mRNA stability, localization, and translation. Myeloid cell leukemia 1 (Mcl-1) is an anti-apoptotic B-cell lymphoma 2 (Bcl-2) family member that promotes cell viability, making it essential for cell survival and activated cell states. By 3'RACE and sequencing, we found that *MCL1* has two mRNA isoforms generated by APA in human T cells that we named pA1 and pA2. By siRNA and FACS analysis, we showed that the longest isoform (pA2) slightly contributes to the anti-apoptotic function of Mcl-1. The RNA-binding protein (RBP) Polypyrimidine tract binding protein (PTBP1) modulates poly(A) site usage either by competing with Cleavage stimulation Factor-64 (CstF-64) or by stimulating pre-mRNA cleavage by recruitment of CstF and poly(A) polymerase (PAP). By RNA-immunoprecipitation (RIP), we demonstrated that PTBP1 binds *MCL1* mRNA, therefore we focused in investigating the function of PTBP1 in *MCL1* APA using human T cells as a model. We observed that knockdown of *PTBP1* by siRNAs upregulates *PTBP2* in different cell types and *PTBP2* expression decreases when *PTBP1* is overexpressed, which suggests a feedback regulation mechanism between these two RBPs. Furthermore, PTBP1 overexpression seems to cause an increase in the mRNA levels of *MCL1* pA2 isoform. Taken together, our results show that *MCL1* is regulated by APA producing two mRNA isoforms with different 3'UTRs, that bind PTBP1. Additionally, we reveal a mechanism of PTBP1 and PTBP2 compensation in T cells, which can originate functional redundancy between these two paralogues in different cell types.

- **14211 | Medium as foundation for the artistic practice**

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Thinking about painting implies a constant exploration and investigation of the theoretical and practical problems inherent to the very act of painting. A theoretical research on painting should not be understood as something external to it, but rather as a theoretical and practical investigation.

Over the past year, the artistic practice has undertaken changes that developed from the practice itself, and new concerns, linked to the materiality of the elements that construct the pictorial image, have arisen.

In an early stage the artistic practice was designed for a painting structure, whether it was a canvas or wood panel, however, it was necessary to build a different structure that had the potential to be manipulated. As a result, a mixture of soil dirt and polyvinyl acetate was formulated where upon the pictorial image was created.

A greater interest concerning the vast variety of mediums and materials available began to emerge, giving way to other ways of working and thinking about painting.

Initiating from different types of materials, such as textured papers and cardboards, fabrics, burlap, ropes and threads, sandpaper, soil dirt, saw dust, among others, painting is thought bearing in mind the potentialities these elements contain and how they interact with each other.

The artistic practice is activated by a constant exploration of the problems inherent to the act of painting itself, not in order to give answers but in order to raise questions.

- **14283 | Mental Health in Medicine Students from Oporto University: Strategies to deal with stress – Extracurricular Activities**

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Background: Being a Med student can be very tiring and stressful. Practicing extracurricular activities (ECA) may improve students' well-being, besides providing important skills for life.

Aim: To characterize the prevalence of mental disorders in med students from University of Porto (UP), checking for association with ECA.

Methods: We applied a self-response questionnaire, containing the Portuguese version of Perceived Stress Scale and Maslach Burnout Inventory, in November/2017.

Results: A total of 364 med students of UP (59.9% of FMUP) answered the questionnaire (73.1% females), with a median age of 19 years old (interquartile range=2). One in ten students presented burnout symptoms (10.3%;CI95%: 7.4-13.9%) and 16,7% are at risk of developing them (CI95%:13.0-21.0%). Severe symptoms of stress affected 20.1% (CI95%:16.1-24.5%). These results were independent of gender, curricular year, institution and number of hours spent on studying, on sleeping and with family. The majority of students reported less than 20h of self-regulated study and around 7h per week spent in ECA. The most common activities were the sports, followed by artistic activities.

Students involved in ECA present lower burnout levels ($p=0,024$), especially when they practice sports ($p=0,03$). Students engaged in college, social, musical, literary and performative activities tend to present less symptoms, although not significant. Better academic performance and higher number of hours spent in ECA correlates with lower perceived stress and burnout levels.

Conclusion: Stress and burnout are common in medical students. Programmes towards inserting ECA in academic community may help to decrease these problems, improving students' health status. According to our results, we propose active intervention in campus to inform students and their families about the pros of ECA, to promote available activities, to facilitate the accessibility to them and to train students to improve their organization skills.

- **13954 | Metabolic response to dietary taurine levels in European sea bass (*Dicentrarchus labrax*) juveniles**

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Taurine (Tau) have been reported to be essential for some fish species, including seabass, however, its role in fish metabolism still poorly studied. Thus, this study aimed to evaluate the metabolic response to four dietary Tau levels in European sea bass. Four isoproteic (45% crude protein) and isolipidic (18% crude lipid) diets were formulated, containing a mixture of plant feedstuffs and fish meal (corresponding to 80% and 20% of total dietary protein, respectively), and increasing levels of Tau (0.2, 0.5, 0.7 and 1.2%). Triplicate groups of 12 European sea bass were fed with these diets for 10 weeks at 24°C. At the end of the growth trial, 4h after the morning meal, blood and liver of 3 fish per tank were collected for analysis of selected plasma metabolites, key intermediary metabolism enzymes, and hepatic total bile acids measurement.

Hepatic total bile acids content increased as dietary Tau levels increased, whereas the opposite occurred for plasma total bile acids. Plasma indirect bilirubin linearly increased with dietary Tau level ($R^2=0.86$; $p > 0.05$). Plasma total, HDL, and LDL cholesterol decreased, though plasma triglycerides were not affected by the increase of Tau level up to 0.7% Tau. The activity of hepatic lipogenesis key enzymes FAS and ME, but not G6PDH, decreased with the increase of dietary Tau up to 0.7%. Post-prandial plasma glycaemia and the activity of hepatic key enzymes of glycolysis and gluconeogenesis decreased with the increase of dietary Tau level. Overall, present results indicate that Tau appear to be involved in different pathways of both lipid and glucose metabolism having a hypocholesterolaemia and hypoglycaemia action.

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- **14217 | Micro Hot Embossing: Influence of different silicon rubber dies on the replicability of micro details on AISI 316L/binder green parts**

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The powder metallurgy technologies involve the production of metallic parts/components based on powders. The Micro Hot Embossing technique is a recent and under development powder metallurgy technique, that allows the replication of micro details with high aspect ratio. It consists of four major steps: 1-preparation of mixtures; 2-embossing step; 3-debinding and 4-sintering. These steps are interrelated and the parameters of each one interact and have an important role on final parts. The innovation of this technique is in step 2 where replication is made by applying temperature and pressure during a period of time. This is a crucial step that requires the optimization of critical parameters (temperature, pressure and time) and straight procedures, especially during demoulding step. The aim of this work is to study the influence of three different silicon rubber dies during shape forming step: a transparent, blue and white-bluish one. In this study it was used an AISI 316L powder with a $d_{50} = 3.6 \mu\text{m}$ and a $d_{90} = 5.9 \mu\text{m}$. The binder used it's a commercial polymer system suitable for Powder Injection Moulding with a density of 0.97 kg.m^{-3} . The production mixtures were performed by torque rheometry. The mixtures have powder content equal to 60 vol.% and 2.2 N.m binary. The embossing step was done using a mould with a silicon rubber die, which was coupled to a tensile test machine equipped with an infrared heater chamber. The critical process conditions were optimized for each silicon rubber die. The influence of the different silicon rubber dies was evaluated by the replicability of micro details in the green parts by stereo and infinite focus microscopy. It was concluded that the white-bluish die was the one that achieved best results. It's fundamental to have a silicon rubber die that upholds and stands the pressures and temperatures. The die must also be tough and should have a high cycle life in order to be effective on replicating micro details.

- **14297 | Microbial community present in sludge from wastewater treatment tank of a refinery**

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The sludge of wastewater treatments plants (WWTP) plays a crucial role in the treatment of domestic and industrial wastewater [1]. The sludge composition includes microorganisms capable of degrading various pollutants, like organic compounds, including hydrocarbons (HC). Hydrocarbons are one of the major contaminants in several ecosystems, both in prevalence and quantity, many of which are biodegradable [2]. In this work, we isolated and characterized phylogenetically the microbial community present in the sludge of WWTP of a refinery. For the isolation, 100µl of the sludge were inoculated in 3 different media (Nutrient agar, the marine M13 medium and media with different hydrocarbons as unique carbon source). For the phylogenetic identification of the obtained isolates the 16S rRNA gene was analysed. More than 100 bacteria were obtained in pure culture belonging to the phyla Firmicutes (42%), Proteobacteria (40%), Actinobacteria (16%) and Bacteroidetes (1%). The Proteobacteria was the most diverse phylum. Of the 20 different genera that this study provided only 3 had not yet been related with hydrocarbon polluted environments. Some isolates are novel taxa.

[1] Shchegolkova, N. M., Krasnov, G. S., Belova, A. A., Dmitriev, A. A., Kharitonov, S. L., Klimina, K. M., and Kudryavtseva, A. V. (2016). Microbial community structure of activated sludge in treatment plants with different wastewater compositions. *Frontiers in Microbiology*, 7(FEB), 1–15.

[2] Tyagi, M., da Fonseca, M. M. R., and de Carvalho, C. C. C. R. (2011). Bioaugmentation and biostimulation strategies to improve the effectiveness of bioremediation processes. *Biodegradation*, 22(2), 231–241.

- **13976 | Millennials Being Leaders: an Exploratory Study of their Self Defense System**

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This work presents a study in development that aims to explore the activation of the defensive system of millennial leaders. Although leadership is deeply discussed nowadays, the references to the challenges underpinning this process are lacking. On the other side, it is important to understand how these challenges are felt by millennials, whose presence and influence in the organizational context is becoming increasingly more significant.

This generation is described as having some resistance to criticism as well as a great need of having immediate gratification and a sense of full realization. Therefore, the possibility of following up the growth of their personal project, their startups, represents, despite of all the difficulties it may entail, a way to compensate everything else (Ramos, 2016).

In order to fulfill the aforementioned objective, there will be conducted Critical Incidents qualitative and semi structured interviews. The data will be collected with 14 startup leaders, born between 1970 and 2000, being, therefore, considered millennials. The interviews transcripts will be analyzed through the content analysis technique, following Bardin (2009), using the NVIVO 11.0 (QSR).

It is expected that this study will enable the identification of situations capable of activating the defensive system of millennials who develop leadership processes in their startup companies and that should be associated with the instability of their environment, characteristics of their own or their generation. In terms of strategies it is expected that individuals that possess in their lives support networks and environments perceived as safe (Ramos, 2016), will be able to activate their caresseeking and exploration systems, thus managing to deal with their challenges in an effective way.

This communication intends to discuss the defined design and the preliminary data collected, as well as its possible impact on the leadership processes of the millennial generation.

- **14298 | Modeling and forecasting electricity prices**

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The electricity prices experience sudden spikes and large declines and it is important to model their fluctuations by implementing an effective tool for managing energy price risk.

The behavior of electricity prices over time can be described by time series models, which take into account the time elapsed between their changes. The Extreme Value Theory (EVT) provides a way to capture the behavior of the most sudden changes.

The main goal of this project is to use time series analysis and EVT to find models that can be useful in predicting extreme events in the Iberian electricity market, approaching the issue of statistical dependency in an appropriate way.

Keywords: Electricity Prices, Time Series, Extreme Value Theory, Generalized Pareto Distribution

- 14187 | Modern interventions of urban and architectural ennoblement of the city:
The project of “Rua do Loureiro”

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This investigation intends to study both urban and architectural transformations in the city of Porto, taking *Rua do Loureiro* as a case study - an important street of the urban composition ever since the 16th century. By means of drawing as an interpretive tool, our main goal is to better recognize and understand its contribution to the city and characterise its different and complex project phases since the promotion of the religious entity, *Mosteiro de São Bento de Avé-Maria*, for their own benefit, and as an intelligent urban intervention.

Thus, we propose to organise our study in four parts.

In the first part, we make an analysis of relevant facts of Porto’s medieval history in order to help us understand its geographic and topographic characteristics and its relationship with both the defensive walls (*Muralha Primitiva* and *Muralha Fernandina*) and also with the existing monastic spaces, road network and public spaces.

Secondly, we propose to analyse this urban and architectural intervention through the written arguments for this project. Particularly in this chapter, the drawing is an essential exploratory tool to interpret the urban parcelling based on modulation principles and to understand how the block was designed. The third part searches for a contribution of this project for the urban composition and its social/cultural legacy, once facing the main and singular monastery’s portico. Finally, the fourth part concerns the study of the urban transformations resulting from the demolition of Monastery and the construction of São Bento Railway Station, at the beginning of the 20th century, since this new building established another urban primary connections, diminishing its relation with *Rua do Loureiro* and therefore its grandeur and unit. In this last chapter, we also interpret the signs of the present to reflect the processes of transformation of the urban design over time.

- 14137 | Motives for participating in competitive swimming: A study with handicapped and regular swimmers

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Motives are what eventually produces action, possibly leading individuals to act differently in diverse contexts, orienting subjects towards a goal that may exist due to internal (i.e., related to intrinsic reasoning) or external factors (i.e., related to the surrounding environment). In sport, particularly in competitive swimming, in which subjects are engaged in systematic practices and competitions, it is important to understand why athletes keep going and push themselves year after year. Swimming has many positive physical and mental health benefits, critically health promotion, physical conditioning, pleasure and entertainment, and socialization with peers. Thus, considering that psychological factors are one of the most important determinants of sports performance in general, and swimming proficiency in particular, the current study investigated whether 36 male and female competitive swimmers (median age = 17.3 ± 4.4 years) from both sexes and different classes (i.e., with [$n = 28$] and without disabilities [$n = 8$]) varied in their participation motives. The participants completed the Sports Activity Motivation Questionnaire and data were analysed using the Mann-Whitney non parametric test for independent samples ($p < .05$). The comparison of male and female swimmers showed no differences regarding the motives for sport participation. On the other hand, handicapped swimmers valued physical form, skill development and competition more than non-handicapped swimmers.

KEYWORDS: motives, competition, regular swimmers, handicapped swimmers

- **14201 | MSW domestic sorting: a system to optimize organic recycling**
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The composting of organic waste has been a need for 10 thousand years, but now more than ever. Agricultural ecosystems are being overexploited, and the need to restore the soil's nutrients is matched by the need to stop land-filling or burning waste. The existing systems for organic recycling in Portugal do not meet these needs, either when we talk about the Mechanical-Biological Treatment widely adopted by our country or about the big-producer focused system used in the municipality of Porto.

With the collaboration of the Municipality of Santa Maria da Feira, this project aims to study the possibility of implementing a third option: a system that relies on the population to sort the Municipal Solid Waste (MSW), including organics. Models for this system exist, most notably in San Francisco, California - a city that sets 'zero waste' as a goal to 2020. After assessing the attitudes of the population regarding recycling habits, providing those willing with an action of environmental instruction and recruiting volunteers for the project, the weight-in of organic waste should provide a good answer as to whether this system is viable to be implemented in our country or not.

If the expected results are confirmed, this project may pave the way for the spread of a circular economy in Europe, where all waste is turned into resources and the extractive pressure on the planet is approximately none.

- **14229 | Musical Representations in the XVIII and XIX century in Lisbon by Gazeta de Lisboa**

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For two years i studied musical representations in Lisbon, to present this dissertation to the master degree in history to the faculty of arts in Porto University.

Based on the analysis of the Gazeta de Lisboa, namely the about 11 800 issues published between 1715-1762 and 1778-1820, this dissertation aims to answer some key questions, of which some stand out: who are the promoters of the events? What audiences were present at the events? Which music/singers/composers are mentioned? Which places are mentioned? Which of those places survived the earthquake of 1755? Which musical genres are reported more often? Can we study musical tendencies from this periodical publication?

Artistic manifestations, namely music, are important indicators for the study of the centrality of certain political and social places, as well as to enlighten ways of social representation, like the sociability of the elites or the relation of a specific political and cultural place with others centers of artistic and cultural production.

Trying to go beyond the state of the art, this dissertation is divided in four chapters, based on: 1. a presentation and analysis of the Gazeta de Lisboa; 2. the musical genres, the musical agents and the promoters; 3. the places of representation before and after the 1755 earthquake; 4. the audiences and their sociabilities.

Keywords: Portugal, Gazeta de Lisboa, Musical Spaces, Musical Manifestations, Sociabilities.

- **14237 | Nanostructured carbon materials for visible light-driven photocatalytic degradation of emerging water contaminants**

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The volume of contaminated urban residual waters derived from the global development is an increasingly bigger burden on the ecosystem. Although wastewater treatment processes have been improved in Europe during the last few years, the amount of pollutants arriving to the rivers is still larger, and with their accumulation, no life can prosper. Diclofenac (DCF) is a common active ingredient used in the synthesis of several pharmaceuticals often found in urban wastewater, thus being a target of great concern [1]. Heterogeneous photocatalysis is a light-driven oxidation process that has been gaining increasing attention for the degradation of emerging water contaminants.

In the present work, the selected photocatalyst was the graphitic carbon nitride (g C₃N₄) material, which is a polymeric semiconductor, easy to prepare by thermal decomposition of several low-cost nitrogen rich precursors, with a narrow band gap (~2.7 eV) [2, 3]. In our approach, a bulk g C₃N₄ material was synthesized by thermal condensation of dicyandiamide, then thermally post-treated at 500 °C under different atmospheres (air and H₂). The performance of the resulted materials was evaluated in the degradation of an aqueous DCF solution using a borosilicate batch reactor under visible LEDs light irradiation ($\lambda_{\text{max}}= 417 \text{ nm}$).

Results reveal that DCF was efficiently decomposed by heterogeneous photocatalysis under visible light irradiation. Among the photocatalysts, the highest efficiency was obtained with the g C₃N₄ thermally pos-treated under air atmosphere, achieving a complete removal of DCF after 20 min of reaction. The role of the post thermal treatments will be investigated, and the efficiency of the photocatalysts for the degradation of other water contaminants will be attempted.

References:

[1] N.F.F. Moreira et al., Top. Water Res. (2015) 87-96.

[2] X. Liu et al., Sci. Rep. 6 (2016) 39531.

[3] M.J. Lima et al., J. Catal. 353 (2017) 44-53.

- **14167 | Nanotechnology breakthrough in neurodegenerative diseases: a new route for the bioavailability improvement of a potent and reversible MAO-B inhibitor**

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Parkinson's disease (PD) is a neurodegenerative disorder characterized by a progressive loss of structure and well-function of neurons. Although many efforts have been made for the pursuit of successful therapies a great part of drug candidates fails in pre- and clinical trials due to several bioavailability setbacks. Even compounds that have good drug-like properties, e.g. solubility and lipophilicity, can be excluded due to blood-brain barrier (BBB) permeability constrains. In fact, BBB is considered one of the major impairments to developing treatments for neurological diseases.

Recent advances in nanomedicine area have provided promising solutions for surpassing the point out constrains. Within this framework, the use of polymeric nanoparticles as colloidal drug delivery systems has been reported as a promising tool to increase the stealth capacity of drugs to surpass biological barriers, while reducing low water-solubility and dose-dependent cytotoxicity issues.

Recently a new reversible and selective chromone-based monoamine oxidase B (MAO-B) inhibitor, CROM_B, displaying picomolar potency was discovered by our group. However, some issues mainly related with water solubility resulted in limitations for its therapeutic application. Therefore, the main aim of this work was the encapsulation of the CROM_B in PEGylated PCL-based nanoparticles using the nanoprecipitation method. Consequently, an extensive evaluation physicochemical and morphologic features of the nanoformulations was performed using several techniques, as well as preliminary cytotoxicity studies in SH-SY5Y, Caco-2 and h3CMEC/D3 cell lines.

In general, the new PEGylated PCL nanoparticles presented sizes around 200 nm or less, z-potential values between -5 to 5 mV under physiological conditions and physicochemical features suitable for a therapeutic application. Furthermore, no cytotoxic effects were observed in neuronal and intestinal cell lines for the nanoformulations prepared.

- **14281 | Novel Fully Biodegradable PEG-dendrimers: promising carriers to siRNA delivery**

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Over the past decades, gene therapy has gained significant attention as an innovative choice to treat/prevent numerous diseases. Research is focused on the development of effective and biocompatible carriers to transport the nucleic acid (NA). Dendrimers are promising NA delivery systems due to their highly branched and globular structure, low polydispersity, and the presence of peripheral groups that can be functionalized with different ligands.¹ Particularly interesting is their capacity to complex and protect NAs in nanostructures ("dendriplexes").² A major drawback of the most used dendrimers applied biomedically is their non-degradability nature under physiological conditions that can result in cytotoxicity due to the accumulation of synthetic materials in the organism. Moreover, biodegradability can be convenient since will favour the siRNA release, leading to higher transfection efficiency (TE).³ Here, we present the biofunctionality assessment of new fully biodegradable, biocompatible, and non-toxic PEG-dendrimers, recently developed by us, as siRNA vectors. The corresponding dendriplexes were physicochemically characterized having nanosizes, polydispersity, surface charges and morphologies appropriate for cellular uptake. A resazurin-based assay also confirmed their non-cytotoxicity. Through fluorescence flow cytometry, the internalization and TE were assessed in U2OS/eGFPLuc cells. The PEG-dendrimers showed a remarkable ability to protect and facilitate siRNA internalization, showing significant TE. The present study puts forward these fully biodegradable PEG-dendrimers as suitable vectors for nucleic acids.

References

1. Leiro, V. et al. Adv. Funct. Mater. 2017
2. Leiro, V. et al. Curr. Gene Ther. 2017
3. Leiro, V. et al. J. Mater. Chem. B. 2017

- **13949 | Nutrients removal from wastewater by *Chlorella vulgaris***

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The impact of pharmaceutical active compounds (PhACs) on aquatic ecosystems is still unclear and the data on biodegradation, toxicity and environmental fate are scarce. Consequently, the potential chronic adverse effects on human health are subject of concern. Therefore, microalgae can be used in wastewater treatment for a range of purposes, some of which are the reduction of both chemical and biochemical oxygen demand, removal of nitrogen and phosphorous and also the removal of heavy metals. However, due to limited information on algae biofilm based systems for wastewater treatment, there is a need for fundamental studies on algal biofilm processes in terms of growth rates, nutrient removal capacity, physiological processes, and heterotrophic–autotrophic interactions. This work aimed to study both the removal of nutrients from wastewater by the microalga *Chlorella vulgaris* in the presence of pharmaceuticals, namely sulfamethoxazole and trimethoprim. The growth conditions were maintained constant, under controlled temperature (25 ± 1 °C), illuminance (4000 Lux) and photoperiod (12:12). The concentration of pharmaceuticals, was measured at different initial concentrations (0, 0.1, 0.5, 1 mg·L⁻¹) during 12 days of exposure. The Gompertz model was applied to experimental data to determine the removal kinetic parameters. The results obtained are very promising for both nutrients as 35.4% of phosphate and 21.6% of nitrate were removed in the presence of sulfamethoxazole and trimethoprim. These overall results are expected to contribute to the knowledge on the application of microalgae on the bioremediation of wastewater, namely on the removal of emerging contaminants particularly recalcitrant pharmaceuticals.

- **14198 | Obesity and environmental pollutants: a reason for concern?**

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Obesity has been ranked in the top 10 health risks in the world by the World Health Organization. This medical condition is a serious risk factor for the development of type-2 diabetes, hypertension, cardiovascular disease, hepatic steatosis, as well as some cancers, and can cost countries billions of euros annually in either direct or indirect care.

Besides reaching epidemic proportions in human beings all around the world, recent findings point to an association between obesity and environmental chemicals named “obesogens”, able to alter lipid metabolism and thoroughly affect the animal Kingdom. Aiming to elucidate the mode of action and assess the ability of environmental mixtures (1.25% and 2.5% pure WWTP influent) and model obesogen Tributyltin (environmental concentrations: 100 ng/L Sn and 200 ng/L Sn), to promote obesogenic effects, we have combined an *in vivo* assay targetting fat accumulation using the model species zebrafish (*Danio rerio*), alongside evaluations of the altered expression of key genes involved in lipogenesis/adipogenesis (SREBP1, FASn, PPAR γ and RXR α) and lipolysis (ACOX1). We also performed an *in vitro* transactivation assay with human and zebrafish nuclear receptors peroxisome proliferator-activated receptor γ (PPAR γ), the "Master regulator of adipogenesis", its heterodimeric partner retinoid X receptor α (RXR α) and the RXR α :PPAR γ heterodimer.

Despite the increase in lipid accumulation in all treatments (except at 1.25% influent), TBT did not enhance the expression of lipogenic genes with the exception of FASn at 100 ng/L Sn. Transactivation results indicated that TBT represses the zebrafish heterodimer.

In general, our study demonstrates the ability of environmental samples and tributyltin to interact with the RXR α and/or PPAR γ receptors, thus modulating the expression of key genes from downstream pathways, which might be one of the mechanisms underlying the observed accumulation of lipids *in vivo*.

- **14209 | Occurrence and characterization of *Vibrio parahaemolyticus* in retail mollusks in Portugal**

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The global increasing demand for seafood, which is commonly eaten raw or undercooked, has led to the rise of acute gastroenteritis outbreaks. These outbreaks can be associated with the consumption of seafood contaminated with *Vibrio parahaemolyticus*, a halophilic bacterium with worldwide distribution. In this study, we aimed to determine the prevalence of *V. parahaemolyticus* in live bivalve mollusks marketed in Portugal, thereby attempting to infer the potential foodborne hazard for the Portuguese population. The most probable number-polymerase chain reaction (MPN-PCR) approach was used to estimate the vibrio abundance in the bivalve samples purchased from local markets. *Vibrio sp.* were detected in all samples (n=45), 65% of which were positive for *Vibrio parahaemolyticus* (ToxR), with abundance ranging from >3 up to 10^6 MPN g⁻¹. Furthermore, the primary virulence factors in *V. parahaemolyticus*, thermostable direct hemolysin (TDH), and thermosable direct hemolysin-related hemolysin (TRH), were respectively found in 20% and 13% of the samples. Seasonality was observed in the abundance of *Vibrio parahaemolyticus*, with highest levels in the Fall. *Vibrio* isolates were characterized for pathogenic traits and antibiotic resistance. *V. parahaemolyticus* presence in shellfish is a major public health problem, and the results obtained allow concluding the dear need to increase surveillance and regulation of the production, transportation, and retail of seafood. This is the first report in Portugal on the prevalence of *V. parahaemolyticus* in marketed bivalve mollusks. This research was partially supported by INNOVMAR (Reference NORTE-01-0145-FEDER-000035), Research Line INSEAFood, supported by the Northern Portugal Regional Operational Programme (NORTE2020), through the European Regional Development Fund (ERDF), and the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT and ERDF, in the framework of the programme PT2020

- 14090 | Optimization of the method to extract phenolic compounds from tomato fruits

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Nowadays, there is a crescent concern on the nutraceutical quality of what people eat. Therefore, there have been made great advances in biotechnology with the aim to increase the quality of aliments, in particular fresh food, which is especially sensible and experiences great losses since its production until it reaches the final consumer. To keep up with the development in technology, it is necessary to optimize the analytical methods used in laboratories that characterize nutritional aspects of fresh foods. Tomato is one of the most consumed vegetables worldwide, and it is reported to have many beneficial health effects. Hence, it is being used in many studies that relate its compounds with its potential therapeutic properties, as well as in studies that evaluate the effect of post-harvest treatments in the nutritional characteristics of the fruit during shelf-life. Tomato is important essentially because of its content in phenolic compounds and its potential antioxidant activity. Therefore, the need to optimize a method to obtain extracts that would allow the evaluation of the referred characteristics emerged. Based on previous methods used for other species, different conditions of extraction were used and tested to ascertain which ones would allow better results in the phenol quantification and determination of antioxidant activity. For one gram of freeze-dried fruit, the best results were obtained using 20 mL of methanol 70% (v/v) followed by vacuum filtration. Phenolic compounds were quantified using microplate-adapted colorimetric total phenolics assay with Folin-Ciocalteu reagent and the antioxidant activity was determined by DPPH assay, also adapted to microplate. It is still necessary to evaluate the influence of the time of extraction.

- **14118 | Optimization Study in Natural Gas Infrastructure Planning with Multi-Criteria Analysis**

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The activity of a natural gas distribution company is based on harmonious development of the infrastructure, increasing the densification rates of the existing network and the expansion to new geographical areas, centred on a rigorous planning. This key activity is carried out taking into account the geographical distribution of the population, market players and end users requirements and technical needs.

The development of natural gas infrastructures depends on the consolidation of strategic planning policies that optimize the investment, guarantee quality of service and assure a return on investment to the shareholders of the company, because since the energy market split between suppliers, transport and distribution operators, the remuneration model implies investment optimization and cost-effective companies.

Therefore a strategic planning of the infrastructure points towards policies that are not only based on economical conditions, but also based on commercial, regulatory, geographic and operational criteria. Therefore, the fundamental point of this project is to systematize the multi-criteria analysis to support the decision making in the strategic planning of infrastructures.

To answer this last topic a small part of the natural gas network will be optimized using real data provided by REN Portgás Distribuição combined with various optimization techniques (global optimization approach and mixed integer nonlinear programming), in order to achieve a viable process for infrastructure investment optimization.

- **14141 | P-cadherin enrichment dictates sensitivity of breast cancer stem cells to DCA metabolic reprogramming**

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Breast cancer stem cells (BCSC) exhibit a pro-glycolytic metabolism, allowing them to decrease oxidative stress, escape anoikis and survive in circulation. Disturbing this survival skill by metabolic reprogramming would impact the efficacy of cancer treatment.

P-cadherin expression is a poor prognosis factor in breast cancer, being associated with hypoxic, glycolytic and acidosis markers. Still, P-cadherin enriched populations, which have increased stem-like properties, are more likely to exhibit increased glycolysis and to survive to metabolic-driven pH alterations.

Thus, our aim was to evaluate if P-cadherin expression has a role in metabolic reprogramming of BCSC, acting as an antioxidant and enhancing cell survival in circulation by promoting anoikis-resistance, using dichloroacetate (DCA), a pyruvate dehydrogenase kinase (PDK) inhibitor.

Here, we show that P-cadherin-enriched cells were more sensitive to DCA. We also observed that P-cadherin expression modulates pPDH and that DCA decreases P-cadherin expression. Interestingly, DCA induced increased anoikis of P-cadherin-enriched cells, in comparison to cells silenced for this protein. Finally, we also observed that P-cadherin downregulation induces an increase of reactive oxygen species (ROS), being its expression responsible for anoikis resistance in breast cancer.

In conclusion, P-cadherin might be a valuable biomarker to predict response to DCA treatment, improving the selection of breast cancer patients to metabolic targeted therapies.

- **14220 | Pharmacogenomics in epithelial ovarian cancer first-line treatment outcome: validation of genome-wide association studies-associated *NRG3* rs1649942 and *BRE* rs7572644 variants in an independent cohort.**
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 Pereira, D., Instituto Português de Oncologia do Porto, Portugal
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Objective: The identification of predictive biomarkers for epithelial ovarian cancer (EOC) first-line treatment remains a challenge. Although genome-wide association studies (GWAS) have identified several genetic polymorphisms as predictors of EOC clinical outcome, the subsequent validation has not yet been performed. This study aims to validate the influence of two GWAS-identified variants (*NRG3* rs1649942 and *BRE* rs7572644) in an independent cohort of EOC patients from the North region of Portugal.

Methods: We conducted a retrospective hospital-based cohort study gathering 339 EOC patients submitted to first-line treatment. Polymorphisms genotypes were determined by Real-Time PCR using validated assays.

Results: Patients carrying the *NRG3* rs1649942 A allele presented a significantly longer overall survival (OS) when compared to GG genotype patients (log-rank test, $P=0.011$) in the FIGO IV stage subgroup. No impact was observed for early stage patients or considering disease-free survival (DFS) as outcome. For FIGO I/II stage patients, *BRE* rs7572644 C allele carriers` exhibit a decreased OS ($P=0.014$) and DFS ($P=0.032$) when compared to TT homozygous patients. Furthermore, a Multivariate Cox regression analysis revealed a three-fold increase in the risk of death (HR, 3.09; $P=0.015$) and recurrence (HR, 3.33; $P=0.009$) for FIGO I/II C allele carriers. No significant impact was observed for late stage patients.

Conclusions: The *BRE* rs7572644 and *NRG3* rs1649942 genetic variants were validated in an independent cohort of EOC Portuguese patients, particularly in specific subgroups considering FIGO staging. Further functional post-GWAS analyses are indispensable to understand the biological mechanisms underlying the observed results.

- 13883 | Phylogenetic and Diversity Patterns of the Algerian Whip Snake
Hemorrhois algirus

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The Algerian whip snake, *Hemorrhois algirus*, and the horseshoe whip snake, *H. hippocrepis*, are two sister species inhabiting the Maghreb. They have mostly an allopatric distribution, with the first being present in southern semi-desert regions and the second in the northern Mediterranean habitats, but many individuals have been found with intermediate traits, mostly in regions of sympatry in Morocco. Former genetic studies had no data on the intraspecific variation of *H. algirus* and the nature of the intermediate forms is not clear. The aims of this work were to assess the phylogeographic patterns of *H. algirus*, the phylogenetic relationship between the pure and intermediate forms and to relate the results with the current intraspecific taxonomy of the species.

For this, samples were collected and sequenced for 1 mitochondrial and 4 nuclear loci. ML and BI phylogenetic analyses and a phylogenetic network analysis based on mitochondrial data showed a deep divergence between two *H. algirus* lineages, that correspond to the subspecies *H. a. algirus* and *H. a. intermedius* as their geographical distributions coincide with the ones proposed for them.

The phylogenetic network analyses of the nuclear markers unveiled deep incomplete lineage sorting between *H. algirus* and *H. hippocrepis*. However, the pattern of nuclear haplotype sharing in individuals from the contact areas also indicates a role of hybridization and introgression in shaping the observed genetic structure. Despite this, *H. a. algirus* individuals had a particular set of haplotypes for all the loci analysed.

The deep mitochondrial divergence between the two subspecies and their reciprocal monophyly at nuclear loci raises the question of whether the *H. algirus* subspecies merit full species status. Given the current data, we suggest this nominal change requires additional samples and morphological data, especially of *H. a. algirus*.

- **14044 | Physical exercise during gestational diabetes as a mean to improve brain tissue and mitochondrial function in the offspring**

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Obesity and related comorbidities such as diabetes and gestational diabetes have become a global epidemic. In normal pregnancy conditions, the increase of placental hormones results in mild insulin resistance to facilitate the fetus macronutrient uptake. However, inappropriate diets, such as those with high content of carbohydrates or saturated and trans fats, can induce an exacerbation of this physiological process leading fetus excessive glucose exposure. As the placenta is not permeable to the maternal insulin, the fetus produces it as much as it needs. These increased levels of glucose and insulin can result in several deleterious effects, including excessive body weight, adiposity and altered neurological development.

Physical exercise is a non-pharmacological intervention that has been proven to efficiently overcome some of the deleterious effects related to obesity and diabetes, including improved blood glucose handling, insulin sensitivity and cognitive performance, being this last one associated to the genetic and protein expression regulation of neural growth factors such as the brain derived neurotrophic factor (BDNF). This exercise-induced positive phenotype is mediated by several cellular and molecular mechanisms, often with mitochondria playing a central role in the mediation of adaptations. Indeed, regular exercise has been extensively associated to improved mitochondrial dynamics and bioenergetics, which ultimately benefits the whole cell and tissue homeostasis.

This project aims to ascertain whether physical exercise performed during pregnancy translates into cognitive benefits in the offspring, with a special focus on the analysis of mitochondrial-mediated alterations. Epigenetic and protein signaling mechanisms/pathways related to these adaptations will also be discussed.

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- **14259 | Physical skill testing in adolescent water polo players: The INEX project**

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Sport is a major context of systematic and meaningful physical exercise for youth. However, giving excessive importance on those aspiring for elite detracts from the potential of sports participation for all children and adolescents. This is one of the reasons why we started a research project addressing the acquisition and development of sport expertise also aiming to better understand how water polo players reach the pinnacle of their sport, as well as which particular performance attributes are key contributors to their achievements. In the current study we will show an ongoing project that aims to characterize 11 to 14 years old water polo players in a number of areas (e.g. anthropometric, game analysis and cognitive skills), one of which is determinant for their performance: the motor performance skills. For that purpose the following battery of tests will be implemented: (i) running velocity (5, 20 and 30 m); (ii) agility T test (10 x 10 m); (iii) standing long jump; (iv) sit-ups (maximum number of repetitions on 60 s); (v) handgrip; (vi) medicine ball throw; (vii) Yo-Yo intermittent test; and (viii) squat and countermovement jumps (performed on a force plate). All assessments will use standardized protocols. Available longitudinal research in young players is scarce, is mostly biologically oriented and limited to soccer and handball. We plan to do a follow-up of this group along three consecutive training seasons. In the future, data analysis will be linked to results from the other assessment domains and compared with participants from other team sports (handball, basketball, football and volleyball) of the same chronological ages, as well as from references available in the literature.

- 14105 | Physiologic and stroke mechanics characterization of long distance front crawl

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The future of open water swimming, understood as the intention to develop the performance capacity of these specific swimmers, depends on the increase of scientific knowledge on this topic. Our purpose was to identify and characterize the biophysical determinants in 5000m front crawl. Thirty-four swimmers were evaluated in a formal competition and 10 in a 5x1000m protocol for the assessment of blood lactate concentrations ($[La^-]$), blood glucose and biomechanical variables. We also performed an experiment in which we included analysis of ventilatory variables and oxygen uptake ($\dot{V}O_2$) kinetics with two swimmers during performed 5x1000m. Mean velocity (v) for the 5000m event was $1.31 \pm 0.08 \text{ m}\cdot\text{s}^{-1}$, with $35.0 \pm 3.2 \text{ cycles}\cdot\text{min}^{-1}$ for stroke rate (SR), $2.49 \pm 0.3 \text{ m}\cdot\text{cycle}^{-1}$ for stroke length (SL), $3.26 \pm 0.5 \text{ m}^2\cdot\text{s}^{-1}\cdot\text{cycle}^{-1}$ for stroke index (SI), $3.0 \pm 1.6 \text{ mmol}\cdot\text{L}^{-1}$ for blood lactate ($[La^-]$) and $115 \pm 21 \text{ mg}\cdot\text{dL}^{-1}$ for blood glucose. Concerning the 5 x 1000 m test the mean v , SR, SL, SI, $[La^-]$ and blood glucose were respectively $1.29 \pm 0.01 \text{ m}\cdot\text{s}^{-1}$, $33.0 \pm 3.4 \text{ cycles}\cdot\text{min}^{-1}$, $2.62 \pm 0.3 \text{ m}\cdot\text{cycle}^{-1}$, $3.39 \pm 0.4 \text{ m}^2\cdot\text{s}^{-1}\cdot\text{cycle}^{-1}$, $2.3 \pm 1.1 \text{ mmol}\cdot\text{L}^{-1}$ and $96 \pm 20 \text{ mg}\cdot\text{dL}^{-1}$. During the 5 x 1000 m test using the portable gas analyzer, values ranged around $1.30 \pm 0.03 \text{ m}\cdot\text{s}^{-1}$ for v , $34.7 \pm 1.1 \text{ cycles}\cdot\text{min}^{-1}$ for SR, $2.47 \pm 0.04 \text{ m}\cdot\text{cycle}^{-1}$ for SI, $3.20 \pm 0.08 \text{ m}^2\cdot\text{s}^{-1}\cdot\text{cycle}^{-1}$ for SI, $2.0 \pm 0.3 \text{ mmol}\cdot\text{L}^{-1}$ for $[La^-]$ and $92 \pm 9 \text{ mg}\cdot\text{dL}^{-1}$ for blood glucose. $\dot{V}O_2$, pulmonary ventilation and heart rate did not change as function of time. The energy expenditure and energy cost ranged around $576 \pm 70 \text{ kJ}$ and $0.6 \pm 0.07 \text{ kJ}\cdot\text{m}^{-1}$ with the aerobic pathway accounting for $\sim 99.5\%$. Results allow us to conclude that in long distance exercises at low to moderate intensity, the aerobic energy contribution plays a fundamental role in the energy demand of the swimmers and that a physiological steady state occur associated to biomechanical adjustments.

Key words: SWIMMING, PHYSIOLOGY, BIOMECHANICS, FRONT CRAWL

- **14013 | Physiological and biomechanical evaluation of age group swimmers: a longitudinal study**

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Swimming performance is influenced by several factors, especially the physiological and biomechanical, being developed through a well structured training process using a careful planning and periodization. However, longitudinal studies assessing factors associated with swimming performance evolution in young swimmers are scarce. The purpose of this study was to characterize and explain the age group swimmers improvement along a training season, taking into account their growth and maturation, as well as their physiological and biomechanical characteristics. 43 swimmers (12.07 ± 1.14 years old) participated in two studies, the first along a macrocycle and the second during a training season. At the start and at the end of the macrocycle and the training season the swimmers performed 400m front crawl at maximum velocity. The post-effort heart rate, Borg scale, blood lactate and blood glucose concentrations were assessed. A video camera recorded the clean swimming phase for later analysis of stroke rate and stroke length. There was an improvement in the 400m performance along the macrocycle (444.40 ± 76.95 vs 408.95 ± 61.40 s) and along the competitive season (432.37 ± 71.78 vs 366.66 ± 47.7 s). However, during the macrocycle, the physiological (with the exception of glucose) and biomechanical variables did not change. During the competitive season there was an increase in blood lactate concentrations (6.04 ± 2.33 vs 7.94 ± 2.74 mmol/l) and stroke length (1.58 ± 0.24 vs 1.78 ± 0.22 m/cycle). The improvement in performance throughout the macrocycle was explained by stroke length increase indicating improved propulsive efficiency. Stroke length was increased and blood lactate concentration rise as a result of technical training and increased amount of anaerobic training also explained the 400m improvement over the competitive season. Development of biomechanical and physiological parameters is a slow and long term process that affects 400m performance in age-group swimmers.

- **14188 | Phytotoxic effects of nano-NiO on growth, photosynthetic pigments and lipid peroxidation in *Lycium barbarum* L. under in vitro conditions**

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Nanomaterials (NMs) have been incorporated into many lifestyle products and their release into the environment makes them a threatening agent for organisms. Despite the toxicological effects of metal-based nanomaterials, including nickel oxide (NiO), on plants have been already reported [1], further investigation is required. Although Ni is an essential micronutrient for plant growth, high levels of this metal induce phytotoxicity at multiple levels. However, little is acknowledged about its toxicity on *Lycium barbarum* L. (goji berry plants), which consumption over the past years has been increasing, due to its anti-aging properties. In this way, this study aimed to evaluate the effects of nickel oxide nanomaterial (nano-NiO) on goji berry plantlets grown under in vitro conditions. For this purpose, shoot explants (1 cm long) obtained from in vitro plantlets of *L. barbarum* were cultured on MS medium, containing 0, 2, 10 and 20 mg/L of nano-NiO and, after 18 days of growth, shoots were collected for the evaluation of growth (fresh weight-FW), chlorophyll (Chl) a and b and lipid peroxidation (LP). Results showed that nano-NiO negatively affected fresh biomass in a dose-dependent manner, reaching a reduction of 60% in shoots exposed to the highest concentration of nano-NiO (20 mg/L). These results were further supported by LP analysis, since MDA levels were increased in all treatments, suggesting the occurrence of oxidative stress, as LP remained always higher than the control. Chlorophylls content showed a reduction of about 39% in the two highest concentrations, though the ratio between Chla/Chlb remained unchanged. Overall, the obtained results pointed out that nano-NiO impaired the normal plant growth, imposing oxidative stress on goji berry plantlets grown under in vitro conditions.

[1] Du et al. 2017. Interaction of metal oxide nanoparticles with higher terrestrial plants: Physiological and biochemical aspects. *Plant Physiol. Bioch.* 110: 210-225.

- **14170 | PINCH1 and PINCH2 in the Regulation of Central Nervous System**

Myelination

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Myelin consists of a lipid rich membrane surrounding axons that significantly increases axonal conduction velocity. This is critical for proper central nervous system (CNS) function, as illustrated by numerous pathologies with deficits in myelination. In CNS, myelination is carried out by oligodendrocytes which are responsive to different signals including those derived from the extracellular matrix (ECM). A major group of receptors for ECM molecules are integrins. Since their cytoplasmatic domains lack enzymatic activity, integrins require the recruitment of adaptor and signaling proteins such as ILK, PINCH and parvin to form signaling hubs (focal adhesions). In mammals, there are two main PINCH isoforms that bind in a mutually exclusive way to ILK, which, in turn, binds to parvin to form the IPP complex. This complex serves as an adaptor between integrin signaling and the actin cytoskeleton. In addition, the IPP complex is associated with the activation of different pathways, including the PI3K pathway, which is also involved in myelination. In fact, the disruption of the complex due to the absence of one of its components impacts the process of myelination. The impact of IPP in CNS myelination may also depend on the specific recruitment of PINCH1 or PINCH2, which alters the signaling specificity of this complex. Nevertheless, the role of each isoform in CNS myelination still needs further clarification. Results previously obtained in our lab showed that conditional ablation of each PINCH in oligodendrocytes causes distinct phenotypes. We further showed that the pattern of expression of each PINCH protein varies differentially during the development of the CNS in normal conditions (reinforcing the possibility of them having different functions) and that independent loss of each isoform may lead to compensation mechanisms. We are now determining the specific signaling mechanisms regulating myelination that may be controlled by each isoform.

- **13953 | Pinpointing Pickpockets with Machine Learning**

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Major modern cities reflect the complexity of societies both in size and in diversity. Diverse cities also stimulate social differences, that alone is sufficient reason for thieves to arise. They come in many forms, some are subtler than others and some work upon that which large cities provide, enter the pickpocketing world. Large cities require public transportation systems - buses, trains, tubes - an ideal environment for pickpockets to let themselves loose on other traveller's possessions. As a traveller, anyone will find there are plenty of reasons for being distracted, be it the absorbing sight, the span of time to catch up with one's thoughts, the reading of a book, the overheard conversation up front or just the tiredness of either an early morning or, consequentially, a long day of work. Distraction and ways of misdirection are what drives the act of pickpocketing.

I come forward to delve into the work of others and to improve upon their findings. I aim at gathering enough data from travel logs from urban buses and tubes - in the city of Porto, Portugal - cross information between those and known pickpocketing perpetrators - gathered from credible sources such as newspapers and the police - and then teach a machine to identify unknown ones.

Possible problems will include convincing the source of the data to yield said data; classifying map sections according to the data; to ascertain outliers and special cases - false positives, that is; and finding a way of visualizing information.

This work may as well be extended to the identification of other relevant groups of criminals, such as robbers, stalkers, etcetera.

- **14309 | Political Participation in Digital Culture**

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Social communication is no longer how it used to be. Social media play a big part in the transformation of the society and behaviors. In the digital environment we find a wide convergence of cultures, where the boundaries between nations are broken giving place to a new world, where we are still in a discovery process. The different social platforms settled in the cyberspace also have their own systems of interaction, molding the way we relate to each other. But we are also the ones that attribute new functions to those platforms, functions that were not thought at the time they were created.

People are not only consuming content, they are now also the creators and advertisers, sharing it with the rest of the world. The cyberspace is a place where we can get together, create communities around a specific topic and also organize ourselves in ways that could bring repercussions to the real world. Digital platforms allow people with common interests and needs to get together and pressure other groups, companies and also governments to achieve some kind of change. Those same groups can bend new technologies to their own purposes, creating fake content and causing ruckus. At the same time those new resources can give us voice and the power to effectively make some change, they can also be used without the best of intentions.

The phenomenon of the fake news is a danger to politics in a global view. Donald Trump's election was surrounded by doubtful news, a controversial use of digital marketing in social media, lots of shared content and some form of organization in an online forum called 4Chan. This paper presents a review of scientific literature regarding political participation in media on Trump's election, analyzing his use of social media and also how the community of 4Chan played a part in his ascension to power.

- **14218 | Politics and Diplomacy (1834-1851): the African and Asian empire - a comparative analysis between Portugal and Great Britain.**

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The present investigation is based on the analysis of Portuguese and British politics and diplomacy during the 2nd quarter of the 19th century, doing so in an expanded analysis and comparative way, focusing on multiple aspects of the colonial empires in Africa and Asia in both political spheres. On the one hand, the Portuguese Empire, designated as a "Virtual Empire", which was regulated as an empire of constant political and administrative weakness. On the other hand, the British Empire, which in the mid-nineteenth century saw a phase of robust expansion, both politically and economically.

The East, one of the regional dimensions asserted in this investigation, was characterized as a land of desire and imaginary, which led to the growing greed of the European empires. As for Africa, a reduced interest was perceived on plan for it to become the initial expansion of the empires. The idea of the European colonialism stems from an intricate process of factors, where development and ideals have allowed the European powers to perpetuate their territorial conquests around the world. This political and economic conjuncture allowed the colonial empires to delineate the colonial projects spun in the second half of the 19th century between the already existing and the emerging powers. In summary, it is corroborated that both Portuguese and British empires during the second quarter of the 19th century pursued overseas policies in both domains, through distinctive features. This last aspect was more noticeable in the British case, but also in the Portuguese, where there was an increase in the inequalities between the Metropolis and its possessions, as well as among citizens in the most diverse commensurations. Such is the situation of the political, social, legal and legislative realm, that became more acute in the second half of the 19th century with the intensification of the interest of the European powers after the Berlin Conference in 1885.

- **13932 | Portuguese Tiles: A Methodologic Analysis Proposal – Quinta Vila Beatriz, Ermesinde**
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The following research starts with an analysis of a set of tiles of which an inventory was made, followed by the elaboration of methodologies of analysis and characterization.

The *Quinta Vila Beatriz* farmhouse belonged to Amadeu Sousa Vilar (1872-1942), an outstanding personality in the population of Ermesinde, being the first president of his parish council and responsible for many constructions, as well as the creation of many jobs in the city. The *Quinta Vila Beatriz* farmhouse results of a transformation of a pre-existent farm and summer house, which was attributed the name of his daughter, Beatriz.

This building reveals itself to be an excellent case study for tiles, where twenty five panels can be found.

The work was conducted by the photographic capture and inventariation of the panels starting from the visible elements. Therefore, through the conference “*Da Fotografia ao Azulejo*” (from photography to tiles), taken place in 2016 it became possible to identify seven exterior panels, these being copies of photographs made by Marques Abreu. Through another conference, in this meeting, it was possible to identify the signatures on the tiles.

One can also establish a dichotomy between the exterior and interior panels. The exterior panels depict the countryside work life and in the interior panels we can find bucolic scenes that invoke the pleasure brought by those surroundings. The interior panels are copies of paintings made by François Boucher, part of Louvre Museum.

This building also has hagiographic themes, which are painting copies from artists like Rafael and Bartolomé Estebán Murillo.

In the year of 2017, the facade tiles became protected by portuguese law (number 79/2017), so it is important to reflect about the divulgation and difusion of inventory means for safeguarding this objects, that can present important patrimonial value, as the example in this case study.

- **14115 | Potentiometric determination of histamine in biological samples: forense application**

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Post-mortem interval is the time between death event and the moment that the body is found. Many factors and signs can be analyzed to estimate the post-mortem interval such as liver temperature, cadaverous fauna and analysis of signs of death, including cadaveric livors, mydriasis and corpse stiffness. This dating is not always easy to perform because it is too dependent on several factors.

One of the main challenges of the legal medicine is to have an easy, low cost and accurate method to evaluate the post-mortem interval, to be performed by unskilled professionals. Considering the accelerated production of biogenic amines in the body after death, the aim of this work is developed a potentiometric sensor to measure histamine levels and apply it in biological matrices. It is our goal to create a database of histamine levels in different death conditions to be used by the forensic pathologists.

In the present work a histamine sensor is evaluated by using an ionophore cucurbit[6]uril (CB6) and α -cyclodextrin. Different solvent mediators were considered in the presence or in the absence of anionic additive. The polymeric membrane was also assessed by using polyvinyl chloride (PVC) or carboxylate PVC. The effect of multiwall carbon nanotube (MWCNT) were also considered in different percentages.

The optimal formulation for the membrane comprise 1.0% of CB6, 66.8% (w/w) of 2-nitrophenyl phenyl ether as plasticizer, 29.8% (w/w) of PVC, 0.3% of additive and 2.0% of MWCNT. The sensors were soaked in water before it uses. The histamine sensor performance is characterized by the slope of 30.9 ± 1.2 mV dec⁻¹, a detection limit of $(3.01 \pm 0.61) \times 10^{-7}$ mol L⁻¹ and the lower limit of linear range of $(2.99 \pm 0.00) \times 10^{-7}$ mol L⁻¹. It was also observed a potentiometric response to cadaverine and putrescine. For that, this sensor will be coupled to a chromatographic system to improve the separation and it our goal to develop a multiparametric method that enables more accurate results.

- 14183 | Power in the "Cities": Comparison of the concept of power in "The City of God" and "The Book of the City of Ladies".

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The existence of medieval intellectual women seems surprising to us. In fact, common sense prevents us from considering that women could have a position in the Middle Ages other than submission. However, recent research has been dedicated to overcoming this discourse of oppression and presenting women according to behaviors, productions, activities and powers employed in their private, family and social lives.

Considering the historical and spatial context of medieval Europe, it came to light the interest in the study of the medieval women as a subject of history, as well as the study of their work. More precisely, a woman in particular, Christine de Pizan, and her work "The Book of the City of Ladies". In this work of the fifteenth century, Christine de Pizan demonstrates a notion of power based on the ideal of education and teaching for women.

Since, as well as Christine de Pizan's work, "The City of God" by Saint Augustine is also based on the idea of "city", it is intended, in this research, to establish a comparison between the concepts of power explained in both works, from the analysis of "Book XIX" of "The City of God" and "Part I" of "The Book of the City of Ladies".

- **13907 | Predictive Model for Acceptance of Occasional Deliveries**

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In this day and age, we can see many kinds of work done by large networks of people that do not know each other neither do it for a living. This process is known as crowdsourcing and it is constantly evolving through new online technologies. May it be for unpaid intellectual sharing, such as Wikipedia, or paid completion of a task, such as Amazon Mechanical Turk, people are able to contribute to something once solicited, without being a traditional employee or supplier. Since this work is not considered as part of one's career, these tasks or contributions are called occasional tasks. From Wal-Mart's employees being compensated to make customer deliveries on their way home to Amazon Flex's collaborators earning money per hour of work, people are ready to perform tasks informally for some reward.

In this work, we focus on the study of occasional couriers, where we analyse the willingness of a customer accepting dropping a package on the way home. However, the reward it would take to convince a customer to accept such a task is yet unknown. It may depend on a great number of factors, such as psychological and social, varying from person to person. Big companies with costly deliveries to manage can save a lot of money by outsourcing some of the deliveries to occasional couriers. It may cost them less to compensate customers for some deliveries than to include all of them in the routes of their own fleet. In our project, we aim to find a model that determines the probability of a customer accepting to make a delivery when offered a certain reward, given the customer's characteristics.

- **14149 | Preparation and characterization of nanostructured lipid carriers for methotrexate delivery into breast-cancer cells – a hyperthermia approach**

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Superparamagnetic iron oxide nanoparticles (SPIONs) act as the potential multimodal anti-cancer agents due to their abilities to carry pharmacological agents and generate localized heat when exposed to an alternating magnetic field, resulting in combined chemotherapy and hyperthermia. In cancer therapy, hyperthermia (temperature raises up to 40-45°C in the tumor) becomes a promising approach to kill cancerous cells as they are susceptible to high temperature as compared to normal healthy cells. Moreover, in combination therapy, hyperthermia has enhanced the cellular uptake of anti-cancer agents. To explore this potential, we have co-encapsulated SPIONs (magnetite Fe₃O₄ core) and methotrexate (MTX) into a lipid based colloidal carrier known as nanostructured lipid carrier (NLC). Lipid based colloidal carriers have been of choices due to the biocompatible and biodegradable materials, in particular NLC have been extensively studied due to their good colloidal stability, low toxicity, high encapsulation efficiency and controlled drug release properties.

In this study, SPION-NLC and MTX-SPION-NLC have been formulated by hot ultra-sonication method with excellent physicochemical properties such as high encapsulation efficiency (89% of SPIONs and 73% of MTX that successfully encapsulated into NLCs), particle size less than 250 nm, high particle homogeneity (polydispersity index less than 0.2) and good stability up to 3 months at room temperature and 4°C. In vitro MTX release study also showed that MTX-SPION-NLC exhibited controlled drug release up to 67% over 8 hours under hyperthermia condition (42°C). The anti-breast cancer property of both formulations was then determined by in vitro cytotoxicity study with MDA-MB-231 cell line.

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- **13951 | Production of European sea bass (*Dicentrarchus labrax*), European sea urchin (*Paracentrotus lividus*) and sea lettuce (*Ulva lactuca*) in an Integrated Multitrophic Aquaculture (IMTA) System**

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The aim of this study was to evaluate the effect of low, medium and high fish stocking density (respectively LD, MD, and HD) of European sea bass on the productivity of European sea urchin and sea lettuce, in an integrated multitrophic aquaculture system (IMTA).

Six equal, thermoregulated and independent experimental scale IMTA sea water systems (240L) were implemented at the Marine Zoological Station, Porto University. Each system was composed by four tanks (60L), each one supplied with a continuous water flow from the previous tank (flow direction: fish, sea urchin, seaweed, returning to fish unit) in a closed recirculating system. The fish tank was designed to include a particulate matter trap which ensured that all feces and uneaten food continuously moved to the sea urchin tank, and then to the seaweed tank.

The trial was conducted for 70 days at 18°C with a 12:12 hours light:dark photoperiod. Three fish stocking densities were established, in duplicates: LD: 3.5 kg/m³, MD: 7 kg/m³ and HD: 14 kg/m³. The initial stocking density of sea urchin was 20 kg/m³ and that of seaweed 2 kg/m³ in all systems. Fish were daily fed with a commercial diet, and sea urchins were fed twice a week with seaweeds (15g/week). Seaweeds were weekly weighted, and the initial stocking density was reset, being the surplus biomass used to feed the sea urchins.

At the end of the trial, growth performance and feed utilization of sea bass were not affected by stocking density. Sea urchin produced under MD conditions had higher total diameter gain and daily growth rate, while relative growth rate of seaweed was not significantly affected by fish density.

In conclusion, sea bass effluents proved suitable for sea urchin and sea lettuce cultivation, suggesting that production and economic diversification of industrial sea bass mariculture using IMTA may be feasible.

- **13867 | Prospective Parenting: Sexual Identity and Intercultural Trajectories**

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We explored the impact of sexual identity and country of origin in parenting aspirations among childless individuals (N = 336). Lesbian, gay and bisexual (LGB) participants revealed lower levels of parenting desire and intention; were less concerned by the prospect of being childless; perceived children as less of a source of psychological enrichment; and anticipated more stigma as parents, than heterosexuals. Compared to UK participants, Portuguese participants desired and intended more to have children; were more concerned with childlessness; reported higher levels of parental commitment; anticipated less stigma as parents; and expected more social support for parenting. Only in the UK did LGB individuals perceive children less as a factor of psychological enrichment, anticipate more isolation as parents or think there would be higher costs associated with parenting, than heterosexuals. The influence of cultural values in the parenting aspirations of both heterosexual and LGB persons should be taken into account.

Keywords: LGB, parenting desire, parenting intention, perceptions of parenting, culture.

- **13916 | QM/MM Study of DszB Reaction Mechanism for Crude Oil Biodesulfurization**

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Sulfur oxides emission by transportations that use crude oil derivatives is the major contributor in acid rain formation. It is also involved in other environmental problems like the release of harmful greenhouse gases and particulate matter emissions. Legislative measures are being applied in refineries for the reduction of sulfur in the final products of crude oil processing, particularly, dibenzothiophene (DBT) [1].

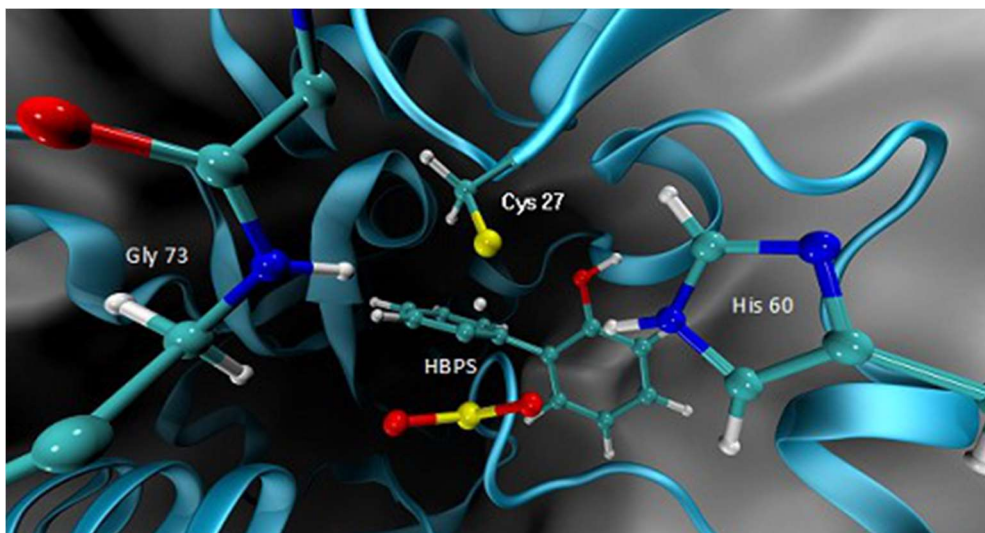
Crude oil biodesulfurization has been an emerging topic over the last decades, as an alternative to the very expensive chemical hidrosulfurization. The 4S pathway is a set of reactions performed by the enzymes DszA, DszB, DszC and DszD of the bacteria *Rhodococcus erythropolis* whose substrate is DBT and its derivates. These reactions are based on the oxidation and removal of the sulfur moiety of DBT's without loss of its calorific value. Despite its potential 4S pathway biodesulfurization rate is still too slow to be applied in crude oil refineries [2, 3].

In this work, we determine the energetic profile of the reaction regarding the removal of the sulfite group from the carbon skeleton of DBT using QM/MM simulations and also shed light into the specific role of the different active-site residues of DszB.

1. Kumar, S., V.C. Srivastava, and S.M. Nanoti, Extractive desulfurization of gas oils: A perspective review for use in petroleum refineries. *Separation & Purification Reviews*, 2017: p. 1-29.

2. Ferreira, P., et al., Improving the Catalytic Power of the DszD Enzyme for the Biodesulfurization of Crude Oil and Derivatives. *Chemistry*, 10.1002/chem.201704057, 2017.

3. Sousa, S.F., et al., Improving the Biodesulfurization of Crude Oil and Derivatives: A QM/MM Investigation of the Catalytic Mechanism of NADH-FMN Oxidoreductase (DszD). *J Phys Chem A*, 2016. 120(27): p. 5300-6.



Transition state of the desulfurization of 2-hydroxy biphenyl sulfoxide (HBPS) and the key residues of the reaction.

- **14008 | Quantum dots differential reactivity for iron (Fe²⁺ and Fe³⁺) speciation**

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Semiconductor quantum dots (QDs) have been extensively studied for their huge potential as fluorescent probes for metals quantification. QDs reactivity is dependent on several aspects, including size and surface chemistry [1]. In this regard, when in the presence of a variety of surface capping ligands, a given analyte could generate a diversity of variable magnitude responses either in terms of fluorescence quenching or enhancing.

Despite the high analytical potential of binary QDs (such as CdTe QDs), the occurrence of toxic elements in the inorganic core raised serious health and environment concerns.

For this reason, our research group has been focused on the synthesis of nanocrystals of less toxic elements. Carbon dots (CDs) are a new class of fluorescent nanomaterials that have harvested increasing interest as alternatives to cadmium-based quantum dots [2]. In addition to their incomparable optical properties, CDs have shown to have low toxicity, biocompatibility and low cost. Ternary I-III-VI QDs, such as AgInS₂ QDs, have also been emerging as promising cadmium-free fluorescent probes. [3]

In this work, we have investigated the reactivity of distinct types of quantum dots, namely CDs binary QD-MPA of different sizes, binary QD-Cys and ternary QD of different sizes (MPA capped AgInS₂/ZnS QDs) towards two iron species (Fe²⁺ and Fe³⁺).

The obtained results showed that the combination of multiple QDs in the same analysis could be exploited to guarantee a specific analyte-response profile (considered in terms of a combined emission spectrum), assuring the required assays selectivity.

[1] Bittar, D. B., Ribeiro, D. S. M., Páscoa, R. N. M. J., Soares, J. X., Rodrigues, S. S. M., Castro, R. C., Pezza, L., Pezza, H. R. and Santos, J. L. M. (2017), *Talanta*, 174, 572-580.

[2] Lim, S. Y.; Shen, W.; Gao, Z. *Chem. Soc. Rev.* 2015, 44, 362-381.

[3] Xu, G. X., Zeng, S. W., Zhang, B. T., Swihart, M. T., Yong, K. T. and Prasad, P. N. (2016), *Chem. Rev.*, 116, 12234-12327

- **13945 | Quercus cerris seeds as coffee substitute**

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Coffee is one of the most consumed beverages around the world, but sometimes it is related to negative effects in certain consumers. In Serbia, a product based on *Quercus cerris* seeds is used as a coffee substitute.

The aim of this study is to evaluate the nutritional composition of *Q. cerris* seeds, as well as the antioxidant activity (through scavenging activity on DPPH radicals and ferric reducing antioxidant power, FRAP) and the total phenolic (TPC) and flavonoid contents (TFC) of aqueous solutions.

Q. cerris seeds were randomly collected in November 2016, on Kosmaj mountain, Serbia. They were placed at room temperature to dry and exposed to heating at 200 °C for 30 min for toasting. After milled, the nutritional composition (moisture, ash, fat, protein and carbohydrates) and vitamin E profile were determined. The beverage (12 powder spoon per liter of water) was characterized regarding TPC and TFC and antioxidant activity. Cell viability was assessed in intestinal cells (Caco-2 and HT29-MTX).

Regarding the nutritional composition, seeds presented 60.4% of carbohydrates (of which 26.9% were fiber), 6.7% of moisture, 6.3% of proteins, 4.0% of fat and 2.4% of ash. The TPC and TFC were, respectively, 2070.2 mg of gallic acid equivalents per liter (mg GAE/L) and 285.3 mg of catechin equivalents per liter (mg CEQ/L). In FRAP and DPPH assays, the IC50 determined were, respectively, 203.1 mg/L and 271.6 mg/L. In the range between 0.1 and 100 µg/mL the cell viability was not affected. To the best of our knowledge, this is the first study that evaluates *Q. cerris* seeds beverage.

Acknowledgements:

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- **14247 | Regarding Landscape: Le Corbusier's architectural intent**

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The landscape plays a decisive role to a broader comprehension of Le Corbusier's diverse body of work. Ever since his return to La Chaux-du-Fonds - after the Voyage d'Orient - the lessons upon landscape learnt in the East become a constant source of resources to be used by Le Corbusier to deepen the problematization of architecture. Indeed, the various publications from the 1920s underline a reflection on nature and landscape at the service of the themes that transversally cross Le Corbusier's artistic and architectural thinking. Particularly, we could read in "*L'illusion des Plans*" - an article first published in the revue *L'Esprit Nouveau* in 1922 - a personal definition of landscape and how it should be integrated in the design process.

Having regard to "*L'illusion des Plans*", the present paper aims to discuss Le Corbusier's continuous research to achieve harmony between architecture and landscape. We set to explore how observation and interpretation through drawing constitute the most significant moments concerning the initial approach to the project through the understanding of landscape as a fundamental condition of architecture. Using the Villa Savoye (1928-31) and the Convent of la Tourette (1953-1959) as study cases, we will be able to understand how the building's site and surroundings will guide the development of the design process.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2017/18, under the supervision of Helder Casal Ribeiro. It is our objective to contribute to the growing body of research on the relationship between Le Corbusier's work and landscape.

- **14227 | Regionalisation and Technology: The Cyber Government and the New Spaces of Power in a Society of Control**

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In this paper we intend to understand the impact of the technological advance in the Regionalisation dynamics, in Portugal, especially how the change of the power paradigm can influence the evolution of Regionalisation policies, in Portugal.

Regionalisation is an unresolved question, in Portugal. Regardless of being present in the Portuguese constitution since its inception, in 1976, Regionalisation never really materialized and remains an unfinished project.

Regional policies generally tackle questions of State's proximity, efficiency and efficacy, nevertheless, with technological progress, the figure of State is increasingly present in the digital world. Power is now installed in more areas and it seems that it controls almost every aspect in one's life, what makes us wonder if proximity policies are really necessary in this new paradigm of a Society of Control.

Therefore, this subject ends up forgotten due to the (apparent) success of the existent model of Cyber governance that exists in our country. But if we consider this model's flaws, an actual existing power structure may be seen by people as a way of getting off of the permanent control the State exercises in us or, even, an inflexion of that social paradigm of total control through virtual means, in which we live.

- **13866 | Regular voluntary running has favorable effects on doxorubicin-induced kidney toxicity in Wistar rats**

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This study aimed to verify the effectiveness of regular exercise on the cellular damage and collagen deposition in rat kidney induced by a prolonged doxorubicin (DOX) administration, mimicking a chemotherapy protocol. Thirty-four male Wistar rats were randomly divided into two clusters: 1) one treated with DOX (n=17), receiving weekly an intraperitoneal (i.p.) injection of 2 mg/kg for 7 weeks and 2) the other treated with sterile saline solution (SSS, n=17) that received i.p. injections of vehicle for seven weeks. Two weeks after the last injection, five animals from each cluster (SSSG, n=5; DOXG, n=5) were euthanized while the remaining rats were subsequently divided into sedentary (DOXsedG, n=6; SSSsedG, n=6) and active subgroups (DOXactG, n=6; SSSactG, n=6). Active animals were placed individually in cages with a run wheel for voluntary running during two months, whereas sedentary animals were housed individually in conventional cages, with mobility restricted to the cage space. At the end of the protocol, animals were euthanized and kidneys were histologically examined. Compared to SSSG, kidneys from DOXG revealed higher levels of damage, collagen content and increased bowman's capsule thickness ($p < .05$). The levels of damage and thickness of bowman's capsule increased on DOXsedG compared to DOXG ($p < .05$). Comparatively to DOXsedG, the DOXactG presented an overall improvement in kidney structure ($p < .05$), with decreased collagen content and thickness of bowman's capsules. The results allow concluding that voluntary running, applied after a prolonged DOX administration, attenuated the long-term harmful effects on kidney structure induced by a DOX treatment mimicking a chemotherapy protocol.

Keywords: Physical exercise; Renal structure; Tissue damage; Anthracycline; Collagen deposition; Nephrotoxicity.

- **14015 | Relationship between buyers and brands: the power of influencers on the gastronomic sector in Portugal**

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Communication between brands and their target audiences has gained new shapes after the advent of the websites, social media and applications. This study, still in its development phase, searches to analyze the relationship between brands and their buyers through the power of digital influencers, individuals who nowadays are reference in the world of internet and exercise daily influence over their "followers". The focus of this project is on the gastronomy sector. In order to do that, this study will analyze profiles of portuguese influencers on Instagram, focusing on those who share services and products of brands on this segment.

Among its goals, there is the reflection about the impact of social media on the creation of influencers and the investigation of the power of influencers on the decision of buying. The question the study seeks to answer is how the gastronomic market appropriates the influence of digital celebrities to create relationships with buyers and promote brands. Following researches analyzed during the study, Instagram is the social media which grows the most in Portugal, which justifies its choice as the focus of the investigation.

The methodology applied will search initially to identify four profiles on Instagram of people who correspond to the definition of a digital influencer. Following, an analysis of "posts" will identify the presence of advertising - spontaneous or not - of brands of the gastronomic sector, to, then, be capable of verifying how this exploration of brands happens, its content and its impact on the public. The conclusion shall answer the initial question through the implementation of the research methodological chronogram, with results which provide valued information to comprehend and analyze the current moment of communication, marketing and advertising - where it's necessary, more than ever, to learn how to transform opinions into sales.

- **14038 | Remote monitoring system for physiotherapy clinics**

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In physiotherapy clinics, patients have to perform a set of treatments previously defined by a physiatrist. In general, during the treatments the patient is on his own, and, at the end of each treatment, there is no automatic system for the caregiver, causing the patient to be often "forgotten" for more or less time. Thus, in this project we intend to use some nodes based on microcontrollers to track the patients, and keep the caretaker aware of the process.

The company intends an information system with database and subsequent interfaces in Tablet and microcontroller. The use of Tablet refers to the need for real-time professional information and notification of ongoing treatment's times of patients for which their team is responsible.

The web-based database component is due to the need for wireless communications and the need to store patient, treatment, historical, and related information. Regarding the need for a microcontroller, this is due to the requirement to add identification of the patient being treated and the time of treatment remaining on an LCD, as well as light signaling on the state of occupancy of the cabin (free, patient being treated and patient on hold).

The system presented has the purpose of canceling the disorganization and lack of computerization in the company for which it is intended, in which, by way of example, analogue time counting systems are used. Synthesizing, this health system offers the following advantages: Real time tracking of patient treatments, centralization of information, reduction of waiting times between treatments (better performance), statistical indicators and performance metrics, computerization of processes, computerization of occupation status in real time and automatic notification of professionals at the end of time. In general, there is a considerable increase in the company's QoS at the expense of implementing the treatment introduction habit and its times for new patients.

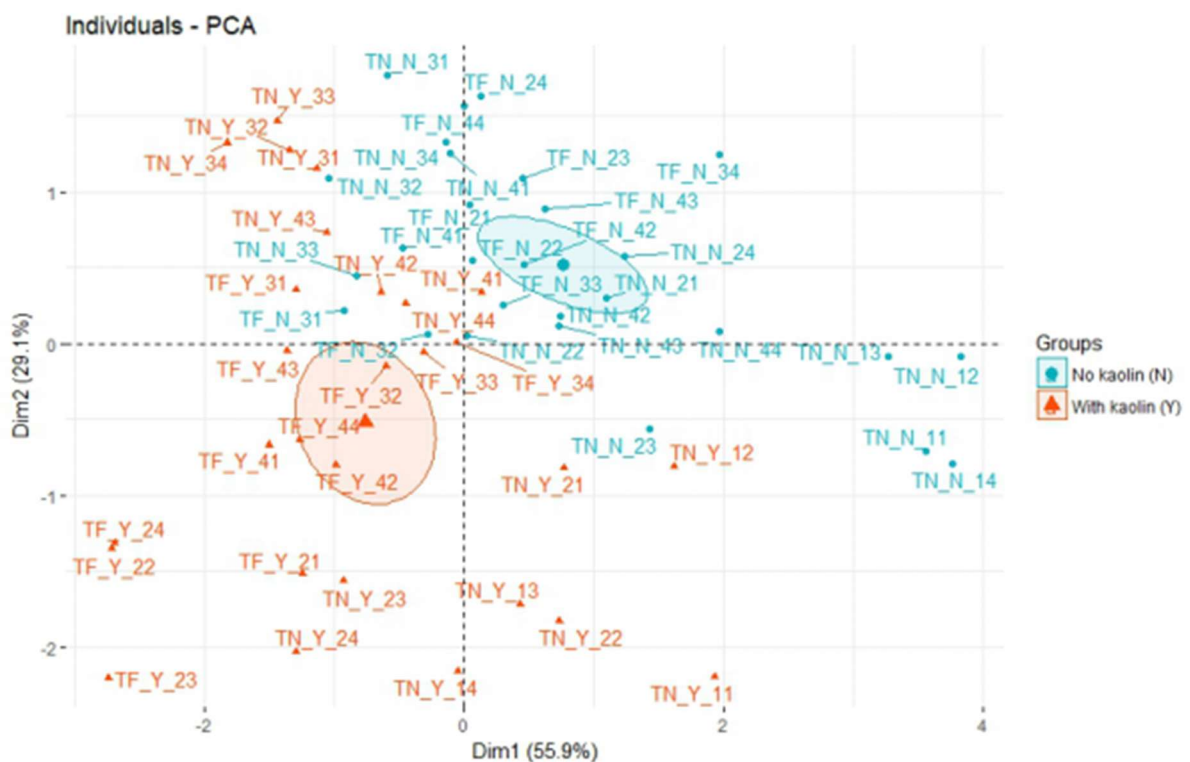
- 13987 | Remote sensing techniques on assessment of application of kaolin in leaves of *Vitis vinifera* L.

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Kaolin is often sprayed in vines to prevent damages from the drought and from the high solar radiation. To better understand the behaviour of the kaolin in the vineyard leaves, this study aimed to compare leaves with and without kaolin application based on the temperature and the spectral reflectance information. Differences between leaves with and without kaolin were explained by the normalized maximum leaf temperature, reflectance at 400 nm, reflectance at 535 nm, and reflectance at 733 nm. The wavelengths of 535 nm and 733 nm suggest an association with plant physiological processes which supports the selection of these variables for assessing the kaolin effect on leaves. Additionally, the results show a similarity with leaves with and without kaolin by the time of the kaolin application. The application of a principal component analysis (PCA) based on four variables allowed explaining 85% of data variability and obtaining a clear differentiation between leaves with and without kaolin treatment. The normalized maximum leaf temperature and the reflectance at 535 nm were the variables with greater contribution for explaining the data variability.



Principal Component Analysis for the kaolin treatment in grapevine leaves (cultivars Touriga Franca – TF and Touriga Nacional – TN). The first digit refers to acquisition dates: 5/7/2017: 1; 21/7/2017: 2; 3/8/2017: 3; 31/8/2017: 4 and the second is the repetition number.

- **13974 | Repurposing ibuprofen to control *Staphylococcus aureus* biofilms**

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Given the increasing prevalence of multidrug-resistant bacteria to conventional antibiotics, bacterial infections have again become an important human health problem. Additionally, biofilms play a fundamental role in many persistent bacterial infections because they have inherent resistance to antimicrobial agents due to the nature of biofilm structure and the physiological attributes of biofilm-embedded microorganisms. However, there is a lack of new antibiotics in the drug development pipeline. Unlike *de novo* drug discovery, repurposing old drugs can greatly reduce time, cost and risk associated with antibiotic innovation. Therefore, drug repurposing arises as an interesting alternative for the treatment of recalcitrant bacterial biofilms. The main purpose of this study was to evaluate the action of ibuprofen, a non-steroidal anti-inflammatory drug, against monolayer adhered cells and biofilms of *S. aureus*. Firstly, the minimum inhibitory concentration (MIC) of ibuprofen was determined by broth microdilution method. Then, the physicochemical characterization of bacterial surface was performed. Finally, the effects on the control of monolayer adhered cells and 24 h old biofilms were analysed using the microtiter plate assay by quantification of biomass and metabolic activity. The MIC value of ibuprofen was 500 µg/mL. After 1 h of incubation, bacterial surface became less hydrophilic and surface tension parameters were affected. The treatment of monolayer adhered cells and biofilms with ibuprofen prompted a moderate action ($\leq 40\%$) in terms of biomass removal. However, it elicited metabolic inactivation up to 80%. At 2500 µg/mL it was possible to achieve the best commitment between the amount of drug and efficacy, and the exposure time of 6 h showed relevant effects on biofilm control. This work emphasizes that ibuprofen may be a good candidate for repurposing as an antimicrobial and antibiofilm agent.

- **14139 | Responses of tomato plants after the exposure to Cr(VI)**

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Chromium (Cr) is a heavy metal considered a major environmental contaminant, with high amounts being released by anthropogenic activities. Cr occurs in soils predominantly in Cr(III) and Cr(VI) forms. While Cr(III) is required as a micronutrient for animals, being toxic at high levels, Cr(VI) is toxic even at low levels, with carcinogenic, teratogenic and mutagenic effects. None of these forms have a described role in plant metabolism. Cr accumulation in soils can achieve toxic levels for crops, affecting agriculture and entering the food chain, with risks to human health by consumption of contaminated food. Cr enters in plants by root uptake and can induce toxicity by interfering with nutrient absorption, inducing photosynthetic damage and leading to the production of reactive oxygen species. Plants have developed response mechanisms to deal with this problem, which makes them potential candidates to extract Cr from the soil, acting as phytoremediation tools. In this study, *Solanum lycopersicum* L. cv Micro-Tom was chosen as a model to study the effects of Cr toxicity due to its agro-economic importance. The seedling assay, with concentrations up to 3400 μM , did not show differences in germination rates, but a decrease in seedling length and fresh biomass was observed, with more pronounced effects on shoot length. Plants were exposed to several Cr(VI) concentrations for 5 weeks (2.5, 5, 112.5, 225 and 850 μM) or only on the 5th week (50 and 100 μM). Prolonged exposure treatments showed a tendency to decrease all biometric parameters analysed, with more pronounced effects at the highest concentrations and no surviving plants at 850 μM . Plants with shock treatment showed withered leaves, possibly due to loss of water content. These results suggest that tomato plants suffered from Cr stress at higher levels but can withstand it at low levels. Therefore, biochemical and molecular studies are in process to evaluate their response mechanisms.

- **14095 | Resting-state functional connectivity within the dorsal pathway predicts auditory emotion recognition in children**

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Understanding others' emotional states from variations in the 'tone of voice' - emotional prosody - is crucial for personal and social adjustment. Recognizing emotions in prosody relies on an interplay between several brain regions along the ventral and dorsal auditory pathways (Sammler et al., 2015). While the role of temporal and inferior frontal cortices in vocal emotional recognition is well established (e.g., Fruehholz & Grandjean, 2013), an emerging body of work also suggests a potential involvement of the motor system (e.g., Lima et al., 2015; Sammler et al., 2015). The aim of our study was to examine if the motor system plays a role in emotional prosody processing. Specifically, we examined if functional connectivity between the motor system and well-established brain regions implicated in vocal emotional processing indexes behavioural differences in emotion recognition performance. Fifty-five children (aged 8.31 ± 0.32 years; 23 male) completed a resting-state fMRI protocol, and an offline behavioural emotional recognition task including four emotions (happiness, sadness, anger, fear) plus neutrality. Resting-state data were analysed using a hypothesis-driven seed-based correlation approach: the auditory cortex, superior temporal cortex (STC) and inferior frontal gyrus (IFG) were considered as seeds, and the motor cortex as target. We found that a stronger connectivity between IFG and motor regions predicts a better ability to recognise prosodic emotions. Furthermore, follow-up analyses within IFG subregions indicate that this result is mostly driven by the IFG triangularis (BA45). Taken together, these findings suggest that the motor system plays a role in predicting vocal emotional recognition abilities in children, adding to the emerging evidence on the role of the dorsal pathway regions in prosodic processing. At a broader level, this study contributes to delineating the neural mechanisms supporting vocal emotional processing during development.

- **14019 | Role of mitochondrial dynamics in Hürthle cell tumors: Coupling, uncoupling and fission**

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Hürthle cells are characterized by the cytoplasmic accumulation of abundant mitochondria that frequently display abnormal morphology. Our group have recently described an overall increase in the levels of "mitochondria-shaping" proteins in Hürthle cell tumors, suggesting a role for abnormal mitochondrial biogenesis in Hürthle cell transformation. From those proteins, DRP1 (Dynamin-related protein 1), a member of the dynamin family GTPases required for mitochondrial fission, appears to be one of the most overexpressed in Hürthle cells tumors, a pattern which has also been described in other non-oncogenic tumors. A recent study demonstrated that UCP2 (Uncoupling protein 2), a member of a larger family of mitochondrial anion carrier proteins and a key modulator of mitochondrial reactive oxygen species, regulates mitochondrial fission process, through DRP1 expression regulation. Through immunohistochemical technique, we further assessed DRP1 expression in a larger thyroid cancer series, with and without Hürthle cells, and correlated its expression with UCP2 expression. Our results indicate that UCP2 and DRP1 present a significantly higher expression in Hürthle cell tumors when compared to non-Hürthle cell tumors. In addition, we observed a significantly positive correlation between the expression of both mitochondrial proteins in Hürthle and non-Hürthle cell tumors, suggesting that DRP1 expression is regulated by UCP2 in both phenotypes.

- 14138 | Role of tomato glutathione-S-transferase and the contribution of glutathione metabolism-related enzymes in response to diclofenac - molecular and biochemical approaches

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One emerging environmental problem that recently has become a vastly acknowledged topic of concern is surface and groundwater pollution from pharmaceuticals. The urgency in studying the effects of these compounds correlates with recent studies showing that some pharmaceuticals can affect the environment and cause damage on living systems in concentrations as low as ng/L. Diclofenac (DF) is one of the most frequently found substances in sewage treatment plants effluents and surface waters, due to its high utilization rate and low removal rate in wastewater treatment processes. With acute effects of DF ingestion already being reported in animals, the metabolism of this drug is well studied in these organisms, with reports showing that P450-catalyzed oxidation of DF forms intermediate metabolites that can be trapped by glutathione (GSH) to form GSH adducts that can be further degraded and excreted. In contrast, little is known about how this drug interacts and is metabolized by plant systems, so the aim of this research was to study how plants of the agronomically important species *Solanum lycopersicum* L. cv. Micro-Tom are affected by DF. Special relevance was given to the role of glutathione-S-transferase and GSH metabolism-related enzymes, since xenobiotic detoxification in plants is thought to follow a similar pattern to animal metabolic pathways. Seedlings grown for 10 days on different DF concentrations, ranging from 15 µg/L to 10 mg/L, showed no effect on both germination and biometric parameters. However, grown plants treated with 1 mg/L DF for 5 weeks presented a significant increase on shoot size, but similarity on the other biometric parameters. Molecular and biochemical assays are currently underway to analyse GSH metabolism-related enzymes activity and expression in plant shoots and roots to better understand DF metabolism in tomato plants.

- **14189 | Route to xanthone derivatives and in silico determination of their biophysicochemical properties.**

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The emergence of new infectious agents and the resistance to the current treatments by pathogens justifies the discovery of new anti-infectious drugs as a field of great interest [1]. The marine environment, namely the secondary metabolites isolated from marine organisms, are an important source for new bioactive molecules [2]. In fact, xanthonic derivatives with anti-infectious activity were recently discovered on a marine fungus [3]. These compounds are isolated in small quantities, making synthesis fundamental in order obtain larger quantities, allowing the researchers to expand studies concerning the bioactivity potential. Herein, we describe the total synthesis of two marine xanthenes and two structural analogues. Starting from simple building blocks, the synthesis of these new molecules was achieved in a multistep process. Moreover, the biophysicochemical properties (log P and log D, pKa, solubility, permeation and plasma protein binding) of the synthesized compounds were also predicted using different *in silico* tools. The obtained results allow us to predict the pharmacokinetic profile of these potential antimicrobial agents, understanding its pharmacodynamics and the design of new bioactive molecules.

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References:

1. Tanwar, J.; et al, *Interdisciplinary Perspectives on Infectious Diseases* 2014, 2014, 7.
2. Hasan, S.; et al, *Bioinformation* 2015, 11 (4), 176-81.
3. Sun, R. R.; et al, *Magnetic Resonance in Chemistry* 2013, 51 (1), 65-68.

- **14282 | São Julião, a parish in the county of Portalegre: the present and the future**
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São Julião is a parish of Alto Alentejo, with a great potential for development, despite presenting some problems regarding its near future, such as the demographic aging and the absence of developed agricultural or industrial structures. The only types of activities are linked to the primary sector and almost solely to subsistence.

The dispersed settlement and the characteristics of the communications network between the different places and isolated houses, among themselves and with other bordering areas, also contribute to their situation as a remote space. The road network reaches many parts of the parish, however, only public transport operates at some intervals and not all inhabitants can afford a private car.

Nowadays, the production of olive oil or fruit growing, are economic and social enablers that end up having a prominent role. If they are stimulated, they can definitely uproot the parish to a social dimension of higher quality of life.

Despite some negative aspects, the inhabitants of São Julião have a good quality of life: the residents have house and agricultural parcels with vegetable garden, orchard or olive grove.

Tourism can also play an important role, namely with the implementation of structures for recreational river activities in the river Xévorá, housing tourism, pedestrian tourism, which may include the Serra de São Mamede Natural Park, or the construction of paths for sports competitions.

The border line which, in part, coincides with the boundary of the parish, has in the past been a factor of fundamental importance for trade and smuggling, today for the food and gasoline transaction and, above all, for gastronomic tourism.

In sum, from a geographic point of view, São Julião is a territory with a particular individuality, whose ideal characteristics may contribute for the promotion of agricultural practice and tourism. It is urgent to take measures to establish young people in terms of social and economic incentives.

- **14051 | Searching for the developmental origin of the visual system in Molluscs**
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Molluscs are among the phylum with greatest variation in both eye morphology and function: from mere pigmented cells capable of photoreception, to the hundreds of simple eyes in the mantle of scallops, all the way to the complex eye of cephalopods, the last quite like the one found in vertebrates, a prime example of convergent evolution.

It remained to be seen if these similarities extended to the expression of the genetic networks during development and how preserved were they among different taxa, especially in species without a complex visual system. Studying the latter would allow us to understand the ancient mechanisms which lead to the development of complex eye-sight in Molluscs.

To that effect, we aimed for the isolation of genes related to the visual system in *Ruditapes decussatus* (Bivalve):

Sonic hedgehog (SHH) plays a key role in splitting the eye field and triggering the final differentiation of photoreceptors and visual neurons;

Pax6, a transcription factor which activates the genes involved in eye formation during embryonic development;

Rhodopsin (RHO), responsible for the formation of the homonymous protein, vital for vision and found in specialized light receptor cells.

We proceeded to RNA extractions from the clam's siphons, followed by conversion to cDNA. Designing degenerated primers, we attempted to amplify the genes through PCR. At the lack of results, we aimed to extract DNA directly.

New primers were drawn, this time aligning shotgun sequences of *R. philippinarum* with known gene sequences from other mollusc species. This was successful for Pax6, but not Shh. The Rho fragment was too short to draw primers from; an inverse PCR would be necessary to get the whole gene.

The ensuing PCR amplifications, followed by cloning and sequence analyses, revealed not the desired gene but a microsatellite sequence. This might prove vital in understanding the evolution of repetitive DNA sequences in the genome and how they can be used as genetic markers.

- **14148 | Searching for the origin of TTR Val30Met Familial Amyloid Polyneuropathy within Portuguese regions**

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Familial amyloid polyneuropathy (FAP) is an autosomal dominant systemic amyloidosis caused by point variants within the transthyretin (*TTR*) gene, that lead to the expression of a variant amyloid-forming protein. Of these variants, Val30Met is the most common substitution worldwide and Portugal remains the largest cluster, with more than 500 families diagnosed at Unidade Corino de Andrade in Porto.

To further understand the phenotypic heterogeneity and the disease distribution pattern among the different clusters (Japan, Sweden and Italy), several genetic studies analyzed the origin of the Val30Met substitution and its haplotype structure.

Although it was first described in Portugal, Póvoa do Varzim by Corino de Andrade (1952), there is no clear evidence whether the variant originated there, since earlier studies regarding the origin of Val30Met variant in Portugal are not conclusive.

Now, taking advantage of a much larger sample, we analyzed a group of families from Póvoa do Varzim and Vila do Conde to investigate whether the high frequency of the disease in these regions is due to a founder effect. Bearing this in mind, we selected 8 microsatellite markers (STRs), some of them previously used in studies in other populations, encompassing 11.4 Mb. STRs are being amplified by polymerase chain reaction (PCR), using fluorescent-labelled primer pairs. Microsatellite multiplex genotyping is performed using ABI-Prism 3130 XL genetic analyzer and genotypes determined using GeneMapper version 5.0.

A most frequent allele for each STR was found for both regions and importantly, a genotypic region shared by Póvoa do Varzim and Vila do Conde was identified. These preliminary results lead us to hypothesize whether this common region is also shared by other Portuguese regions. Our aim now is to enlarge these groups of families and extend the study to other regions, in order to assess the Val30Met path within the Portuguese population.

- **14147 | Seawater degradability and leachability of a new antifouling compound**

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In our research group, some nature-inspired sulfated compounds were synthesized and interesting antifouling (AF) properties were disclosed with no toxicity observed against several organisms [1]. In this work, seawater degradability and leachability from polymeric marine coatings containing one of the most promising synthetic sulfated compound, gallic acid persulfate (AGS), were assessed by ion-pairing reverse-phase high performance liquid chromatography with diode array detector (IP-RP-HPLC-DAD). Degradation studies were performed during 9 months in different stress conditions (4°C, 18°C, and 25°C in the dark; 25°C in natural light). For leaching studies, stirring tests (adapted from ISO15181) on coated polymeric substrates (3.5x6cm) were performed in artificial seawater for 45 days under continuous stirring (pH=8.3 and 18-25°C). The obtained leaching waters were further passed through SPE cartridges (OASIS® WAX 6cc) to concentrate the analyte. AGS was quantified using a C18 column and an aqueous solution containing 25mM of tetrabutylammonium bromide (TBAB) and acetonitrile (degradation studies - 38:62v/v; leaching studies - 50:50v/v) as mobile phases. The method was shown to be linear ($r^2 > 0.999$) over the concentration range of 10-500µM.

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References:

[1] Almeida J.R.; Correia-da-Silva M.; Sousa E.; Antunes J.; Pinto M.; Vasconcelos V.; Cunha I. Sci. Rep. 2017, 42424.

- **14074 | Sensitive Spaces - From Montessori pedagogy to school design**
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Although significant advances have taken place in the pedagogical field in recent decades, and it is understood that education should not be interpreted as an undifferentiated process, it is too often given preference to rigid models of pedagogy and consequently to traditional school buildings.

This research aims to reflect upon educational spaces, in order to underline the benefits that a properly designed environment has on children's learning. In particular, its purpose is to explore the connections between school design and the Montessori pedagogy.

This pedagogy, developed by Maria Montessori a century ago, differs a lot from the traditional methods usually used by public schools. It is built around a new understanding of the children, promotes their natural inclinations and stimulates their independence. The students are invited to explore freely the topics that interest them most and improve their knowledge, both individually and as a group, with the teachers guiding them throughout the process. This freedom also affects architectural design by providing school buildings with greater flexibility and organizational variety. These educational environments should reflect the fluidity of the learning while stimulating creativity and space appropriation in children.

Moreover, Montessori method comprehends the strict relationship existing between sensitive perception and cognitive processes, and emphasizes the interaction between body and space. Indeed, it is demonstrated how much the quality of living spaces has important consequences on our emotional, intellectual and physical development.

We intend to reflect on the child's experience of architectural space and seek a new approach to school design that translates the principles of the Montessori method into innovative educational spaces and structures.

This work is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2017/18, under the supervision of Professor Helder Casal Ribeiro.

- **13931 | Sexual Functioning Differences by Gender and Reproductive Stage**

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Introduction: Many researchers have found a relationship between infertility and sexuality. However, it should be noted that there is scarce evidence regarding the impact of an infertility diagnosis on sexuality. The purpose of this study was to analyze sexual functioning in both members of the couple and comparing three groups: Group 1 (presumably fertile couples); Group 2 (couples trying to conceive for less than 12 months (<35 years old) or 6 months (>35 years old)); Group 3 (diagnosed infertile couples).

Methodology: We recruited 186 couples (92 G1, 20 G2, 74 G3) from social networks, gynecology and infertility clinics, marriage preparation courses and shopping centers. All participants were asked to complete a self-report questionnaire, including the International Index of Erectile Function (IIEF) and the Female Sexual Function Index (FSFI) to assess sexual functioning.

Results: Findings showed significant differences between diagnosed infertile couples and presumably fertile couples in both genders. Specifically, diagnosed infertile women reported lower sexual pain levels in comparison with presumably fertile women, while diagnosed infertile men revealed lower sexual satisfaction than men from presumably fertile group.

Conclusions: This study suggests a progressive transition from recreative to procreative sex, highlighting the importance of greatest group categorization in future studies. On the other hand, the differences found regarding infertile couples could be due to the concern about conceiving, the frequency of sexual practice and the direct goal of pregnancy at a specific schedule, that consequently could deprive recreational and erotic power of sexuality. Therefore health professionals should explore more creative ideas for the benefit of couple's sexuality.

- **14200 | Simultaneous production of benzaldehyde and hydrogen: Photocatalytic reforming of benzyl alcohol over metal-loaded graphitic carbon nitride**

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Benzaldehyde (BAL) is an aromatic aldehyde currently used in cosmetics, as a safe food additive and flavouring. Denser than water and reasonably insoluble. The primary hazard is to the environment. Easily penetrates the soil to contaminate groundwater and nearby waterways. Additionally, the production of BAL requires high temperatures and pressures and consumes high amounts of energy. Photocatalytic oxidation of Benzyl alcohol (BA) to BAL can overcome these limitations, by running at mild conditions (of pressure and temperature) in aqueous medium [1], and operating with molecular economy. Furthermore, this photocatalytic oxidation produces hydrogen from water splitting. The overall process generates a valued added-chemical and produces energy, in the form of hydrogen.

In this work, graphitic carbon nitride (g-C₃N₄) was prepared and loaded with different metals (Au, Pd, Pt, Ru). These materials were applied to the photocatalytic reforming of BA to BAL under Vis-light irradiation. The effect of metal and different thermal post-treatment to g-C₃N₄ (Bulk for non-treated and T500 for the g-C₃N₄ treated at 500°C) were simultaneously tested.

The photocatalytic runs were carried out in a glass photoreactor using LEDs emitting at 412-417 nm as irradiation source. H₂ was continuously quantified using a GC. BA conversion and BAL formation were followed by HPLC.

The materials based on T500 had enhanced photoactivity, with a higher production of hydrogen. This improved photoefficiency is due to a larger surface area of the material, resulting in more pronounced separations of g-C₃N₄ layers.

The photocatalytic activity of the materials loaded with metal exceeded that of both Bulk and T500. The adding of a metal-phase increased the efficiency of the process. This superior performance was attributed to a synergistic interaction between the two constituent phases and their lower electron-hole recombination.

References:

[1] Lima, M.J., et al., Journal of Catalysis 353 (2017) 44-53

- **14294 | SPATIAL AUDIOGRAPHY: research on the relationship between acoustics and spatial perception**

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The research I propose for my master's thesis revolves around the relationship between acoustics and space perception. While I was studying at the University of Porto the aural spacial perception and architectural design and representation never crossed paths. This study comes from the decision to explore the relationship between these two different topics.

My main objective is to digitally synthesize the modulation produced by a real space on an abstract sample through two phases of research. On a first phase, I will explore the human perception of space. The human senses: to enlist and describe the various ways our bodies sensitive mechanisms give us a sense of spatial awareness through visual, auditory, olfactory, equilibrioceptory, thermal and kinesthetic inputs.

Next, I will explore the cognition of space. How various input signals are interpreted by our brains (and how our intellectual and contextual individuality affects that interpretation).

After the perception and cognition, I want to explore the prediction/interference in space. How, based on the cognition of our surroundings, we predict its future behavior and consequently, how our self-consciousness of presence influences that behavior.

On a second phase, I intend to analyze audio field samples, of a yet to choose case study (a built architectural space) and try to select the spacial information present, as a drawing of the aural experience component's influence on human spatial awareness.

The two aforementioned topics, complemented with a third, parallel one on the recent software development efforts to synthesize three-dimensional spaces, not only visually (more frequent in architectural community) but also aurally, aim to expose the mechanisms through which sound can be modulated in order to emulate a realistic auditory experience of a virtual architectural space.

- 14145 | Spread of arsenic tolerance genes among *Salmonella enterica* serotype 4,[5],12:i:- major European clone

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Salmonella is a major foodborne zoonotic pathogen, with metals (copper-Cu/silver-Ag), currently used in the animal-production setting, possibly contributing to the emergence of multidrug-resistant (MDR) serotypes/clones, such as *S.* 4,[5],12:i:- (PMID-25816978). However, the selection of such bacteria by arsenic due to the environmental contamination by anthropogenic activities (e.g. use of coccidiostatics/pesticides or waste in farms) remains poorly explored. Our objective was to study the occurrence of arsenic tolerance (AsT) genes, their genetic location and tolerance phenotypes in major *S.* 4,[5],12:i:- clones from different sources.

We include 82 *S.* 4,[5],12:i:- isolates (Portugal: 2002-2015 and Austria: 2013-2014) recovered from humans (n=50), food (n=17), food-animal production (n=8), pets (n=3) and aquatic environment (n=4). They are representative of the major clones (PT-European/Spanish/Southern-European; AU-European) and present MDR (n=73/82-89%) profiles and Cu/Ag tolerance (n=67/82-82%). Screening of AsT genes, *arsB* and *acr3* (both coding for arsenical efflux pumps), was done by PCR/sequencing. MIC_{Na2HAsO4} were determined in aerobic and anaerobic atmospheres by agar dilution method. Genomic location of AsT was assessed by I-Ceul/S1-PFGE-hybridization.

A high occurrence of AsT genes (only *arsB*) was found in isolates from Portugal (36/63-57%) and Austria (18/19-95%), with all belonging to the emergent pig-associated *S.* 4,[5],12:i:- European clone. Isolates carrying *arsB* showed higher MIC_{Na2HAsO4} (MIC₅₀=>128mM) than those without these genes (MIC₅₀=1-2mM) in both aerobic/anaerobic conditions. The *arsB* was chromosomally located, together with Cu/Ag tolerance genes and antibiotic resistance genes.

The high occurrence of *arsB* genes conferring high MICs to Na₂HAsO₄, among MDR *S.* 4,[5],12:i:- European clone suggests that AsT, along with tolerance to other metals, might have contributed to their successful expansion, particularly in food-animal farm environments.

- **14194 | Study of chemical contaminants that occur during the curing process of smoked products**

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Although smoked products are considered safe food due to their reduced pH and water activity, food processing and preservation methods can boost the development of chemical compounds with a potential impact on consumer's health. Biogenic amines (BAs) can develop in food due to microbial decarboxilation of amino acids. Not only their ability to exert toxicity and induce allergic reactions but also their capability to be an important marker of food deterioration raises interest in these compounds. The great interest comes from the possibility to evaluate not only the quality of raw material but also the impact of production processes on the final product quality. In this work the BAs content was evaluated in smoked and non smoked Portuguese meet sausages (alheira and chouriça), with or without seasoning. This study aims at evaluating the impact of the smoking process and presence of substances with antioxidant potential on the final amine content. The determination of BAs was performed after one-step salting-out assisted liquid-liquid extraction with derivatization and subsequent analysis by HPLC-DAD-ESI/MS. In general, the concentration of BAs increased during the smoking process whereas seasoning does not indicate a consistent impact on BAs content. The most relevant BAs identified in smoked chouriças and alheiras were putrescine, cadaverine and tyramine, with maximum values of $1371 \pm 70 \mu\text{g/g}$ and $196 \pm 29 \mu\text{g/g}$ for putrescine in chouriças and alheiras, respectively; and minimum values of $213 \pm 87 \mu\text{g/g}$ and $17 \pm 3 \mu\text{g/g}$ for tyramine in chouriças and alheiras, respectively. Moreover, higher amounts of BAs were formed in chouriças than in alheiras, which may be related to the fact that the duration of the smoking process is three times higher for chouriça samples (15 days) and may lead to food degradation due to microbial activity. Though, the content of ABs found in smoked samples is below the toxicity values documented and does not represent a direct health hazard.

- **14146 | Study of the Chemiexcitation Step of Coelenterazine Luminescence**

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Bioluminescence consists on the conversion of thermal energy into excitation energy, thereby leading to light emission. These reactions have been attracting attention from the research community due to high quantum yields, relative nontoxicity of luciferins and high signal-to-noise ratio. These properties make bioluminescent systems helpful tools in the real-time and noninvasive imaging *in vivo*. Bioluminescence has been found in over than 700 genera, spanning organisms as different as the fireflies, fungi, fishes and bacteria. Moreover, most of the marine organisms react with the same bioluminescent substrate: Coelenterazine.

In Coelenterazine bioluminescence reaction, thermal energy is converted into excitation energy. Besides that, it is also known to emit chemiluminescence in the absence of enzymes. As the scaffold of Coelenterazine is present in organisms of eight phyla, it is a prototypical system for marine chemi-/bioluminescence. The characterization of the chemiexcitation step responsible for light emission is essential for future applications in bioimaging, bioanalysis and biomedicine.

We have found evidence to support the identification of a neutral dioxetanone intermediate as the responsible for efficient chemiexcitation. This is explained by attractive electrostatic interactions between the CO₂ and Coelenteramide moieties, which allow the reacting dioxetanone to spend time in a PES region of degeneracy between singlet ground and excited states. There is no relationship between electron (ET)/charge (CT) transfer, from an electron-rich moiety to the peroxide, and efficient chemiexcitation. Thus, Chemically Induced Electron-Exchange Luminescence (CIEEL) and Charge Transfer-Initiated Luminescence (CTIL) cannot be used to explain chemi-/bioluminescence. We have also found a concentration-dependent quenching effect, more prevalent at acidic pH.

- **14261 | Study of the effects of physical activity on the brain structure and functioning**

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Physical activity is associated with an increase in the life expectancy, a decrease in the risk of chronic diseases and an increase in cognitive performance. Some brain studies have shown the existence of an association between physical activity levels or an exercise intervention and increased gray matter density in frontal, temporal and cingulate areas of the brain. In parallel, another growing area of study known as "functional connectivity" uses resting-state fMRI (rs-fMRI) has been used to demonstrate that a single session of exercise increases connectivity in sensorimotor-related brain networks.

The main aim of this project is to understand how physical activity could modulate brain structure and function using neuroimaging techniques as well as how these changes correlates with cardiorespiratory fitness, functional fitness, body composition, cognition performance and emotional status. The study group (N = 20-30) will be composed mainly by elderly adults (65-75 years) from the "Mais Ativos Mais Vividos" project of the FADEUP with no history of neurological diseases, cardiac diseases and contraindications for an MRI Scan. For the evaluation of the functional fitness, we use the Senior Fitness Test and aerobic fitness assessment is performed by the Bruce protocol on a treadmill and a standard open-circuit spirometer technique to assess VO₂ peak. In addition, we evaluate the body composition (dual energy radiological absorptometry or DEXA) and habitual physical activity using the Actigraph MTI. Neuropsychological evaluation is also obtained to address different domains of cognitive function and emotional status and the MRI Scan (3T Siemens) is conducted for structural MRI analysis as well to evaluate the resting state networks mainly the sensorimotor network (SMN).

- **13962 | Study of variants of the training system LYS in the Vinhos Verdes region**
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The scarcity of manpower and the increase in its cost as well as the large number of hours required for wine-growing activities led to a growing commitment to the mechanization of the vineyard. The research and implementation of machinery in viticulture has become essential for the optimization of operations namely at the time of harvest. The essay intended to study two variants of the training system LYS, created by Rogério de Castro, characterized by its three canopies, one trained upwards and two trained downwards, its great capacity of yield but that is quite demanding in labour. This study intends to compare two variants, one more adapted to the mechanization, the LYS without dash, and other less adapted, the LYS with dash, since the mechanization, namely of the harvest is an important economic factor, provided that this has no negative effects in production and quality. The studied vineyard is located in Quinta de Lourosa, in Lousada, in the heart of the Region of Vinhos Verdes, with cv. Loureiro, grafted in 1103P, and two modalities were compared: the LYS (without dash), with greater mechanization ability and allowing the use of the harvesting machine and the LYS (with dash), less suitable for mechanization, which does not allow mechanical harvesting. Twenty grapevines of each modality were used, in a total of 40 vines. The plot was divided in 4 blocks and in each block the 2 modalities were applied. The results of this study demonstrate that, in general, there are no significant differences between the two modalities in the yield and quality parameters. Only the values of the Fertility Index and the Water Potential (measured at 10 am and 2 pm) shown to be different in plants with a dash and without a dash. Being mechanization and the possibility of using the grape harvesting machine an asset, the LYS without dash presents advantage against the LYS with dash, even if it presents the disadvantage of increasing the manual work of canopy management.

- **13930 | Success of Cluster of Demarcated Douro Region under the light of Cluster Life Cycle Theory**

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Port Wine historically represents the main production of the Demarcated Douro Region cluster, which already counts more than two centuries of history and internationalization. The dynamic perspective in the study of clusters nowadays has become even more relevant, because throughout a cluster's evolution, the structure, composition and the factors of its success change. Since there is no such study for the DDR cluster, the main objective of this work is to identify which are the relevant factors for its success in the current phase of its life cycle. The success is analyzed at two complementary levels: the company level – what competitive advantages does belonging to the cluster bring to the internationalization process of the companies; and the cluster level – which factors are important for its overall success. Based on the literature review two models are elaborated: Cluster Life Cycle Identification Model and the Cluster Success Model - company vs. cluster.

In the empirical dimension, the case study of the DDR cluster was developed with the application of qualitative and quantitative methodologies. Secondary data was collected for the longitudinal study of the CLC of the RDD and primary data was gathered by semi-structured interviews to main actors in the cluster with a brief questionnaire at the end.

The study concluded that the current phase of the DDR cluster is the Renewal phase. Most actors interviewed admit that belonging to the cluster is an advantage for their firm's internationalization process. According to the two levels of success analyzed, the following factors were systematized as important for the success of the DDR cluster in the current phase of its life cycle: region/terroir/product; international promotion; attraction of human resources and entrepreneurship; clear vision/strategy of profitability and sustainability; cooperation and knowledge sharing; innovation and R&D; modern legislation; and access to financing.

- **14244 | Support provided and felt needs: The perspective of parents of children with ASD**

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Empiric evidence highlights the importance of formal and informal support to parents of children with Autism Spectrum Disorder (ASD) (Renty & Roeyers, 2005). Regarding the support needs of these parents, several studies indicate that taking care of children with ASD influences family dynamics (Hutton & Caron, 2005). Therefore, it is important to develop strategies and resources to support these families. Although there is a lot of international literature on the needs of families with children with ASD, little is known about the support provided and the needs felt by the parents of children with ASD in Portugal.

Our study aimed to understand to what resources and support parents of children with ASD have access. Furthermore, we intended to identify the additional support that the existing resources could not supply. Seven parents of children with ASD attending elementary school and receiving institutional support were interviewed. The seven interviews were transcribed and a content analysis was conducted. The results highlighted 13 different support resources. Moreover, 19 support needs were identified, among which Family-Centered Support; Family Support; Information; Training; Financial Support; Professional Support. These needs were not always supplied by the support provided by the services. Results pointed out that the existing parental support does not meet all the existing needs.

- **14129 | SVCT2 modulation in Vitamin C homeostasis and neurodegeneration: a fly based approach**

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Maintenance of homeostatic levels of vitamin C is essential to sustain proper brain function and counteract cellular damage associated with increased oxidative stress, during aging or disease conditions. Vitamin C can be found in two forms: dehydroascorbate (DHA), the oxidized form, and ascorbate, the reduced form, and both are transported across the plasma membrane. The plasma membrane sodium-vitamin C cotransporter 2 (SVCT2) is the sole transporter of ascorbate, which acts as a powerful antioxidant in neurons. Upon ascorbate release into the extracellular moiety, SVCT2 is translocated to the membrane to improve ascorbate uptake. It has been shown that ascorbate levels are reduced in neurodegenerative conditions and this correlates with increased levels of oxidative stress. In agreement, ascorbate intake is viewed as a potential therapeutic approach. Here, we will establish a fly model of SVCT2 to address in vivo if modulation of SVCT2 activity has the potential to enhance ascorbate uptake and counteract neurodegeneration in fly models of Alzheimer and Parkinson disease. In addition we will address if changes in SVCT2 activity may underlie aging-associated neurodegeneration.

- **14290 | Swimmers low back pain: diagnosis and treatment**

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High training volumes and body extension during swimming reduce lumbar mobility due to spine erector muscles continuous contraction. In fact, back pain is an increasingly recurrent complaint in competitive swimming, with ~50% of butterflyers and breaststrokers reporting it, leading to training limitations and drop out. Our aim is to present a conservative diagnosis and treatment allowing swimmers to maintain high performances throughout their career. Swimmers will perform isokinetic evaluations on a dynamometer (Biodex) for testing the hip joint pre and post a fascial therapy and functional training combined treatment. After the initial evaluation, it will be analysed the force and range of motion values (angular limitations), and an osteopathic and muscle palpation (injured osteoarticular structures and soft tissues) will be done. The treatment for positive diagnosis will consist in myofascial release, osteoarticular structure manipulation, isometric and eccentric contractions with neuromuscular electrostimulation (NMES), proprioceptive training with and without NMES (including elbow plank exercises and squats without extra weight) and hypopressive method, hoping to reinforce the sacroiliac joint and improve the erectors muscles contraction power. This is an ongoing project that aims to obtain reference values for recreational and elite swimmers, as well as to develop preventive workouts to maintain a spine good mobility. These aims are especially important since: (i) in front crawl and backstroke, the rotational movements combined with the erectors stress increase compression by rotation and (ii) in butterfly and breaststroke, the trunk flexors are overused (mainly psoas and adductors), causing sacroiliac alterations and increasing lumbar intervertebral compression. The reinforcement and functional relearning of the joints involved in the etiology of low back pain will allow an improvement in the daily training work by reducing the exposure to injuries.

- 14034 | Synthesis of a xanthone derivative by a multi-step pathway via benzophenone

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Xanthone derivatives (XDs) have noteworthy interesting in Medicinal Chemistry concerning the promising core for the design and development of new drugs. This family of compounds is well known considering the associated wide range of biological and pharmacological activities [1,2], which can diverge depending on the nature and position of the different substituents on the xanthone scaffold.

Although natural xanthenes have proven to be a great source of bioactive compounds [3], molecular modifications using these compounds as synthetic substrates or total synthesis using these molecules as models for new compounds [4] contributed to expand the spectrum of new pharmacologically activities. Therefore, it is very important to follow the diverse methods used for the synthesis of this class of compounds.

In this study, the total synthesis and the structure elucidation of a promising XD was successfully carried out. The synthetic strategy, involving a multi-step pathway *via* benzophenone intermediate and an alkaline intramolecular cyclization of the benzophenone under microwave (MW) irradiation, is discussed.

Additionally, the growth inhibitory effect of the synthesized XD on three different tumor cell lines was evaluated.

This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT and ERDF, in the framework of the programme PT2020, the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599-PPCDT) as well as project INNOVMAR (reference NORTE-01-0145-FEDER-000035, within Research Line NOVELMAR), supported by NORTE 2020, under the PORTUGAL 2020 Partnership Agreement, through the ERDF, and Chiral_Drugs_CESPU_2017.

[1] A.I. Shagufta, Eur J Med Chem, 2016, 116, 267-280.

[2] M.M.M. Pinto, et al, Cur Med Chem, 2005, 12, 2517-2538.

[3] K.S. Masters, S. Bräse, Chem Rev, 2012, 112, 3717-3776.

[4] C. Fernandes, et al, Bioorg Med Chem, 2014, 22, 1049-1062.

- **13966 | Synthetic analogues of marine natural flavonoids: synthesis and biological evaluation**

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Marine environment has been considered as a source of environmentally friendly natural antifouling agents [1]. In fact, many structurally diverse marine natural products have been reported as antifouling compounds, including the glycosylated flavone sulfate thalassiolin A [2]. Inspired by the potential of this flavone as non-toxic antifouling agent, some thalassiolin A structure-related flavones were obtained. Flavones were synthesized by Mentzer Pyrone Synthesis followed by propargylation. Afterward, these compounds were submitted to microwave assisted Copper(I)-catalyzed azide alkyne cycloaddition with acetoglucoopyranosyl azide, followed by deprotection of the glycosidic moiety with sodium methoxide and sulfation with sulfur trioxide adduct, providing the final products.

The antifouling potential of synthesized compounds, as well as a small library of structure related flavonoids previously synthesized in LQOF, were assessed using the anti-settlement activity of *Mytilus galloprovincialis* plantigrade post-larvae.

References:

1. Qian, P. Y. et al. N. *Biofouling* **2015**, 31(1), 101.

2. Jensen, P. R. et al. *Appl. Environ. Microbiol.* **1998**, 64(4), 1490.

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- **14001 | Teaching portuguese in a migration context: reflections on teaching and learning experiences at CNAIM**

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Managing linguistic and cultural diversity and the differences between the culture of the original society and the culture of the host society becomes, currently, a challenge for our modern day society stimulated by multilingualism and multiculturalism to find promising and viable strategies to sustain stability. In fact, with regard to portuguese teaching to immigrant communities, the right to learn the host language through the reinforcement of interculturality amongst other cultural and linguistic skills is a mandatory priority in order to promote tolerance and respect towards eachother. Thus, this work results in an official and unprecedented proposal to Centro Nacional de Apoio à Integração de Migrantes of Porto to teach Portuguese as a host language to the immigrant community. This action-research project proposes a reflection about teaching and learning experiences of Portuguese in a migration context and it's divided in two main parts. As a first step, we develop theoretical contributions that were used as pedagogical approaches, namely, the development of the intercultural competence and the practice of pedagogical differentiation, arising from the finding of heterogeneity and linguistic and cultural diversity of the target audience. As a second step, we describe the educational context regarding the main instruments and aspects that have contributed to improving the classroom management. Lastly, we present different teaching proposals that have been more successful in representing the teaching and learning process of this specific and challenging context.

- 14265 | Terminological expression in the Arab political discourse vis a vis the international events .

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There have been a lot of talks about political language and propaganda after the 11 September incident that had led to the application of new terminologies, expressions and language variations in contrast with what were associated with these words previously in the minds of the recipient. Hence, new strings of language were woven but nonetheless they remained far from being acquainted with the political and propaganda discourses. The one who is responsible in language policy is the one who is successful in including the language of the streets to explore its various concepts. This is in the absence of the growth of language movements, language personalities, and the challenges of discovering self-identity and in the efforts to search of the future that is characterized by the elements of language survival in the face of the clashes of civilization, thinking, political and economy. In addition to that, the inner conflicts that are witnessed by the Arab world to adapt to the arising matters and issues. This effort will entail to overcome the new direction in language that is vicious toward the past and at the time try to accommodative to the new and contemporary. The research has concluded that: semiotic rules and regulations of political speech should be reviewed, so as for mass media to penetrate deeply in the technical meanings and expression like the politicians .then Semiotics rules and regulations have to be rewritten for this language following dialogue and communication and reception, and draw the alphabetical references and their contexts and positions .

Keywords: Arabic Language - Terminological phrases -reception of political expressions - politics of phrases .

- **14128 | The African Languages of the Transatlantic Slave Trade until mid-Seventeenth Century**

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The beginning of the transatlantic slave trade coincides with the dawn of the Early Modern Europe. In 1444, according to Gomes Eanes de Zurara, the first African slaves to be sold in Portugal arrived at Lagos brought by Portuguese navigators. This is considered the foundational moment of the transatlantic slave trade. The construction of the Arguim fortress in 1448, the very first commercial warehouse that set up the initial trade networks between Portugal and the west coast of Africa (Senegambia and Sierra Leone), is also fundamental. The colonization and the setting up of sugar plantations in the archipelagos of Cape Verde and São Tomé also increased the demand for slaves during the fifteenth century.

The sixteenth century saw further exploration of the African Atlantic coast and the expansion of the areas brought to this slave trade. The colonization of Brazil and the Spanish Americas, with the consequent indigenous demographic collapse, vastly increased the need for slaves, especially in the mining sites and plantation economy. In the seventeenth century several other European states (the Dutch, England and France) started to carry slaves to their American colonies. Obviously, this put even more pressure in the local populations. The slave trade in Africa was not created by the Europeans but they increased the demand for forced manpower and disrupted the local equilibrium between neighboring states that fueled this trade in terms of war captives. The transatlantic slave trade forced the migration of about one million people in and out of Africa until mid-seventeenth century. What languages did all these migrants spoke? What impact did these languages have in the destination regions of the slaves? And what is the impact of these languages in today's American languages? Based on the most recent historiography about the transatlantic slave trade, especially cultural studies, this article addresses these questions and hopes to shed some light on the subject.

- 13879 | The Apollonian and the Dionysian: the contemporary representation of the Doppelgänger's myth in the novel *O homem duplicado*, written by José Saramago, and in the movie *The enemy*, directed by Denis Villeneuve
Amaro, Maurício P., Faculdade de Letras, Brazil

This study is about the contemporary representation of the Doppelgänger myth in the novel *O homem duplicado*, written by José Saramago, and in its film adaptation *The Enemy*, directed by Denis Villeneuve. This work analyses the construction of the conflict among the characters Tertuliano Maximo Afonso and Daniel Claro, both protagonists of Saramago's book, as well as of its filmic counterparts, Adam Bell and Anthony Claire, respectively. Saramago criticizes the relation of the contemporary man with himself and with the people around him, using the Double's theme to construct that critique. On the other hand, Villeneuve's film, as a cinematographic adaptation, seems to fail to approach Saramago's social critique, since the theme of Doppelgänger appears in the movie only as a narrative movement, disregarding the deeper reflection of why there are two exactly equal people in our world and the consequences of that factual event.

- **14279 | The benefits of the progymnasmata in modern day classrooms: articulation between comprehension and writing**
Silva, Ana R., Faculdade de Letras, Portugal

This project seeks to illustrate the significance of a joint study on literary education and writing competence. In order to achieve this goal, we adapted to the texts to be studied some writing exercises created in antiquity (the *progymnasmata*), such as chreia and ethopoeia. To contact with literary texts and to reflect, by writing, about its themes represent a great asset for our students. Developed during the teacher training in Portuguese and Latin, in accordance with the principles of action research, we started to outline the theoretical framework of our research that contextualizes the importance of a study in which texts and writing practices could communicate. We confirmed the role of the progymnasmata as an organized methodology that links these practices for the consolidation of knowledge pronounced in writing. This theoretical approach tied in with the description and analysis of the activities set into practice in Portuguese and Latin classes. It can be very challenging for students to imitate the style of another speaker or writer, and in this process of imitation, they learn a lot about a text - its rhythm, grammar, images, sentence structures, audience, authorial persona. In fact, this complex and interdependent relationship between interpretation and composition is unfamiliar to many contemporary students and teachers. Therefore, I think that there is great value in developing pedagogies that attempt to bring the two sides of this inventional process together again, and that help students to understand how they are interrelated. At the end, we presented some suggestions for prospective deepening of the theme discussed.

- **14106 | The Chapel of S. Frutuoso de Montélios: Principles of design**

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Oliveira, Marta, Faculdade de Arquitectura, Portugal

This investigation was developed within the Early Middle Ages architecture present in the Portuguese territory, and it focus on the S. Frutuoso de Montélios' chapel, in Braga - a one of a kind pre-Romanesque temple that has long been a topic of discussion amid researchers. A new approach is now suggested, closely linked to the architect's perception and working tools - through drawing analysis.

The main focus is the principle of the chapel's design. In practise, it stands within the exploration of a metric, a module and proportional relations that evidence a modulation for the chapel. Part of the methodology used was to revisit what was known and studied - to further incite new questions and connotations. Further focus on its historical and physical context, documental sources, historiography and the DGEMN's intervention, which was needed to identify its original features. A metric survey and visits to the building pertain an essential part of this study. It was crucial to proceed with a strict drawing analysis with real measures to redesign a new plan and section of the present state of the chapel.

Further along, this investigation also makes a thorough comparative study of the principals of design and proportional relations between buildings, through the overlay and scale reduction/enlargement of drawings. A relevant comparison is established with a group of buildings with which the Chapel of S. Frutuoso presented narrow affinities: Sta. Comba de Bande, S. Pedro de la Mata and Sta. Maria de Melque. However, the key comparisons of this investigation are: the Basilica of Dume in Braga, a paleo-Christian temple near Montélios, which certainly served as a design model; and the Chapel of Bom Jesus de Valverde in Évora, built in the 16th century after a visit to Montélios, which may have served as an inspiration for its design.

This research was developed within a Master Dissertation in Architecture entitle A Capela de S. Frutuoso de Montélios, FAUP, 2016/2017.

- **13925 | The construction of the colonizer's image in the Portugal Colonial magazine**

Ferreira, Joana, Faculdade de Letras, Portugal

This research paper falls within the context of the Language Sciences graduation. Its main aim is to analyze the linguistic mechanisms used by different addressers in the first number of the magazine "Portugal Colonial" in order to, not only give credibility to their own statements but also to regulate the beliefs, the attitudes and the behaviour of the readers. Writing the present study allowed us to realize that the construction of the identity of the Portuguese colonizer is usually done by a process of enhancement of the latter, either through sentence structures and the use of lexicon aiming to praise him, or through a process of polarization against an external actant (the Other), all this in a conflict perspective. In addition, the linguistic material used to define the Self-presentation is notoriously more abundant than the linguistic material used to define the Other. At the same time, isotopies and lexical choices axiologically marked by negativity regarding now, and positivity, regarding the past (id best, the "Glorious Past") stand out. The set of linguistic mechanisms found in this analysis is sufficient to understand the propagandistic method of Estado Novo, in favour of expanding the Empire. Those linguistics mechanisms are based on the use of Adjectives and Metaphors, offering a heroic vision of the Portuguese Nation. It should be emphasised that the Salazarist writing tends to impose a meaning, to postulate an interpretation, to persuade and to make others surreptitiously adhere to meanings they would not understand. KEY-WORDS. Portugal Colonial magazine, Discourse, Argumentation, inherent linguistic mechanisms in argumentation, negative other-presentation, positive self-presentation.

- **13873 | The decision-making process in female leaders: An exploratory study with human resources managers**

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Brandão, Catarina, Faculdade de Psicologia e Ciências da Educação, Portugal

Decision making is a fundamental process in organizational contexts. This study aims to explore the decision-making process in female leaders in organizations. It looks at the thoughts, emotions and behaviors experienced in that process, in order to understand the constraints that these leaders face and the strategies they adopt to manage them, having as reference the model of TABELS. Considering the importance of Human Resources departments for organizations, information will be collected from 10 women leading this department, using the Critical Incidents Interview. The data will be subject to Thematic Content Analysis (Bardin, 2011), with the support of NVivo11 (QSR). It is hoped to identify the steps of the decision-making process, as well as the thoughts, emotions and behaviors experienced by female leaders and how these influence the decision making process. It is also intended to understand if when faced with a challenging decision that causes discomfort and anxiety, the leaders' exploratory system remains active, through the careseeking system and the caregiving system, rather than the self-defense system (Heard, Lake, McCluskey, & McCluskey, 2009). This study contributes to understanding a fundamental process in organizations, influenced by emotions and cognitions.

Key Words: female leadership; making-decision; TABELS; human resource management

- **14300 | The effect of alcohol consumption on the treatment outcome of nontuberculous mycobacterial infection**

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Jacob, Maria, Faculdade de Medicina, Portugal

Duarte, Raquel, Faculdade de Medicina, Portugal

Gaio, Rita, Faculdade de Ciências, Portugal

The purpose of the present study was the evaluation of the effect of alcohol consumption on the treatment outcome of nontuberculous (NTB) mycobacterial infection, the latter being binary evaluated as death or survival. The used database contained 610 individuals and several variables concerning individual demographic and clinical information. It was obtained from the National Epidemiological Surveillance Commission for TB and reviewed the years 2003-2016.

The crude effect of the alcohol consumption on the treatment outcome, as the other variable's effects, were evaluated by adequate hypotheses tests. The adjusted effect, taking into account confounding variables such as age, total time of symptoms, total time of treatment, sex, alcohol dependence, co-morbidities, diabetes, neoplasms, seclusion or homelessness or community residence, main product, main location, RX Thorax, drug dependence, number of previous treatments, HIV and treatment medication were evaluated by a binomial logistic regression model. Logistic regression is the designation attributed to a generalized linear model with binomial response, that is, the set of possible outcomes reduces to success or failure. The goal is to predict how the response varies according to a set of explanatory variables of continuous or categorical type.

The final logistic regression model included 8 statistically significant variables, namely sex, total treatment time, alcohol dependence, co-morbidities, neoplasms, number of previous treatments and HIV-infection. Alcohol dependence, chronic lung disease and other types of co-morbidities, neoplasms, the existence of at least one previous treatment and HIV-infection were shown to be risk factors for a bad outcome, while the female sex and having a large treatment time were protective factors. Some measures for the goodness-of-fit of the model validated the obtained results.

- 14114 | The effect of diclofenac on tomato plants: evaluation of some stress indicators

Leal, André, Faculdade de Ciências, Portugal

Sousa, Bruno, Faculdade de Ciências, Portugal

Lopes, Jorge, Faculdade de Ciências, Portugal

Fidalgo, Fernanda, Faculdade de Ciências, Portugal

Teixeira, Jorge, Faculdade de Ciências, Portugal

Human pharmaceutical products tend to end up in almost every type of water bodies because of poor elimination systems. Non-Steroidal Anti-Inflammatory Drugs and their mixtures are present in almost every ecosystems and their uptake by organisms is bound to happen whether directly or indirectly. Although these substances are present in low concentrations, they are beginning to cause problems to the ecosystems. Plant-based technology has to be developed and researched to help remove and eliminate these substances. In this study, the plant model used was *Solanum lycopersicum* L. cv Micro-Tom because of its commercial importance and usage in science research. A solution with 1 mg/L of Diclofenac was used to study some biochemistry parameters after 5 weeks of exposure. Overall, the quantifications of Proline, photosynthetic pigments and lipid peroxidation showed slightly higher values in the Diclofenac-treated plants, being found significant differences in lipid peroxidation levels on the aerial part of the plants, an indication of possible oxidative stress. Nevertheless, additional studies are necessary to ensure that this substance is not damaging to plants and ecosystems.

- **14026 | The fonts in women violence news: a case study about G1 news portal**
Florêncio, Camila (Florêncio, C.), Faculdade de Letras, Portugal

Eleven years ago, the 11.340 law, popularly known as Maria da Penha, was implemented in Brazil. This law was created to increase the rigor and punishment in women domestic violence. But, even after the creation of this law, Brazil is the 5th country with the biggest femicide rate in the world, according to the research "National Guidelines for Investigating, Processing and Judging with Gender Perspective the Violent Deaths of Women - Feminicides", made by the Brazilian Government, and the High Commissariat Office of the United Nation to the Humans Rights, ONU Women.

The general situation of the violence against women can be even worse than we can see in the statistics, as many cases of rape and psychological violence against women are not reported. According to the research made by the Instituto de Pesquisa Econômica Aplicada, IPEA, a Brazilian institute, in 3.180 Brazilian interviewed about the tolerance in violence against women, 58% agrees that "if women know how to behave, there would be fewer rapes". The male superiority culture, the patriarchy and the public opinion blame the victim in many of these cases. And, how does the press behave before this scenario? Do the newspapers companies assume the responsibility to decrease the patriarchal impact in cases of violence against women? Do the news approach the theme in a human way? Are the victims heard?

To answer these questions, this research will analyze the fonts used to report cases of violence against women at G1, the biggest news portal in Brazil. The aspects analyzed will be the fonts of the news in the editorials of the States of Roraima, Goiás, Mato Grosso, Rondônia e Espírito Santo, the most violent States for women in Brazil according to a research of IPEA.

- **14285 | The Fundamental Theorem of Algebra obtained from Quantum Mechanics**
Ribeiro, Pedro Manuel M., Faculdade de Ciências, Portugal

The aim of our presentation and work is to prove the Fundamental Theorem of Algebra. Since Gauss's and D'Alembert's detailed study of this magnificent theorem (which Gauss called the *fundamental theorem of algebraic equations*), a vast set of fresh proofs has emerged in the literature, with many of these proofs using techniques from Complex Analysis.

In our presentation, we will give another proof whose main argument uses some formalism of Quantum Mechanics. It will also be discussed how this first approach is connected with some results in Fourier Analysis and Probability Theory.

- **14121 | The geo-blocking and other forms of discrimination against consumers in e-commerce**

Almeida, Carla Azevedo de, Faculdade de Direito, Portugal

The Internet and digital technologies are increasingly present in modern life and influence the performance of the national and European economy. The implementation of a safe and transparent Digital Single Market is one of the main concerns of the European Union. By eliminating discrimination in access to goods and services based on the nationality, place of residence or establishment of customers, it is expected that there will be an expansion of the internal market, increased consumer confidence and growth in the business fabric.

Therefore, the purpose of this study is to examine whether or not geo-blocking is justified and to what extent it may or may not protect the interests of companies and how it violates the principle of non-discrimination between consumers in online commerce.

As a first step, we will focus on the legislative activity of the European Parliament and the Council and the proposals of the European Commission aimed at harmonizing consumer rights and the legal certainty of the internal market. At a later stage, this research will focus on the national and international academic contributions about this subject, pondering over the different interests in opposition while surging for possible legal solutions. Finally, we want to conclude to what extent this legislative impetus of the European Union serves the interest of the 28 Member States in e-commerce in the struggle to strengthen the Digital Single Market.

- **14184 | The Influence of Computer-assisted Learning tool on Spatial Abilities of Medical Students**

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Introduction: In a context of curricular reforms, different challenges to Anatomy education were imposed, favouring the introduction of new pedagogical approaches, as Computer-assisted Learning (CAL). This tool offers the capacity to assess students' learning abilities. Considering that the insight into students' learning profiles became the new paradigm of enhanced knowledge acquisition in Medical Education, the study of the influence of CAL on anatomy students' skills became very important. To understand the influence of anatomy CAL training on students' spatial abilities, an experimental study was conducted.

Methods and Materials: Medical students attending Musculoskeletal (MA) and/or Cardiovascular Anatomy (CA) courses were allocated in three groups (MA group, CA group, MA+CA group). Students' baseline and post training spatial abilities were assessed through Mental Rotation Test (MRT). The MRT score difference between moments (Delta MRT) was correlated to students' characterization variables, while multiple linear regression models assessed the association between these variables and Delta MRT.

Results: After CAL training sessions, students' spatial abilities improved ($9,72 \pm 4,785$ vs. $17,05 \pm 4,567$, $P < 0.001$). Delta MRT score showed a correlation with the Musculoskeletal Anatomy training sessions in MA Group ($r = 0.333$, $P < 0.001$) and MA+CA Group ($r = 0.342$, $P < 0.001$), and was correlated with the Cardiovascular Anatomy training sessions in CA Group ($r = 0.461$, $P = 0.001$) and MA+CA Group ($r = 0.324$, $P = 0.001$). Multiple linear regression models showed to be good predictors of the studied reality in all three groups, showing association between the amount of training and the improvement in spatial abilities.

Conclusion: CAL training in anatomy has an incremental dose-dependent effect on spatial ability, having a direct impact on students' profiles. The inclusion of CAL into anatomy curriculum can improve students' core characteristics.

- **14260 | The Interculturalism in Human Rights: The problems of universalization**
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Cultural diversity can bring some problems when we talk about Human Rights.

Indeed this concept works in a very westernized way, which makes all the other cultures a "target to beat".

The exchange between cultures in different spaces leads us to a series of questions about the role of the "others" and the differences surrounding them.

Therefore, new theories that seek to overcome the cultural differences through dialogue, interaction and inclusion emerge.

From these new approaches, concepts like multiculturalism and interculturalism arise, with an ambiguous acceptance and a long dialog about their power, or not, to offer truly practical alternatives and ways of coexistence between cultures.

Taking this into account, this work intends to focus on the problems that the concept of Human Rights can bring when putting aside the intercultural dialogue, developer of peace, respect and tolerance, based on a knowlegdge mobilization from the fields of International and Intercultural Relations, Antropology and History, as well as from the analysis of a few reports.

- **14109 | The Mining Industry in the District of Porto at the end of the 19th century: antimony in the counties of Valongo and Gondomar**

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The mining of antimony in Portugal had its main focus a well-defined area of the interior of Oporto district implicating then many researches of deposits. Antimony occurrences in other areas of the country have turned out to have little relevance, being the exploration located mainly in the counties of Valongo and Gondomar. Only during the second half of the nineteenth century antimony aroused the interest of the financial markets, taking place then many researches of deposits and, later on, a great number of granting requests.

The most intensely mineralized area and with the richest deposits was distributed along Valongo anticline. Gold, also mined in a more reduced way, is associated to antimony. The most active period of mining operation in the district of Oporto took place between 1880 and 1890 and it was in the county of Gondomar that the most important mines were set out. Their installation enabled the development of several centers of population, as they employed hundreds of workers, promoting, through this industrial activity, a greater dynamism in the area. From the moment that the price of antimony started to decline and with the emergence of this mineral in Asian countries the mines of Valongo and Gondomar didn't resist to the created crisis.

At the beginning of the twentieth century practically all mines had closed and were finally left behind, being the exploration not resumed. Currently, what remains of the majority of the mines of antimony are ruins surrounded by a thick vegetation. These industrial units that, in the past, represented a great richness are now forgotten and only few people know about their existence. Thus, we advocate the preservation and the dissemination of this legacy that clearly is so little and is in a poor conservation status, in order that the local community and the general public become acquainted with the development and the decline of a remarkable historic and mining space.

Key-words:

Antimony; Mining Industry

- 14197 | The new anticancer drug candidate SLMP53-1: exploring its impact on mutant p53

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Inactivation of p53 tumor suppressor protein by mutation occurs in 50% human cancers, and relates to poor prognosis [1]. Recently, our group discovered the small molecule SLMP53-1 as a novel activator of wild-type (wt) and reactivator of mutant p53 (mutp53) R280K (restoring its wt-like function), with encouraging in vivo antitumor activity [1,2]. Herein, we studied the ability of SLMP53-1 to reactivate other mutp53s, and to interfere with tumor metabolic reprogramming. The capacity of SLMP53-1 to reactivate distinct prevalent mutp53s was evaluated using a yeast-based assay and human non-small cell lung cancer H1299 cell lines with ectopic expression of mutp53. The impact of SLMP53-1 in tumor metabolism was evaluated by western blot, and by immunohistochemistry of tumor tissues of human xenografts mouse models (obtained in [1]). The results showed that, besides R280K, SLMP53-1 is able to reactivate other mutp53s. Moreover, SLMP53-1 inhibited glycolysis both in vitro and in vivo. Indeed, SLMP53-1 induced a p53-dependent upregulation of SCO2 and TIGAR expression, with decrease of MCT4, GLUT1 and HK2 expression, both in human colon adenocarcinoma HCT116 cells and in tumor tissues. Collectively, these results further support the potential of SLMP53-1 as anticancer drug candidate.

[1]Soares et al. Oncotarget 2016;7:4326-4343; [2]Saraiva et al., European patent EP14739561.0; US Patent Nº14/901,314

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- **14208 | The numerical analysis of a resin-bonded bridge using finite element method**

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The purpose of this work is to test numerically if the abutments teeth can support the resin-bonded bridge, used in dental reconstructions. In order to achieve this goal, this study considered a 3D discretized model of a part of maxilla in which a tooth was missing. This model was constructed using the anonymized DICOM files from the CT scan. The numerical analysis was performed using an advanced discretization technique - the finite element method (FEM). Thus, the academic FEM software FEMAS[®] was used. FEMAS is being developed at the Faculty of Engineering of the the University of Porto [1]. In the end of the analysis, it was observed that the maximum stresses obtained, due to the loads applied, are lower than the ultimate tension stress of each material that was consider. In the end, it was possible to conclude that in the analysed case, the stresses measured were not sufficient to damage the abutments teeth that are responsible for the structural support of the bridge. Thus, this work allowed to understand that the resin-bonded bridges appear to be a valid method of dental reconstruction since they do not damage the original teeth of the patient.

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[1] J.Belinha. (2014) Meshless Methods in Biomechanics - Bone Tissue Remodelling Analysis. Springer International Publishing. ISBN: 978-3-319-06399-7. p. 320.

- **14120 | The role of calcineurin in cellular death of a yeast model of Niemann-Pick type C1 disease**

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The Niemann-Pick type C1 (NP-C1) disease is an autosomal recessive neurodegenerative disorder due to loss-of-function point mutations in NPC1 gene. It results from accumulation of cholesterol in lysosomes and imbalance of intracellular sphingolipid levels. Deregulation of intracellular calcium levels associated with changes in sphingolipids, particularly sphingosine, has been associated with the pathophysiology of NPC1. The exact molecular mechanisms that link sphingolipids and calcium homeostasis to mitochondrial function and cell death in NPC1 are uncharacterized. Previous work showed that deregulation of sphingolipid homeostasis mediates mitochondrial dysfunction and cell death in a yeast model of NPC1. Using yeast as model organism, we aim to disclose how calcium may impact on sphingolipid homeostasis and mitochondrial respiration. Our results demonstrate that *ncr1Δ* cells are more sensitive to calcium. In agreement, the activity of calcineurin (CaN), a calcium-activated phosphatase, is increased in *ncr1Δ* cells. Also, the nuclear localization of Crz1 transcription factor, a downstream target of CaN is more pronounced in *ncr1Δ* cells and is more activated when compared to the wild-type. Deletion of CNB1, the regulatory subunit of CaN, or overexpression of a constitutively activated version of CaN is not sufficient to recover mitochondrial function and viability of *ncr1Δ* cells. Calcineurin is also a modulator of sphingolipid metabolism by modulating ceramide synthases (CerS). Future studies will focus on the phosphorylation status of CerS in *ncr1Δ* and *ncr1Δcnb1Δ* cells. Also, the levels of intracellular calcium will be measured in these cells. The overall results support the hypothesis that CaN-Crz1 pathway may contribute to sphingolipid deregulation in a yeast model of NPC1 disease. These pathways are conserved in mammalian cells and may be pharmacologically manipulated for novel therapeutic strategies.

- **14122 | The role of mitochondria in the non-targeted effect of ionizing radiation**

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Radiotherapy is a clinical modality dealing with the use of ionizing radiation (IR) in the treatment of cancer patients. It aims delivering a precisely measured dose to a defined volume with as minimal damage as possible to the surrounding healthy tissue.

Radiation induced bystander effects (RIBE) are a variety of changes which emerge in cells that were not directly irradiated. Some authors point the role of mitochondria in these effects by showing an absence of RIBE if the irradiated cells did not have mitochondrial DNA (mtDNA).

We proposed to investigate mitochondrial dysfunction role in production of a signal by the irradiated cells that will cause RIBE in non-irradiated cells.

Osteosarcoma cell lines (143B), manipulated to obtain 3 strains varying only in their mitochondrial content (one wild type, one mtDNA mutant and one without mtDNA) were irradiated and its culture media (conditioned media) was used to treat non-irradiated cells from the same strains.

Direct irradiation induced an increased DNA damage in all three cell lines but increased apoptosis was not observed. Conditioned media increased DNA damage but the effect of the damage was different according to the cell line it derived and the dose used, suggesting that mitochondrial dysfunction, whether mtDNA mutation or mtDNA absence modulate the response of cells to irradiation and their RIBE potential.

These results point to a possible role of mitochondria in the radiation-induced bystander effect which upon better characterized, may be an interesting modulator of the response to Radiotherapy.

- **14171 | The role of the hypoxic tumor microenvironment on the macrophage-tumor cell interplay**

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Microenvironment, in most cases hypoxic, is composed by cancer cells, extracellular matrix, stromal and immune cells, that cooperate and affect each other activities. Macrophages are one of the most abundant immune cells at the tumor microenvironment, acting as tumor suppressors or promoters.

Previous research had shown that both hypoxia and immunosuppressive macrophages are associated with tumor progression. Nevertheless, these studies did not focus on the interplay between hypoxia and macrophage-cancer cell crosstalk. The aim of this work is to unveil the role of the hypoxic microenvironment on macrophage-tumor cell interplay, using colorectal cancer (CRC) as a model. To achieve our goal co-cultures of CRC cells and human macrophages, both in normoxia and hypoxia, were established. Macrophages were characterized functionally and phenotypically and their potential to induce cancer cell invasion was evaluated.

Our results suggest that hypoxia, and the presence of cancer cells, decreases the cell surface expression of an anti-inflammatory marker (CD163). Nevertheless, hypoxia induced an increase in the mRNA expression of the macrophage pro-inflammatory marker (CCR7). Notably, macrophages in hypoxia decrease their ability to phagocyte bioparticles. Macrophages metabolic activity was not altered by hypoxia but decreased when co-cultured with cancer cells. In addition, lactate production decrease in co-culture while glucose consumption increased. Interestingly, MMP-2 and MMP-9 activity profiles were not altered by the presence of cancer cells or hypoxia. Nevertheless, cancer cell invasion ability increased in the presence of macrophages, suggesting that other MMPs might be involved. Findings in normoxia regarding macrophage potential to induce cancer cell invasion are consistent with those previously described by our group. Interestingly, we demonstrate now that hypoxia potentiates the invasive behavior of cancer cells and also macrophage pro-invasive ability.

- **13903 | The Shape of Us: Stability and Change in Romantic Attachment and the Experience of Life Events**

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Attachment theory conceptualizes meaningful relationships as attachment bonds. Most research focusing on attachment's stability and change within the couple states that dimensions tend for more stability than change. However, studies are inconsistent regarding the impact of life events on attachment fluctuations. Our work aims to examine romantic attachment stability and change at the dyadic level as well as to analyse how several life occurrences and their meaning influence attachment fluctuations. Eighty Portuguese dual-earner couples answered a self-report measure on attachment and a questionnaire on life events at three time points, during nineteen months, as part of the (IM)BALANCE Project: Impact of Work- Family Conciliation on Parenting and Children's Development, funded by the Foundation for Science and Technology (PTDC/MHC-19CED/5218/2012). The psychometric properties of the attachment measure were verified through confirmatory factor analyses. Changes were made to the factorial structure of the questionnaire, which was transformed into three dimensions: anxiety, avoidance, and security. Relational measurement invariance was also tested, and evidence supporting partial invariance was found for all moments of assessment. Repeated measures analysis of variance, and linear, multiple, and hierarchical regression analyses showed that only women's anxiety and avoidance significantly changed through time. There was also a co-regulation effect within-dyad regarding anxiety: one's higher anxiety levels seemed to increase their partner's anxiety levels. Life events did not contribute as expected to attachment fluctuations: men in dyads who classified interpersonal events as positive decreased their security levels. This study contributed to a better understanding of attachment trajectories and co-regulation in Portuguese dyads, alerting us for the need to further study life events' impact on those trajectories.

- **13919 | The special forum and the Federal Supreme Court of Brazil: brief notes**
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With the increase of accusations against public agents in Brazil, the discussion about the nonconformity of the forum by function prerogative with a republican order that has equality as a fundamental principle emerged. This is because the institute, which would serve to safeguard legal security, would have become an odious privilege. Privilege that would be causing impunity, due to the slowness of justice. In Brazil, about 800 authorities enjoy the prerogative of a forum before the Supreme Court, which has only 11 Ministers and still accumulates the functions of Constitutional Court, contrary to what happens in Portugal. The deputies and senators make up a large part of the figure, with 594 members in total. The STF faces serious problems from this, especially regarding overwork. Even the constitutional functions of the Court would be compromised by the excessive scope of the special forum. So much so that the Supreme Court itself discusses, in Question of Order in AP 937, the extension that must be given to the institute, seeking to confer a new and restrictive interpretation of constitutional norms. The prevailing view is that the special forum should be limited only to crimes committed during the exercise of parliamentary mandate and when linked to its functions. Finally, it is concluded that the special forum in Brazil needs an urgent reformulation, due to philosophical, structural and justice issues, according to Roberto Barroso, STF minister. However, the remaining question is the way to do it: if by legislative means, by representatives elected by the people, changing the Major Charter and restricting the special forum? Or by the Supreme Court itself, through the restrictive interpretive interpretation of constitutional mutation? This is an issue in which both actors mentioned have a deep interest, which makes the debate even more essential.

- **13923 | Titin Phosphorylation by Protein Kinase G as a Novel Mechanism of Diastolic Adaptation to Acute Load**

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Background: Systolic adaption to myocardial stretch is known, but whether the heart is able to modulate its stiffness following such challenge remains unknown. Our aim was to evaluate acute adaptations of myocardial stiffness to acute stretch and characterize the underlying mechanisms.

Methods: Left ventricle (LV) of rat Langendorff hearts, rabbit papillary muscles and myocardial strips from cardiac surgery patients were acutely stretched. Skinned cardiomyocytes from Stretched and Non-stretched myocardium were studied. Stretch was assessed by echocardiography in healthy volunteers; pressure-volume hemodynamics in cardiac surgery patients and in a rat model of LV hypertrophy. Myocardial cGMP, phosphorylated VASP and titin phosphorylation were quantified. Pharmacological studies assessed the role of NO and natriuretic peptides (NP).

Results: After stretch, end-diastolic pressure (EDP) or passive tension (PT) decreased over 15 minutes in all preparations. Skinned cardiomyocytes from Stretched hearts showed decreased PT, abrogated by protein phosphatase incubation; those from Non-stretched hearts showed decreased PT after PKG incubation. Stretched samples showed increased cGMP levels and phosphorylation of VASP. Titin phosphorylation was increased in Stretched samples - attenuated by PKG inhibition (PKGi). PT decay after stretch was blunted by PKGi or joint NP antagonism, NO synthase inhibition and NO scavenging. Moreover, it was remarkably attenuated in hypertrophic rat hearts, which showed reduced titin phosphorylation. Healthy volunteers and cardiac surgery patients showed E/E' and EDP decrease after sustained stretch maneuvers.

Conclusions: We describe a novel physiological mechanism whereby myocardial compliance increases in response to stretch, by titin phosphorylation through cGMP-PKG signaling. This is translated to human physiology and may be abolished in the hypertrophic heart (potentially playing a part in heart failure with preserved ejection fraction).

- **14042 | To gaze on the Past on behalf of the Future**

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To be "sustainable" is not a post-modern attitude.

Architecture relies, more than ever, in the relearning of the Modern Era critical spirit and the revisiting of the past, proving that architecture does not depend on a key concept. Instead, it depends on "being born", paraphrasing Távora, "from the people and from the land", in accordance with conditioning factors established by the surroundings. In the 60s, a new posture, linking conscience and responsibility, was born to assure the return of dwelling quality, the respect for nature and the central position of Man, promoting the focus on the features of places, for an architecture in the "presente" free of a negative impact on the future. "Sustainability" was presented as a rescue against the International Modern Architecture, known for its destruction habits towards all forms of architecture based on identity, on the place, on the people and the sensitivity regarding Regional Architecture, born of the symbiosis between necessity and rationalism.

It seemed a rational stance, were it not for the possibility of proving that "sustainability" concerns always proven to exist in the works of both intern. architects (Le Corbusier, Wright, Mies, Aalto) and Portuguese ones (Lino, Távora, Viana de Lima, Siza); that such modern features can be seen in a touching variety of languages and interventions left to posterity by the revered masters of the 20th century (in opposition to the international post-war movement) and the greater reflexion (achieved at the epicenter of modernismo - CIAM - as registered in Portugal in '48) that architecture must hear the echoes of the "Heart of the City" and learn from the historical past and the history of places, in appreciation of the connection between erudition and popular knowledge.

Through a renewed look at the steps taken in the architecture of the first International and Portuguese modernity of the 20th century, we intend to prove the timelessness of the "sustainable" arguments.

- **14159 | Topical delivery of methotrexate using Fucoidan/Chitosan nanoparticles**
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Some severe skin diseases have been hard to control only by using topical formulations. The need for more potent drugs is becoming more relevant when disease management involves the need for drugs that are administered orally, as it is in the case of methotrexate (MTX). By this route, the drugs reveal more non-specific interactions, thus the adverse effects are even more evident, complicating the patients compliance and dose-effect response to the imposed treatments.

The polysaccharides are a class of marine origin compounds with very interesting features, namely the possibility of creating drug delivery systems to release drugs to specific targets. Combining two marine polysaccharides, fucoidan(F)/chitosan (C) nanoparticles were produced to entrap MTX, and proceed to their application as a possible topical therapy.

The FC nanoparticles were prepared in different ratios and characterized in terms of size, zeta potential, morphology and FTIR. Evaluation of storage stability over three months, in vitro drug release in skin conditions, in vitro skin permeation and cellular studies were also performed.

The nanoparticles ranged from 300 to 475 nm, the 3F1C and 5F1C ratios were not cytotoxic and enhanced skin permeability when compared with free MTX. The 1F1C ratio was exhibited a surface potential of +60 mV and was cytotoxic.

The obtained results show that fucoidan/chitosan nanoparticles may present a solution to deliver MTX by topical administration.

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- **14029 | Towards Bionic Teeth**

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Advances in bioelectronics and microtechnology have offered a panoply of new techniques, allowing us to witness the birth of a new generation of medical implants, namely bionic devices, which are able to restore functions in the body. These include neurostimulation and neural recording devices, providing great benefits in the treatment of neurological diseases or restoration of senses, such as by means of a cochlear implant.

In the domains of dental medicine, neurostimulation has been explored in the treatment of Xerostomia and of some facial pain conditions.

The aim of this work is the development of a bionic tooth, meant to restore the broken somatosensory activity associated with the dental pressure sensitivity, of people who lost several teeth. The impact of teeth lost on the sensory feedback is considerable and leads to sensitivity loss, influencing the control of the jaw function, impairing the fine mandible movement and even diminishing cognitive functions [PAC09, CER16]. The prototype translates the mechanical forces exerted when chewing into electrical pulses and to stimulate the endings of inferior/superior alveolar branches of the trigeminal nerve.

This Smart Tooth comprises two modules: one that captures and processes information obtained from the force or pressure recorded in the implant and transmits this information to the second module, which is responsible for converting it into proportional stimuli to be applied to the nerve endings. Nociceptive stimuli run then through the sensory pathway to the thalamus and from here directly to the sensorial cortex, causing the brain to generate an adequate motor response of the masticatory muscles, stopping in a more adequate way the parafunctional mastication movements.

This project concentrates on the development of the circuits for pressure sensing, signal conditioning, modulation and electrical stimulation in a submicron CMOS technology.

Keywords: Smart Implants, neurostimulation, bionic tooth

- **14119 | TTR-induced cytoskeleton remodelling: a double-edged sword**

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Transthyretin (TTR) is a homotetrameric protein, mainly synthesized in the liver and choroid plexus of the brain, being present in plasma and cerebrospinal fluid. Physiologically, TTR functions as a transporter of thyroxine and retinol and impacts on neuronal biology, having a neuritogenic effect. Pathologically, it is linked to familial amyloid polyneuropathy (FAP), a neurodegenerative disease characterised by the deposition of mutated TTR aggregates, particularly in the peripheral nervous system, resulting in dying-back axonopathy and neuronal death.

In this work, we aim to investigate whether TTR impacts on neuronal cytoskeleton and, for that, we used mouse dorsal root ganglion (DRG) neurons, untreated and either treated with WT soluble TTR, to mimic the physiological condition, or TTR aggregates, to mimic the pathological scenario. Previous data from the laboratory support our hypothesis demonstrating that WT soluble TTR increases microtubule growth speed in the growth cone of DRG neurons. Concerning the pathological scenario, after treating cells with TTR aggregates, a disturbance of the growth cone morphology was observed, with altered actin organization and reduced growth cone area. Additionally, using a FAP *Drosophila* model, previous results suggested the involvement of Rho GTPases in TTR-induced neurodegeneration.

We are currently dissecting the impact of WT soluble TTR on microtubule dynamics, by evaluating tubulin post-translational modifications and determining the underlying molecular mechanism. Concerning the effect of TTR aggregates on actin organization, we are assessing their impact on the activity of Rho GTPases. Additionally, we are performing proteomic analysis to identify molecules regulated by either WT soluble TTR or TTR aggregates and unravel the mechanism through which they impact on the neuronal cytoskeleton.

Importantly, this work could provide insights into the role of TTR on neuronal cytoskeleton, a target in health and disease.

- **14303 | Tuberculosis in the elderly studied through a logistic regression model**

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It has been noticed that the number of deaths among the elderly with tuberculosis (TB) has been increasing in a surprising and unexpected way. The ultimate goal of this study is to find out why this is happening. The database was obtained from the National Epidemiological Surveillance Commission for TB and concerned the years 2008-2015 and the studied sample consisted of 4104 patients, with individual information on the following variables: age, sex, clinical - imagiological criteria, HIV infection, obstructive pulmonary chronic disease, neoplasms (lymphomas or Myeloproliferative Diseases, lung cancer, neoplasms in other organs), other comorbidities (if the patient has one or more of the following diseases: renal disease, renal failure, chronic dialysis, inflammatory joint, other interstitial disease, diabetes, silicosis, sarcoidosis or othera), dependencies on alcohol and drugs, reclusion, homelessness, main location of tuberculosis, chest X-Ray, quick test to tuberculosis, conventional antibiogram, resistance to TB-antibiotics, and existence of a previous TB-treatment. The first step in the analysis concerned the choice of the adequate explanatory variables. The response variable consisted of the binary TB-treatment outcome (death vs survival). Exploratory univariate analyses consisted of the chi-squared/Fisher test for categorical variables and the Mann-Whitney test for continuous variables. Only the variables presenting a p-value lower than 0.150 were considered in the logistic regression model. The choice of the final model was essentially based on the backwards' selection algorithm grounded on the Bayesian Information Criterion (BIC). The final model included the variables sex, age, comorbidities (none, neoplasms or other), reclusion/ homelessness, chest X-Ray and previous treatment. The identified statistically significant risk factors were being male, being older, the existence of comorbidities (neoplasms or other diseases) and being recluded or homeless.

β_0	β_1	β_2	β_3	β_4	β_5	β_{61}	β_{62}	β_7
-7.31	0.42	0.07	0.79	0.45	0.86	-0.19	-0.74	-0.70

Coefficientes do modelo

- **14084 | Tungsten concentration process from tailings using Wilfley Shaking Table**

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Nowadays, tailings reprocess can be considered a new opportunity to recover minerals present on tailings dam as a result of less advanced beneficiation technologies. Many of raw materials are present on dams, which are crucial to Europe's economy. Therefore, the European Commission has created a list of critical raw materials for the Europe, which is subject to a regular review and update. These combine raw materials of high importance to the economy and of high risk associated with their supply.

This project refers to a part of an ongoing research that concerns in studying a process to reminer the tailings currently disposed on a dam. The case study refers to the Cabeço do Pião dam, which is composed by the tailings of Panasqueira Mine Plant, located in Castelo Branco district, Portugal. In this case, one of the most important element present is the tungsten (considered one of the critical raw material in 2017). However, it is crucial to investigate processes to separate them from the other chemical elements. Therefore, it was studied the concentration process by Wilfley Shaking table.

First of all, tests were carried out using tailings directly sampled from the dam. The obtained results were unsatisfactory because the concentrate product was composed by a higher concentration of arsenic, which is harmful to a efficient concentration process. After that, it was studied a flotation process and its tailings were used as feed for the Wilfley table. Finally these two approaches were compared in order to understand if the Wilfley Shaking table can be implemented to concentrate tungsten.

Acknowledgment: This work is a part of the project supported by the Portuguese National Funding Agency for Science, Research and Technology (FCT) "Improve Resource Efficiency and Minimize Environmental Footprint (REMinE)", Reference ERA-MIN/0007/2015, Network on the Industrial Handling of Raw Materials for European Industries (ERA-MIN).

- **14054 | Ultrafine particles in primary school microenvironments**

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Ultrafine particles (UFP) consist of particles with aerodynamic smaller than 100 nm. Due to their smaller size, UFP can penetrate to the deepest parts of the respiratory system (reaching the alveoli from where they can enter the bloodstream, being transported within various organ tissues). They have high surface areas and commonly adhered harmful substances which can lead to further adverse health consequences. The complexity of UFP exposure indicates the need to further assessment of this pollutant in order to fully comprehend its impacts on human health. This is especially relevant for susceptible population such as children which respiratory and immune systems are not fully developed. The majority of their time children spend in schools, which makes this environment relevant for their healthy development. Thus the objective of this work was to assess the risks associated with exposure to UFP in school environments.

UFP were sampled in 20 primary schools located in Oporto metropolitan area. Sampling was done during 75 weekdays (excluding Mondays and Fridays) in various indoor spaces (classrooms, canteens, gymnasiums and spaces for extra-curricular activities) as well as outdoors. The sampling was done during occupied periods (when students were in schools or rooms).

In 80% of the analysed schools UFP levels in indoor air were lower than the outdoors ones; indoor UFP resulted mostly from penetration of outdoor emissions. Canteens was the indoor environment with the highest UFP levels, followed by gyms. UFP levels in classrooms were the lowest ones which is somewhat assuring considering that these are the places where children spend on a daily basis the majority of their school time. The levels in other indoor microenvironments (libraries, spaces for extra-curriculum activities) were in general lower (11 - 54% when compared with classrooms). These results demonstrate that all school microenvironments should be considered when risks due to UFP exposure are assessed.

- 13869 | Um crime de ódio chamado Gisberta: uma abordagem crítica e interseccional sobre os conteúdos da imprensa em Portugal | A hate crime called Gisberta: a critical and intersectional approach to the contents of the press in Portugal

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Based on a social constructionist position, this master dissertation intends to make an intersectionalist approach to the case of Gisberta, the transsexual who was murdered in Oporto in 2006 by a group of 14 teenagers. The data collecting method used was documental research, and a total of 76 news items were collected. In turn, the data analysis method used was the thematic analysis, and six themes emerged from the data set, namely: Gisberta's Gender Reference in the press discourse, Disinformation about transsexuality, Partiality in press discourse, Transphobia, One hate crime committed by a group of teenagers and Gisberta, the face of discrimination. The central organizer resulting from this analysis was the "Portuguese media skews over Gisberta".

Among the main conclusions of this study is the fact that the press has a transphobic discourse, the fact that the crime committed against Gisberta was motivated by hatred towards trans* population and the vulnerability of the victim it's not only due to the fact that she is trans*, but to the crossing of different identity belongings subject to stigma and discrimination.

This dissertation aims to contribute to a critical reflection on the attitudes towards the trans* population, as well as on the dehumanizing and deeply violent effects of these attitudes, in particular as regards the way in which these processes are present in the media discourse that in Portugal was being elaborated over the 11 years elapsed on the death of Gisberta.

- 14280 | Understanding the role of KRAS hotspot mutations in the regulation of the KRAS/Galectin-3/p16INK4a axis in colorectal cancer

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Colorectal cancer (CRC) is a leading cause of cancer-related death. Activated KRAS mutations are frequent events in CRC contributing to cancer cell survival through autophagy. In CRC, Galectin-3 has an abnormal localization, which is correlated with altered cell-cell adhesion, cell-matrix interactions, macrophage activation, cancer cell invasion and tumor angiogenesis. Mutations or deletion of P16INK4a, a cyclin dependent kinase inhibitor, are associated with abnormal proliferation and carcinogenesis. Here we aimed to better understand the interplay of KRAS, Galectin-3 and p16INK4a, which for the best of our knowledge, is not well understood.

Co-immunoprecipitation and co-localization studies, performed in distinct CRC cell lines, suggest that these molecules form a multiprotein complex. These proteins seem also to regulate each other, as suggested by western blot protein analyses upon RNA interference assays. Currently, we are exploiting the impact of this complex on cancer cell migration, proliferation and invasion. Further studies are needed in order to understand the role of KRAS/Galectin-3/p16INK4a feedback loop in the colorectal carcinogenic process.

- **13977 | Unlawful pleasures: Adultery, Woman and Morality in Augustus' Empire.**
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This research aims to analyze and discuss the role of women in the early Roman Empire, a recurrent study of the marriage laws, Lex Iulia de Adulteriis, implemented by the then Emperor Augustus (63 BC-14 BC)

One of the objectives, perhaps the greatest, of this research is to understand how the laws about marriage and its impositions cross the field from the public to the private, making the practice of adultery a crime, and the judicial limitations on the pleasures of the flesh. It is also intended to discuss the motives surrounding this political act as well as its cause-and-effect relationship with a focus on the results generated on the life of women in this society of the early Roman Empire, with the object of study Julia, The Elder (39 BC - 14 AD) the only daughter of Augustus, who suffered the legal penalties that supported the Law.

What is intended here is to seek to perceive her purely natural desires several and several years before our present time, twenty-first century, and how this image defines, and sometimes gives an air of guilt to the woman herself and her desires purely natural. What paths follow these decrees made by Augustus, what are the consequences before Roman society at the time, and what paths has this law extended to the present day.

Keywords: Lex Iulia de Adulteriis, Politics in the Roman Empire, Women.

- **14205 | Unravelling the cause of spindle orientation defects**

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Accurate spindle orientation in mitosis is critical for faithful distribution of the genetic material to daughter cells and for determination of the progeny fate. Spindle misorientation is intimately associated with cancer progression as it is proposed to generate aneuploidy, potentiate tissue disorganization, metastization and cancer stem cell pool expansion.

In this study we report our recent findings describing novel pathways that contribute to spindle orientation defects. Resorting to gene overexpression, RNAi-mediated depletion and live-cell imaging of *Drosophila* S2 cells and follicular epithelium cells we have identified new mitotic factors that when mis-regulated, result in massive rotation of the mitotic spindle and in loss of normal tissue architecture, forming a multilayered epithelium.

We uncovered preliminary insights underlying the observed spindle rotation defects, yet the molecular mechanisms remain elusive. Unravelling the underpinning molecular cues will generate critical knowledge to understand the causes of spindle misorientation in cancer and provide a well-characterized set of molecular signatures that might be used to assess tumor aggressiveness and invasion potential.

- **13910 | Use of Immersion Treatments and Modified Atmosphere Packaging for Shelf-life Extension of Minimally Processed Mango cv. Tommy**

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Modified Atmosphere Packaging, allied with immersion treatments, increases the shelf-life of fresh/minimally processed food products. These technologies were applied in mango cv. Tommy (10x10x10mm cubes). Quality parameters (mass loss, firmness, color), microbial load and sensory attributes were evaluated over 9 days at $4\pm 2^{\circ}\text{C}$. Combinations of 3 immersion treatments (ascorbic acid+calcium chloride (A), lactoperoxidase (L), and both (AL)) with 2 atmospheres (normal (N) and modified with low level of O_2 (B)), totalizing 7 conditions (N, NA, NL, NAL, B, BA, BAL) were applied. Mass loss increases during time (between 0,09% and 1,44% m/m), but modified atmosphere minimizes it (about 0,09%). Firmness decreases until day 2, maintaining constant until the end of storage (loss of firmness of about 1N); immersion treatment with lactoperoxidase has a beneficial effect (maintains its initial value of about 2N). The luminosity presents better results in modified atmosphere (L^* values closer to initial values), whereas the treatments with ascorbic acid (A and AL) prevent the browning (a^* and b^* values are smaller and higher, respectively, which indicates less browning). At the microbiological level, the normal atmosphere has a shelf-life of less than 8 days (high loads of molds and yeasts), as well as modified atmosphere without treatments (B) (high loads of yeasts); modified atmosphere with immersion treatments (BA and BAL) have a shelf-life of more than 8 days, reducing significantly the microbial load (especially with lactoperoxidase). The sensorial evaluation showed that the dual immersion (AL) presents the worst results; treatment with ascorbic acid+calcium chloride (A) is effective in maintaining texture and color; modified atmosphere has worse odor and taste results. Immersion treatments fulfill their objectives (avoid browning, softening and microbial growth), and modified atmosphere also minimizes microbial growth, although it presents worse sensory results.

- **14304 | Using critical velocity for swimmers evaluation**

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The swimmers critical velocity is the maximal velocity maintained without exhaustion by a long period of time and could be determined in training using a 400m test. The purpose of the present study is to use this test in young swimmers to evaluate aerobic performance changes during a macro cycle. Subjects were 15 male (8) and female (7) swimmers with 12.2 ± 0.77 years, 44.7 ± 8.09 kg and 1.57 ± 0.10 m high. Swimmers performed 3x400m front crawl with bloc start separated by 36 and 21 days, respectively. Coaches have register 400m swimming times using hand chronometers. The critical velocity rise in a progressive way: 1.06 ± 0.09 (beginning), 1.10 ± 0.10 (after 36 days) and 1.12 ± 0.09 (after 21 days). Coaches could conclude that the swimming training was a positive effect on the aerobic capacity of the young swimmers.

- **14182 | Using Ferromagnetic Material to Increase the Efficiency of the Inductive Power Transfer to Active Medical Implants**

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Keywords: Bioelectronics implants, wireless power transfer, ferromagnetism.

Abstract

Recent developments in both microsystem design and fabrication and the enhanced understanding of human physiology and anatomy allows addressing a wider range of treatment modalities and improving the integration of electronics with biology and medicine. The development of useful and effective bioelectronics implants requires them to consume little power and be wirelessly powered.

An inductive link is the best option for transferring power through biological tissue when the distance between the transmitter and receiver coils is short [1]. To avoid the need of bulky coils and to improve the transmission efficiency it is convenient to incorporate a magnetic core in the receiver coil in order to increase the magnetic flux. However, medical implants with ferromagnetic cores can cause image distortion in Magnetic Resonance Imaging (MRI) and be subject to displacement, when subjected to intense magnetic fields.

The objective of the present work is to study whether it is possible to use ferromagnetic materials, eventually with no fixed position, or/and alternative circuit configurations to improve the efficiency of wireless power transfer to active medical implants. In order to answer this question, it is needed to quantify how much power the body can be exposed to, and, consequently, to what extent this leads to heating of the tissue, through the specific absorption rate (SAR), and also of the ferromagnetic material. For this purpose, magnetic field simulations are being carried out using Ansys HFSS, using different core material characteristics, coil shapes and dimensions, in order to find the best trade-off in terms of power transmission efficiency, SAR, and heating of the ferromagnetic material.

Bibliography

[1] H. Basaeri, D. B. Christensen, and S. Roundy, "A review of acoustic power transfer for bio-medical implants," *Smart Mater. Struct.*, vol. 25, no. 12, pp. 1-23, 2016.

- **14306 | Utopia's Architecture: A Study on Space, Idealism and Degeneration in the Utopian Genre**

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Taking into consideration architecture as an active space of art, this presentationthis presentation aims to dissect on how architecture plays a role in the construction of utopian and dystopian views on and of itself. In this way, it draws its energy from a preoccupation on how these spaces represent and are represented in the utopian genre and from utopian-driven ideology.

Departing from Peter Cohen's documentary "The Architecture of Doom", in which parallels are made between the "degenerated" art of Cubism and Dadaism and physical deformity; and also from architecture as cultural memory and artefact, on the one hand, and utopian affirmation, on the other in William Morris' book "News from Nowhere", the communication intends to answer on how architecture serves a narrative that can be either subversive or utopian-oriented.

- **14252 | Vasorelaxant activity of the aqueous extract from the dried leaves of *Mentha Suaveolens***

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Background: *Mentha suaveolens* belongs to the family of the lamiaceae and grows in several Morocco regions where it is traditionally used as a decoction to treat diseases as hypertension, stimulating, stomachic, carminative, choleric, antispasmodic, sedative, tonic, anti-convulsive, insecticida. However, there is no scientific proof to justify the traditional use of aqueous extract of *Mentha suaveolens* (AEMS) in these conditions.

Aim: To investigate the vasoreactivity of the AEMS in the rat thoracic aorta and mesenteric artery. Animals and methods: Protocols were approved by the Animal Welfare Body. Female Wistar rats (8-14 weeks-old) were euthanized by decapitation and rings of the thoracic aorta and first branches of the mesenteric artery were mounted, with intact endothelium, in a myograph filled with Krebs-Henseleit solution at 37°C, aerated with carbogen. Vessels were precontracted with noradrenaline (5 µM) and then, cumulative concentration-response curves to AEMS (0.01-30 mg/m) were performed in the absence and in the presence of L-NAME (100µM), indomethacin (10µM) or atropine (6µM).

Results: AEMS caused a marked concentration-dependent relaxation of both the rat thoracic aorta and the mesenteric artery. In the aorta, L-NAME, Indomethacin and atropine displaced the concentration-response curve to AEMS to the right. In the mesenteric artery, L-NAME and atropine also shifted the concentration-response curve to AEMS to the right, but indomethacin altered it to the left.

Conclusions: The vasorelaxant activity of the AEMS is described for the first time. Although preliminary, these data suggest that the mechanism responsible for the vasorelaxant effect is different between the two arteries. Overall, this study supports the use of AEMS in folk medicine for the prevention or the treatment of cardiovascular diseases.

Acknowledgements: The authors thank Mrs. Céu Pereira for excellent technical assistance.

- **14039 | Venezuelan migration: the situation's management in the State of Roraima, Brazil**

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The Venezuelan crisis forced thousands of Venezuelan citizens to migrate. In this scenario, UNHCR's spokesperson said that Brazil is the second country in the world with most Venezuelan refugee status applicants. Only in the State of Roraima, Brazil, local news report that the requests for refugee have surpassed twelve thousand. Even though Brazil had already faced the Haitian migration before, the causes were different then. Haiti had gone through a natural catastrophe; meanwhile Venezuela is now facing some political and economic issues. These different causes are capable of completely changing the status of the migrant. Therefore, this situation is unprecedented and needs to be explored. For now, it is possible to conclude that, given the situation's extraterritoriality, the vulnerable condition of the individuals involved and the actions taken so far, the Venezuelan migration is an international issue and as well as a human's rights issue. Adopting the phenomenology as logic basis, this draft aims to provide a general view of the situation's management in Roraima, Brazil, using the observational method. The expectation is to identify and to analyze the Brazilian government's, in the three federation spheres, and the non-governmental international worldwide organizations' legal and political approaches of the problem discussed, highlighting some possible and better-suited solutions for the problem from an international point of view. After evaluating the situation, the results will be able to assure whether the management is or is not satisfying the migration's needs. Thinking through a functionalist sight, if the management is not satisfying, then it is necessary to rethink social formations, in order to make them capable of providing what the situation requires. In this draft, the theory that international partnerships or cooperation can create or reinforce the social formations which are really capable of fully managing the situation is defended.

- **14286 | Vertical jump between acrobatic gymnastics and track and field female athletes**

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Both acrobatic gymnasts and track and field athletes perform a specific training of the vertical jump since this ability is used in both sports and has a significant contribute to the accurate execution of the diverse techniques and movements. Therefore, the aim of this study was to compare the vertical jump (podal and unipodal) between acrobatic gymnasts and track and field athletes. The sample was constituted by twelve female participants (six from track and field and eight from acrobatic gymnastics) with ages between 11 and 15 years old. To evaluate this capacity, the participants executed the Squat Jump (SJ) and Counter Movement Jump (SMJ) bipodal and unipodal in the Bosco platform. The data was analyzed using a nonparametric test of two independent samples (Mann-Whitney). Results showed that gymnasts achieved higher results with the non-preferred foot tests and track and field athletes with the preferred foot tests. Also, gymnasts attained a better performance in the counter movement jump and track and field athletes in the squat jump. There were statistically significant differences in the counter movement jump with the preferred foot. In this case, track and field athletes performed better than gymnasts. Over this study, it is possible to sustain that gymnasts and athletes performed differently in each test, which demonstrates that, through their specific training they develop divergent skills that are related to the sport and its demands.

- **14291 | Vitamin A encapsulation in lipid nanoparticles for food applications: development, characterization and stability**

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Vitamin A plays a major role in several aspects of human biology. The goal of this work is to develop lipid nanoparticles (NPs), solid lipid nanoparticles (SLNs) and nanostructured lipid carriers (NLCS), containing vitamin A for food fortification.

Two solid (stearic acid and gelucire) and liquid lipids (oleic acid and miglyol) were studied as components of the NPs. SLNs made of gelucire and NLCs made of this and miglyol had the highest vitamin incorporation and were further studied. Light scattering techniques were applied to assess the size, polydispersity index and zeta potential. SLNs had an average size of 140 nm, while NLCs were around 210 nm. Both NPs had PIs below 0.2 and zeta potential of -20 to -30 mV, with encapsulation efficiencies of almost 80%. The spherical shape of SLNs and NLCs was observed under transmission electron microscopy. To increase stability of the NPs in aqueous suspension, α -tocopherol was added, in a 1:10 ratio to the vitamin amount. These formulations were stable up to a month, both at room temperature and at 4°C.

Based on the ISO 10993-1:2009, L929 fibroblast was the chosen cell line to evaluate the biological safety of the NPs. While non-encapsulated vitamin A showed high cytotoxicity, NPs containing this compound do not cause toxicity in fibroblasts.

To simulate several conditions of foodstuffs, SLNs and NLCs were placed in different solutions of NaCl, sucrose and under acidic pH, in which the NPs were stable for 24 hours. The NPs were also resistant to a heat treatment of 60°C for 15 minutes.

In conclusion, the produced NPs were capable of entrapping vitamin A, exhibited biocompatibility and stability under different conditions. Thus, they are suitable for vitamin fortification in food products.

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- **14258 | Water quality of Torrão reservoir: zooplankton dynamic as a bioindicator**
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Reservoirs are artificial lentic aquatic ecosystems and they are an integral part of the Iberian landscape. The study of lentic and lotic aquatic ecosystems has become increasingly important in recent years, namely in terms of water policy and Water Framework Directive. This line of research improves our knowledge of the structure of the communities that inhabit them and provides a better understanding of the impact of the surrounding environment. The structure and composition of the communities in the aquatic ecosystem are the result of a different abiotic and biotic interactions as well as the structure and composition of the habitats. Therefore, the objective of this study was to evaluate the seasonal changes in water quality of Torrão reservoir and understand the relevance of zooplankton and phytoplankton communities as biological indicators. For this purpose, 5 sampling sites were defined in the reservoir, and sampling will be done in all seasons. In each site, in situ physical and chemical parameters were recorded and water collected for nutrient determinations. Additionally, planktonic community (zoo and fito) were sampled to characterize the seasonal fluctuations of these organisms and the impact of water quality in their dynamics. The results of physical and chemical parameters were under the thresholds defined in the Water Framework Directive for lakes and reservoirs, classifying this ecosystem with a good status. Preliminary results of zooplanktonic community showed most encountered individuals belong to the calanoid and cyclopoida groups, although cladocerans are also represented with *Ceriodaphnia* and *Chydorus*. In the summer, the results showed that *Bosmina* spp and *Chydorus* spp and cyclopoids are more frequent upstream, whereas calanoids are more frequent downstream. This may indicate that there is a tendency for an eutrophic state upstream, since these species are described as more common in eutrophic waters.

- **14185 | Water soluble polyphenols: synthesis, solubility and photostability studies**

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The use of polyphenols into topical formulations is often hindered by their poor aqueous solubility, which prevents the use of these compounds at high concentrations. Three water-soluble derivatives of polyphenols were synthesized for potential use in skin care formulations. The water-solubility of the synthesized compounds was determined by UV-Vis spectrophotometry and, overall, the synthesized compounds proved to be 4 to 10000 times more water-soluble than their precursors. Additionally, a photostability assay by UV-Vis spectrophotometry was conducted for one synthesized derivative and its precursor, resveratrol, known by its photoinstability. The resveratrol derivative presented a similar degradation/isomerization behaviour, which means that the chemical modification did not modify the photostability of the parent compound.

1. Neves, A. R., et al., Resveratrol in medicinal chemistry: a critical review of its pharmacokinetics, drug-delivery, and membrane interactions. *Curr Med Chem*, 2012. 19 (11), 1663-81.
2. Kumano, Y., et al., In Vitro And In Vivo Prolonged Biological Activities Of Novel Vitamin C Derivative, 2-O-A-D-Glucoopyranosyl-L-Ascorbic Acid (AA-2G), In Cosmetic Fields. *Journal Of Nutritional Science And Vitaminology*, 1998. 44 (3), 345-359.

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- **14073 | Why The Tate Gallery is right to put on a queer art exhibition: issues in justifying queer art**

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Queer curating can be thought of as an attempt to dismantle heterosexist and normative concepts of society in contemporaneity embodied by the art museum. This means taking into consideration Art History's discourse but also how history is being defined by values of present times. Sexual and gender dissidence is not usually taken into account in Art History as art and culture institutions remain rather conservative on the topic. One could even to the length of saying one could attend a museum exhibition about Andy Warhol without learning about his sexuality. One could also claim that it is one irrelevant piece of information. Is identity irrelevant to the production of art? Are not sexual and gender identity part of one's self construct? What or who determines its relevance to the production of art to the point of eliminating it from the historical discourse? Given the apparent irrelevance why does this seem to call forth a clash between outrage for censorship measures and free expression in a discussion still kept alive to this day? Queer art attempts to make the point that an alternative history can be told because Art History is generally uninterested in its issues. This is not to say that queer is the only account to be told in history's discourse but it's an account that has not been told for institutions keep choosing to maintain it that way. This paper finds its justification on the premise that a queer perspective is inviting to think of the multiple worlds in which art is produced and enjoyed and the difference of artistic expression in private and public forms. This paper is titled with the exact opposite premise of a famous newspaper article intended to perpass a queer art exhibition by The Tate Gallery as wrong and unnecessary. The arguments used here are made in an attempt to contradict the aforementioned article's arguments while several past queer art exhibitions are brought up as support evidence to justify them.

- 14016 | Women moving to organizational leadership positions: exploring the process

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This study focus the process of adopting organizational leadership positions by women. It aims to explore the transition process to a leadership position and describe the positive and negative stress factors (e.g., eustress and distress) inherent to this process. Data was collected using a convenience sampling process. Semi-structured interviews were conducted with 2 women that had recently experienced the process of transitioning to an organizational leadership position. An online questionnaire with open and closed questions was applied to 30 female university students. Qualitative data was subject to content analysis (Bardin, 2011) with the support of NVivo 11.0 (QSR); quantitative data was analyzed using descriptive statistics, with the support of Excel. Results show that the transition process to an organizational leadership position comprises three phases: Learning, Autonomization and Consolidation. Results also show that women are perceived as experiencing several difficulties during the transitioning process and facing positive and negative stress effects. More studies are needed to confirm these results. As the presence of women on organizational leadership positions is increasing, it is necessary to take into account their needs, as this influence not only them, but the people who surround them and it can have a strong effect on the whole organization and its productivity.

- **14239 | Zooplankton dynamics of the reservoirs from the Guadiana River basin**

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The Alqueva Global Irrigation System is a newly established network of dams that ensures water availability for agriculture and population needs. The new zooplankton communities established in its eutrophic reservoirs remain unmonitored. Zooplankton exhibits a typical seasonality and, through its community structure at a given moment, it is possible to infer the eutrophication level of reservoirs and level of fish predation. Our aim was to assess the spatial and temporal zooplanktonic dynamics of the reservoirs from the Alqueva tributaries.

Eight sampling sites were selected, each corresponding to one of the reservoirs located in the tributaries of the Alqueva reservoir. At each of these sites, several physicochemical parameters were evaluated monthly and zooplankton samples were collected via pumping through a 55 µm filter. Zooplanktonic taxa were identified to the species level, whenever possible.

A similar pattern was observed in all samples, where copepod nauplii and cyclopoids were the dominant taxa and *Daphnia longispina* the dominant branchiopod throughout spring. However, the latter started to decline in late spring, followed by an increase in the number of small branchiopods, such as *Bosmina longirostris* and *Ceriodaphnia* sp.. This situation is commonly attributed to predation by planktivorous fish, namely young-of-the-year. In July, *D. longispina* disappeared in practically all sites, being replaced by groups more resistant to high temperatures (like *Diaphanosoma mongolianum*) and to cyanobacterial blooms, such as the carnivore cyclopoids.

Two exotic species were found in several tributaries: *Daphnia parvula* and *Bosmina coregoni*. Some authors considered them invasive in other locations and this justifies an a posteriori in-depth analysis.



U.PORTO

POSTER SESSIONS



- 14264 | Flavonoids are promising modulators of diabetes mellitus through the inhibition of α -glucosidase

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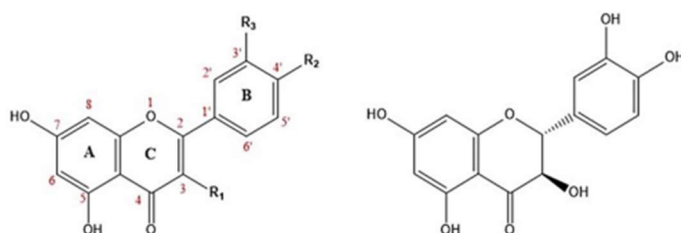
Flavonoids are polyphenolic compounds with promising antidiabetic properties through the regulation of several pathways. One of them is the inhibition of the enzyme α -glucosidase, that is one of the most important enzymes for the breakdown of carbohydrates before monosaccharides absorption. This inhibition allows an efficient control of hyperglycemia, a condition characteristic of type 2 diabetes mellitus.

The aim of this project was to study the inhibitory activity of structurally related flavonoids (figure 1) against α -glucosidase. For this purpose, the α -glucosidase-mediated transformation of the substrate p-nitrophenyl- α -D-glucopyranoside into p-nitrophenol was monitored. The inhibitory kinetic analysis of the most active flavonoids was made by using nonlinear regression Michaelis-Menten enzyme kinetics and the corresponding Lineweaver-Burk.

We concluded that the flavonoid structure, and the position and number of OH groups are determinant factors for the intended effect. The most active compound was quercetin, showing a competitive inhibition. The results allowed us to conclude that the presence of a catechol group in the B ring, the hydroxylation in carbon 3 of C ring and the existence of a double-bond between the carbons 2 and 3 of ring C directly contribute for the inhibitory activity of flavonoids against α -glucosidase.

Acknowledgments

This work received financial support from FCT/MEC and FEDER under the program PT2020 (PT2020 UID/MULTI/04378/2013 - POCI/01/0145/FEDER/007728), the framework of QREN (NORTE-01-0145-FEDER-000024), and Programa Operacional Competitividade e Internacionalização (COMPETE) (PTDC/QEQ-QAN/1742/2014 - POCI-01-0145-FEDER-016530, POCI-01-0145-FEDER-007265).



Galangine – $R_1 = \text{OH}$, $R_2 = \text{H}$, $R_3 = \text{H}$

Taxifolin

Kaempferol – $R_1 = \text{OH}$, $R_2 = \text{OH}$, $R_3 = \text{H}$

Chrysin – $R_1 = \text{H}$, $R_2 = \text{H}$, $R_3 = \text{H}$

Quercetin – $R_1 = \text{OH}$, $R_2 = \text{OH}$, $R_3 = \text{OH}$

Luteolin – $R_1 = \text{H}$, $R_2 = \text{OH}$, $R_3 = \text{OH}$

Apigenin – $R_1 = \text{H}$, $R_2 = \text{OH}$, $R_3 = \text{H}$

Figure 1: Chemical structure of the studied flavonoids

- **14158 | Effects of sex on the static and dynamic balance in artistic gymnastics**

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Artistic gymnastics is a complex sport that covers various motor skills. According to Cohen et al. (2002), the balance must be one of the most worked capabilities in artistic gymnastics because it is necessary to maintain the balance in almost every moment and, in our view, specifically on the balance beam work. Having this capability a preponderant role in the performance of Women's artistic gymnastics (WAG) has raised our interest to find out if the same occurs on men's artistic gymnastics (MAG) since the importance of this capacity is much smaller in comparison with the WAG athletes. So, the aim of our study was to investigate the effect of sex on the balance skill. We studied 21 gymnasts: 11 boys and 10 girls, with an average age of 11.10 ± 0.944 . The tests used were: the Flamingo balance test for the static balance and Star excursion test for the dynamic balance. The study results obtained by the nonparametric test showed that the WAG athletes were those who obtained best results in both tests, although there were only statistically significant results with the preferred limb in the posterior position of the dynamic equilibrium test (MPFem = 88.73 and MPMasc = 77.90) and in the preferred and non-preferred members in the static equilibrium test (MPFem = 9.27 e MPMasc = 16.50, MNPFem = 8.09 and MNPMasc = 18.20). We came to the conclusion that girls have a better performance in the balance tests due to greater practise/preparation for the apparatus that this sport requires.

Cohen, S., Whiting, W. and McLaine, A. (2002). Implementation of Balance Training in a Gymnast's Conditioning Program. *Strength and Conditioning Journal*, [online] 24(2), p.60. Disponível em: https://www.researchgate.net/publication/245764684_Implementation_of_Balance_Training_in_a_Gymnasts_Conditioning_Program [Acedido a 11 Nov. 2017].

Keywords: Dynamic balance, static balance, artistic gymnastics, functional motor assymetry.

- **13893 | Elodea canadensis: an aquatic plant to be discovered**

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The method of data treatment and evaluation of the natural bioactivity is the basis for the improvement of the general healthcare and treatment of pathologies that affect us as individuals. Aquatic plants reflect a great chemical diversity, becoming a study area of enormous interest.

Elodea canadensis (Michx.) is a native aquatic angiosperm of North America that attracted considerable attention from the scientific community due to its invasive nature for new geographic areas, producing different metabolites due to factors like the amount of light, nutrition or depth. It is particularly important as an ornamental plant in aquariums, because it significantly improves the oxygen levels of circulating water.

An ethanolic extract of *E. canadensis* was chemically and biologically analysed. GC-FID was performed, enabling the identification of several fatty acids. HPLC-DAD was also applied, allowing identifying carotenes, xanthophylls, chlorophylls and derivatives. Phenolic compounds were also detected, though none could be identified. Their presence was confirmed by chromatic reactions. The ethanolic extract showed a low concentration-dependent antioxidant activity against DPPH•. For •NO, no antioxidant effect was detected at the tested concentrations. Considering the role natural matrices play in obtaining new drugs, it is interesting to understand how the extract can be used to provide compounds that can reveal important therapeutic effects. Although the antioxidant activity was reduced, further assays should be developed in order to verify the presence of other molecules and activities that could make *E. canadensis* a new source of viable drugs.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 5th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- **14005 | (Homophobic) Bullying among Students of the University of Porto: Factors and Experiences in the Webs of Gender and Sexual Orientation.**

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Homophobic bullying is a phenomenon that has been the subject of growing interest in research, however, studies that focus on this phenomenon in the university context, especially in our country, are still scarce, despite their relevance in a society in which increases and increases access to higher education. Bullying with homophobic content is a phenomenon more studied in schools and lower levels of education, being neglected at the social level in higher education institutions. In this way, with the present study we intend to bring a contribution in this field, as well as a better understanding of this phenomenon and related peculiarities, among a sample of 347 students from the University of Porto, aged between 18 years and 55 years.

The results of this study show that 7.8% of the subjects reported having suffered homophobic bullying in their Institution and 6.6% answered that they suffered bullying in the academic context, so this phenomenon is indeed a reality in the academic context of University of Porto.

The results also showed that most of the subjects in this study reveal a positive attitude index regarding gender roles, showing a positive and sensitive positioning of the students regarding gender issues. In addition, results on the HCAT scale, which allows verifying homophobic verbal content in the role of victim / target and perpetrator / bully, has proved important in understanding the dimension of bullying with verbal homophobic content. It was possible to verify that, according to the perception of the majority of the subjects, they rarely express homophobic content in relation to other students and were rarely the target of homophobic verbal content.

The effects of the variables on these scales were discussed, as well as limitations and possible contributions of this study are pointed out for future investigations.

Keywords: Sexual orientation; Gender stereotypes; Homophobia; Bullying; Homophobic bullying; Gender identity

- 14113 | 2D models for the assessment of acetylcholinesterase inhibitors – lipid membrane interactions

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Alzheimer is a progressive neuro-degenerative disorder that initially comes from the loss of cholinergic activity. Therefore one of the therapeutic strategies is to use acetylcholinesterase (AChE) inhibitors, which leads to acetylcholine increase in the brain and thus a compensation of cholinergic deficits.

The study of two-dimensional lipid monolayers is crucial to understand the interaction between neuronal cell membranes and potential AChE inhibitors in order to fully understand the therapeutic and toxicological mechanism. In this work, the search for the most suitable composition in order to better mimic the neural cell membrane and find optimal conditions for the best enzymatic activity of AChE are the main steps to study AChE inhibitors effects on the enzyme and in the membrane.

For this purpose were used Langmuir monolayers composed of POPC and Cholesterol, because these molecules are the major lipids in neuronal cell membrane. Several biophysical techniques were employed as a way of characterizing the membrane itself: surface pressure-area isotherms to confirm monolayer formation and get information about its compressibility and collapse behavior; Brewster angle microscopy (BAM) to investigate morphological features, including size and shape of domains; and polarization-modulation infrared reflection-absorption spectroscopy (PM-IRRAS) to acquire structural information.

*these two authors contributed equally for this work.

- **14249 | A comparative toxicological study between the effects of synthetic cannabinoids and Δ 9-tetrahydrocannabinol in placental cytotrophoblast cells**
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Placental development involves proliferation, differentiation and apoptosis of trophoblasts, in which the endocannabinoid system (ECS) has a relevant role. Δ 9-tetrahydrocannabinol (THC), a major psychoactive cannabinoid from cannabis has an impact in the turnover of trophoblast. Synthetic cannabinoids (SCs) bind and activate cannabinoid receptors with higher affinity and efficacy than THC. Therefore, consumption of herbal mixtures that contain SCs or of cannabis may alter the balance of the ECS, leading to alterations in the development of the placenta. We aim to investigate the effects of SCs in trophoblasts and compare them with THC by using a BeWo cell line (ATCC, USA), a model of cytotrophoblasts. The cells were treated with JWH-018, UR-144 and JWH-122 and with THC at different concentrations for 24, 48 and 72 h. Cell viability was evaluated using MTT and LDH assays. Production of reactive oxygen/nitrogen species (ROS/RNS) and alterations in the mitochondrial membrane potential ($\Delta\psi_m$) were measured by fluorimetry. Morphological alterations were evaluated by Giemsa and H \ddot{o} echst staining. After 48 h, JWH-018, at 10 μ M, caused a slight decrease in cell viability while UR-144 and JWH-122 led to a significant loss of cell viability. In the case of THC, this decrease was significant at 20 μ M. LDH activity was not detected, suggesting that the effects are not due to necrosis. SCs promoted the release of ROS/RNS and the decrease in $\Delta\psi_m$ was greater for UR-144 and JWH-122. In addition, morphologic alterations were observed. The results suggest that SCs affect trophoblast cells turnover, at lower concentrations when compared to THC, which may be due to apoptosis, cell cycle arrest or alterations in proliferation and impair placental development. Funding: FEDER through COMPETE and FCT through PTDC/DTP-FTO/5651/2014-POCI-01-0145-FEDER-016562; FCT/MEC and FEDER, under PT2020 (UID/01/0145/FERDER/007728) and CCDR-N/NORTE2020/Portugal 2020 (norte-01-0145-FEDER-000024).

- **14004 | A New Saliva NH₃ Sensor for Disease Diagnosis**

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Clinical diagnosis based on blood tests is one of the primary means that health professionals resort to in assessing the particular condition of a patient. However, there are some disadvantages associated to these tests, due to its invasiveness, the requirement of trained staff and the need of expensive equipment.

Saliva is a natural fluid that can be used as a mean to develop new diagnostic tools, based on the presence of specific biomarkers in its constitution which opens the possibility for using this fluid in the detection of some diseases. It was verified that salivary urea has a positive correlation with blood urea, fact that allows its use in the diagnosis of some pathologies, e.g., chronic kidney failure.

The aim of this work is the development of a diagnostic tool for oral and systemic diseases, meant to be easy to use, portable, prone to be automated and implemented in clinical environments. The first step to be addressed is the design of a sensor to detect salivary urea concentrations.

In saliva, the urea hydrolysis process catalyzed by urease enzyme originates ammonium ions (NH₄⁺) which can be presented in the form of volatile molecule ammonia (NH₃), depending on the pH, factor that defines the acid-base balance. The sensor under development to detect NH₃ molecules present in saliva involves the use of a gas diffusion unit (GDU) where gas molecules are separated from the oral fluid by means of a hydrophobic membrane present in the GDU. A carbon nanotubes (CNTs) based sensor included in the GDU is then used to sense the concentration of NH₃ in the released gas. It is expected that the interaction between the gas and the CNTs will cause a change in their electronic properties (e.g. resistance and capacity) that can be measured. This change will allow the quantification of NH₃ levels present in the saliva sample, and consequently help in the diagnostic of a pathological condition.

- 14253 | Adenosine A2A receptors are not involved in long-term growth of cardiac fibroblasts from rats with pulmonary arterial hypertension

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Pulmonary arterial hypertension (PAH) is a devastating cardiopulmonary disease characterized by increase in pulmonary vascular resistance leading to right ventricle (RV) failure. Adenosine (ADO) plays a role in cardiac remodeling via the activation of A2A and A2B receptors, which are most expressed in cardiac fibroblasts (CFs). Our group showed previously that activation of the A2B receptor favors the proliferation and type I collagen production by CFs of rats with PAH, but the role of the A2A receptor is still unknown.

PAH was experimentally induced in male Wistar rats by a single injection of monocrotaline (60 mg/kg, SC; MCT group); control animals received saline (NaCl 0.9%, SC; CTRL group). Cell viability/proliferation (MTT assay) and type I collagen production (Sirius Red assay) were assessed in primary cultures of CFs isolated from the RV of both animal groups.

CFs from MCT-treated rats proliferate more ($p < 0.05$) than those from CTRL animals (MTT assay at day 28: 0.35 ± 0.02 A/well ($n=18$) and 0.28 ± 0.02 A/well ($n=16$), respectively). This trend is less evident regarding type I collagen production ($p > 0.05$). The stable ADO analogue, NECA (10 μ M, applied for 28 days), increased the proliferation and type I collagen production by CFs. The pro-fibrotic effect of NECA (10 μ M) was more evident in MCT-treated than in CTRL rats (MTT values: $34.08 \pm 5.55\%$, $n=13$, and $57.19 \pm 6.81\%$, $n=14$, in CTRL and MCT rats, respectively; $p < 0.05$). While the proliferative action of NECA (10 μ M) was attenuated ($p < 0.05$) by the A2B receptor antagonist, PSB 603 (100 nM), blockade of the A2A receptor with SCH442416 (100 nM) was devoid of effect. Moreover, the A2A receptor agonist, CGS 21680 (3-10 nM, applied for 28 days), also failed to modify CFs proliferation and type I collagen production in both animal groups. Data suggest that ADO exerts a long-term pro-fibrotic effect on CFs of the RV of rats with PAH via the activation of A2B, but not A2A, receptors.

- **14255 | Agreement between BMI ratings in the elderly**

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Abstract: In clinical practice, it is common to use the Body Mass Index (BMI) classification proposed by the World Health Organization (WHO). However, in the elderly population, there is no consensus, as to the cutoff point for BMI that is most adequate for assessing their nutritional status.

Objective: Compare the WHO classification with the classification of Lipchitz and Hajjar *et al.*

Methods: A cross-sectional study, conducted between January and July 2017, which included 112 hospitalized elderly individuals, above 65 years. From this sample, were excluded bedridden elderly and those who have pathologies that may interfere in the determination of weight. For BMI analysis, weight and height data were collected, whom were analyzed using descriptive statistics and the chi-square test. The value of p less than 0.05 was adopted as level of statistical significance.

Results: The average age of the samples was 77 ± 7.3 (36% males and 64% females). According to the WHO scale, only four elders (3,6%) were considered underweight, 40 of them (35,7%) were classified as eutrophic and 68 (60.7%) were classified as being overweight/obesity. The cut-off points set by Lipschitz determined that 19 elderly people (17.0%) were underweight, 45 (40.2%) were eutrophic and 48 (42.9%) were overweight. On the other hand, the cut-off points of Hajjar and coworkers demonstrate 37 elderly (33.0%) with low weight, 44 (39.3%) normoponderias and 31 (27.7%) with overweight / obesity. Both classifications differed significantly ($p < 0.001$) from the WHO classification.

Conclusion: The present study showed the variation in the results of the different cutoff points of the BMI compared to the WHO scale. The classification of Hajjar *et al* was the one that included a greater number of elderly with low weight. When concerning to elderly people, other limits should be considered because malnourished patients may be mistakenly considered well nourished.

- 14166 | Amidinopurines as a promising scaffold for sleeping sickness drug development

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HAT is a parasitic disease caused by the protozoan *Trypanosoma brucei* (*T. brucei*) that appears in two stages: a haemolympathic stage 1, and a stage 2 characterized by the penetration of the parasites through the blood-brain barrier (BBB) and usually fatal if left untreated. The current chemotherapy against HAT is unsatisfactory due to the emergence of resistances, toxicity, complex treatment regimens and/or limited efficacy. Thus, there is an urgent need for new effective and safe drugs. A new series of 69 compounds, derived from an amidinopurine scaffold, originally tested for tuberculosis, were evaluated for their in vitro activity against bloodstream forms of *T. brucei* and toxicity against THP1 cells. Overall the series presented promising antiparasitic activity with sub-micromolar potency. The most promising compound, MA2, with 9 ± 2 nM EC50 and a selectivity index of $>100x$ is a promising hit that deems further evaluation.

- **14233 | An alternative, solidary and conscious way of commerce and consume: a case study on a consumer cooperative**

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Parente, Cristina, Faculdade de Letras, Portugal

The present communication is based on the research currently developed in the 2nd year of the Master's Degree in Sociology at the Faculty of Arts of the University of Porto. The main axis of analysis is Social Economy - one of the most recently valued topics of global, European, national academies and political spectrum of the contemporary era.

We address a case study about the successful and highly awarded Fruta Feia, a consumer co-operative founded in 2013 which aims to reduce food waste (fruit and vegetables) due to its appearance through the promotion of conscious consumption and the improvement of farmers' socioeconomic conditions, providing a fair value for the goods.

Our intention is to develop a broad understanding of the following key goals and concerns: (1) the alternative market's self-managed organization model; (2) the producers' motivations to join the co-operative and the respective worldviews and social representations about the initiative (peasant rationality), taking into account that the current free market penalizes them; (3) and the recent consumers' trends around responsible consumption, trying to understand the motivations and if sociodemographics and social class play a major role in these choices of consumption (consumer rationality).

Methodologically, we rely on a mixed method procedure, named convergent parallel mixed methods design by Creswell (2014). After (1) mobilizing initial exploratory techniques (direct observation and documentary analysis), (2) we will proceed to the qualitative and inductive phase, applying semi-directive interviews to a socially diverse sample of farmers to capture singularities and detailed descriptions, (3) closing the methodology chapter with the application of a survey to a representative sample of cooperative consumers in order to collect, quantify and deductively analyse the main regularities.

By February the investigation's results will be preliminary only.

- **14248 | Analysis of Publications of FEP and their Affinities**

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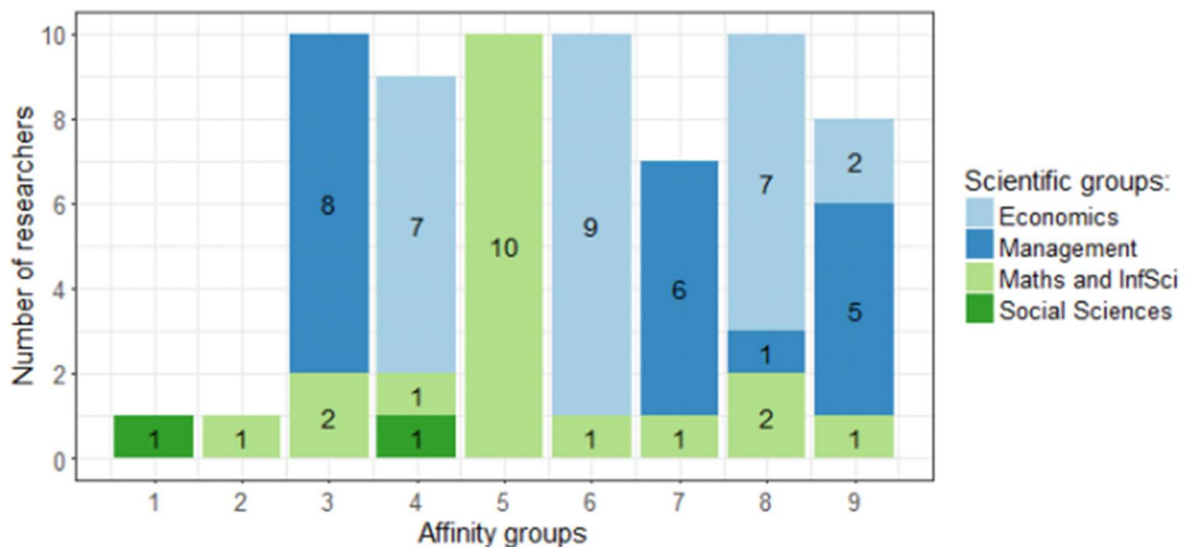
Trigo, Luís, INESC TEC, Portugal

Sarmiento, Rui, INESC TEC, Portugal

Networks are used to represent agents and their interactions. As an investigation centre, the School of Economics and Management of the University of Porto (FEP) can benefit from being represented as a network. Using a modified version of Affinity Miner (Trigo, 2015), we can create a network where each node is a researcher, and they are connected by the level of similarity of the titles of their publications. Affinity groups can be discovered in this network, giving us insight into its structure.

Given the original network high density of links, we simplify it by removing the weakest links. Using a measure called modularity with component penalty, we determine an adequate value for the minimum weight of a link, and show that the tested community detection algorithm that performs better for this network is Louvain's method.

We analyse the simplified network, in particular the scientific groups defined by the Faculty. We discover that the most central researchers belong to the scientific group of Economics. We then apply Louvain's method to the network and obtain 9 affinity groups, most of which have very balanced sizes with 7 to 10 researchers in each. By doing a cross-analysis between the scientific and affinity groups, we verify that the affinity groups were composed mainly of researchers from the same scientific group. We also present the graphs obtained for each affinity group, their members and the keywords that describe them, as generated by Affinity Miner. Based on our opinion, the structure discovered is pertinent and provides interesting insights into the Faculty's organisation.



Cross-analysis of scientific and affinity groups

- **13920 | Aneuploidy promotes intestinal dysplasia in *Drosophila***

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Although aneuploidy is a hallmark of cancer and it is associated with other human pathologies, how different cell types within tissues respond differently to chromosome alterations is not fully understood. Aneuploidy has been shown to have a detrimental cellular effect and lead to cell death in some contexts, but it can also behave as a causal event of tumorigenesis under certain circumstances. Contrasting with other proliferative non-stem cells, adult stem cells have been proposed to tolerate aneuploidy and not activate apoptosis in response to genomic instability. This resistance to aneuploidy underscores a need to understand how tolerated aneuploidy impacts adult stem cell behavior and tissue homeostasis. Here, we show that *Drosophila* intestinal stem cells (ISCs) are competent for the Spindle-Assembly Checkpoint (SAC), a surveillance mechanism that ensures faithful chromosome segregation during mitosis. However, while we find that prolonged SAC impairment results in induction of aneuploidy in intestinal progenitor cells, this does not have a detrimental effect on ISCs. Instead, loss of SAC signaling induces tissue dysplasia characterized by an accumulation of progenitor cells, increased stem cell proliferation rate, and an excess of cells of the enteroendocrine lineage. Importantly, these phenotypes are recapitulated when aneuploidy is induced via defects on kinetochore structure or centrosome amplification suggesting they portrait a broad effect of aneuploidy on ISCs. Our findings highlight a distinct tolerance of adult stem cells to aneuploidy and provide an in vivo model of how these cells can act as reservoirs for genomic alterations that can lead to dysplasia.

- **14080 | Anticancer Metal-Polyamine Complexes Against Breast Cancer**

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Breast cancer is the most frequent cancer among women and the 5th most common malignant neoplasia worldwide. Platinum compounds are well-known chemotherapy agents, used alone or in combination, for the different breast cancer treatment regimes. Despite their clinical success, severe toxicity and acquired drug resistance are complications that limit their use and explain the need for more efficient and tumour-selective metal-based drugs. This study aimed at determining the cellular drug uptake and cytotoxicity of metal-polyamine complex, Pt2Spermine, in two human breast cell lines (human metastatic breast cancer cell line MDA-MB-231 and non-cancer human breast epithelial cells MCF-12A). For the drug uptake studies, cells were exposed to the drugs at 0-8uM for 24h, or at IC50, for 3-48h. After incubation period, intracellular drug concentrations were quantified using Inductively Coupled Plasma Mass Spectrometry (ICP-MS). Effects on cell proliferation were evaluated using the standard Sulforhodamine B colorimetric assay by exposing cells to 0-64uM drugs for 48h. Linear relationships were found for intracellular drug concentrations, in 24h drug uptake studies. Intracellular drug accumulation ratios in cancer vs healthy cells were found to be similar for cisplatin (0.59%, 0.64%) and Pt2Spm (0.53%, 0.69%). Pt2Spm showed comparable accumulation profile as cisplatin, however, without effects on proliferation of healthy cells. Our data evidenced a clear selectivity of Pt2Spm towards breast cancer cell line with nontoxic effects on healthy cells, revealing Pt2Spm as a promising therapeutic agent against triple negative breast cancer.

The authors acknowledge financial support from the Portuguese Foundation for Science and Technology: PTDC/QEQ-MED/1890/2014, within Project 3599 - to Promote Scientific Production and Technological Development as well as the formation of thematic networks (3599-PPCDT) - jointly financed by the European Community Fund FEDER.

- 14206 | Antimicrobial activity of the essential oil of *Leptospermum scoparium* (manuka)

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Microbial infections due to fungi and bacteria represent an important public health problem. The high global prevalence and incidence of these infections may be attributed to an increasing use of broad-spectrum antibiotics, cytotoxic drugs, corticosteroids and to a growing number of immunosuppressed individuals. The rising of microbial resistance is also a major contributor. Thus, the search for new antimicrobial therapies is essential. Manuka oil, tested in the present study, has been traditionally used as an antiseptic, antifungal and antibacterial by Maori people for centuries (1).

The aim of this study was to evaluate the antimicrobial activity of manuka oil against clinically relevant bacteria (*Staphylococcus aureus* and *Escherichia coli*) and fungi (*Candida albicans*, *Aspergillus fumigatus*, and *Trichophyton rubrum*) species, according to the CLSI reference protocols. To evaluate the activity of manuka oil in antimicrobial resistant strains, a *S. aureus* MRSA and a fluconazole resistant *C. albicans* (D5) were included.

Antimicrobial activity was observed for all the microorganisms, except for *A. fumigatus* (filamentous fungi) and *E. coli* (gram negative bacteria). Concerning antifungal activity, *T. rubrum* (filamentous fungi-dermatophyte) showed higher susceptibility in comparison with *C. albicans* (yeast). On the other hand, *S. aureus* (gram positive bacteria) revealed being the most susceptible microorganism. Manuka oil exhibited fungicidal activity against *T. rubrum* and a bacteriostatic activity against *S. aureus*. Furthermore, the activity was higher on resistant strains (MRSA and D5) when compared with the ATCC susceptible strains.

(1) Chen CC et al. (2016). J Microbiol Immunol Infect 49:104-111.

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- **13960 | Antioxidant activity of different plant infusions: a comparative study**
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Plants have always been used for medicinal purposes, namely in the form of infusions, due to their antioxidant, anti-inflammatory and anti-microbial properties. [1],[2] These effects may vary depending on the part of the plant used, the species and the geographical origin.[2] Recently, we are assisting to an increase of chronic diseases associated to lifestyle and constant stress of society. Oxidative stress resulting from the production and accumulation of reactive oxygen species plays an important role in the development of such diseases [1],[2] and the number of studies about herbal and plant products have been increasing in order to evaluate their contribution to human health maintenance.

In this study, the antioxidant activity (DPPH• inhibition and Ferric Reducing Antioxidant Power) of infusions prepared with six different plants (rosemary, lemon balm, lemon verbena, olive leaves, cherry stem, and fennel), in a total of 24 commercial products (4 different brands of each plant), was analysed and compared. Total phenolic and total flavonoid contents were also estimated. Infusions were prepared in triplicate.

The lemon balm infusions presented the highest values for all assays, followed by the lemon verbena infusions, indicating the greater antioxidant ability of these samples and a higher content in total phenolic and flavonoid compounds. The olive leaves infusions showed the lowest antioxidant power. This could be explained by the eventual presence of more lipophilic antioxidant compounds (less soluble in water), but also by the size and dense texture of the leaves that could impair the compounds extraction.

References

[1] Gonçalves et al. (2013) *Ind. Crops Prod.* 43, 465-471.

[2] Farzaneh, V., Carvalho, I. (2015), *Ind. Crops Prod.*, 65, 247-258.

Acknowledgements:

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- **14155 | Antioxidant properties of synthetic cannabinoids in endometrial stromal cells**

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The main psychoactive compound of *Cannabis sativa* is Δ^9 -tetrahydrocannabinol (THC) that exerts its effects through cannabinoid receptor type 1 (CB1) and type 2 (CB2), causing behavioral and physiological alterations. It is known that synthetic cannabinoids (SCs) such as JWH-018, JWH-122, THJ-2201 UR-144, AB-Fubinaca and 5F-PB-22 can function as full agonists of CB1 and / or CB2, and exert more potent effects, as compared to THC. Because SCs are easily available and legal in many countries their use as recreational drugs has been increasing.

We previously observed that SCs induced an increase in MTT metabolism without affecting mitochondrial number. Thus, we assessed whether SCs at different concentrations (0.01 – 25 μ M) for 48 h, affect primary human decidual fibroblasts (HdF) and the endometrial stromal cell line (St-T1b) redox status, through detection of reactive oxygen species (ROS) using the probe 2',7'-dichlorodihydrofluorescein diacetate (DCFH-DA), and detection of total (GSx), oxidized (GSSG) and reduced glutathione (GSH) using the glutathione reductase and 2-vinylpyridine. Relatively to HdF, we observed that JWH-018 and JWH-122 induced a decrease in ROS/RNS generation and an increase in GSH. In the cell line St-T1b, JWH-018 was the only SC that induced a decrease in ROS/RNS generation. Moreover, JWH-018, JWH-122, THJ-2201, UR-144 and AB-Fubinaca induced an increase in GSH leading to an increase in ratio of GSH over GSSG.

Our data suggests that some of the SCs in study improve the antioxidant status of the endometrial cells. Whether these results reflect a positive effect (better defenses against oxidative stress) or a negative outcome (interference with cellular redox signaling) remains to be further appraised. Authors are grateful for financial support under the PORTUGAL 2020 Partnership Agreement - UID/MULTI/04378/2013-POCI/01/0145/FEDER/007728 from FCT/MEC through national funds and the Partnership Agreement PT2020 - NORTE-01-0145-FEDER-000024.

- **14236 | Application of infrared thermography to assess surface temperatures of city park lakes and evaluate their potential effect on the surrounding environment**
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In an urban context the existence of water bodies, such lakes, play an essential role in terms of ecosystemic advantages. Not only they act as leisure areas in parks but they are a sink for biodiversity. Lakes may be considered blue-green infrastructures as an integrated component of a strategical planned network in urban areas to promote ecosystem services and support climatic challenges working with nature. The rising of air temperatures in cities framed as the heat island effect is a phenomena that has being registered and gaining awareness.

The aim of the present study was to conduct a survey of the hygrothermal conditions of four lakes from a city park, focusing on the differences between them and with the surrounding area, including presence or absence of plants. This assessment comprised a qualitative and quantitative analysis.

Infrared thermography (IRT) was applied in the evaluation of the lakes effect in surface temperature. This method allows for a surface temperature spatial distribution detailed observation, being non-destructive and no object contact needed. Based on that observation, differences on the surrounding area and impact on microclimate and human comfort can be evaluated. This innovative application of IRT is challenging due to the surface cover by vegetation. The results obtained in the IRT analysis allowed to observe that the temperature of the lakes and surrounding vegetation is generally lower than the temperature of stones in the space surrounding the water bodies evidencing the importance of their presence in the urban environment. These results are relevant in terms of supporting a strategy for the inclusion of water masses, such lakes, in urban context, in order to influence the surrounding surface temperature and to some extent attenuate the heat island effect. Further studies will allow to infer about the potential influence in air temperature and heat island effect mitigation.

- **14301 | Aptamer functionalized DNA nanostructures for the development of potential neurotropic devices**

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DNA nanotechnology is a promising tool for the engineering of DNA-based nanostructures (DNA-NS) acting as smart nanoparticles for drug delivery. In this work we have explored the potential of a DNA-nanostructure to directly target and interact with neuronal cells through the functionalization with RNA aptamers and neuro-targeting peptides. In addition, the RNA aptamers used had the potential to activate neurotrophin receptors thereby immediately conferring biological relevant functionality to our DNA-NS device. The biological functionality was evaluated in terms of targeting capability and neurotrophin receptor stimulation. Cell internalization was evaluated in neuronal primary cortical cells, revealing an enhanced cell uptake of the functionalized DNA-NS in comparison with not-functionalized ones. Preliminary evaluation results of neurotrophin receptor activation suggested a tendency of aptamer-functionalized DNA-NS to present a similar activity than the free-aptamers. In summary, the successful outcomes demonstrate the potential of DNA-based nanostructures as neuronal targeted carriers. Multifunctionalization of the DNA nanostructures with other types of therapeutic nucleic acids are possible future strategies to achieve neuronal protection in pathological or traumatic brain conditions such as stroke.

- **14230 | Architecture and Virtual Reality – Inhabiting the FAUP building**

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The present communication summarizes the research on "Architecture and Virtual Reality", developed as a Master in Architecture dissertation at FAUP under the supervision of Prof. José Pedro Sousa, which had the support of the "New Realities" innovation pedagogic project promoted by the UP, and the DFL research group of CEAU/FAUP.

This work is structured in four main parts. The first one, sets the historical background in architecture that helps to frame the current interest and integration of Virtual Reality (VR) technologies in practice. The second, investigates the state-of-the-art of such technologies, highlighting its increasing democratization and diverse range of applications in many areas. The third part proposes reading the architectural interest in VR in four different domains: conception, visualization, simulation and object (i.e. final product). Finally, the fourth part presents a personal experiment of VR application in architecture.

After describing the framework of the theoretical background of the thesis (chapters 1, 2 and 3), the communication will present in detail the latter experiment. This project aimed to build a VR model of the FAUP building in order to provide an alternative mode for visiting it or, in other words, to inhabit it without having to be physically in the site. The work thus unfolded through a digital process of 3D modeling and VR characterization, which evolved in detail overtime.

A VR model was presented to the public in two main events. The public opening of Casa da Arquitectura in Matosinhos, where 70 children had the opportunity to try it. And CONCRETA (i.e. construction fair of Porto), which targeted adults and professionals in the architecture and construction field. Both experiences served to test the impressions and reactions of different users to this alternative immersive way of architectural representation. It contributed to think about the opportunities it can bring to architectural design practice and education.



Photo montage of the FAUP VR visit

- **14164 | Assessed the biodiversity associated to Sabellaria alveolata**

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Sabellaria alveolata (Linnaeus, 1767) is an annelid polychaete that builds sand reefs in the Atlantic Ocean, Mediterranean and North Sea. The complex structure built by this species, facilitates the survival of countless other marine species due to the physical structure and conditions, contributing to the increase of site-specific diversity. The main objective of this study is to evaluate the biodiversity of marine macroalgae and invertebrates associated to *S. alveolata* reef colonies in the Castelo do Queijo (Porto) rocky shore.

The study area is a rocky beach located along the north coast of Portugal (Castelo do Queijo Beach, Porto). Samples were collected in two different seasons (September 2017 - summer and November 2017 - autumn). In the field, 3 replicates were randomly collected with an approximate volume of 25cm³ enabling a statistically relevant study to examine seasonal variability. The invertebrates and macroalgae were screened and stored in 70% ethyl alcohol solution, they were not printed and were kept out of a freezer for later identification. The collected species were taxonomically identified to the lowest possible level.

Preliminary results show a strong dominance of *Porcellana plathycheles* and *Hyale nilsoni* (Arthropoda), *Mytilus edulis* (Mollusca) and *Pomatoceros lamarckii* (Annelid) associated to the *S. alveolata* colonies in summer and autumn. Additionally, the dominant macroalgae associated within *S. alveolata* colonies in Castelo do Queijo beach are *Ulva* spp. (Chlorophyta), *Lomentaria articulata* and *Osmundea pinnatifida* (Rhodophyta).

- **14035 | Assessing the environmental impacts of fish species consumed in Portugal: a Life Cycle Assessment study**

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The Portuguese population is one of the biggest fish and seafood consumers¹. In this context, it was applied the Life Cycle Assessment Methodology to analyze the potential impacts associated to the main species consumed in Portugal, in 2012.

The most consumed fish species in Portugal are cod, hake, sardines, horse mackerel, chub mackerel and salmon.

In this study, it was examined the impacts from cradle to gate, that included the capture, aquaculture (focusing on salmon), transport and processing. The functional unit considered was one kilogram of edible fish delivered at the wholesaler in Portugal in 2012. For the impact assessment the selected categories were Abiotic Depletion Potential (ADP), Acidification Potential (AP), Eutrophication Potential (EP), Global Warming Potential (GWP), Ozone Layer Depletion Potential (ODP), Human Toxicity Potential (HTP), Freshwater Aquatic Eco-Toxicity Potential (FAETP), Marine Aquatic Eco-Toxicity Potential (MAETP), Terrestrial Eco-Toxicity Potential (TETP) and Photochemical Oxidant Formation Potential (POFP).

Considering the global results, the diesel production and combustion in the fishing vessels are the main operational inputs in the most part of the impacts categories analyzed. However, the use of cooling agents during fishing is also an important input.

Cod and hake contribute the most for the impact of all categories except for FAETP and TETP. In the case of small pelagic, since they have a high efficiency on the fleet and there is no need of cooling agents in this fishery, the impact is lower when compared with the other analyzed fish. Despite of salmon being one of the least consumed fish in this study, is practically the only responsible for the impacts in FAETP and TETP, due to the use of pesticides and other chemicals in the feed production.

- **14207 | Assessing the potential of near infrared spectroscopy to discriminate *Camellia japonica* cultivars**

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Camellia japonica cultivars are very difficult to discriminate due to their small phenotypic characteristics variation among species members. Also, their genotypic characteristics are very similar making difficult its discrimination. This work aims to explore the ability of near infrared spectroscopy to discriminate among 12 distinct cultivars of *C. japonica*. Adult leaves of 31 distinct plants belonging to 12 cultivars ('albino botti'; 'alba plena'; 'augusto leal gouveia pinto'; 'bella milanese'; 'bella portuense'; 'camurça'; 'conde do bomfim'; 'duchesse de nassau'; 'etoile polaire'; 'mathotiana'; 'maria irene' and 'roi des belges') were included in this work. Near infrared spectra of the leaves were acquired immediately after harvesting and after a drying period of 6 weeks. Spectra were modelled by partial least squares discriminant analysis (PLSDA). The total of correct predictions obtained through the PLSDA model were above 70% being the best results achieved with the air dried leaves. Despite the benefit of including more cultivars and/or robust the included ones with additional samples from distinct plants, the results obtained in this work clearly shown the ability of this infrared based technique to discriminate *C. japonica* cultivars.

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- **14104 | Assessing the potential of near infrared spectroscopy to discriminate *Vaccinium corymbosum* cultivars**

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Vaccinium corymbosum, from the Ericaceae family, is the source of the most commonly commercialized blueberries varieties in Portugal. This work aims to explore the ability of near infrared spectroscopy to discriminate among 8 distinct cultivars of *V. corymbosum*. Adult leaves of 16 distinct plants belonging to 8 cultivars ('legacy'; 'ochlochone'; 'drapler'; 'bluecrop'; 'duke'; 'powderblue'; 'chandler' and 'camelia') were included in this work. Near infrared spectra of the leaves were acquired immediately after harvesting and after a drying period of 6 weeks. Spectra were modelled by partial least squares discriminant analysis (PLSDA). The total of correct predictions obtained through the PLSDA model were above 80% being the best results achieved with the air dried leaves. Despite the benefit of including more cultivars and/or robust the included ones with additional samples from distinct plants, the results obtained in this work clearly shown the ability of this infrared based technique to discriminate *V. corymbosum* cultivars.

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- **14021 | Assessment of the enzymatic activity of vineyard soils**

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The vineyard landscapes of Douro Demarcated Region represent a strong cultural legacy, that must be protected. Thus, it is essential to assure its sustainability in terms of soil functioning, since a decline in soil quality has a marked impact on vine growth, and grape quality. The loss of soil's biodiversity is of special concern since microorganisms are involved in several functions and services such as soil organic matter mineralization processes and nutrients recycling. Thus, it is of utmost importance to understand the effects of different agricultural practices on soil microbial functions.

Organic farming is seen as a sustainable alternative to conventional farming, mostly due to restrictions on the use of pesticides. It is expected to have positive impacts on soil quality at long-term. However, some studies could not prove that there are benefits of organic farming on global soil quality of vineyards. The purpose of this project is to evaluate changes in the enzymatic activity of important geochemical cycles, in vineyard soils under different management practices. This study took place in three vineyards located in the Douro Demarcated Region: two under integrated farming, and another one under organic farming management. About sixteen samples were collected in each vineyard, before the beginning of pesticides application (January). The enzymatic activity of dehydrogenase, arylsulfatase, cellulase, and fosfatase was measured. Some differences were noted between the study areas for the different enzymes studied. However, based on the results obtained until this moment, the benefits of organic farming regarding the indicators measured are not yet unequivocal.

- **14010 | Assessment of the total phenolic content through near infrared spectroscopy in roasted almonds**

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Phenolics are an important class of chemical compounds with known antioxidant capacity. Almonds are also recognized as possessing several health benefits due to their high content in vitamin E, healthy fats, protein and fiber. In this context, this work aims to explore the ability of near infrared spectroscopy to assess the total phenolic content of almonds during the roasting process. Almonds were roasted and a total of 7 samples were taken during the process. The total phenolic content was determined by the Folin-Ciocalteu assay. Near infrared spectra were modelled through a partial least squares (PLS) after proper pre-processing. The regression coefficients, together with the root mean square errors, obtained allowed to propose these infrared based technique as a suitable tool for such quantification.

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- **13998 | Banks' investment and financing policies towards firms from controversial sectors – Evidence from sustainability reports**

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The pressures to consider the social and environmental impact of business operations have been growing steadily over the past decades. Engaging in socially responsible activities and communicating it to stakeholders has emerged as an important dimension of corporate voluntary practice. The European Commission (EC, 2011) has defined corporate social responsibility (CSR) as firms' responsibility for their impacts on society, and considers its communication as an important cross-cutting issue in CSR.

In the case of banks, one can distinguish internal and external CSR related issues: internal issues are related to the business processes within banks whereas external issues are connected to its products. The former include issues pertaining to banks' environmental impacts, labour and employment practices, and the fight against corruption. In spite of the importance of these internal issues, the main link between the banking sector and sustainable development is indirect, through lending or investing (Weber et al., 2014). Examples of socially responsible products are socially responsible investing, financial products aimed at reducing energy use and greenhouse gases, and microcredit (Weber, 2009).

This paper focuses on banks' policies towards the investment on or financing of entities that deal with environmentally or socially sensitive transactions (gambling, tobacco, alcohol, arms, etc.). Although some studies have explored CSR and the reporting thereof in firms from controversial sectors (Cai, 2012; Kilian and Hennigs, 2014; Gregoriou et al., 2016), as far as the authors are no study has explored the issue of banks' investment and financing policies towards such sectors.

This paper examines to what extent and how current sustainability reporting of banks incorporates issues pertaining to the investment on and financing of firms from controversial sectors. In addition, it seeks to capture the influence of national culture and firm specific characteristics.



Global Report Initiative

- **14062 | Base studies for the Arborization Plan of Espinho**

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With the increase of the urban population and the development of the urban areas, there is an increasing need to plan cities that are designed for the future. For this, it is necessary to recognize the importance that each infrastructure has for the urban environment and how to make them coexist in harmony. When it comes to planning the Urban Green Infrastructure, it is necessary to recognize its components and, in like manner, the Urban Forest planning is fundamental for the Urban Green Infrastructure planning.

However, it is unclear how the Urban Forest planning should proceed. In Portugal, the first Arborization Plans begin to appear and several municipalities are beginning to realize the importance of the elaboration of a plan that regulates their urban trees effectively and into the future. Given the great need to plan the urban trees, the present work aims to develop the guidelines necessary for the elaboration of an Arborization Plan, exemplified by the application of the methodology proposed to the case study of Espinho.

The methodology proposed relies on three major questions: What do we have?, What do we want? and How do we get what we want?. This way it's possible to support a cyclical and dynamic process that can withstand the continuing change of the urban life and the life cycles of the trees. The principal objectives in this work were the mapping and inventory of all the street trees and the analysis of the city and factors that can influence the implementation and success of the urban forest. It was possible to indicate that of the 2352 trees, 76% are not suitable for the site because of the current condition of the individuals, the chosen species and the conditions of the public space.

Planning the Urban Forest isn't just about the trees, it's about planning the city to support and embrace all the infrastructures needed for a healthy and sustainable city.

- **14089 | Beneficial effects of salicylic acid on glyphosate-induced oxidative stress in barley plants**

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Nowadays agriculture is dependent on the use of chemicals to control weeds. Although glyphosate (Gly) is currently the most widely used herbicide, recent studies have been raising concerns about its safety in terms of toxicity to non-target organisms, including crops. Thus, there is a need to find new strategies that enhance plant tolerance to Gly, allowing a more advantageous, yet not safer, use of this herbicide without loss of productivity. Salicylic acid (SA) is a hormone-like substance, able to enhance the efficiency of the antioxidant (AOX) system in plants and their tolerance to oxidative stress (OS). Thereby, this study aimed to evaluate the effects of SA on the oxidative damage induced by Gly in *Hordeum vulgare* L. (barley). For this purpose, plants were grown under Gly contamination (30 mg/kg) and watered with 0.5x Hoagland solution supplemented or not with 100 μ M SA. A control situation was carried out where plants grew without glyphosate or SA. After 14 days of growth, fresh weight and root length were measured, followed by some biochemical assays. Biomass production and biometric parameters greatly decreased in response to Gly, but this inhibition was slightly attenuated by SA. Data revealed the occurrence of OS in plants exposed to Gly, which was partially mitigated by the application of SA. Results showed that Gly differentially affected the production of ROS, with increases in H₂O₂ and O₂⁻ levels in leaves and roots, respectively; lipid peroxidation (LP) was higher in plants exposed to Gly in both organs, accompanied by a decrease in thiols content in leaves and an increase in roots. In general, the exogenous application of SA had a role in preventing OS, lowering the levels of LP and H₂O₂ and enhancing the redox homeostasis, although not always statistically meaningful. Overall, results suggest that SA tends to mitigate Gly phytotoxicity, though further research is required to adequately unravel SA mode-of-action and its effects on the AOX system.

- 13921 | Bioactivity and chemical characterization of *Combretum micranthum* G. Don

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The use of plants is probably one of the oldest methods employed by man in order to prevent, cure and treat diseases. The rise of the pharmaceutical industry had a great impact on prevention and treatment of disease, decreasing the enthusiasm on the use of plant extracts for the discovery of new pharmaceutical leads. However, most researchers believe that plants and other natural products contain a huge variety of bioactive compounds, being sources of high molecular diversity. The challenge today passes by the discovery of plants with promising activity and isolation of the active principles. The present work aimed the study of the chemical composition and antioxidant activity of an ethanolic extract of the species *Combretum micranthum* (Combretaceae), native from Republic of Guinea-Bissau.

The analysis by HPLC-DAD allowed detecting carotenoids and chlorophylls derivatives. Seven fatty acids were determined following GC-FID analysis, *trans*-9-octadecenoic acid (elaidic acid) being the main one in the studied extract.

Concerning to the antioxidant capacity, a strong scavenging ability was observed against DPPH radical (higher than 90% at 85,43 mg/mL), but the same was not found against NO (24,8% at 32,04 mg/mL, the highest concentration that was possible to test).

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 5th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- 14231 | Biological effects of endo- and phytocannabinoids on ER+ breast cancer cells

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Breast cancer is the most common cause of cancer death worldwide, with the oestrogen receptor positive (ER+) form making up around 75% of all cases. These cancer cells overexpress the oestrogen receptor, to which oestrogens bind in order to increase cell proliferation. Aromatase inhibitors are the current first-line treatment for this type of cancer in postmenopausal women (1), though resistance can arise, highlighting the need for new therapies. The anticancer properties of cannabinoids have already been reported in various cancer cell models. Endocannabinoids, such as anandamide (AEA), and phytocannabinoids, like cannabidiol (CBD) and Δ^9 -tetrahydrocannabinol (THC) derived from the Cannabis plant, bind to specific receptors, such as CB1 and CB2, that are often upregulated in cancer cells, making them an attractive anticancer target (2). This project aims to evaluate the antitumoural properties of AEA, CBD and THC in MCF-7aro cells, an ER+ breast cancer cell line that overexpresses the enzyme aromatase. Thus far, we have collected results for cannabinoid receptor expression (Western-blot), in-cell aromatase inhibition (radiometric assay), cell viability (MTT/LDH assays) and changes in cell morphology (Giemsa/Hoechst staining). Results demonstrate that CB1 and CB2 receptors are expressed in MCF-7aro cells. All three cannabinoids inhibit aromatase by at least 50% and decrease cell viability in a dose or time dependent manner, without LDH release. Moreover, all cannabinoids reduced cell density and caused chromatin condensation/fragmentation. The results show that cannabinoids have a strong potential for use as a therapy for this type of cancer, though further studies are required.

Acknowledgements: Amaral C (SFRH/BPD/98304/2013) Augusto T (BD/128333/2017) grants; Shiuhan Chen (Beckman Research Institute, USA) for MCF-7aro cells.

References

(1) Sobral AF et al. J Steroid Biochem Mol Biol. 2016;163:1-11

(2) Fonseca BM et al. Rev Physiol Biochem Pharmacol. 2017;173:63-88

- **14112 | Can microplastics increase the uptake of agrochemicals by the soil biota and have bigger adverse effects?**

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Microplastics (MP) are a serious environmental issue on aquatic ecosystems (oceans, rivers and lakes) due to the widely reported adverse effects on organisms. More than 700 papers are focused on MP research on marine and sediment ecosystems (beaches, etc.). Although the main source of plastic waste in marine environments are terrestrial ecosystems, the characterization of soils is still recent, and the impact of MPs on the physical, chemical, biological soil properties is poorly studied. MP are accumulating in agricultural soils because of the increased use of plastic on agriculture or soil amendment with wastewater sludge, which can contain MP, like fibers from clothes or microbeads from personal care products.

MPs can enter the soil systems through three pathways: i) inputs from agricultural practices; ii) by water and winter erosion/deposition of plastics from other sources and iii) from environmental weathering of large plastic debris and macroplastics.

Several questions can arise from this theme and our study focus on assessing the combined effect of MPs and adsorbed pesticides. In order to evaluate the effects of microplastics in soil-dwelling organisms, the earthworm *Eisenia fetida* was the chosen test organism. Earthworms were selected for this study due to their importance in maintaining soil structure and permeability, as well as their role in degrading organic matter. As a preliminary assessment, *E. fetida* were exposed to a reference soil contaminated with different pesticide concentrations (chlorpyrifos) for a period of 14 days in which they were not fed.

Later on, a new trial will be held in which some of the previously used concentrations will be chosen to once again contaminate 5mm MPs which will then be added to the soil. In both cases, acetylcholinesterase (AChE) activity and protein quantity will be measured as a way to infer if the pesticide will desorb from MPs causing adverse effects on earthworms.

- **14246 | Cannabis Delta9-tetrahydrocannabinol (THC) impact in leptin production by placental cells**

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Cannabis is the most common drug of abuse used by pregnant women. Delta9-tetrahydrocannabinol (THC) is the active compound of cannabis and due to its lipophilicity, THC can cross the placenta and lead to the well described pregnancy complications such as low fetal weight, intrauterine growth restriction and preterm labor. The biochemical mechanisms underlying these clinical evidences are unknown. In addition, THC may affect the endocrine function of placenta, so the aim of this work was to study the impact of THC in leptin production, a hormone known to play an important role in pregnancy as evidenced by placental leptin synthesis and an increase in plasma levels during gestation. We used term placenta explants and the BeWo cell line, a representative model for cytotrophoblast that were subjected to different concentrations of THC (1, 10, 20 and 40 μ M) for 24 h. After RNA extraction and conversion into cDNA, the levels of the gene encoding leptin were determined by qRT-PCR. Leptin expression by the different trophoblast types was evaluated in explants by immunohistochemistry.

After 24h treatment for 20 μ M and 40 μ M of THC, we found a significant increase of mRNA leptin levels in BeWo cells while in placental explants this effect was observed for 10 μ M. Immunohistochemistry analysis revealed leptin expression by the syncytiotrophoblast that was not affected by THC treatment.

Therefore we conclude that THC, at high concentrations, increases transcription of the gene encoding for leptin leading to hormonal levels deregulation which may impair placental development.

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- **13888 | Centrality and Community Detection: a co-Marketing Multilayer Network**

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Purpose - In this study, we explore the centrality of clients, verifying if socioeconomic variables influence consumers' degree centrality, detecting communities within the network, identifying consumption patterns and verifying if there is any relationship between co-marketing and consumers' choices.

Design/methodology/approach - A multilayer network was created from data collected through a consumer survey, to identify customers' choices in thirteen different markets. We also tested a few hypotheses through an econometric model to study the centrality of consumers, with variables related to their respective socioeconomic profile.

Findings - Based on 595 responses, analysing individual consumers we found out which consumers invest and which variables influence consumers' centrality. By detecting communities within the network with the same consumption patterns, we verified that this is a good way to establish co-marketing strategies.

Originality/value - The analysis of networks has become a very used technique in the extraction of knowledge on consumers. This paper's main contribution lies in providing a greater understanding of how multilayer networks represent hidden databases with potential knowledge to be considered on business decisions. Centrality and community detection are crucial measures in network science which enable customers with the highest potential value to be identified in a network. Customers are increasingly seen as multidimensional, taking into account their preferences in various markets.

Keywords: Multilayer Networks, Centrality, Community Detection, Co-Marketing.

- **14100 | Cereals based baby food quality control through near infrared spectroscopy**

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Food quality control is a relevant topic for the public health especially when dealing with baby food. Quick and reliable techniques able to monitor its quality are of utmost relevance. This work aims to explore the ability of near infrared spectroscopy to monitor the alterations of baby cereals after the package opening. Seventeen samples of commercially available cereals based baby food were purchased in local stores. Near infrared spectra of the samples were acquired immediately after open the package and 2, 4, 6, 8 and 12 weeks from the opening. Spectra were modelled by principal component analysis (PCA). Globally, it was possible to observe some degree of clusterization related with the main samples composition (mostly, cereal type). The technique also allowed to monitor sample changes related with the open time of the package. This work still is in progress but these preliminary results clearly indicate the potential of the technique to monitor such food products.

- **14087 | Cervicalgia as a disturbance to microscopy researchers**

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Cervicalgia is a localized sharp or constant pain or discomfort in the neck, upper back or shoulder region. It is a common occurrence for many adults. Whether this condition is present temporarily from muscle strain or chronically from a spine condition, cervicalgia might prevent people from optimally performing their daily activities

To evaluate its extent on individuals that spend a considerable time using the optic microscope, a small sample of 28 microscopy researchers of ICBAS (Instituto Ciências Biomédicas Abel Salazar, Porto, Portugal) volunteered to complete a survey regarding their current health status, as well as possible handicap due to such status.

Cervicalgia was the most reported type of pain, which is likely caused by prolonged periods of tension on the cervical spine. Deeper and more specific studies should be conducted if the precise causes and corrections are to be determined.

- **13942 | Characterization of antibiotic resistant Enterobacteriaceae isolates as intestinal colonizers of health care users**

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Since the 60's that we have been assisting to an aging of the world population, and Portugal is not an exception. With the aging of the Portuguese population, there is a greater need for medium and long-term-care units, such as Integrated Continuous Care Units (ICCU). Thus, a significant problem emerges with the colonization of the population with microorganisms showing multiresistance to antibiotics, especially gram-negative, such as *Escherichia coli* and *Klebsiella pneumoniae* [1].

Therefore, the objective of this work is to detect and identify multiresistant gram-negative bacilli, as intestinal colonizers, in ICCU residents, with particular interest in Enterobacteriaceae, producing extended-spectrum β -lactamases and showing reduced susceptibility to carbapenems. In the present project, we analyzed 40 fecal samples of 3 different ICCU and 1 Senior Residence of the North of Portugal. Forty four relevant isolates were identified and in a preliminary screening, 8 suggested to be AmpC, 31 ESBL (13 *K. pneumoniae*, 17 *E. coli* and 1 *Proteus sp.*) and 5 carbapenemase producers (all *K. pneumoniae*). Molecular characterization of the presumptive ESBL and carbapenemase producers revealed carbapenemases of the KPC type and ESBL from the CTX-M 1 group, particularly CTX -M 15.

Results show that intestinal colonization by multiresistant Enterobacteriaceae, in patients residing in ICCU, mainly ESBL and carbapenemase producers is already a reality. These health units may function as effective vehicles in the spread of genes associated with resistance to antibiotics and, consequently, multiresistant bacteria.

As this study suggests, intestinal colonization and spread of bacteria with acquired multidrug resistance, should be a major priority to health units in terms of serious infection control measures and coherent antibiotic decisions.

1. Majumdar, S.S. and A.A. Padiglione, Nosocomial infections in the intensive care unit. *Anaesthesia & Intensive Care Medicine*, 2012. 13(5): p. 204-208

- **13956 | Characterization of hospital clinical isolates resistant to beta-lactam antibiotics**

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Antibiotic resistance is a worldwide health problem. Biological products of hospitalized patients with resistant strains is an added risk for dissemination, triggering increased number of infections [1]. This study includes *Escherichia coli* and *Klebsiella* spp selection as representative species of *Enterobacteriaceae*, commonly associated with hospital infection.

Between 2010 and 2011, hospital isolates were collected (n=76) in the north of Portugal. Isolates were selected on MacConkey agar with cefotaxime and carbapenem (ertapenem or meropenem) disks. The isolates with reduced susceptibility to one or more antibiotics tested were selected (n=44). β -lactam antibiotic susceptibility test was performed, according to the EUCAST specifications. Confirmatory identification was achieved by CHROMagar orientation. ESBL positive isolates were studied by PCR for detection of blaCTX-M, blaTEM, blaOXA, blaSHV genes. Isolates producing AmpC were studied by PCR for Ampc, CMY, dha-1 and dha-2, DHA regulator, ACC, MIR-1T ACT-1, LAT-1 to LAT-4 CMY-2 to CMY-7 and BIL-1 genes.

Of 44 isolates, 10 had simultaneously ESBL and AmpC (n=4 *E. coli* and n= 6 *Klebsiella*), 32 were ESBL (n=17 *E. coli* and n=15 *Klebsiella*) and 2 had reduced permeability to β -lactams (n=1 *E. coli* and n=1 *Klebsiella*). Results showed high prevalence of CTX-M-1 (n=32) and CTX-M-15 (n=22) enzymes. Other isolates belonged to groups 9 (n=4) and 25 (n=3). The blaTEM (n=28), blaOXA (n=30) and blaSHV (n=21) genes were detected. Ampc (n=1), CMY (n=4), DHA (n=5) and CITM (n=1) genes for AmpC were detected.

Results showed similar phenotypes which can be explained by hospital clonal propagation. Healthcare facilities represent a rapid and easy resistance dissemination system.

[1] Loureiro, Rui João, et al. "O uso de antibióticos e as resistências bacterianas: breves notas sobre a sua evolução." Revista Portuguesa de Saúde Pública 34.1 (2016): 77-84

- **14156 | Characterization of Male Lineages in the Ashaninka from Peru**

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The geographical location of the Americas led for it to be the last continent to be colonized by modern humans, a topic that is still widely covered by researchers from various scientific areas. It is believed that this colonization occurred from a single mass migration, no longer than 15.000 years ago, the age of the oldest human artefacts there discovered. After the entrance of the founder population by the sub-continent of Beringia, they expanded via the Pacific Coast throughout the whole American continent. Peru is a country that is home to a population with high admixture, having European, African and Native American genetic contributions. Due to the vastly diverse ecosystem of Peru, most of the native populations are fairly isolated from one another. The Ashaninka is a Native American tribe that spans across a large variety of territories in eastern Amazon, where it constitutes one of the most numerous native populations. Reportedly, the Ashaninka suffered little admixture after the 15th century discovery of the New World. To delve further into the migratory events that led to the population of the Americas, samples belonging to 59 males from 42 Ashaninka communities will be genotyped for SNPs in the Y chromosome. According to the previsions provided by Haplogroup Predictor, using Y-STR data previously obtained, most of the individuals belong to haplogroup Q, which is the most typical haplogroup of South Amerindians. Given this and the fact that most Native Americans belong to the Q-M3 lineage, being M3 the most downstream SNP, a pre-developed Multiplex Q was optimized, through the addition of new SNPs that were chosen according to bibliography, in order to obtain a higher resolution characterization of the male lineages present in the Ashaninka and to evaluate the genetic differences between them and other indigenous Native American populations.

- **14179 | Characterization of Rat distal colon and rectum's response to Angiotensin II in an experimental model of inflammatory bowel disease**

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Background: All components of the renin-angiotensin system (RAS) are found in the gastrointestinal tract. Angiotensin II (AngII) contracts colonic muscle, but its effect in inflammatory bowel disease (IBD) is unknown.

Aim: To characterize the effect of AngII on the rat colon and rectum in an experimental model of IBD and in controls.

Animals and methods: Protocols were approved by the Animal Welfare Body. Male Wistar rats (9 weeks-old) were instilled in the rectum with TNBS 20mg/rat in a 30% ethanolic solution, or used as controls. After 7-8 days, the rats were euthanized and segments of the distal colon and rectum were mounted longitudinally in organ baths. Isometric responses to acetylcholine (ACh, 10 μ M), potassium chloride (KCl, 125mM) and AngII (non-cumulative concentration-response curves) were recorded. Statistical analysis was performed by the Student's t test.

Results: AngII concentration-dependently contracted colon and rectum in control (n=4) and TNBS-treated rats (n=4). In the rectum, TNBS-treated rats presented lower maximum contraction than controls for ACh (20.73 \pm 4.92mN vs 40.56 \pm 5.18mN, respectively, p<0.05), KCl (43.54 \pm 7.48mN vs 109.85 \pm 18.53mN, respectively, p<0.05) and AngII (8.73 \pm 3.78mN vs 49.12 \pm 11.59mN, respectively, p<0.05), with no difference in the EC50 of AngII (40.3 \pm 19.1 nM vs 28.4 \pm 10.2 nM, respectively, p>0.05). The contractile responses of the colon to ACh (21.14 \pm 6.15 mN vs 40.41 \pm 13.29 mN, respectively, p>0.05), KCl (57.48 \pm 12.29 mN vs 35.45 \pm 12.70 mN, respectively, p>0.05) and AngII (23.55 \pm 5.66 mN vs 10.85 \pm 1.71 mN, respectively, p>0.05) were similar between groups.

Conclusions:

Although preliminary, these results suggest that experimental IBD is associated with a decreased contractile response of the colon and, even more markedly, of the rectum to AngII.

- **14240 | Characterization of the Food Habits in the First Year of Life in Santa Casa da Misericórdia de Barcelos**

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Breastfeeding is considered the ideal practice for the first six months of life and the onset of complementary food during the first year is essential for children's adequate nutritional status. Eating habits during the first years of life can determine later eating habits and food preferences. The present study aimed to characterize the food habits of children in the first year of life in Santa Casa da Misericórdia de Barcelos.

This was a cross-sectional study using a questionnaire that evaluated the prevalence of breastfeeding (BF) and exclusive breastfeeding (EBF), the onset of complementary feeding (CF) and the timing of introduction of solid food. This study also evaluated the children's food preferences and who decides their food habits (only parents or parents and health professionals). The sample comprised 114 children, predominantly female (55,3%), with a mean age of 21,8±9,4 months.

Among the children, 95,9% were exclusively breastfed, the majority of them less than six months. The mean for EBF was 3,9±2,1 months and for BF was 7,4±6,6 months. The onset of CF was at 5,4±1,1 months, with soup followed by fruits. Only 7 children consumed cow milk before completed 12 months. It was found that some foods were - in some cases - introduced too early (yogurt) or too late (pulses) in the children's diet.

The children's feeding habits were, in the most of cases, decided by their parents and health professionals (n=59; 54,6%). The children's food preferences were fruit (n=87; 82,1%), yogurt (n=86; 81,1%), and soup (n=82; 77,4%). In cases of feeding habits decided by parents and health professionals the children's food preferences were healthier than when feeding habits are only determined by parents.

In conclusion, despite the high prevalence, there was a low duration of EBF and an early CF. Promoting breastfeeding and healthy food habits are still a priority of action in Public Health.

- **14334 | Characterization of the red fox (*Vulpes vulpes* Linnaeus, 1758) habitat preferences**

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The fox, *Vulpes vulpes*, is a carnivorous species that can be found in Portugal and that shows a wide distribution. The species dispersion is due to the great adaptability that this mammal shows to the different habitat conditions and resources. With this study, we pretend to obtain a detailed characterization of the habitat preferences of this specie in Portugal, taking into account habitat characteristics.

In order to obtain this data a database with the MHZ annual notices concerning the 2017-18 hunting season, and available at the ICNF web site. All MHZ offering 1639 battues to the red fox. All MHZ are being contacted to gather information on the fox kills. The kill sites will be characterized (factors such as vegetation type, food sources, water resources availability and signs of human presence) based on the analysis of the 1:25000 scale maps and Google aerial photographs.

So far, the red fox hunting effort has been very small and no data has been obtained yet. That was because during the first months (October-December) none of the battues took place, but the experience of previous hunting seasons allows us an optimistic perspective that during the last period of the hunting season (January and February) enough data will be collected in order to allow the characterization of the red fox habitat preferences.

The knowledge of fox habitat preferences is fundamental for the proposal of correct management measures, especially in a critical period such as this one, when game species are facing habitat changes and loss that result mainly from the recent natural disasters in a substantial part of the Portuguese territory.

- 14195 | Chayote (*Sechium edule*) as a source of vitamin C and carotenoids - imported vs. local organic cultivars

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Chayote (*Sechium edule*) is an edible plant belonging to the gourd family Cucurbitaceae. Nowadays, the main producer countries of chayote include Mexico, Costa Rica, Brazil and the Dominican Republic; in Portugal, chayote commercialization can reach an annual distribution of around 50 tonnes. Although most consumers are familiar only with the fruit, the root, stem, seeds and leaves are edible as well and recognized by their health-benefits, particularly its antioxidant activities.

This research sought to compare the vitamin C, chlorophyll a and b, and β -carotene contents, present in the peel and pulp fractions of imported (I.chay), and local organic (O.chay) chayote cultivars. Two varieties of chayote were studied, "light green" (n=3) and "pale yellow" (n=3); the I.chay samples, originally from Mexico, were store-bought (Porto, Portugal) and the O.chay samples were acquired from a local farmer (Braga, Portugal). Vitamin C was determined according to the method of Klein and Perry with some modifications; results were expressed as mg/ 100g dry weight (dw). To determine the chlorophyll a and b, and the β -carotene contents, the protocol of Nawirska et al. (2009) was used with some modifications; results were expressed as $\mu\text{g}/ 100\text{g}$ dw.

Results showed that for I.chay samples, the "light green" chayote varieties presented a vitamin C mean contents of 81 mg/100g dw and 75 mg/100g in peel and pulp fractions, respectively. In case of "pale yellow" chayote varieties, these contents were, respectively, 81 mg/100g dw and 66 mg/100g dw. For "pale yellow" chayote varieties, the mean content of vitamin C present in peel (81 mg/100g dw) and pulp (99 mg/100g dw) fractions of O.chay were significantly higher ($p > 0.05$) than the contents observed for I.chay samples. The contents of chlorophyll a, b, and β -carotene were significantly higher ($p < 0.05$) in the chayote peel of "light green" chayote varieties.

- 13892 | Chemical composition and antioxidant activity of *Charonia lampas* (Linnaeus)

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Charonia lampas (Linnaeus) is a species of shellfish found in northeast Atlantic Ocean and Portuguese marine waters. Its diet is rich in echinoderms, such as starfish, sea cucumbers and sea urchins. Little is known about the chemical composition of this species. Until now, only enzymes, such as sulfatases or α -fucosidase, were reported to be present in *C. lampas*.

Reactive oxygen species (ROS) and reactive nitrogen species (RNS) are a product of the normal aerobic metabolism of the cell and, when found in high concentrations comparing to the antioxidant systems, can contribute to oxidative stress, which results in lipid peroxidation, oxidation of biological macromolecules (DNA and proteins) and inflammation. The aim of this work was to study the chemical composition of an ethanol extract of *C. lampas* and to evaluate its antioxidant potential.

To determine the chemical composition HPLC-DAD and GC-FID were used. HPLC-DAD analysis allowed the identification of pheophytin α and chlorophyll α derivatives. GC-FID enabled finding several fatty acids, hexadecanoic acid being the most representative. The ethanol extract displayed very low radical scavenging activity against DPPH and no effect against \bullet NO.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 5th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- **13927 | Chia Seeds: A review of the current knowledge**

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Nowadays to complement the normal diet, ensuring an adequate intake of nutrients, the consumption of seeds, such as *Salvia hispanica* seeds (commonly known as chia) is increasing, leading to concerns about their composition and potential health effects. On the other hand, the European Parliament has recently approved the use of chia seed as a Novel Food, increasing the degree of usage in a wide range of foods. The aim of this work is to perform a review to update the knowledge about the composition, morphology, nutritional properties, possible human health benefits and role as a functional food of chia seeds.

In what concerns to nutritional aspects, chia seeds are a great source of fat, particularly polyunsaturated fatty acids such as α -linolenic and linoleic acid. High levels of protein, mainly prolamins, have been reported as well as carbohydrates. The majority of total fibre content present in chia seeds is insoluble. Vitamins (predominantly from complex B) and minerals (such as calcium, phosphorus or potassium) have also been described in huge amounts. In addition, the absence of gluten makes these seeds appropriate for celiac patients. Regarding bioactive compounds, chia seeds are a rich source of antioxidants, such as chlorogenic acid, caffeic acid, quercetin or kaempferol.

Based on the described composition chia seeds have been associated with different therapeutic effects, namely anti-inflammatory and antidiabetic activity as well as positive effects on cardiovascular diseases, depression, hypertension or anxiety. The aim of this work is to perform a revision of the different aspects of chia seeds in order to provide an overall, yet comprehensive view, about this grain.

- **14023 | Chlorhexidine has a good activity against multidrug-resistant *Enterococcus faecium* from human, animal and environmental origins**

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Chlorexidine-gluconate (CHX) is an antiseptic often used in the hospital, community and animal production settings. Its activity against the major nosocomial pathogen *Enterococcus faecium* (Efm), has been scarcely described, with most available data not addressing strain's genetic background. Three clades are currently described for Efm: A1-mostly includes infection-derived strains; A2-sporadic human infections and animals; and B-human commensal strains. This study aimed to evaluate CHX activity against antibiotic resistant Efm from diverse sources and clades.

Fifty-three Efm isolates (Portugal, Spain, Angola; 1995-2016) were included. They corresponded to 37 sequence types clustering into clades A1 (n=14 isolates), A2 (n=33) and B (n=6). Multidrug-resistance (MDR) was observed in 87% (n=46/53) of them and resistance to the clinically relevant antibiotics vancomycin (VRE) in 36% (n=19/53) and ampicillin (AmpR) in 81% (n=43/53). CHX minimum inhibitory concentration (MIC) was determined by broth microdilution (adapted from EUCAST guidelines) (CHX range: 2-32mg/L; ECOFF: MIC<=32mg/L-PMID:24466194).

CHX-MIC ranged between <=2-16mg/L. MIC50/MIC90 for isolates from clades A1, A2 and B were 16/16mg/L, 4/16mg/L, 8/8mg/L, respectively. VRE (clades A1/A2) and vancomycin-susceptible (clades A1/A2,/B) isolates presented a MIC50/MIC90=8/16mg/L and 4/16mg/L, respectively. AmpR (A1/A2/B) or ampicillin-susceptible (A1/A2/B) isolates showed the same values of MIC50/MIC90=8/16mg/L. The MIC50/90 of isolates from clinical (n=20, clades A1/A2/B) or community (n=33, clades A2/B) were 8/16mg/L and 4/16mg/L, respectively.

CHX presented good activity against MDR Efm from different origins and clades, with all isolates classified as wild type. Despite its very good activity against Efm, those strains from clade A1 seem to be somewhat less susceptible, stressing the need of evaluating the impact sub-inhibitory concentrations in the selection of such strains in the clinical setting.

- **14275 | Circadian Cycle: Effect of night shifts in human health**

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It is known that the human body is, to some extent, regulated by the circadian cycle (CC) which influences the synthesis and release of several types of biomarkers. The objective of the present work is to model the CC and deliver a tool to be applied in education, research and decision support in clinical environment. This work is part of a major research project, divided in three main areas: (1) Sleep/wake cycle, (2) blood viscosity variation and (3) optimal drug intake. A vast research on the state of art was done in order to produce a review of the CC. Then a conceptual model was depicted and implemented in a mathematical modelling software - Stella 10.0.6. The focus of the conceptual model was made to take in consideration the sleep/wake cycle and the physiological impact of night shifts in human health. The calibration and validation processes are in progress to be achieved. An expectation from this tool is to improve our understanding of the human physiology in order to understand the negative impact of night shifts.

- **14274 | Circadian Cycle: Relationship with heart attack**

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Ribeiro, Daniel, Instituto de Ciências Biomédicas Abel Salazar, Portugal

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- **14276 | Circadian Cycle: When do you take your meds?**

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Ribeiro, Daniel, Instituto de Ciências Biomédicas Abel Salazar, Portugal

It is known that the human body is, to some extent, regulated by the circadian cycle (CC) which influences the synthesis and release of several types of biomarkers. The objective of the present work is to model the CC and deliver a tool to be applied in education, research and decision support in clinical environment. This work is part of a major research project, divided in three main areas: (1) Sleep/wake cycle, (2) blood viscosity variation and (3) optimal drug intake. A conceptual model was depicted and implemented in a mathematical modelling software - Stella 10.0.6. The focus of the conceptual model was made to take in consideration the input of exogenous corticosteroid, with the aim of finding the optimal administration time of this type of drug. After implementation of the conceptual model in Stella environment, we were able to mathematically describe the physiological variation of CRH, ACTH and Cortisol seric concentrations when compared to real data from other authors. Additionally, we have simulated an input of a corticosteroid in different moments (at 2 a.m and at 6 p.m) corresponding to the natural raising and falling of endogenous cortisol concentration. The results indicate that the administration of exogenous corticosteroid between 2 a.m. to 8 a.m. have less impact in CC disruption than when it is administrated during physiological minimum levels of endogenous cortisol (6 p.m to 8 p.m). The results also suggest that prolonged use of exogenous corticosteroids will inhibit the endogenous production of cortisol, with higher impacts when administrated between 6 p.m and 8 p.m. We expected that the continuous development of the present model will deliver further insight on the subject.

- 14092 | *Codium tomentosum*: A sustainable marine source of lipid-based phytochemicals for promising nutritional, cosmetic and pharmaceutical applications

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Lipids of seaweed have been gaining a renewed biotechnological interest with the broad scientific recognition of the beneficial bioactivity of many of their components, providing them a great potential to be used in food, cosmetic and pharmaceutical applications. However, new extraction procedures are required since the traditional methodologies use toxic solvents. Also, the obtained extracts are, usually, a complex mixture containing diverse groups of compounds, making difficult to understand their bioactivity and the rationalization of their use for high-specific applications. Thus, this ongoing work aims to develop an efficient methodology for the extraction of algae lipids and to obtain the different lipids groups in separated fractions, by using solvents authorized for food processing. The green algae *Codium tomentosum* was chosen as valuable model system, since it grows in Portuguese coast, is used in aquaculture systems and can be consumed by humans. Taking advantage from the differences in the solubility exhibited by different lipids groups in organic solvents, our procedure allows obtaining the algae lipids in six fractions, each one with a distinctive and well-defined chemical composition, enabling their subsequent used in differentiated biomedical applications. For example, the membrane phospholipids, composed by six phospholipid classes, are collected in one fraction without other metabolites. This fraction is enriched n-3 polyunsaturated fatty acids (PUFA) and has a n-3/n-6 PUFA ratio, at least 50% higher than the values reported in literature for the lipid extracts obtained from this alga by the traditional extraction procedures.

This work received financial support from National Funds (FCT/MEC) through project UID/QUI/50006/2013, co-financed by FEDER through COMPETE, under the Partnership Agreement PT2020, and from NORTE 2020, under the PORTUGAL 2020 Partnership Agreement, through ERDF (NORTE-01-0145-FEDER-000024).

- **14266 | Communicating Food Procedures to Caregivers of Patients with Dysphagia in Inpatient Hospital Settings - Literature Review**

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Introduction: Dysphagia is a frequent disorder in the course of stroke and is a change in swallowing characterized by difficulties in moving the food from the mouth to the stomach. Dysphagia is accompanied by complications such as malnutrition, dehydration, pulmonary complications, and in more severe cases, mortality. Intervention in patients with dysphagia requires a careful change in fluid / food consistency. These procedures, performed by professionals in a hospital context, are often out of the focus of attention of caregivers of the patient, and, if not observed, endanger the health and life of the patient. Objective: To examine, in the scientific literature, how health professionals communicate food procedures to caregivers of hospitalized patients with dysphagia. Method: The literature search involved the period between 2010 and 2017, in the PubMed and Web of Science databases. Keywords were "communication" and "dysphagia" and "family" and "caregivers". Of the initial 46 articles, 36 were excluded after abstract reading. Only 10 articles dealt with the communication in dysphagia. Results: The studies indicate a lack of communication about food procedures in dysphagia, about the necessity of the change, to the users with dysphagia and their relatives. There are studies that report that the communication of the risks of dysphagia is performed by: use of punitive and/or technical language of professionals; emphasising patients limitations; reducing motivation to eat; making the process of food change difficult to understand; frequently omitting dysphagia background; and use of different recommendations among team members. Conclusions: The articles analyzed show that caregivers involvement in dysphagia is essential for the rehabilitation of patients, and it is crucial that professionals adapt the way in which they communicate with them. Based on this literature review, future research on alternative methods of communication with caregivers is also recommended.

- **14186 | Comparative evolutionary analyses of the protein-protein interactions of the wild-type polyQ proteins ataxin-2 and androgen receptor, associated with neurodegenerative disorders in Homo sapiens**

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Polyglutamine (polyQ) diseases are neurodegenerative disorders triggered by the expansion of CAG trinucleotide repeats at nine unrelated genes. PolyQ regions are common in proteins, and their function seems to be the stabilization of protein-protein interactions (PPI) and/or spacer elements between individual folded domains in molecules that mediate PPI. The expansion of the polyQ stretch in a protein correlates with presence of strong abnormal PPI. The evolutionary analysis of human orthologues and family related proteins of ataxin-2 and androgen receptor in four model eukaryotic species revealed the presence of wild-type polyQ stretches only in humans. Using this information, analyses of the publicly available PPI repositories revealed four interactors of ataxin-2 and androgen receptor that potentially interact on wild-type polyQ stretches. These results are part of a broader study on wild-type polyQ-containing proteins associated with neurodegenerative disorders that will provide background to understand which protein pathways are being altered due to polyQ stretches expansion.

- **14175 | Complex pre- and postsynaptic effects of DAMGO on excitability of spinal lamina I projection and local-circuit neurons**

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Lima, Susana C., I3S, Portugal

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Despite the advances in the development of new analgesics, pain continues to be a significant problem for millions of people. Thus, understanding the mechanism of spinal nociceptive processing is indispensable for elaboration of new therapeutic approaches. Opioids represent the standardized treatment of severe pain, although their mechanism of action is not well understood. The spinal superficial dorsal horn is a major target for opioids which act mainly on the mu-opioid receptors (MORs).

Immunohistochemical and electrophysiological studies suggest that functional post-synaptic MORs are expressed mainly on lamina II (substantia gelatinosa-SG) neurons while pre-synaptic MORs are located in primary afferents and axon terminals of unknown origin in the spinal cord. MOR positive SG neurons are rare (about 10%), have a tonic firing pattern and are mainly excitatory. Administration of a potent MOR agonist [D-Ala², N-Me-Phe⁴, Gly⁵-ol]-enkephalin (DAMGO) hyperpolarizes these neurons via activation of G-protein-coupled inward-rectifier K⁺ conductance, and can also convert their firing pattern from tonic to adaptive.

At the same time, very little is known about the effects of opioids on lamina I neurons that include projection neurons transmitting processed nociceptive information to supraspinal centers. Thus, we combined whole-cell patch-clamp recordings, primary afferent stimulation and immunocytochemistry in the in vitro intact spinal cord preparation to shed light on opioid actions in lamina I.

We found that a subpopulation of lamina I neurons, with both projection and local-circuit neurons, showed reduced primary afferent excitation with or without hyperpolarization indicating a complex effect of opioids. We hypothesize that unbalanced input from lamina II excitatory and inhibitory neurons may also contribute to the opioid action. Our results provide new insights into how opioid analgesia affects superficial dorsal horn network function and nociceptive information flow.

- **14268 | Computer skills in older adults across Europe – a SHARE perspective**

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We live in the digital age. Nowadays, websites, online platforms and mobile applications are being launched to, somehow, improve people's life. Given that the population in general is aging at a worrying rate, most of these initiatives are particularly focused on the health of the elderly population. Increasingly, the elderly uses computers as a way of communicating, either with friends and relatives, as a form of entertainment, and as a source of information. However, this relationship between the elderly and new technologies is not as strong as it should be. Thus, this gap between the elderly and these new technologies makes it impossible for them to take advantage of all their potential, resulting in a more debilitated health for the patient. In this work, we aimed to evaluate computer skills in the elderly population, across Europe.

For this, we used data from SHARE (Survey of Health, Ageing and Retirement in Europe) project, Wave 6. Computer skills were evaluated through the question "How would you rate your computer skills? Would you say they are: excellent, very good, good, fair, poor or I never used a computer". We analyse the data from 61704 individuals who answer to this question, and whose age were 55 years or older.

Of all SHARE countries, an average of 36.5% of the population never used a computer. Poland, Croatia and Italy are the countries where the elderly has less computer skills (only 34.6 to 47.1% of the population have ever used a computer), while Denmark, Sweden and Switzerland are the countries with higher use of the computer by the elderly (between 82 to 89.9%). In general, men have more computer skills, and computer skills decreased with age.

The results of this work highlight the low digital skills of elderly population across Europe. Empowerment of digital skills in the elderly population is urgent to give response to the European Plan for the Digital Transformation of the European Digital Agenda.

- **14316 | Contribution of the sugar industry to the Mozambican economy**

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Sugarcane production was distributed in Mozambique at the end of the 19th century in the Zambezi and Búzi river valleys. Presenting levels of production, in the 70s, was considered a third largest export of the country, after cashew and cotton. However, a few years after the sugar independence suffered successive declines, losing much of the production capacity. Since the mid-1990s, sugar production in Mozambique has started to show itself relatively significantly since 2001.

The country proved to have climatic conditions, existence of water and soil favorable to its cultivation, besides the advantageous location in relation to the regional markets and sea routes for the world markets, thus providing favorable conditions for the cultivation of sugarcane with a low cost of production that makes it possible to make the sugar sector competitive at regional level. Another factor that allows an expansion of sugar production and population growth at the national as well as global level and a better distribution of income that lead to a higher demand for sugar.

The Mozambican economy is dominated mainly by agriculture, employing this sector about 83% of the population. From the main industries of the country, sugar and the company's major industries, in addition to natural gas, aluminum, cashew, electricity and among others. As well as an important role for a recognized economy in the sugar industry, taking into account the main source of income for a population in rural areas, generating employment and providing better living conditions. It is also recognized as a generator of foreign exchange in the country, thus contributing to a reduction of the trade deficit and accelerating economic growth.

- **14069 | CrossFit induces acute redox impact. A perspective from a Comet**

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Introduction: CrossFit (CF) is a demanding physical conditioning program, with growing popularity, that aims to optimize physical capacities through a variety of high intensity functional exercises. Despite the growing number of practitioners, scientific data regarding the physiological effects of this exercise training type are still scarce. Therefore, the aim of this study was to analyze the effects of a CF-related high intense work of the day (WOD) session in some metabolic parameters, as well as in the DNA damage of blood circulating cells, comparing with a traditional aerobic exercise (treadmill running) matched for the same intensity based on mean percentage of maximal oxygen consumption of the WOD session. Methods: Ten subjects (6 males and 4 females; 31 ± 5.6 years) with at least three months of CF training experience were evaluated. Oxygen consumption and heart rate were continuously monitored during the WOD session. One week later, the subjects performed a treadmill running exercise with the same duration and at an average percentage of oxygen consumption as the WOD training. Blood samples were collected at rest and immediately after the exercise protocols to evaluate blood cell DNA damage through the Comet assay. Capillary blood lactate concentration was measured immediately and 3, 5 and 7 minutes after exercise protocols. The maximum value obtained was considered. Results: Compared to treadmill running, CF WOD session induced a significantly higher increase in lactate levels (1.6 mM vs. 17 mM $p < 0.05$) and mean heart rate (155 bpm vs. 188 bpm $p < 0.05$). Moreover, the CF induced slightly higher DNA damage (3% tail DNA vs. 7% tail DNA $p < 0.05$) than the treadmill running, as reflected by the percentage of degraded DNA. Conclusion: A CF training session induces acute redox impact on blood cell DNA.

Keywords: CrossFit, running, lactate and DNA damage

- **13943 | Dance and music influence on physical activity of children in school period**
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The present study aims to investigate the influence of dance and music on physical activity of children in school context. The sample of this study includes children who attend a group of schools in the District of Porto, who are enrolled in physical education classes. Perspective that comes from three distinct classes (two first-year classes and a class of 2nd year). The data collection will include an evaluation anthropometric (body mass-1 through electronic digital scales, 2. stature - through a portable estadiómetro, 3. Subsequent calculation of body mass index) and evaluation of physical activity using accelerometers, which students will use (only in school period) on a day that have physical education, on a day that have dance and in two days that do not have any physical activity oriented , one of them with a break with music (4 days of collection). After this first phase, will be taught dance classes (in the course of the physical education classes for three months, with a frequency of one class per week nakedm 4 total choreography taught. At the end of our intervention, a new evaluation of the physical activity of participants, also divided into four days, but the ranges are divided into three groups: no music intervals; music intervals applied to dance classes; random music intervals, in order to assess whether or not a positive influence on children's physical activity from the intervention (dance class). For it will be held a direct observation of the activities carried out by students during these intervals.

All the statistical treatment will be effected through the program SPSS.

- **14176 | DCA and everolimus as possible therapies to overcome resistance to MAPK inhibitors treatment in cutaneous melanoma patients**

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Cutaneous melanoma is a very aggressive malignancy, and despite being the least common type of skin cancer, it is responsible for most skin cancer-related deaths. Regardless of new diagnostic and therapeutic tools, the overall survival of patients treated for melanoma did not improve and most patients die of metastatic disease. Several new drugs were approved for stage IV cutaneous melanoma patients, namely selective inhibitors of the MAPK pathway, such as vemurafenib. This therapy present limitations due to rapidly acquirement of resistance to the MAPK pathway inhibitors. Therefore, there is a need to develop therapeutic modalities to achieve more efficient melanoma therapies that improve survival of melanoma patients.

As cutaneous melanoma cells evidence the presence of the Warburg effect and deregulation of MAPK and PI3K/AKT/mTOR pathways, we hypothesize that MAPK pathway inhibitors resistance, which occur frequently in BRAFV600E melanoma patients, can be overcome by the combination of vemurafenib with the metabolic modulator dichloroacetate (DCA) or with mTOR inhibitors (everolimus).

In this work, the effects of the combinatorial therapies were evaluated by quantification of cell viability, using Presto Blue assay, in a cutaneous melanoma cell line resistant to vemurafenib and in a cutaneous melanoma cell line not resistant to vemurafenib.

Our results suggest that the combination of vemurafenib with DCA can be a valuable approach for the treatment of melanoma patients.

- **14215 | Design and Synthesis of Novel Estrone Analogs as Breast Cancer Treatment**

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One of the most diagnosed cancers among women is breast cancer, the second leading cause of death, next to lung cancer.¹ Estrogens are important physiological regulators but have also been associated pathologically with breast cancer, therefore, estrogen receptors (ERs) have been essential in the beginning and growth of these cancers. Existing therapies for ER-positive breast cancers target either estrogen or ER levels and/or activity.²

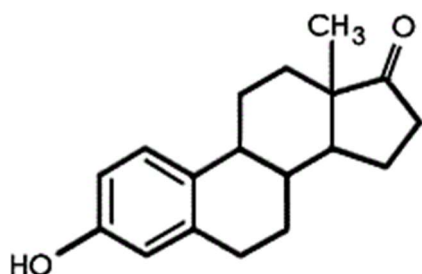
Minor modifications on the estrone or estradiol result in significant changes in the biological activity, as the metabolite 2-methoxyestradiol displays by exhibiting anticancer capabilities,³ while it shows low bioavailability. In consequence of this, research has continued to focus on the synthesis of analogs of estrogen in order to increase their overall activity.⁴

This work is focused on the design and synthesis of novel estrone analogs for subsequent biological activity assessment to discover if it exhibits anticancer activity.

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REFERENCES

1. Alsayari, A.; Kopel, L.; Ahmed, M. S.; Pay, A.; Carlson, T.; Halaweish, F. T., *Steroids* 2017, 118, 32-40.
2. Shao, W.; Brown, M., *Breast Cancer Res* 2004, 6 (1), 39-52.
3. Mueck, A. O.; Seeger, H., *Steroids* 2010, 75 (10), 625-31.
4. Kopel, L. C.; Ahmed, M. S.; Halaweish, F. T., *Steroids* 2013, 78 (11), 1119-25.



Molecular representation of estrone.

- **14107 | Determination of liposomes gel-to liquid crystalline transition temperature of by UV-vis**
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Liposomes are widely used as model membranes [1] and as nano-particles for drugs and food components encapsulation and/or delivery (nano-delivery systems) [2]. The knowledge of the phase transition temperature is fundamental in most applications, and thus it is very important to obtain accurate values for this property, to enable the nano-particles' characterization.

In this work, we explored an alternative approach to determine the transition temperature of lipid membranes, taking advantage of the difference in light dispersion observed when liposomes are in gel or liquid crystalline phases. The UV-vis absorption spectra of unilamellar vesicles (LUV) were collected (220-400 nm) at discrete temperatures, spanning an interval of +/-10 oC around the expected transition temperature. The temperature of the sample was in each case measured in situ by means of a temperature probe. Transition temperatures were obtained by calculating the first and second derivatives at chose wavelengths. Pure and binary lipid systems were used. The method is validated by comparison of the temperatures retrieved with the corresponding ones obtained by DSC (differential scanning calorimetry), the reference method for the determination of this property.

Acknowledgements

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References

- [1] Silva, T., Adão, R., Nazmi, K., Bolscher, J. G.M., Funari, S., Uhríková, D., Bastos, M. (2013), Structural diversity and mode of action on lipids membranes of three lactoferrin candidacidal peptides, *BBA - Biomembranes*, 1828, 1329-1339
- [2] Liposomes, Lipid Bilayers and Model Membranes. From Basic Research to Application. (2014). Editors Georg Pabst, Norbert Kucerka, Mu-Ping, Nieh-John Katsaras, Taylor & Francis

- **13915 | Development and characterization of an atropine potentiometric sensor**

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Potentiometry with Ion-Selective Electrodes (ISEs) is an analytical technique used for direct determination of ions activities with application in multiples areas. When compared to other techniques, ISEs show advantages, mainly because, besides of being selective to a certain chemical specie, they are economic, with small dimensions and consume low energy. Therefore, in this work, it is proposed the construction and evaluation of an atropine selective electrode for application in the atropine content control of a pharmaceutical product, injectable, frequently used in surgeries environments.

The electrodes were built with a membrane using cucurbituril (CB[6]) as a chemical recognition specie, 2-nitrophenyl octyl ether (2-NPOE) as mediator solvent and plasticizer, and potassium tetrakis(4-chlorophenyl)borate (KTPCIPB) as additive, all immobilized in carboxylated polyvinyl chloride (PVC-COOH) of high molecular weight. After membrane optimization, the electrodes were evaluated in solutions with pH set to 6, using the buffer MES (2-(N-Morpholino) ethane sulfonic acid)-NaOH, showing a lower limit of linear response of $(2.00 \pm 0.00) \times 10^{-6} \text{ mol L}^{-1}$, a practical limit of detection of $(6.93 \pm 1.72) \times 10^{-7} \text{ mol L}^{-1}$ and a calibration curve slope of 58.5 mV. Interference degree determination of many ions, namely, sodium chloride, calcium chloride, magnesium chloride, potassium chloride, ammonium chloride and lithium chloride, and excipients, like benzalkonium chloride, sodium citrate dihydrate, polysorbate 80, disodium EDTA, boric acid, dibasic sodium phosphate, sodium phosphate and benzylic alcohol, shows that electrodes were quite selective.

- 13995 | Development and characterization of knock-down RNAi and promoter-induced GUS expression lines for Arabinogalactan Protein 20 (AGP20)

in *Arabidopsis thaliana*

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AGP20 belongs to a large family of proteins rich in hydroxyproline and highly glycosylated, the Arabinogalactan Proteins (AGPs). Preliminary results from our lab, resulting from the expression pattern analysis of AGP20, revealed its presence in the female gametophyte cells and pistil tissues. This expression pattern marks the pathway followed by the pollen tube until it reaches the embryo sac inside the ovule, revealing the possible involvement of AGP20 in this process. Several AGPs are related to different aspects of sexual reproduction leading to the formation of seeds. Most of the AGPs are connected to the cell membrane by a glycosylphosphatidylinositol (GPI) anchor that can be cleaved, releasing the AGPs to the extracellular matrix where they can act as signalling molecules.

This study focused in one of these proteins - AGP20 - with the aim to obtain two constructs for this protein's function assessment in *Arabidopsis thaliana*: one for tracking AGP20 promoter activity using the reporter gene GUS; and one for the silencing of AGP20 gene by the RNA interference technique and proceed with the phenotypic analysis of the *agp20* knock-down plants.

- **14082 | Development of a gas chromatography-mass spectrometry method for quantification of chiral drugs in surface waters**

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The use of illicit drugs and legally prescribed pharmaceutical drugs that may be used as drugs of abuse is increasing exponentially worldwide. Recently, these compounds have been considered environmental contaminants due to their continuous disposal into the environment. Many of these drugs are chiral and available either as racemic mixtures or single enantiomers. It is well known that enantiomers may differ in their pharmacological and pharmacokinetics properties and toxicity [1,2]. These compounds are excreted as parent compounds or metabolites into the sewage system. Analysis of these residues in waste and surface waters can give insights about patterns of drugs consumption.

The aim of this work is the quantification and estimative of consumption of various classes of chiral drugs as beta-blockers, antidepressants and stimulants in surface and wastewaters. For that a gas chromatography-mass spectrometry method based on the diastereoisomers formation is being developed using chiral derivatization reagents as MTPA-Cl and different derivatization protocols. This method will be applied to the analysis of chiral drugs in waste and surface waters. Data will contribute to the best knowledge about drugs consumption by local population and to understand the environmental fate of these contaminants in the aquatic environment.

This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the program PT2020 and Chiral_Drugs_CESPU_2017.

[1] Ribeiro AR, Maia AS, Cass QB, Tiritan ME. Enantioseparation of chiral pharmaceuticals in biomedical and environmental analyses by liquid chromatography: an overview. *Journal of chromatography B*. 2014;968:8-21.

[2] Ribeiro C, Ribeiro A, Maia A, Tiritan M. Occurrence of Chiral Bioactive Compounds in the Aquatic Environment: A Review. *Symmetry*. 2017;9(10):215.

- **14024 | Development of moisturizing formulations containing urea and glycerine suitable for use in EEG techniques**

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The main barrier to signal transfer in electroencephalography (EEG) techniques is the stratum corneum. However, the high electrical impedance associated with this skin layer may be reduced by skin hydration, which is usually achieved by using humectants and occlusive agents.

The aim of this study was to develop gelled emulsions with hydrating properties suitable for use in EEG techniques. Therefore, gelled emulsions incorporating an electrolyte (NaCl), so that it can be used as conductor for the electrodes, and 10% (w/w) of urea and/or glycerine, as moisturizing agents, were prepared. A formulation without any of the moisturizing agents was also prepared. The first measurements of skin hydration, transepidermal water loss (TEWL), energy, smoothness and desquamation were assessed without any product applied on the skin. Then, 20 milligrams of each formulation were applied in the sites previously marked on the forearm of volunteers and spread with 20 circular movements. After the products were applied, measurements of skin hydration and TEWL were taken at 15, 30 and 60 minutes. Measurements of energy, smoothness and desquamation were taken at 25 and 60 minutes. The laboratory where the measurements took place had controlled conditions of temperature and relative humidity. All tests were performed on healthy women, aged around 20, after signing an informed consent.

The formulation containing both moisturizing agents caused a greater increase on skin hydration and showed lower values of TEWL comparing with the other formulations tested. Although there were no significant differences regarding energy, desquamation and smoothness of skin after the application of the different formulations it can be concluded that the association of the two moisturizers has synergistic effect and is more suitable for use in EEG techniques. However, more studies should be performed in order to better understand the mechanisms involved in the skin hydration process.

- **14226 | Differentiation of Portuguese wines according to their multi-elemental analysis**

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Portugal has the capacity of producing unique wines whose quality is increasingly recognized worldwide. Thus, the development of methods that are able to ensure their authenticity and quality is crucial. The mineral composition of wines reflects the mineral composition of the "bedrock" and the multi-elemental analysis of wine may be a valuable tool to ascertain its authenticity and geographic origin.

70 Portuguese wines, from 9 different regions, were analyzed for a wide panel of elements (53) in order to investigate whether the wines from different Portuguese Protected Geographical Indications (PGI) could be differentiated based on their multi-elemental analysis. Discriminant analysis was used to find the elements with greater discriminant power to distinguish among regions.

The analytical procedures used were those recommended by the Organisation of Vine and Wine (OIV), based on Flame Atomic Absorption Spectroscopy (FAAS) - for Na, K, Ca and Mg determination - and Inductively Coupled Plasma Mass Spectrometry (ICP-MS) - for the trace element determination. Since the OIV method for multi-elemental analysis of wine was only validated for 14 elements, a first step in this work was to validate it for a wider panel of elements, which was achieved for an additional set of 37 elements.

The multi-elemental analysis of the samples showed that the concentration of several elements was significantly different among regions. Discriminant analysis was used to analyze obtained data and showed that it was possible to differentiate the wines from the different PGI according to their elemental concentrations.

Despite being a preliminary work, performed on a limited set of samples, it was possible to verify that the concentration of certain elements is discriminant between PGI regions.

- 14257 | Distribution of renin-angiotensin system receptors in fetal programming hypertension: Influence of gender

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Background and aims. In western countries, placental insufficiency and intrauterine delay or prematurity are rising by delayed motherhood, increasing the risk of Fetal Programming Hypertension (FPH). The renin-angiotensin-system (RAS) also influences FPH. We aimed to investigate the distribution pattern of RAS receptors in the heart of male and female offspring from an animal model of FPH. **Methods.** Offspring of Sprague-Dawley rats exposed to global nutrient restriction from mid pregnancy to delivery (MUN) were compared to control offspring (CONTROL). Hearts from male and female MUN and CONTROL rats were processed for immunohistochemistry against AT1, AT2, Mas and MrgD receptors using microscopic images, acquired using the same microscope/CDD operating conditions. Quantitative image analysis and processing was done using PAQI software. From RGB images, only the blue component was used. Boundaries were delineated to extract the object of interest. Lower intensity level from control images was 138. This value was used for threshold segmentation of the objects of interest. **Results.** All receptors were detected in myocardium and vessels from female and male CONTROL rats. In MUN rats, there was an increase in AT1 and a decrease in AT2 and MrgD receptors. Differences between female and male tissues were also observed. **Conclusions:** The expression of RAS receptors is altered in FPH highlighting a role for the RAS in the development of FPH. Moreover, the differences observed between males and females reinforces the view that RAS dynamics is influenced by gender. **Acknowledgments:** This work received support from the European Union (FEDER funds through COMPETE) and National Funds (FCT) through project Pest-C/EQB/LA0006/2013 and FEM2015-63631R (Spain).

- 13952 | Do spanish speakers have awareness of the emblematic portuguese gestures?

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The present work aims to reflect on the phraseological units and emblematic gestures of the European Portuguese, but also to reflect on the phraseological units and Portuguese emblems within foreign language classes concerning a group of Spanish Speakers, last year, in Cáceres, Spain, where I did my internship, teaching Portuguese as a Second/ Foreign Language. The main goal was to provide knowledge to the students regarding phraseological units and emblems, making it possible, then, to establish a comparison with their native language, Spanish.

In this context, we made a choice of emblems that we consider to be typically used in the European Portuguese. Based on these emblems, a survey was submitted.

Moreover, to deepen this subject, we explored two types of specific and usual emblems in the European Portuguese and we tried to explain their symbolic information, change and loss of motivation over time and, finally, how did it established in the portuguese community.

Through this study, we intend to demonstrate that, in the teaching and learning of a foreign language, is fundamental to make known the phraseological units and emblems, because these are inherent to a culture, to people, to a community and to the look that they have towards the world and the Other.

- **14136 | Does Western diet induce neuroinflammation in the rat hippocampal formation of adolescent rats?**

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Western diets are considered a lifestyle risk factor related to obesity and to development of other pathologies such as type 2 diabetes, cancer or cardiovascular diseases. Childhood obesity is a chronic and complex disease, considered by the World Health Organization (WHO) as the most prevalent pediatric disease and one of the most serious public health challenge of the 21st century. Evidence shows that childhood obesity might be involved in cognitive impairment with decrease in school performance. The hippocampal formation is a region of brain responsible for learning and memory tasks and is diet-responsive.

The present study aimed to examine the effect of western diets on neuroinflammation and on microglial activation in the hippocampal formation. At 4 weeks of age, 30 adolescent male Wistar rats were randomly allocated to control, high-sugar (HS) and high-fat high-sugar (HFHS) diet groups during 8 weeks. After this period, rats were euthanized, perfused with 4% formaldehyde or PBS, and brains were removed for stereological methods or molecular biology techniques. The expression levels of the pro-inflammatory COX-2, IL-1, TNF α and IL-15 were measured by qRT-PCR in isolated hippocampal formation. Stereological methods were applied to estimate the total number of microglia and activated microglia detected by CD11b immunohistochemistry in hippocampal formation.

Our results showed that COX-2 gene expression increased significantly to 163% in HS animals and to 203% in HFHS group. IL-1 gene expression tends to increase in HS and also in HFHS animals, although the results were not statistically significant. TNF α and IL-15 genes did not change with tested diets.

The results obtained so far seem to indicate that western diets may in fact modulate neuroinflammation in the hippocampal formation, namely through COX-2 expression, and thus hippocampal-dependent memory. Nevertheless, experiments should be carried out to better understand the pathways involved in this process.

- **14267 | Drug-membrane interaction studies on revealing NSAIDs-induced cardiovascular toxicity**

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Nonsteroidal anti-inflammatory drugs (NSAIDs) play a prominent role worldwide due to their remarkable effectiveness in the treatment of acute and chronic inflammation. However, the chronic therapy with NSAIDs is associated with a high incidence of adverse effects.¹ NSAIDs-induced cardiovascular (CV) toxicity has been bringing up the importance of reviewing, through novel methodologies, the current therapeutic arsenal. Diclofenac (DIC) and Naproxen (NAP) take special interest in this question for opposite reasons: while DIC has generally been associated with high CV risk among nonselective NSAIDs, NAP has demonstrated lower risk than other nonselective NSAIDs and coxibs.² The increasing evidence that the occurrence of CV diseases is related to changes in the lipid composition and membrane structure has been triggering the study of the NSAIDs-induced alterations in membrane properties.³ Therefore, this work aims to describe the interaction of DIC and NAP with membrane model systems made of 1-palmytoil-2-oleoyl-sn-glycero-3-phosphocholine (POPC) or a mixture of POPC and cholesterol (CHOL) (3:1). Large unilamellar vesicles were prepared by the film hydration method followed by extrusion. The partition coefficient of these drugs was determined by derivative spectrophotometry at physiological temperature (37° C) and pH (7.4). Both drugs have affinity for POPC and POPC:CHOL bilayers, as log D of DIC was 3.3 ± 0.1 (POPC) and 3.1 ± 0.1 (POPC:CHOL) and log D of NAP was 3.2 ± 0.1 (POPC) and 3.4 ± 0.1 (POPC:CHOL). Further techniques will be used to evaluate the interaction of these drugs with membrane models, such as isothermal titration calorimetry and leakage

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1. Conaghan PG. Rheumatol Int 2012;32(6):1491.

2. Pawlosky N. Can Pharm J 2013;146(2):80.

3. Pereira-Leite C, et al. Prog Lipid Res 2013;52(4):571.

- **14098 | Effect of a Western diet on food intake regulation in adolescent rats**

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Obesity is a pandemic disease associated with the most prevalent and morbid pathologies in developed countries. Western diet is a well-known lifestyle risk factor related to metabolic dysfunction, abdominal obesity and metabolic syndrome, increasing the risk of cardiovascular diseases, type 2 diabetes and cancer. The aetiology of obesity is multifactorial, however, it is accepted that the dysfunctional control of appetite has a huge impact on energy balance. Long term high-fat and high sugar (HFHS) and high-sugar diet (HS) intake change plasma levels of ghrelin and leptin, and these changes are correlated with increase body fat weight.

The present study aimed to examine the effect of western diets on appetite pathways underlying food intake.

At 4 weeks of age, 30 adolescent male Wistar rats were randomly allocated to control, HS and HFHS diet groups during 8 weeks. After this period, rats were euthanized, tissues and blood were collected and preserved at -80°C. The expression levels of several genes involved in appetite regulation pathways were measured by qRT-PCR.

Unexpectedly, the results obtained in the hypothalamus showed that the anorexigenic gene pro-opiomelanocortin (POMC) increased its expression in HSHF group. Nevertheless, leptin receptor (OB-RB) tended to decrease in HFHS animals which may be in accordance with the observed tendency to an increase of the orexigenic neuropeptide Y (NPY) gene expression. Glucagon-like peptide 1 receptor (GLP-1R) gene also seemed to increase in HS animals. Ghrelin receptor (GHSR-1A) did not change in response to the tested diets.

The results obtained so far seem to indicate that western diets may modulate food-intake in adolescent rats although other analysis should be carried out to better understand the pathways involved in this process, namely serum insulin levels and leptin expression in visceral adipose tissue.

- **14050 | Effect of an increase in recirculation rate on a moving bed biofilm reactor (MBBR) used in a trout cultivation system**

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With an increase of fish exploitation and climatic changes, aquaculture gained an essential role in the supply of the human population. To increase production and make it as environmental friendly as possible, Aquaculture Recirculating Systems (RAS), where water is recycled after treatment, have been the central focus of numerous investigations.

In this study we focused on Trout RAS Systems in which the water is treated by nitrifying bacteria present in biofilters that remove ammonia, which is toxic to the fish. These bacterial communities develop in biofilm carriers, which are in motion in the moving bed biofilter system (MBBR). Studying their behavior under disturbance is an important subject for RAS.

Here we tried to understand the effects that an increase in water recirculation rate has in these microbial communities and eventually in water quality. The latter was monitored daily and more thoroughly before, during and after a disturbance event. Water samples were also taken before and after feeding the fish. Later, carriers from the three sampling times were incubated at the laboratory with water from the trout system supplemented with 2 mg 15NH₄⁺-N L⁻¹. From this point on samples were collected at time 0, 30 min and 60 min for posterior nutrient and isotope analysis. Carriers from each incubation were removed for biofilm dry weight quantification and DNA extraction.

It is expected to see changes in water quality, biofilm growth, nitrification behavior and bacterial community due to the increased recirculation applied.

KEY WORDS: Aquaculture; RAS; biofilm; MBBR; dry weight; nitrification, bacterial communities

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- **14144 | EFFECT OF ANGIOTENSIN II AT1 RECEPTOR ACTIVATING AUTOANTIBODIES ON THE RESPONSE OF THE RAT DISTAL COLON TO ANGIOTENSIN II**

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Background: Autoantibodies against the angiotensin II type 1 receptor (AT1R-Abs) are found in malignant and refractory hypertension, preeclampsia, systemic sclerosis (SS) and renal-allograft rejection patients. It is thought that AT1R-Abs mimic the action of Angiotensin II (Ang II) and worsen the prognosis of these conditions.

Aim: To characterize the response of the rat distal colon to AT1R-Abs and to evaluate if they affect the response to Ang II.

Animals and methods: Protocols were approved by the Animal Welfare Body. Male Wistar rats (8-14 weeks of age) were used. On the day of the experiment, rats were euthanized by decapitation and segments of the distal colon were mounted, along their longitudinal axis, under 1g of resting force, in organ baths filled with Krebs-Henseleit solution aerated with carbogen and maintained at 37°C. Isometric responses to AT1R-Abs from SS patients (non-cumulative responses) and to Ang II (cumulative responses) were recorded in the absence and presence of the SS serum. Emax and EC50 values were compared by Student's t test.

Results: Ang II caused a concentration-dependent contraction of the rat distal colon (Emax=22.78±6.72mN; EC50= 6.66±1.27nM). Differently, direct incubation with AT1R-Abs obtained from SS patients caused no alteration in the tension of the rat distal colon. Moreover, the AT1R-Abs tested did not alter the maximum contraction induced by Ang II (Emax=18.23±3.10mN, p>0.05) but the EC50 for Ang II was lower in the presence of the tested AT1R-Abs (EC50=3.53±0.36nM, p<0.05).

Conclusion: Activation of AT1 receptors with AT1R-Abs from SS patients increases the sensitivity of the rat distal colon to Ang II although it does not seem to alter the Ang II-mediated maximum contraction of the tissue. Further experiments are needed in order to better characterize this effect.

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- 13940 | Effect of early defoliation at flowering in cv. "Folgasão" B (*Vitis vinifera* L.) in Madeira Island

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The 'Folgasão' grape variety on Ilha da Madeira is a white and noble variety of Madeira Wine (sin. 'Terrantez'), producing high quality single-variety wines. 'Folgasão', due to the intrinsic characteristics of this variety and edaphoclimatic of the island, is very susceptible to powdery mildew and gray rot, making its cultivation extremely difficult.

In this work, we aimed to study the effects of early defoliation at flowering (EDF), and to verify the effects on yield and quality of grapes, of the white grape variety grafted in 99R. Also, as a comparison factor, a modality with classic defoliation (CD) was applied at veraison and another modality without any defoliation, representing the control (C). The three modalities, each one with 10 vines, were randomized applied in four blocks, in a total number of 120 vines.

It was verified through the obtained results, that at the level of yield, no differences with statistical significance, had been found. However, at the level of the porosity, early defoliation, conducted to a more aerated canopy.

It was verified that early defoliation promoted a lower compactness of the bunches and, due to better microclimate of the canopy, a reduction in the incidence of powdery mildew and grey rot. With regard to musts quality, this study showed a tendency to higher sugar content in the defoliated modalities, but a lower total acidity, what can be disadvantageous, in the production of Madeira Wine.

It was concluded that the modality of early defoliation at flowering (EDF), in cv. 'Folgasão', conducted to better grapes quality, without significant reducing of yield. It also presented the advantage of reducing the necessity of phytosanitary treatments, thus appearing as an alternative to anti-rot phytosanitary treatments.

Key-words: *Vitis vinifera* L., 'Folgasão', early defoliation, yield, quality.

- **14228 | Effect of gluten-free diet on serum HDL cholesterol levels in children and adolescents with Type 1 Diabetes Mellitus and Celiac Disease**

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Autoimmune diseases are a set of pathologies that result in an immune response against specific antigens in genetically predisposed individuals, more than one disease from this group of pathologies may occur in the same individual. Patients with Type 1 Diabetes *Mellitus* have an increased risk of developing Celiac Disease due to the common presence of HLA DQ2 and / or HLA DQ8 alleles and according to more recent studies, by the effect of the ingestion of gluten-containing foods on the human microbiota, associated with an inflammatory process that results in the reduction of HDL cholesterol. In this context, we intend to verify the effect of glutenfree diet in serum levels of HDL cholesterol in children and adolescents with both pathologies as well as in the comorbidities associated. For this, we collected the biochemical parameters of all the children and adolescents followed in Pediatric Service of the Centro Hospitalar de São João with a confirmed diagnosis of Type 1 Diabetes *Mellitus* and Celiac Disease, before and after the start of the gluten-free diet. The results showed an improvement in the glycemic profile with the exclusion of gluten from the diet, however, it was not found, with statistical significance, changes associated with the comorbidities of both pathologies.

- **14047 | Effect of Natural Deep Eutectic Solvent and chitosan nanoparticles on physicochemical properties of Locust Bean Gum films**

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In the recent years, production of food packaging films derived from renewable sources is a current topic within the food industry. This interest emerges due to the serious ecological problems caused by the continuous use of synthetic films (for example the production of large amounts of waste) which can be harmful for human health and the environment and have opened a big door of opportunity to develop eco-friendly film materials based on polysaccharides (PI).

In this respect, Locust Bean Gum (LBG) and Chitosan (CH) are certainly good candidates to serve as PI bioplastic materials since they are renewable, non-toxic and biodegradable. LBG and CH have been the subject of different studies with the objective to develop packaging applications. Nevertheless, the physical properties (poor mechanical properties and great moisture sensitivity) of these transparent bioplastics are not very satisfactory when compared with the oil-derived plastics. The addition of plasticizers come forth as strategy to improve these properties, however migration from the polymer film into the food can occur. Recently, Natural Deep Eutectic Solvents (NADESs) have arisen as novel alternative plasticizers that comply with the Green Chemistry principles, showing promising results in the early stages of investigation.

Within this scenario, in this communication, we report the use of choline chloride (ChCl)/lactic acid, NADES, as plasticizer for the production of blend films composed of LBG and CH nanoparticles (NPS) at different mixing ratios. CH-NPS were obtained after sonication and used as reinforcing agents in the LBG films. Films were prepared by the knife-coating technique. Transparent films were obtained and evaluated in terms of mechanical, water resistance, optical and microstructural properties. Significant differences were verified in the biofilms mechanical, microstructural properties and hygroscopic behavior for the LBG/CH ratios and plasticizer content considered.

- 13963 | Effects of a physical exercise program on the body composition of obese patients undergoing bariatric surgery - BaSEIB clinical trial.

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Introduction: Bariatric surgery (BS) is the most effective treatment for severe obesity, but also induces losses of lean (LM) and bone mass (BM). Our objective was to evaluate BS effects on body composition of obese patients and the effectiveness of exercise (EX) in preventing those changes. Methods: Randomized controlled clinical trial. Seventeen patients (13 women, 45 ± 11 years) with severe obesity ($BMI = 46.0 \pm 3.5 \text{ Kg/m}^2$) enrolled for gastric bypass were randomized to control (usual follow-up after BS; $n = 8$) or exercise group (usual follow-up + exercise; $n = 9$) and followed for 6 months. EX started 1 month after BS and consisted of 3/wk sessions of 90min/d, for 22 weeks. Body weight (BW), total and appendicular fat mass (FMt, FMa), total and appendicular LM (LMt, LMa), whole body and appendicular bone mineral content (BMct, BMCa) were assayed by DXA before, 1, and 6 months after BS. For statistical analysis we used IBM SPSS® version 23.

Results: One month after surgery patients had a reduction in BW ($-12.93 \pm 1.16 \text{ kg}$, $p < .001$), LMt ($-6.23 \pm 0.65 \text{ Kg}$, $p < .001$), FMt ($-6.20 \pm 2.78 \text{ Kg}$, $p < .001$) and an increase in BMct ($+0.39 \pm 0.01 \text{ g}$, $p < .001$). From the 1st to the 6th month after BS there was a further decrease in BW ($-22.49 \pm 6.30 \text{ Kg}$; $p < .001$), LMt ($-3.25 \pm 0.79 \text{ Kg}$; $p < .001$) and FMt ($-18.82 \pm 1.11 \text{ Kg}$; $p < .001$) and a decrease in BMct ($-0.53 \pm 0.01 \text{ g}$; $p < .001$). Between the 1st and 6th month after BS there were no differences in the variation of BW ($p = 0.675$), LMa ($p = 0.809$), LMt ($p = 0.765$), FMa ($p = 0.711$), FMt ($p = 0.714$), BMCa ($p = 0.876$) and BMct ($p = 0.443$) between the control and exercise groups. Adherence to the EX sessions (average attendance of $54 \pm 30\%$) had no influence on the effects of exercise on the variables assayed.

Conclusions: Six months after BS there was a significant decrease in BW, LMt, FMt and BMct. EX did not prevent the losses of LM and BMC associated with BS regardless of the adherence to the EX sessions.

Key words: Bariatric surgery, DXA, body composition, exercise.

- **14225 | Effects of aging on the density of interneurons containing neuropeptide Y and vasoactive intestinal polypeptide in the rat anterior piriform cortex**

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Normal aging is associated with various structural, neurochemical and functional brain changes. The olfactory deficits that occur during aging significantly affect health, well-being, and quality of life. The piriform cortex has an important role in the neural processing of odors. It has been identified as the main target of the olfactory bulb and the primary center by which olfactory information reaches several brain regions, including the olfactory bulb. This cortical area is a 3-layered cortex with a simple architecture, and contains a wide variety of interneurons that participate in feed-forward and feedback inhibitory circuits that regulate the excitability of pyramidal cells and modulate their response to odors. Most, if not all, of these interneurons contain gamma-aminobutyric acid (GABA) and many co-express several neuropeptides, including neuropeptide Y (NPY) and vasoactive intestinal polypeptide (VIP). These neuropeptides are involved in functions and behaviors, such as cognition, endocrine regulation, feeding, reward, modulation of circadian rhythms and olfaction. NPY and VIP influence olfactory bulb output via modulation of the activity of the internal granule cells. Due to this fact, in this study we have examined the density of NPY- and VIP-immunoreactive neurons in the anterior piriform cortex of adult and aged male Wistar rats. We found an age-related reduction in the neuropeptide expression. Thus, our results raise the possibility that the changes in neuropeptide levels herein observed in the anterior piriform cortex of aged rats might contribute for the olfactory deficits that occur during normal aging.

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- **14174 | Efficiency of hyperbaric medicine in acute carbon monoxide poisoning**

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Over the years we've been able to see the biggest technologic evolution ever. Regarding the therapeutic area, notable advances have been made among which we highlight Hyperbaric Medicine, that has been used in the treatment of various pathologies with magnificent results. Acute carbon monoxide (CO) poisoning is one of the most recommended pathologies for treatment through hyperbaric oxygenation. Lower temperatures and the ensuing need for heating in winter season are the cause of the increased number of accidents involving CO poisoning in this time of the year. In order to study the efficacy of this therapy in the treatment of acute CO poisoning, we performed an analysis of 17 clinical cases that occurred in 2016, of patients who were victims of this accident and were treated by hyperbaric oxygen therapy in Unidade de Medicina Hiperbárica do Hospital Pedro Hispano, Matosinhos.

To evaluate this 17 clinical cases (6 males and 11 females), we considered some important variables such as CO exposure source, carboxyhemoglobin (COHb) level, number of treatment sessions and its extent. The maximum level of COHb registered was 44,1% and the medium value observed was 26,2%, which is a higher value when compared to the reference range, which is 5% to 10% in smokers. After the recommended treatment, normally one or two sessions depending on COHb levels detected, this values decreased to a normal range. This improvement occurs because when the pressure is two to three times the atmospheric pressure, pure oxygen (100%) disassociates CO of hemoglobin and other cellular hemoproteins, promoting its elimination and consequent detoxification of the patient. Therefore, we could conclude that Hyperbaric Medicine is an efficient treatment in cases of CO poisoning.

- **14295 | EMG in backstroke start: prediction of entry velocity**

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A proficient start is decisive in sprint swimming events, requiring maximal forces to be exerted in a short time period. We aimed to determine if the electromyography (EMG) activity can predict the entry velocity of two backstroke start variants. Following a four week familiarization with each start variant (with hands on the highest horizontal vs vertical handgrip, both with feet positioned parallel and partially emerged), 10 male competitive backstrokers (20.6 ± 6.0 and 12.8 ± 8.43 yrs of age and training background) randomly performed six 15 m maximal trials (three in each variant), being the mean used for statistical procedures. Surface EMG of biceps brachii, triceps brachii, rectus femoris, biceps femoris, gastrocnemius medialis and tibialis anterior was recorded and processed using time integral EMG (iEMG) during the entry phase (from the first fingertip water contact until the swimmers full immersion). After a correlational analysis, regression equations for entry velocity prediction were defined by EMG activity of rectus femoris for variant with horizontal handgrips and by biceps brachii for variant with hands vertically positioned: $r = -0.62$, adjusted $r^2 = 0.30$ and $p = 0.06$ vs $r = -0.60$, adjusted $r^2 = 0.28$ and $p = 0.07$. Data suggest that swimmers with lower EMG activity in the reported muscles will be capable of higher entry velocity in backstroke starts. Coaches should plan strength training to maximize the contribution of relevant muscles depending of the start variant (that do not present inverse relationships with entry velocity). In the future these relationships should be studied individually or with a more homogenic group of swimmers (e.g. control the effect of gravitational force and expertise level). This work represents the beginning of a starting artificial intelligence project with the purpose to develop a model to predict backstroke starts performance in a more reliable way, using EMG activity.

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- **14151 | Enantioselective method for quantification of chiral drugs in environmental matrices**

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The connection between surface and groundwater can result in contamination of drinking water by drugs. Drugs can affect the environment through its elimination by industry, hospitals and domestic sewage, as they can either be unused or after human consumption (main source of drugs in the environment). Medicinal products and their metabolites are excreted and collected in wastewater treatment plans (WWTP). However, WWTP are not designed to completely remove small molecules at low concentrations, as is the case with drugs and its metabolites.

Chiral drugs (CD) have shown a serious concern as they are found in different forms in the environment. They can be used as racemates or as pure enantiomers and have been detected in different enantiomeric compositions.

Enantiomers have differences in pharmacokinetics, pharmacodynamics and (eco)toxicity, which may affect aquatic organisms in an enantioselective way.

Concerning the quantification in the environment, normally, CD are ignored and treated as a single molecular entity[1]. Metabolism and biodegradation in biotic media, as in the secondary treatment of WWTP is expected to be enantioselective due to the involvement of chiral molecules. Herein, it is important the quantification of enantiomeric composition as a tool in biodegradation, toxicological studies and the monitorization of waste and surface waters, using enantioselective analytical methods[2].

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1. Maia, A.S., et al., Chiral Analysis of Pesticides and Drugs of Environmental Concern: Biodegradation and Enantiomeric Fraction. 2017.
2. Ribeiro, C., et al., Occurrence of Chiral Bioactive Compounds in the Aquatic Environment: A Review. 2017.

- **14168 | Epi/genetic mechanisms are involved in the expression modulation of Receptor tyrosine kinases in Gastric Cancer**

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Gastric cancer (GC) is one of the most incident and deadliest cancer types. Most cases are diagnosed in advanced stages, with few treatment options available. Several clinical trials have taken place, using antibodies targeting genes known to be aberrantly expressed in GC, such as the receptor tyrosine kinases (RTKs) HER2, VEGFR2 and FGFR2. Trastuzumab (anti-HER2) and Ramucirumab (anti-VEGFR2) are clinically approved targeted therapies in GC, while anti-FGFR2 therapy is still in trial. The impact of targeted treatment in patient overall survival is however poor. We hypothesize that the target molecules and/or their partners are impaired by epi/genetic events that may affect therapy efficacy. We analysed selected GC cases for promoter methylation status and copy number variation of VEGFR2 and FGFR2, by bisulfite sequencing, and VEGFR2, VEGFA and FGFR2 RNA expression by Real-Time PCR.

We verified that hypermethylation of VEGFR2 promoter correlates with increased expression of VEGFR2 mRNA, while hypomethylation correlates with decrease expression of the gene. VEGFA copy number gain was correlated with increased expression of VEGFA expression, supporting amplification as an activating mechanism of this VEGFR2 ligand. FGFR2 promoter was frequently hypomethylated and its mRNA isoform frequently overexpressed.

These preliminary results demonstrate that RTKs and/or associated partners are impaired by epi/genetic events and this may affect how tumour cells respond to targeted therapy.

- **14081 | Evaluating the lipophilicity of drugs using liposomes**

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Lipophilicity is an important parameter that influences pharmacokinetics and pharmacodynamics behaviors, and its evaluation is important and meaningful in design of new drugs [1]. Lipophilicity is commonly expressed as a partition coefficient (LogP) [2]. Octanol/water system is the classical method for logP determination, in which octanol is the hydrophobic phase and water is the hydrophilic phase [1-3]. However, this method is too simplistic, since only takes in account the non-polar interactions and do not mimics all the complexity that is present in the biological membranes [2, 4]. The biomimetic models, namely using liposomes, allow to express the lipophilicity of drugs with greater biological relevance. In fact, liposomes are bilayer systems that mimic the cellular membranes and take in consideration not only the non-polar interactions but also the electrostatic ones [4].

The aim of this work is to compare the partition coefficient of ten drugs, using liposomes as biomimetic model, prepared with two different lipids: POPC (1-palmitoyl-2-oleoyl-sn-glycero-3-phosphocholine) and DMPC (1,2-dimyristoyl-sn-glycero-3-phosphocholine). The partition coefficient was evaluated using derivative spectroscopy. The obtained results allow to establish some considerations about which type of lipid is more convenient to be used for evaluating lipophilicity of drugs.

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References:

1. Arnott, J.A. and S.L. Planey, *Expert Opin Drug Discov*, 2012. 7(10): p. 863-75.
2. Liu, X., B. Testa, and A. Fahr, *Pharm Res*, 2011. 28(5): p. 962-77.
3. Pignatello, R., et al., *J Pharm Bioallied Sci*, 2011. 3(1): p. 4-14.
4. Magalhaes, L.M., et al., *Nat Protoc*, 2010. 5(11): p. 1823-30.

- **13999 | Evaluation of Low Back Pain in a Dance Group of University Students**

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Low back pain is the term used to describe pain in the lower back.

The objective of this study was to evaluate the relationship between the practice of ballroom dancing and the presence of low back pain in the dancers of this modality. Thus, a questionnaire was made to a restricted population, rather, GDICBAS (Dance Group of the Biomedical Sciences Institute Abel Salazar). The first part consisted of a questionnaire of 36 health-related quality of life assessment items (MOS-SF-36): The second part of the questionnaire, carried out for individuals who had low back pain, is based on the Oswestry Lumbar Pain Questionnaire. The third part, for all subjects, consisted in evaluating the pain intensity according to the visual analogue scale (VAS).

We obtained answers from 16 individuals from the academic group in question. It was verified the existence of pain in the lower back in some of the elements of the dance group. The lumbar pains derived from the act of dancing are associated with the orthostatic position, which causes a lumbar overload. The rigid posture acquired in this type of dance by standing for long periods of time, presenting the knees in extension and having a large extension of the spine, causes all the load to go to the lower back, which can cause pain.

Based on this study, a treatment (physical therapy and pharmacology) and prevention, in the sense of avoiding injuries that could be the origin of this kind of pain, can be proposed.

- **14079 | Evaluation of prospective reference genes for the quantification of the expression of profilin in Acer negundo pollen**

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There is an increasing trend towards the prevalence of respiratory allergic diseases in urban areas. This tendency seems to be potentiated by external stimuli such as air pollution. Plant profilins are a small family of molecules that have a similar primary structure between different species and are highly conserved. Profilin is considered an important pan-allergenic, being expressed in pollen of several species of plants. In this work, the expression of pollen profilin from *Acer negundo* subjected to various experimental levels of pollution was observed by conventional PCR. We aim to confirm and quantify the expression of pollen profilin expression by RT-qPCR. This technique allows the measurement of the amplified product in real time by comparison with the amplification of reference genes. Reference genes are those whose expression remains unchanged by the experimental process. The choice of the reference gene is crucial for the reliability of the qPCR results. As reference genes, the tubulin, the actin and the 18S rRNA genes were tested to determine whether their expression remains stable in all pollen samples exposed to different levels of pollution. Preliminary results indicate that the tubulin and actin genes would not be appropriate reference genes, either because there exists variation on the actin gene expression, or because the primers used, tomato specific, do not amplify tubulin in *Acer negundo*. As to the 18S rRNA gene, it has been found that not only the 18S tomato primers can amplify the 18S rRNA of *Acer negundo*, but the expression of the 18S rRNA gene is stable in all samples. That makes it a suitable candidate as a reference gene in the quantification of profilin gene expression in *Acer negundo* pollen by qPCR.

- **14011 | Evaluation of segmental body composition in obese patients submitted to bariatric surgery**

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Introduction: Obesity is an important public health issue. Bariatric surgery appeared to aid the treatment of this chronic disease. Body composition assessment plays an important role in the evaluation of the nutritional status of patients submitted to bariatric surgery. However, changes in the segmental body composition of these patients are not fully understood.

Aim: To assess the segmental body composition of obese patients submitted to bariatric surgery and to study their evolution along the time.

Methods: In this retrospective study, we studied patients who attended Nutrition appointments at Centro Hospitalar de São João, E.P.E., throughout 36 months. We performed anthropometric evaluation and body composition analysis by bioelectrical impedance

Results: The sample consisted of 170 patients, 71.8% females and 28.2% males, with a mean age 39 years. Between the initial to the evaluation 36 months after surgery, there was a decrease in BMI from 43.9 kg/m² to 30.5 kg/m² (p <0.001), a decrease of 15.2% in the percentage of body fat (p = 0.002) and a decrease in the waist-to-height ratio to 0.572 (p<0.001). Regarding the percentage of segmental fat mass, there was a significant decrease in all segments up to the 12th month after surgery. However, in the last months of follow-up, there was increases all these indicators.

Conclusion: Our results showed a greater decrease in the percentage of body fat in the arms when compared with the other body segments.

Keywords: Body Composition, Bariatric Surgery, Obesity, Body Regions, Bioelectrical Impedance.

- **14216 | Evaluation of the best water polo Portuguese male players: a longitudinal project**

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Water polo is an open, discontinuous and acyclic sport, depending on a wide number of performance influencing factors. From this complex group of determinants, a well-developed technique is one of the most relevant characteristics of elite water polo players. Therefore, we propose to evaluate longitudinally some of the most important water polo specific motor skills of the best Portuguese male players. For that purpose we will use the following tests (cf. Canossa et al., 2016): (i) in-water vertical jump (to evaluate players jump performance), using a suspended graduated board and a video camera; (ii) shot speed and shot efficacy (to evaluate players shooting performance), calculating the ratio between shot attempts and goals scored without displacement (penalty situation) and with previous displacement to the 5m mark (a radar and a video camera are used to measure shot speed and shot action, respectively); (iii) shot accuracy (to complete players shooting performance testing), using a pre-designed target with eight holes attached to the front of the goal being allowed six trials per test situation (shot accuracy = $[(n^{\circ} \text{ of balls introduced in the holes} \times 100) / n^{\circ} \text{ of shots}]$); (iv) functional test for agility performance (to evaluate players agility during a decision-making task), using an in-water PVC square in which the tested player moves as quickly as possible, changing its displacement according to ball directions after teammates pass. These tests will be complemented with evaluations under the game tactical analysis scope, where technique acts as a support of team collective actions. The main goal of the project is to characterize the best Portuguese male players and to do a follow up of their performance determinants allow a training season. Canossa et al. (2016). Vertical jump and shot speed, efficacy and accuracy in water polo. *Int J Perform Anal Sport*, 16: 64-79.

- **14191 | Evaluation of the rheological and texture characteristics of hydrogels composed of stimuli-responsive polymers**

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Polymers sensitive to external stimuli such as pH, temperature and ionic strength are used in the preparation of hydrogels with various pharmaceutical and cosmetic applications.

Hydrogels composed of gelling agents sensitive to the following external stimuli were prepared: pH (PFC® 1%, w/w); temperature (Pluronic® F127 20%, w/w) and ionic strength (sodium alginate 2.5%, w/w). The rheological behaviour and the texture characteristics of PFC® hydrogels with pH values ranging from 6.0 to 8.5, Pluronic® hydrogel at temperatures between 20°C and 45°C and sodium alginate hydrogels added with 4% to 6% of a calcium chloride solution were compared.

Texture analysis were performed using a texturometer and the maximum force (correlated with firmness), the negative area (correlated with adhesiveness) and the positive area (correlated with compressibility) were evaluated. The rheological studies were performed using a viscometer of concentric cylinders, and the flow curves were obtained at different temperatures in the shear rate range of 1.0 to 500s⁻¹.

In the case of PFC® hydrogels, there were no significant differences of adhesiveness at pH values between 6 and 8. The values of firmness and compressibility were higher in the case of hydrogels with pH 7.5. The rheological profiles of the hydrogels with different pH were practically overlapping. Regarding the Pluronic® hydrogel, the texture parameters presented maximum values at temperatures of 40-45°C and the viscosity values were high at temperatures above 25°C. In the case of alginate hydrogels, the adhesiveness decreased with the increase of calcium added, while the firmness and the compressibility increased, with maximum values in the case of the addition of 6% of calcium chloride solution.

The PFC® hydrogels presented the highest viscosity, while the hydrogel of Pluronic® at 40-45°C presented the highest values of the texture parameters. The alginate hydrogels presented the lowest values of texture and viscosity.

- 14273 | Excess folic acid during the perigestational period - Impact on adipose tissue and intestinal metabolic and inflammatory gene expression in adult offspring

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Our group has previously demonstrated that perigestational high folic acid (HFA) exposure predisposes female offspring to an insulin-resistant state and renders them more susceptible to develop metabolic dysfunction in adulthood after a metabolic challenge with fructose feeding (1).

This work aims to study the expression of key genes involved in the regulation of lipid metabolism in visceral adipose tissue (VAT), and also in the inflammation at jejunum, of adult offspring previously exposed to perigestational HFA, as well as the effect of fructose feeding on it.

Sprague-Dawley females were administered a dose of folic acid recommended for pregnancy (C, 2 mg FA/kg of diet) or a HFA dose (40 mg FA/kg of diet) which began at mating and stopped only at weaning. Progeny were divided at 10 months of age into a group fed the standard rat diet (C/Std and HFA/Std) and a group fed 10% fructose in the drinking water plus the standard rat diet (C/Fru and HFA/Fru). Fructose feeding lasted from 10 to 13 months of age, when the animals were sacrificed for tissue collection. The expression levels of genes that codify enzymes involved in the synthesis and esterification of fatty acids were analyzed in VAT by qRT-PCR, namely acetyl-CoA carboxylase, fatty acid synthase and glycerol-3-phosphate acyltransferase 1. Interleukin-1beta gene expression in jejunum was also evaluated by qRT-PCR.

The results obtained so far seem to indicate that fructose exposition tended to increase enzymes involved in fatty acid synthesis in VAT and may interfere with inflammatory process in jejunum. Nevertheless, the results are only preliminary and more samples have to be analyzed to confirm these results and to understand if perigestational HFA exposition may also interfere in these pathways.

(1) Keating E, et al. (2015) J Endocrinol 224(3):245-259

- **14272 | Excess folic acid during the perigestational period - Impact on hepatic metabolic gene expression in adult offspring**

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Our group has previously demonstrated that perigestational high folic acid (HFA) exposure predisposes female offspring to an insulin-resistant state and renders them more susceptible to develop metabolic dysfunction in adulthood after a metabolic challenge with fructose feeding (1).

This work aims to study the expression of key genes involved in the regulation of lipid metabolism in the liver of adult offspring previously exposed to perigestational HFA and the effect of fructose feeding on it.

Sprague-Dawley females were administered a dose of folic acid recommended for pregnancy (C, 2 mg FA/kg of diet) or a HFA dose (40 mg FA/kg of diet) which began at mating and stopped only at weaning. Progeny were divided at 10 months of age into a group fed the standard rat diet (C/Std and HFA/Std) and a group fed 10% fructose in the drinking water plus the standard rat diet (C/Fru and HFA/Fru). Fructose feeding lasted from 10 to 13 months of age, when the animals were sacrificed for tissue collection. The expression levels of genes that codify enzymes involved in the synthesis and esterification of fatty acids were analyzed in the liver by qRT-PCR, namely acetyl-CoA carboxylase, fatty acid synthase, glycerol-3-phosphate acyltransferase 1 and the mammalian target of rapamycin (mTOR). Gene expression of two important transcription factors, carbohydrate-responsive element-binding protein (ChREBP) and sterol regulatory element-binding protein (SREBP), were also evaluated by qRT-PCR as well as interleukin-1beta gene.

The results obtained so far seem to indicate that perigestational HFA exposition may potentiate the metabolic dysfunction upon fructose feeding of these animals by changing the expression of some genes involved in lipid metabolism. Nevertheless, the results are only preliminary and more samples have to be analyzed to confirm these results.

(1) Keating E, et al. (2015) J Endocrinol 224(3):245-259

- **14299 | Exercise program for people living beyond cancer: De Volta a Forma project**

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The majority of people living with or recovering from cancer, fail to comply with physical activity recommendations. However, exercise programs in cancer survivors research generally demonstrates significant and positive impact on physical fitness and quality of life. The project "De Volta à Forma" is a partnership between academia (FADEUP), a non-profit organization (APLL) and Porto Municipality aiming to provide regular physical exercise classes to cancer survivors living in Porto. The project offers supervised exercise classes on two days per week. Multicomponent sessions are planned to improve physical fitness components and overall physical activity levels through group activities involving functional movements add a positive social environment. Physical Fitness assessments would be done to help training programming and to verify the impact of exercise on fitness and quality of life among participants. The aim of the present study is to describe some parameters of Functional Movement Scores (FMS) at baseline of "De Volta à Forma" Project.

Data was collected in November 2017, during a regular exercise session. Researchers were trained into FMS protocol before perform the tests.

Participants are 5 women (mean age= 62.4; SD =9.73). Shoulder mobility score was 1.8 (SD= 0.44); Leg Raise score was 2.0 (SD=0.79), rotary stability score was 1.7 (SD=0.44) and Total FMS ranged between 6.0 and 12.5 (mean=9.0; SD =2.43). Results suggested the importance of multicomponent sessions that could improve functionality among participants. Results will also inform exercise prescription and follow up will verify the impact of those prescriptions and practice.

- **13992 | Exploiting fluorescence quenching for quantitative analysis of tartrazine and sunset yellow**

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In this work, the fluorescence resonance energy transfer (FRET) between CdTe quantum dots and tartrazine or sunset yellow was evaluated as a new approach for the analytical quantification of those food colorants. The synthesized CdTe QDs capped with thioglycolic acid (TGA-CdTe QDs) were characterized through spectrophotometric methods and the quantum yield was also determined. The addition of the food colorants tartrazine or sunset yellow caused quenching in the fluorescence emission of the nanoparticles. Some parameters affecting the quenching were studied and optimized in order to achieve the highest quenching efficiency, measured in total quenching percentage. The optimized parameters were the reaction's temperature, concentration of the nanoparticles and time of reaction. Finally, using the optimized experimental conditions, a linear response curve was established and the food colorants concentration in food stuffs could be determined based on the reduction of the TGA-CdTe QDs fluorescence intensity.

Acknowledgements:

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia and Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013.

- **14065 | Exploring the bioactivity of white wine phenolics in the context of type II diabetes and Alzheimer disease interlink**

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The emergence of experimental evidences interlinking type II diabetes to Alzheimer's disease increases the social and economic dimension of these health problems. Thus, the development of new therapeutic strategies to address these overlapping health issues is a scientific and biomedical priority. In this ongoing project, the bioactivity of white wine phenolic compounds is being explored in order to develop a polyvalent therapeutic formulation for diabetes and brain degenerative disorders. An extract of phenolic compounds was obtained from white wine of Douro region by their selective adsorption to polyvinylpyrrolidone polymer (PVPP). HPLC-DAD analysis revealed that PVPP-white wine extract is particularly rich in phenolic acids (gallic, trans-caftaric and chlorogenic acids) and proanthocyanidins. Cell-free assays showed that PVPP-white wine extract displays an effective inhibitory activity towards α -glucosidase (similar to acarbose), suggesting its potential to modulate glucose absorption and, consequently, glucose homeostasis. Additionally, the extract showed a strong ability to scavenge superoxide anion radical produced by xanthine oxidase, an enzyme with a key role in oxidative stress connected with both Alzheimer's disease and type II diabetes. The potential of the wine extract to modulate the brain cholinergic system was assessed by its effects on the kinetics of brain acetylcholinesterase. Results showed a concentration-dependent decrease of the maximum velocity, without significant effects on the K_m of the enzyme. Thus, white wine extract has a large spectrum of bioactivity with relevance in the context of type II diabetes to Alzheimer's disease.

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- **14177 | Expression of angiotensin II AT2 receptor in the colon of TNBS-treated rats**
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Background: Inflammatory Bowel Disease (IBD) is a chronic relapsing condition of unclear etiology, although genetic predisposition and immune system unbalances play a role. Recently, the renin-angiotensin system has been implicated in the development of the disease, namely the angiotensin II type 1 receptor (AT1R). The role for the AT2 receptor (AT2R) is not clear yet.

Aim: To compare the colonic expression and distribution profile of the AT2R in controls and in rats with TNBS-induced IBD.

Animals and methods: Protocols were approved by the Animal Welfare Body. Male Wistar rats (9 weeks-old) were intra-rectally instilled with TNBS 20mg/rat in a 30% ethanolic solution, or used as controls. After 7-8 days, disease activity was scored, rats were euthanized by decapitation, and a segment of the distal colon was processed for immunohistochemistry against the AT2R. Digital images from the immunostained sections were acquired using a digital color camera and a semi-quantitative analysis was performed.

Results: Microscopic observation showed a significant increase in the thickness of muscular colonic layers with infiltration of immune cells in the submucosa. AT2R was expressed in the smooth muscle of both control and TNBS-treated rats, but its expression seemed decreased in the animal model. Interestingly, submucosal inflammatory infiltrate observed in TNBS-treated rats had a higher expression of AT2R.

Conclusions: These preliminary results suggest that the AT2R is less expressed in the structural colonic tissue of TNBS-treated rats but markedly expressed in the submucosal immune cells. Further studies will determine whether these alterations are involved in the pathophysiology of the disease, namely as an anti-inflammatory pathway to control the local damage.

Acknowledgements: M. Morato thanks GEDII - Grupo de Estudo da Doença Inflamatória Intestinal, for funding and Mrs. Céu Pereira for excellent technical assistance.

- 13904 | Extending the knowledge on *Psychotria peduncularis* (Salisb.) Steyererm

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Natural products complexity hides promising compounds with therapeutic efficacy and safety. Drug discovery from plants remains a successful strategy, and despite the use in traditional medicine, most species lack scientific data on their biological properties. *Psychotria peduncularis* (Salisb.) Steyererm is a medicinal species native from Guinea-Bissau, traditionally used as tranquilizer and to treat hypertension. In this work we intended to explore the anti-inflammatory potential of *P. peduncularis* leaves and stem. For this purpose, aqueous extracts prepared from both materials were tested concerning their capacity to scavenge nitric oxide radical, a reactive species with an essential role in inflammation. Results revealed that both extracts scavenge nitric oxide radical in a concentration-dependent way, leaves being the most active material with an IC₂₅ value of 7.19 µg/mL. In order to try to establish possible relationships between the chemical composition and the biological activities observed, the phenolic profile of the extracts was studied by HPLC-DAD. Several phenolic acids and flavonoids were found in the extracts, leaves presenting higher diversity of compounds. Studies on the inhibition of 5-lipoxygenase, an enzyme involved in the inflammatory cascade, are in course.

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- 14086 | Fatty acid profiling of *Armina maculata* and assessment of its potential as a producer of anti-inflammatory agents

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The wide variety of promising marine natural products exerting relevant biological properties, and the emerging trends on the cosmeceutical industry, prompted us to evaluate the anti-inflammatory potential of the Heterobranchia *Armina maculata*, from Portuguese coastal waters. Qualitative and quantitative analysis of its fatty acid profile allowed the identification of more than 20 compounds, revealing considerable amounts of n-3 PUFA. *A. maculata* acetonetic extract significantly reduced the levels of NO in LPS-stimulated RAW 264.7 cells, which appears to be partially correlated with a strong scavenging effect. The results indicate that *A. maculata* may have interest for its content in potential anti-inflammatory agents, with possible applications both in cosmeceutical and pharmaceutical products.

Acknowledgments: This work received financial support from National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia/Ministério da Educação e Ciência) through project UID/QUI/50006/2013, co-financed by European Union (FEDER under the Partnership Agreement PT2020), and from Norte Portugal Regional Operational Programme (NORTE 2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (ERDF) (project NORTE-01-0145-FEDER-000024). To all financing sources the authors are greatly indebted.

- **14052 | Filling Fraction effects on microbial communities present in aquaculture moving bed biofilters (MBBR)**

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In the last few years an increasing consumption of seafood led to a decrease in aquatic biodiversity, forcing the implementation of aquaculture systems. To reduce the negative impacts of the currently practiced aquaculture and to optimize its fish production, Recirculating Aquaculture Systems (RAS) were created, with water recycling after treatment by nitrifying bacterial communities (Tal et al. 2009).

In RAS systems bacterial communities are developed in the form of biofilms attached to moving carriers (MBBR biofilters) (Pedersen et al. 2014). The aim of this project is to understand the effects of the filling fraction (FF, percentage of biofilm carriers in the bioreactor) on these communities and its impact on ammonia removal.

In order to evaluate the effects, three different FF are going to be studied after a biofilm maturation period, where the bacteria are fed daily with a nutrient mix solution at 2mg NH₄⁺-N L⁻¹. Presently, due to the fact that the bacterial biofilm is still developing, data available refer only to the methodologies developed and to preliminary results.

Afterwards, biofilm growth for the different FF will be evaluated and bacteria will be enumerated (CFU and DAPI). Ecophysiological studies (oxygen consumption rates) and molecular analyses, as PCR and DGGE, will also be performed. This way we expect to obtain important information on MBBR functioning for utilization in RAS aquaculture systems.

Key words: aquaculture; RAS; biofilm; MBBR; filling fraction; bacteria; ammonia removal

References:

Tal, Y., Schreier, H., Sowers, K., Stubblefield, J., Place, A., Zohar, Y., 2009. Environmentally sustainable land-based marine aquaculture. *Aquaculture*, 286: 28-35.

Pedersen, L.F., Oosterveld, R. e Pedersen, P. B., 2014. Nitrification performance and robustness of fixed and moving bed biofilters having identical carrier elements. *Aquacultural Engineering*. 65: 37-45

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- **14045 | Fluid inclusion studies in a Li-pegmatite from Covas do Barroso area, Northern Portugal**

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The Covas do Barroso area comprises several lithium-rich aplite-pegmatite veins that crosscut metasediments of upper Ordovician to lower Devonian in age. The host-rocks have been regionally metamorphosed to the andalusite zone. In the region, several Hercynian granites occur, namely syntectonic two-mica granites and post-tectonic biotite granites. Aiming at characterizing the fluid composition associated with Li-mineralizations, fluid inclusion studies were carried out in the quartz associated to spodumene from a pegmatite vein of the "Barroso Mine".

Petrographic, microthermometric and Raman microspectrometry analyses carried out in quartz and spodumene revealed the existence of different fluids trapped in fluid inclusions: H₂O-CO₂-CH₄-N₂-NaCl fluids, with high water content and a volatile phase dominated by CO₂ with lower amounts of CH₄ and N₂. These fluids show medium salinity and a variable density; CO₂-CH₄-N₂ fluids, dominated by CO₂ with lower amounts of CH₄ and N₂ and a high density; aqueous H₂O-NaCl fluids with traces of CH₄ and N₂ in the volatile phase, medium salinity and high density. The micro-Raman spectroscopy analysis performed in the solid phases of the fluid inclusions revealed the presence of quartz and zabuyelite included in spodumene, and nahcolite in quartz.

The combination of fluid inclusion data with the lithium aluminosilicate stability diagram and the metamorphic conditions in the area, allowed to define the P-T trapping conditions of these ore fluids.

- **13993 | Fluorometric methodology based on CdTe quantum dots for determination of amaranth, erythrosine B and malachite green**

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Metal chalcogenide quantum dots (QDs) have attracted considerable attention due to their size-tunable photoemission and quantum confinement. Among them, CdTe based quantum dots constitute an example of nanoparticles with multiple applications in different areas. An array of several methods have been developed to synthesize those QDs, but recently the microwave based procedures have taking more attention from research. In the proposed work, some CdTe QDs capped and stabilized with thioglycolic acid were synthesized in the laboratory through microwave radiation. The obtained QDs were characterized by spectrophotometric methods. Afterwards, they were used to develop a new methodology for the determination of some food colorants: amaranth, erythrosine B and malachite green. The developed procedure exploited the quenching effect of those analytes on the native fluorescence of the TGA-CdTe QDs. Several parameters influencing the determination were optimized, namely: time of the reaction, concentration of the nanoparticles and temperature. By using the optimized parameters, a calibration curve was established and some assays for quantification of the food colorants in real samples was performed.

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- **14058 | Fucoidan/Chitosan nanoparticles: the influence of type and amount of polysaccharides**

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Drug delivery systems are engineered technologies for the targeted delivery and/or controlled release of therapeutic agents. Also the study of marine polysaccharides has opened new doors to the pharmaceutical industry. With this, the idea of studying the interaction between fucoidan and chitosan polysaccharides with the objective of "constructing" a drug delivery system, based on the behavior at different pH.

Chitosan (a sugar that is obtained from the hard outer skeleton of shellfish) and Fucoidan (occur naturally in the cell walls of brown seaweeds) are the two polysaccharides used in this study. Ratios of 1:1, 3:1 and 5:1 of fucoidan and chitosan, respectively, were mixed and characterized to evaluate the physicochemical properties. Two types of chitosan (medium and low molecular weight) were selected to assess their effect in the design of the drug delivery system.

Fourier-transform infrared spectroscopy (FTIR) revealed the interactions between the marine polysaccharides when assembled as nanoparticles. Dynamic light scattering was used to analyze the nanoparticles in terms of size, polydispersity index and zeta potential when submitted to different pH conditions. In addition, the storage stability of the different nanoparticles was evaluated.

The obtained results show that fucoidan/ chitosan nanoparticles have different behaviors, either when the ratio changes, and according to the type of chitosan.

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- 13899 | *Fucus vesiculosus*: from rocky seaside to pharmacy, a reality or a mirage?

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The humanity always searched among natural resources products to satisfy their health needs. Nowadays, more than 90% of the medicines are from natural origin. *Fucus vesiculosus* is a brown algae found in rocky seashores of the Pacific and Atlantic ocean and in zones of high salinity.

An ethanolic extract was prepared for the chemical characterization (by HPLC-DAD and GC-FID) and bioactivity analysis (scavenging of DPPH and NO) of *F. vesiculosus*.

HPLC-DAD analysis showed the absence of carotenoids, usually found in this species, and the presence of chlorophyll a and its derivatives. It was also found a degradation product of chlorophyll a, pheophytin a. By GC-FID it was possible to identify thirteen fatty acids, including both saturated and unsaturated ones. C18:1cis9, C16:0 and C14:0 were the most abundant fatty acids in the extract.

Regarding antioxidant capacity, the extract revealed a reduced scavenging effect: 13.21±1.32% against DPPH and 14.80±2.29% against NO, at the highest concentration tested (85.81 and 32.4 mg/mL, respectively).

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 5th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- **14031 | Habitat use by waterbirds in the lower Douro estuary**

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The large Southwestern Europe estuaries are known to be important stopover and wintering sites for numerous migratory waterbirds. Conversely, information is lacking for the smaller estuaries despite these being more numerous.

The Douro estuary is a narrow estuary located in northern Portugal, which reaches the sea between two highly populated cities, Porto and Vila Nova de Gaia. Its mouth includes a local nature reserve (*Reserva Natural Local do Estuário do Douro*, RNLED) and the mouth of a small stream (*Foz da Ribeira da Granja*, FRG), respectively in the south and northern banks of the river. Both have important biotopes for waterbirds, but there is a lack of information about how they use them.

In this study we looked for differences in the composition of the waterbird communities between the winter and pre-breeding migratory periods, and how the communities used the biotopes available in each area according to tidal conditions.

Bird counts were carried out in both areas, at low and high tide, in winter (December to February 2016-17) and in the pre-breeding migration (March to April 2017) periods.

We registered 26 and 13 waterbird species in RNLED and FRG, respectively.

Analyses of similarity using the Bray-Curtis index did not show differences in the community composition between periods.

Using the Pielou's evenness index we found that: i) in RNLED, at low-tide, waterbirds were more numerous and diverse on mud, sandy mud and muddy sand, whereas at high tide they were mostly concentrated on water, the breakwater or the borders between water and other substrates; ii) in FRG, at low tide, waterbirds were more numerous on rock with sand, rock, sand and dry dock, whereas at high tide, they were mostly concentrated on dry dock, rocks and water. Our results show that the biotopes available in the Douro lower estuary are used differently by waterbirds and this should be, therefore, considered in the management of this area.

- **14254 | Impeachment or coup d'état: considerations on the recent political situation of Brazil**

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In April 2016, the reelected president of Brazil, Dilma Roussef was impeached.

The formal cause was the approval of laws considered illegal by the tax responsibility legislation. But the opposing congressmen, when asked for the reason, differed deeply. Some kept arguing the alleged tax crimes. Others said they were listening the public outcry in the streets. But the new government's inner circle was more direct. The former vice-president, now in charge, Michel Temer, said the president was impeached because she disagreed with the proposals of a new congress majority. In ministries, state companies, and even on the Supreme Court, politicians defeated in the presidential elections, were put in charge. At the same time, new political measures, most with material and formal unconstitutionality, were approved, weakening rights guaranteed in national and international laws.

They deactivated one of the main organs of corruption combat, ended the social inequality and minorities integration policies, criminalized the pro-homeless and landless people movements, closed the Culture Ministry, weakened public schools and universities, petrol is being sold cheaply to foreign companies. Their next goal is to dismantle the social security system.

As the politicians who backed this controversial coup d'état/impeachment were all involved in corruption, with much more serious accusations than the one that impeached Dilma Roussef, the helpless population got even more divided.

Some want the return of the Labor Party, represented by Lula, former president from 2002 to 2010. Others, fearing the left-winged policies that would come with him, support the extreme-right congressmen Jair Bolsonaro.

These are hard times for democracy in the world, not only Brasil. Which is an additional reason why these facts must be discussed in the international community.

This work focuses on showing an overview of each chapter of this rupture, since the accusation that led to the impeachment of Dilma.

- **14110 | Implementing time-driven activity based costing system**

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The objective of this study was to understand how to implement the Time-Driven Activity Based Costing (TDABC) system in a company of the automobile components industry and what the resulting impacts were. The study arises from the need for the company to have a costing system that generates the most rigorous information possible and, thus, to contribute to better decisions, a practice that is fundamental for maintaining the competitive advantages of national companies in a time they compete in a global market. For this, a bibliographic review was done on that costing system and the concepts used, which were then applied to the data collected in the production department of the company in question, the most important and for which most of its resources are directed. It was concluded that the direct allocation of resource costs to cost objects, the need to estimate only two parameters - the cost of capacity provided per unit of time and the time required to execute each activity - and the use of practical capacity rather than theoretical capacity, allows this system to generate cost information in a simpler and more rigorous way, despite the tendency for the consequences of the principle of homogeneity to be ignored. In addition, the operations of that costing system require constant updating to reflect the changes that are occurring, which may involve some complexity, especially when adequate software is not available and a wide range of products are produced.

Keywords: costing systems; tdabc; automobile components industry.

- **14314 | Influence of different irrigation allocations on the yield and quality of cv. Touriga Nacional - region of Douro Superior**

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The main objective of the present study was to develop an optimized deficit irrigation schedule in a vineyard of Touriga Nacional variety located in the Quinta da Cabreira, Sub-region of the Douro Demarcated Region, Douro Superior.

The experimental design was created with the knowledge acquired from empiric results of an irrigation experiment conducted in the past on the same vineyard.

Similar vines were chosen and four water treatments were established. based on the value of evapotranspiration (ET_c) obtained by the weather station located in the site; The treatments are; R0 - Unwatered (Control); R25 - 25% of ET_c irrigation; R50 - 50% of ET_c irrigation; R75 - 75% of ET_c irrigation.

In terms of results, the pre-dawn water potential presented much lower values than those referred in the bibliography, signal of a high water deficit stress. The statistical analysis showed that there is significant differences between the unwatered treatment and the three other watered treatments, but no significant differences between the watered treatments until the fifth week of experiments. After the fifth week, some statistical differences are spotted between the watered treatments, indicating that irrigation takes time to develop its influence.

In terms of quality, evaluated by the sugar content, pH and total acidity, no differences between modalities were found, even if the polyphenolic content and the berry weight were higher in the irrigated modalities. Also in terms of total yield no statistical differences were found, but R50 and R75 modalities had higher productions than R0 and R25.

The choice between the 25 and 50% irrigation of ET_c lays now in the hand of the producers that are now more informed about their choices and how these two treatments affect their vines in this terroir.

Key words: Douro; Touriga Nacional; Deficit Irrigation; Evapotranspiration; Pre-Dawn Water Potential; Water Stress.

- **13938 | Infusions and decoctions of *Actinidia arguta*: a preliminary study**

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Nowadays, wild fruits are well recognized for their health effects and contribution for environmental and social sustainability. Comparatively to *Actinidia deliciosa*, *A. arguta* (hardy berry) is different in size, form and flavor. Hardy kiwi is an excellent source of vitamin C, carotenoids, chlorophylls, minerals, fibers, sugars, organic acids and phenolics. The fruit is also consumed in juices, jams and ice creams. Nevertheless, to the best of our knowledge, no studies report the use of kiwi berry in infusions and decoctions. The main objective of this study is to determine the total phenolic and flavonoid contents (TPC and TFC, respectively) and the antioxidant activity (through DPPH and FRAP assays) of infusions and decoctions of dehydrated hardy kiwi.

Hardy kiwi was harvested in September 2017 in Famalicão, Portugal. Samples were dehydrated and milled in a fine powder. For the infusion, 100 mL of boiling water was added to sample (2g) and filtered after 5 min. For the decoction, sample (2 g) was added to 100 mL of water, heated and allowed boiling, and filtered after 5 min.

The TPC were, respectively, 130.84 mg and 89.76 mg GAE/L for decoction and infusion. In what concerns to TFC, the decoction also presented the highest result (32.28 mg CEQ/L). The decoction displayed the highest antioxidant activity (IC50: 15.45 g/L for DPPH; 1292.45 μ mol FeSO₄ /L for FRAP). Positive linear correlations were established between TFC, TPC and DPPH, FRAP. It was possible to conclude that the decoction presented the best results. Further studies are being performed to characterize this new application.

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- **14142 | Inhibitory activity of chalcones on key digestive enzymes for the management of Diabetes mellitus**

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Diabetes mellitus is one of the biggest epidemics worldwide, characterized by chronic elevated levels of glucose in blood, known as hyperglycaemia, which is related with long-term complications. A possible therapeutic approach to decrease the postprandial hyperglycemia is to retard the absorption of glucose through inhibition of α -amylase and α -glucosidase, enzymes involved in the digestion of carbohydrates by hydrolyzing α -(1,4)-glycosidic bonds. The aim of this study is to evaluate the inhibitory effect of a panel of chalcones, precursors of flavonoids, on α -amylase and α -glucosidase activity, using an in vitro spectrophotometric technique, by measuring the α -glucosidase-mediated transformation of the substrate p-nitrophenyl- α -D-glucopyranoside (pNPG) into p-nitrophenol, and the α -amylase-mediated transformation of 2-chloro-p-nitrophenyl- α -D-maltotrioxide (CNP3) into 2-chloro-p-nitrophenol. The obtained results, showing effective inhibitory activity, indicate that the antidiabetic potential of chalcones should be explored through their inhibitory activity against α -amylase and α -glucosidase.

Acknowledgments

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- 13862 | Interactive effects of dietary tryptophan and chronic stress on gilthead sea bream (*Sparus aurata*) juveniles fed corn distillers dried grains with soluble based diets

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Corn distillers dried grains with soluble (DDGS) is a by-product of ethanol production which has potential as alternative to conventional agriculture feedstuffs, such as soybean meal. Nevertheless, dietary DDGS inclusion reduce total tryptophan (Trp) levels, becoming the second limiting amino acid after lysine. Besides, dietary supplementation with Trp has shown to reduce physiological stress, through a modulatory action on the production of the neurotransmitter serotonin.

Thus, this study aimed to evaluate the effects of dietary Trp supplementation of DDGS based diets on growth performance, feed utilization, and plasma metabolites of seabream juveniles reared under normal (unstressed) or high (stressed) stocking densities.

A growth trial was performed with seabream juveniles (initial body weight of 12g) reared at normal (initial and final densities of 6 and 25 kg/m³) and high (initial and final densities of 18 and 54 kg/m³) stocking densities. Four isoproteic (42%DM) and isolipidic (18%DM) low-fish meal diets were formulated to include 15 or 30% DDGS (diets 15DDGS and 30DDGS, respectively) or 30%DDGS supplemented with Trp at 0.13 and 0.25%DM level (diets 30DDGS+ and 30DDGS++, respectively). Each diet was tested in triplicate. Fish were fed twice a day, 6 days a week during 9 weeks.

Irrespective the experimental diet, high stocking density reduced growth performance and feed intake, but not feed efficiency. Diet composition did not affect growth performance and feed efficiency. However, irrespectively the stocking density fish fed 30DDGS diets with Trp supplementation presented reduced plasma glucose level, a secondary stress indicator. Further studies are required on the effect of Trp on stress response.

This work was supported by INSEAFood-Innovation and valorization of seafood products: meeting local challenges and opportunities (ref NORTE-01-0145-FEDER-000035) founded by Northern Regional Operational Programme (NORTE2020) through the European Regional Development Fund (ERDF)

- **14111 | Iodine levels in Turkish cow's milk**

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Iodine is an essential micronutrient, required for the synthesis of the thyroid hormones triiodothyronine (T3) and thyroxine (T4), key effectors in metabolism regulation. In fetuses and infants they are essential for the adequate growth and maturation of many target tissues, namely the skeleton and CNS [1].

According to WHO, iodine deficiency is the leading preventable global cause of mental illness and development disorders, about 13% of the world's population is affected by diseases caused by iodine deficiency and another 30% is at risk [2].

Daily iodine requirements vary throughout the life cycle from 40 µg/day at birth to 150 µg/day daily in adulthood. Pregnant and lactating women have increased needs (175 µg/day and 200 µg/day, respectively) [3].

Cow's milk is an important source of iodine in Western diets. The concentration of iodine in milk depends on several factors, namely the iodine content of feed, iodine source, farm management, teat dipping with iodine-containing substances, and milk processing in the dairy [4]

In a previous work from our research group the iodine levels in Portuguese cow's milk were studied [5]. Now, using the same analytical procedure - alkaline digestion of the samples with 25% TMAH (3 h, 90 °C) and iodine determination by ICP-MS - the levels of iodine in the most consumed brands of cow's milk from the Turkish market are being determined and compared to the Portuguese values. Results will be presented in our communication.

[1] Mullur R et al. Thyroid hormone regulation of metabolism. *Physiol Rev.* 2014;94(2):355-82.

[2] Andersson M et al (eds). Iodine deficiency in Europe: a continuing public health problem. Geneva: WHO, 2007.

[3] Teixeira D et al. Iodo - importância para a saúde e o papel da alimentação. Lisboa: Direção-Geral da Saúde, 2014.

[4] Flachowsky G et al. Influencing factors on iodine content of cow milk. *Eur J Nutr.* 2014;53(2):351-65.

[5] Vieira C, et al. Iodine levels in Portuguese cow's milk. Porto, IJUP 2017.

- **14059 | Is the prevalence of oral yeast influenced by orthodontic appliances, dental containment apparatus or dental gutters?**

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Introduction: The human microbiome is a complex ecosystem that varies considerably across the body and between individuals. *Candida* is a microorganism of the oral microbiome and its prevalence can be affected by several factors.

Aim: To correlate the use of intraoral devices with the prevalence of oral yeast, such as orthodontic appliances, dental containment apparatus and dental gutters.

Materials and methods: Saliva samples were collected from 267 participants, 27% male, with a mean age of 20.5 +/- 1.6 years. 100 µl of saliva was seeded in duplicate in Sabouraud Agar to count the colony forming units. An anonymous survey was performed in order to analyze the categorical variables using the chi-square test.

Results: According to the limit of detection of the applied methodology, the prevalence of oral yeasts in participants that used or are using orthodontic appliances (48.7% of the analyzed population) was 39.2%, compared to 29.9% in participants who never used orthodontic appliances ($p = 0.110$).

Regarding the use of dental containment devices (23.2% of the population), the prevalence of oral yeast was 43.5%, compared to 31.1% among participants without restraint ($p = 0.086$).

Concerning the use of dental gutters (9.0% of the population), the prevalence of oral yeasts was 33.3% compared to 34.6% in participants without gutter ($p = 0.903$).

Conclusion: In a young population, the use of intraoral devices, such as orthodontic appliances, dental restraint and dental gutters, does not seem to influence oral yeast colonization. Further studies would be necessary to understand whether the same results would be achieved in an older age group.

- 14063 | Isolation of Rare Actinobacteria from the Marine Sponge *Hymeniacidon perlevis*

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Bacterial resistance to antibiotics is a public health issue, causing many concerns in a global perspective. In addition to multiresistant bacterial infections, cancer remains one of the most threatening diseases. A high fraction of antimicrobial and anticancer compounds come from microorganisms. Among these, Actinobacteria stand out for their unparalleled capacity to produce bioactive substances with high biotechnological value. It is believed that oceans represent a wealthy source of new bioactive compounds due to the fact that they have vast ecosystems unexplored in terms of bioprospection.

This study aimed to isolate and identify rare Actinobacteria from a sea sponge belonging to the species *Hymeniacidon perlevis*, for future investigation of the potential of these microorganisms to produce secondary metabolites with antimicrobial and anticancer properties. The sea sponge was collected in the intertidal zone of Praia da Memória, in the north of Portugal. For promoting the isolation of rare Actinobacteria, three different pretreatments were applied and three selective culture media were used. Using this approach, 188 isolates were obtained. To date, 32 isolates have been taxonomically identified through 16S rRNA gene sequencing. The results showed that several rare actinobacterial genera have been isolated from the studied sponge, such as *Nocardia*, *Nocardiopsis*, *Brevibacterium*, *Gordonia*, *Tsukamurella*, but several *Streptomyces* isolates have also been obtained. The remaining 153 isolates not yet identified are currently being identified.

- 13906 | Laboratory evaluation of the suitability of a geotextile for use as a filter in an earth-filled dam

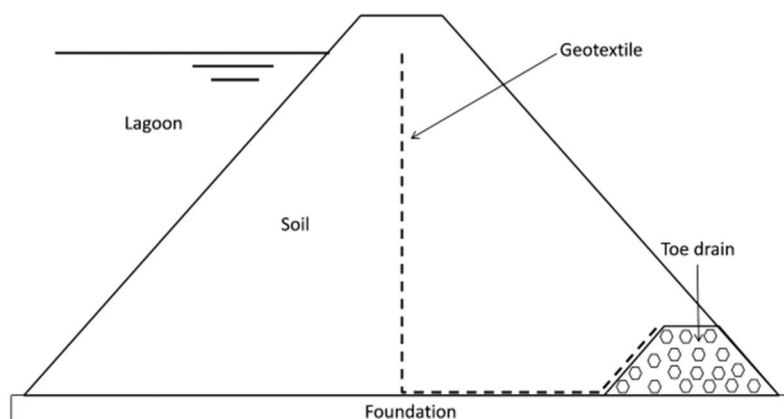
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Geosynthetics include a variety of polymeric materials specially manufactured to be used in geotechnical, geoenvironmental, hydraulic and transportation engineering applications. These materials can perform many different functions, such as separation, reinforcement, protection, filtration, drainage, fluid containment or erosion control. The geosynthetics can be divided into geotextiles, geomembranes and related-products (like geogrids, geonets or geocomposites).

This work presents and discusses the laboratory evaluation of the suitability of a polypropylene geotextile for use in an earth-filled dam as a filter, allowing water to move through the soil while retaining all upstream soil particles (Figure 1). The evaluation of the different properties of the geosynthetics is of utmost importance, since it is necessary to guarantee that they will have the required properties to perform correctly their functions in the civil engineering structures in which they are inserted.

The laboratory evaluation of the geotextile included the determination of physical (mass per unit area and thickness), mechanical (characterisation of tensile, tearing and puncture behaviour) and hydraulic (water permeability normal to the plane) properties. By comparing the results obtained in the laboratory tests with the requirements established by the construction project, it was possible to evaluate the suitability of the geotextile for performing the required function in the earth-filled dam (if any of the properties does not comply with the requirements, the geotextile is considered unsuitable to be applied).

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Schematic representation of the earth-filled dam.

- **14048 | Landscape for a low-carbon future: guidelines for CO2 reduction through land uses changes in Catalonia**

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Low carbon society is a term used in several studies and refers to a society that emit low quantities of CO₂. In this study will be evaluated the land uses of a Landscape Unit and calculated the quantity of emissions and with changes in the land uses associated to the Landscape Quality Objectives, improving them to reduce the emissions.

The Case-studies chosen were two Landscape Units, Plana de la Selva and Terraprimis, present in one of the seven Landscape Catalogues from the Landscape Observatory of Catalonia.

The study aims to propose a list of guidelines that can be applied to the different land uses and contribute to the reduction of CO₂ emissions without transforming the character of the landscape.

- **14076 | Methodologies for the detection of Y-glutamyl-S-ethenyl cysteine dipeptide (GEC) and its importance for food security**

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Nowadays, hunger is a real concern, being of utmost importance the search for affordable and easy to grow plants as alternative foods. In this sense, the viability to use the narbon vetch (*Vicia narbonensis* L) legume as food, whose seeds represent a good source of protein, is a challenge. This plant requires a technically easy and cheap cultivation, is easily adaptable to dry and cold climates, besides demanding a little use of fertilizers and pesticides [1].

Nevertheless, there are cases of related deleterious effects after prolonged ingestion of *V. narbonensis*, mainly due to the presence of the Y-glutamyl-S-ethenyl cysteine dipeptide (GEC) in the seeds of this legume. High levels of bilirubin, suggesting the occurrence of a blood damage, changes in red blood cells and observation of crystals in pig kidneys are some of the pejorative effects described [2].

To answer to this concern, some methodologies for GEC detection and quantification were developed: high performance liquid chromatography (HPLC) [3]; thin layer chromatography (TLC) [1]; capillary electrophoresis with ultraviolet detection (CE-UV) [4]; and capillary electrophoresis coupled to mass spectrometry (CE-MS)[4].

This review provides an overview of the analytical methodologies used for GEC detection and its possible contribution to scaling beyond its current major use (cattle feeding).

References:

[1] Sánchez-Vioque, R. S. et al., Anal. Biochem., 2011, 418, 180-183.

[2] Enneking, D., Ph.D. thesis, University of Adelaide, South Australia, 1994, 121-124.

[3] R. Sánchez-Vioque, et al., Anim. Feed Sci. Technol., 2011, 165, 125-130.

[4] M. Arias, et al. Electrophoresis, 2005, 26, 2351-2359.

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- **13902 | Mitoxantrone-induced toxicity in adult and infant male CD-1 mice**

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Cancer is a worldwide problem with high morbidity and mortality. Several anticancer therapies were developed and mitoxantrone (MTX) is one of the chemotherapeutic drugs currently used against cancer. Nevertheless, MTX causes cardiotoxicity and several risk factors could aggravate it. The aim of the developed work was to study the toxicity of clinically relevant MTX doses in adult (4 months) and infant (1 month) male CD-1 mice. Fourteen adults plus twelve infant mice were used: control groups were injected with saline while the MTX groups received a cumulative dose of 6.0 mg/kg of MTX. The animals were submitted to six administrations, twice a week, for three weeks. The animals weight, food and water consumptions and general welfare were recorded through the experiment. Seven or 17 days after the last administration in adults and infants, respectively, mice were sacrificed and their organs were removed and weighted. Blood was also collected. In the infants, none of the organ weight/ body weight ratios or the organ weight/ brain weight ratios changed in comparison to controls. In the adult mice, the ratios liver weight/ body weight and liver weight/ brain weight were significantly reduced in comparison to the control group. Likewise, the ratio kidneys weight/ brain weight also significantly decreased. Regarding food and water intakes, a decrease in consumptions occurred in the last days of the protocol in the MTX group, both in adult and infant mice. Nevertheless, these changes only reached statistical significance in infants. In conclusion, adult mice seemed to be more prone to MTX-induced toxicity; however, more data needs to be gathered to determine the underlying factors for that susceptibility.

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- **14204 | Modelling of Radiofrequency – Induced Hyperthermia within Electric Circuit Simulators**

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The present work addresses the use of electromagnetic radiation in induced hyperthermia as a treatment for cancer diseases. Thermal ablation refers to the destruction of a biological tissue after heating to temperatures at which cells do not survive. The concept of hyperthermia for treating tumors has been explored after observations that cancer cells exhibit greater sensitivity to heat than normal cells.

Local hyperthermia can be performed by convection/conduction or by electromagnetic radiation. Concerning electromagnetic radiation two distinct groups of frequency bandwidths can be considered, radiofrequency and microwave, i.e., frequencies that only present sufficient energy to cause heating through ionic vibration.

Modeling and simulation of tissue heating has been subject of different research activity. Most of these studies resort to computational simulations based on advanced numerical methods, such as the finite element method (FEM) and finite difference method (FDTD). Several simulation tools are currently available that allow the construction of models, the resolution by numerical methods, simulation and postprocessing of results, such as COMSOL Multiphysics, Sim4life and Ansys. Although these tools are efficient they do not allow performing of simulations in a single environment, including also the electronics of the electromagnetic radiation generating systems. The presented work aims at bringing the electromagnetic propagation and the heating of the tissues to the domain of the electrical simulation, and thus to obtain a unique simulation environment for the entire process. This involves modelling the radiation propagation path, from the radiation emitter, through the air, until the target tumor tissue, as well as, the thermal process - i.e., local heating and conduction of the dissipated power - all with electrical models. The Advanced Design System (ADS) simulation environment is being considered.

- **14083 | Molecular screening of bioactivity related genes in halophile bacteria**

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Saltern environments are inhabited by extreme microorganisms that are able to survive and adapt to the high concentration of salt. Additionally, the genomic adaptations of these microorganisms are highly correlated with the production of natural compounds with biotechnological interest.

These are essentially secondary metabolites, such as nonribosomal peptides and polyketides, which are produced by bacteria as a mechanism of cellular defence and attack against competitors. Nonribosomal peptide synthases (NRPSs) and Polyketide synthases (PKS) are multi-enzymatic, multi-domain megasynthases encoded in large gene clusters. These synthases are involved in the biosynthesis of bioactive secondary metabolites.

In the present study, the biotechnological potential of the halophile bacteria isolated from Aveiro saltern was evaluated through PCR amplification of PKS and NRPS with subsequent sequencing of the amplicons obtained.

- **14311 | Monitoring of water bodies in urban context**

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Water bodies, like lakes, pose in an urban context essential ecosystem services, such biodiversity, climate change mitigation, recreational and tourism, nutrient and sediment processing among others. These lakes have associated several ecological functions that in urban scenario are often threaten due to anthropogenic pressures. In accordance with the Water Framework Directive 2000/60/EC, efforts should be made to preserve and enable the ecological quality of water bodies to be achieved and to prevent water deterioration. In this way, the monitoring of the water quality of these sites becomes crucial, in order to identify potential problems and minimize or solve them.

The present study aimed to monitor the water quality of 4 lakes present in a city park of Porto. This evaluation was performed in Summer 2017, as a part of a previous monitoring work in these lakes. Water samples were collected at the center of each lake using the Waterfish dispositive. The following physico-chemical parameters were evaluated: pH, temperature, dissolved oxygen, total organic carbon, conductivity, turbidity, apparent color, total nitrogen and in the form of nitrates, total phosphorus and in the form of phosphates. The measurement of pH, temperature and dissolved oxygen was done immediately after collection of samples. The other parameters were measured at the laboratory in less than 6 h.

Conditions for eutrophication were identified in the lakes, having in consideration mainly the total organic, nitrogen and phosphorus contents. In general, the analyzed waters were considered non-saline with pH between neutral and alkaline.

- **14263 | Monitorization of *Actinidia deliciosa* performance under bacterial infection: an oxidative evaluation of leaves**
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Kiwifruit (*Actinidia deliciosa* A. Chev. cv. 'Hayward') has a relevant implementation in Portugal since the 70's. It is currently produced in many countries, particularly in New Zealand, China, Chile, Italy, Spain and Portugal, and the global economic value is currently increasing. Kiwifruit has a high content of vitamin C, potassium, magnesium, fibers, anti-inflammatory properties, nutritional qualities that making this fruit greatly appreciated by consumers, and having a high market demand. However, bacterial diseases of *A. deliciosa* have reduced the kiwifruit production in several countries, resulting in economic losses to producers. Disease symptoms are associated with physiological changes in leaves, damage in the stems, reduced fruit sizes and eventually, the plant's death.

In this work, we monitored a kiwi orchard in the North of Portugal, to study the host-pathogen interactions, including the measure of the leaf damage, namely the oxidative disorders, and associated damages promoted by the pathogen. We assessed the oxidative status in leaves collected in symptomatic and asymptomatic young plants, subjected or not to a biological control treatment against the bacterial pathogen (n=10 in both conditions). Damage membranes were evaluated with the cell membrane stability test, and the macromolecules oxidation (lipid peroxidation, through production of malonaldehyde). We also quantified the levels of reactive oxygen species-ROS (H₂O₂, O₂⁻). Results show that the symptomatic plants, and the symptomatic plants subjected to the biological control treatment presented higher membrane permeability and the higher oxidation of macromolecules, possibly induced by increase of ROS's levels. It has also been shown that bacterial infection of *A. deliciosa* leaves interfere with the increase of oxygen reactive species. These cells' damages are macroscopically visible and affect the yield of kiwifruit. Characterization of the pathogen is ongoing.

- 14014 | Nanostructured lipid carriers (NLCs) as a promising drug delivery system for streptomycin delivery

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Tuberculosis (TB) is transmitted by the inhalation of *Mycobacterium tuberculosis*. The treatment of TB involves the continuous administration of multiple drugs for 6 months or more, which contribute to the appearance of multidrug resistance strains and low compliance to therapy. Streptomycin (STR) was the first anti-TB drug used in the clinical practice. This drug has been replaced by other therapies due to its toxicity and to its poor gastrointestinal absorption, which require the parenteral route of administration [1, 2].

Thus, the aim of this study was to develop nanostructured lipid carriers (NLCs) as an alternative drug delivery system for STR. NLCs were synthesized by simple and double emulsion, using the hot homogenization and ultra-sonication techniques. The formulation synthesized in each method with higher encapsulation efficiency (EE) was characterized in terms of size, polydispersity, zeta potential, EE and loading capacity. The formulations were lyophilized using Aerosil® as cryoprotectant. Results showed that the double emulsion is the most suitable method for the synthesis of STRS-loaded NLCs.

In the future, others studies will be performed, including transmission electron microscopy (TEM), drug *in vitro* release, cell viability assays and *in vivo* studies, aiming to develop an alternative delivery form of STR administered by non-invasive routes of administration.

References:

[1] Pai M, Behr MA, Dowdy D, Dheda K, Divangahi M, Boehme C, Ginsberg A, Swaminathan S, Spigelman M, Getahun H, Menzies D, Raviglione M. Tuberculosis. Nature reviews. 2016;2:16076.

[2] Costa A, Pinheiro M, Magalhães J, Ribeiro R, Seabra V, Reis S, Sarmiento B. The formulation of nanomedicines for treating tuberculosis. Advanced drug delivery reviews. 2016;102:102-15.

- **13988 | New 4-aminoacridine analogues as promising dual-stage antimalarials**

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Malaria is one of the deadliest infectious diseases in the world and was responsible for 429 000 deaths in 2015, namely by *Plasmodium falciparum* species. There is no vaccine and we depend on antimalarials to treat and prevent the disease. Current antimalarials target the pathogenic blood stages in humans. But, to reach malaria eradication, new, affordable and safe drugs are required to overcome increasing resistance against artemisinin-based treatments, treat vulnerable populations, interrupt the parasite life cycle by blocking transmission to the vectors, and target parasite forms that, for some species, remain transiently dormant in the liver. Therefore, malaria elimination requires identification of new multi-target drugs. Quinacrine (QN, Figure 1A), the first synthetic antimalarial drug, was widely employed but it was rapidly superseded by chloroquine (CQ, Figure 1A), whose efficiency, bioavailability, and safety were far superior. Analyzing the chemical structure of QN, the acridine moiety of QN can be seen as the fusion between CQ and the heterocycle core of primaquine (PQ, Figure 1A), that is active against all liver forms of the parasite, and gametocytes. In this context, and based on the fact of the new drugs should be produced at low cost, recycling known drugs could be a good way to find new active compounds to treat malaria. Thus, the aim of this work is the chemical synthesis and *in vitro* assessment of the yet unexplored 4-aminoacridine derivatives shown in Figure 1B. This family corresponding to the fusion between PQ derivatives and the heterocycle of CQ. Our group expect that, the new molecules will keep the activity of their parent compounds, acting as novel multi-stage antimalarials with activity against blood-stage, as in CQ, as well as against all liver forms and gametocytes, similarly to PQ.

- **13891 | No stress! *Morinda geminata* can be a bless!**

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The ethnobotanical history of natural matrices contributes to the research of new drugs. In African countries there is no access to conventional medicines, so the use of an unexplored flora ensures health care for endemic diseases. *Morinda geminata* DC is one of the most-used medicinal plants in the Republic of Guinea-Bissau. The main goal of this work was to establish a relationship between the chemical composition of the ethanolic extract of *M. geminata* leaf and its antioxidant activity. The phenolic and pigment profiles of *M. geminata* extract were determined by HPLC-DAD, while the identification and semi-quantification of fatty-acids was performed by GC-FID. Antioxidant properties were assessed in cell-free assays. HPLC-DAD analysis showed that *M. geminata* extract is a mixture of phytochemicals, particularly rich in flavonol heterosides, xanthophylls and chlorophylls. The only phenolic compound identified was quercetin-3-*O*-rutinoside. Several pigments were identified, lutein ensuring the highest absorption between carotenoids and chlorophylls. GC-FID analysis indicated palmitic acid as the major fatty-acid. The extract exhibited poor ability to scavenge DPPH and NO radicals, inhibiting at most 16% and 23% of radicals, respectively. The chemical profiles found support the application of this extract in cultural habits of Guineans.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 5th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- **13990 | Novel 4,9-diaminoacridine derivatives as potential multi-target antimalarials**

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Malaria is a human health concern ever since the dawn of mankind and causes almost half million deaths in 2015. Antimalarial drugs are the unique weapon to fight this disease once there is no vaccine yet. Generally antimalarial chemotherapy targets mainly the pathogenic blood stage in humans. However, there is an urgent need of new, economic and safe drugs in order to: (i) block parasite transmission to the vectors, (ii) target parasite forms that, for some species, remain transiently dormant in the liver, and (iii) overcome the resistance against artemisinin-based treatments emerging in some vulnerable population in Africa, Consequently, malaria eradication is only possible with the discovery of new multi-targets drugs. Quinacrine (QN, Figura 1A) was the first antimalarial drug used but due to the spread of resistance it was replaced by cloroquine (CQ, Figura 1A) whose efficiency, bioavailability, and safety were superior. By "dissecting" the chemical structure of QN, the acridine moiety of QN can be seen as the fusion between CQ and the heterocycle core of primaquine (PQ, Figure 1A), another emblematic antimalarial, active against all liver forms of the parasite, and gametocytes. In this connection, and based on the fact that one fast and low-cost strategy to accelerate antimalarials development is to recycle classical pharmacophores, the aim of this work is the chemical synthesis and *in vitro* assessment of the yet unexplored 4,9-diaminoacridine derivatives shown in Figure 1B. These can be regarded as respectively corresponding to the fusion between CQ and PQ derivatives. Expectantly, the new molecules will preserve the activity of their parent compounds. They will act as novel multi-stage antimalarials with activity against blood-stage, as in CQ, as well as against all liver forms and gametocytes, similarly to PQ.

- **13969 | Observations on moss and lichen Tardigrades**

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Limnoterrestrial tardigrades are common in litter, mosses and lichens. They are an intriguing phylum of micrometazoans (body length 100-500 μm), close related with the Arthropods. They have four pairs of lobopodous legs terminated by claws and a complex feeding apparatus equipped with piercing stylets for feeding on bacteria, algae and other small invertebrates. Tardigrades are known for their amazing cryptobiotic capabilities to survive extreme environmental conditions.

Tardigrades were extracted from dried lichen and moss samples collected in Fafe (41°23'44"N, 8°08'58"W), northern Portugal, in October 2017. Specimens and their eggs were sorted under a dissecting microscope and mounted in Hoyer's medium with a small amount of potassium iodide solution. Examination, morphometric measurements and imaging analysis were made under oil immersion using phase (PCM) and differential interference contrast (DIC) microscopy. The pattern of body plates was interpreted under UV-fluorescence.

Eight species were identified and microphotographed. Six eutardigrade species from the genera *Astatumen*, *Macrobiotus*, *Diphascon*, *Hypsibius*, *Minibiotus* and *Paramacrobiotus*, and two heterotardigrades species from the genera *Echiniscus* and *Pseudechiniscus*, this last one, probably, a new species for Science.

- **14313 | OPTIMAL DOSE OF THREE ANESTHETICS AND ITS EFFECTS ON PLASMA METABOLITES IN GILTHEAD SEABREAM (*Sparus aurata*) JUVENILES**

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Blood sampling has been routinely used in fish nutrition research, and many of the commonly applied sampling techniques require anesthesia. Acute effects of sampling and anesthesia procedures may confound the results, and those potential effects are not well studied. The present work aimed to evaluate the effects on blood biochemical parameters, efficacy and optimal dose for induction of anesthesia of three anesthetics: tricaine methane-sulfonate (MS-222), 2- phenoxyethanol (2-PE) and eugenol.

For that purpose, seabream juveniles (IBW of 153,3g) were randomly distributed by 12 tanks and fed a commercial diet for 1 month. The optimal dose for each anesthetic was established using seabream juveniles (IBW of 153g) by dose-response tests, measuring the anesthesia induction and recovery times. Thereafter, 3 fish per tank (9 per treatment) were anesthetized with the optimal dose of each anesthetic established before, or not anesthetized, and blood samples were collected.

Eugenol induced anesthesia faster at lower concentrations than 2-PE and MS-222, while its recovery time was 6 to 10 times higher than the other anesthetics when exposed to the same concentrations. 2-PE required 3 times higher anesthesia induction time at lower concentrations than the other anesthetics, while its recovery time was similar to that of MS-222.

Irrespectively of the anesthetics used, plasma glucose levels were higher in non- anesthetized than in anesthetized fish. Lactate and triglyceride levels were lower in eugenol anesthetized fish than in fish non-anesthetized or anesthetized with MS-222 or 2-PE. No differences were observed in plasma protein, albumin, and cholesterol levels between non-anesthetized and anesthetized fish.

Overall, results indicate that sampling procedures may affect plasma metabolites level, and this should be considered when designing experiments that require blood sampling in fish.

- **13950 | PIXANTRONE, A NEW ANTICANCER DRUG WITH THE SAME OLD CARDIAC PROBLEMS? AN IN VITRO STUDY WITH DIFFERENTIATED AND NON-DIFFERENTIATED H9c2 CELLS**

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Pixantrone (PIX) is an anticancer drug approved for the treatment of multiple relapsed or refractory aggressive B-cell non-Hodgkin's lymphoma. It is an aza-anthracenedione synthesized to have the same anticancer activity as its predecessors, anthracyclines (e.g. doxorubicin) and anthracenediones (e.g. mitoxantrone), with lower cardiotoxicity. However, data regarding its cardiovascular effects is scarce. This work aimed to assess the potential cardiotoxicity of PIX, at clinically relevant concentrations (0.1; 1; and 10 μ M) in non-differentiated and 7-day differentiated H9c2 cells. Cells were exposed to PIX for 48 h and phase contrast microscopy evaluation, Hoescht staining, the 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyl tetrazolium bromide (MTT) reduction and neutral red (NR) uptake assays were done. Cytotoxicity was observed in differentiated and non-differentiated H9c2 cells, with detached cells and round cells evidenced by phase contrast microscopy, mainly at the highest concentration (10 μ M). In the Hoechst staining, no signs of nuclear condensation were seen. A significant concentration-dependent mitochondrial dysfunction was observed through the MTT reduction assay. PIX also caused concentration-dependent cytotoxicity as seen through the NR assay in both differentiated and non-differentiated H9c2 cells. The differentiation state of the cells was not crucial on PIX effects, although PIX toxicity was slightly higher in differentiated H9c2 cells. To the best of our knowledge, this was the first in vitro study performed with PIX in H9c2 cells and reveals worrying cytotoxicity at clinically relevant concentrations, highlighting that further studies must be carried out to clarify the cardiotoxic potential of this new anticancer drug.

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- **13959 | Plants for urinary tract infections prevention: a review**

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Urinary tract infections (UTI) are one of the most frequent bacterial infections seen in the outpatient setting: one in three women will develop a UTI requiring antibiotic treatment by the age of 24 and 50% experience at least one UTI during their lifetime [1]. Antibiotics are primary tools for the treatment and prophylaxis of recurrent UTI. However, the indiscriminate use of antibiotics for prophylaxis or an error in the therapy of urinary infections can lead to the emergence of drug-resistant pathogens, causing a problem of global public health. Moreover, antibiotics overuse can disrupt gut flora, originating a higher susceptibility to more infections. Traditionally, several plants have been used for UTI prophylaxis as alternatives to antibiotics. Experimental studies based on medicinal plants that act in the infection control and prophylaxis are under development, especially on those with antimicrobial, diuretic, antioxidant and anti-inflammatory activity [2-4].

In this review, the plants most commonly used in the prevention of UTI - cranberry fruit extracts (*Vaccinium macrocarpon* Aiton), *Zea mays* dried stigmata, sweet-cherry (*Prunus avium*) stems, dandelion leaf (*Taraxacum officinale*) and bearberry leaf (*Arctostaphylos uva-ursi*) - are discussed, regarding their medicinal properties and chemical composition. An overview of plant-based food supplements for this purpose available in the national market was also performed.

References

1. Barber, A.E., et al., Clin. Inf. Dis. , 2013, 57, 719-724.
2. Oliveira, J. et al., J. Chem. Pharm. Res., 2016, 8, 746-751.
3. Cotê, J. et al., Crit. Rev. Food Sci. Nutr., 2010, 50, 666-679.
4. Hasanudin, K. et al., Molecules, 2012, 17, 9697-9715.

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- **14289 | Playing Snooker on the sides of a box**

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There are several classical problems which concern the path of a ball starting at 45° from the corner of a rectangular table and changing direction when it hits a side. Here we attempt a generalization allowing the ball to move on the surface of a box and finding several interesting properties of the resulting paths that arise. We show that some answers are similar to those already known in the case of the plane, while several new interesting patterns appear, bearing a strong arithmetic flavour.

The main related problem we tackle is that of determining the vertex of the box at which the ball finishes its path. We will show that, under suitable constraints on the side lengths of the box, this vertex is determined by an arithmetic rule involving 2-adic valuations of the differences between the side lengths.

- **14027 | Pre and postoperative micronutrient deficiencies in patients submitted to bariatric surgery**

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Background: According to the World Health Organization obesity it's a result of an abnormal or excessive body fat accumulation, which presents a high risk for the health. Bariatric surgery appears as an alternative to the conventional treatment for the morbid obese individuals. However, this type of intervention causes changes in the anatomy and physiology of the gastrointestinal tract, which may lead to the development of nutritional deficiencies in patients. Objective: To evaluate micronutrient deficiencies in patients submitted to bariatric surgery in preoperative and postoperative periods. Methods: In this longitudinal study, we evaluated, retrospectively and prospectively, patients who attended the nutrition consultation at Centro Hospitalar São João. We completed preexisting database containing anthropometric and biochemical data, adding biochemical data, at various periods: pre and post-surgery 6th, 12th, 18th, 24th, 30th and 36 months. Results: from the 12 patients submitted to bariatric surgery, 79,3% were female. The most prevalent deficiencies were vitamin D, magnesium and zinc. There was more than 85% adherence to take the multivitamin supplementation and frequent use of specific supplementation. Conclusion: The prevalence of nutritional deficiencies is high, with a tendency to persist over time even with use of multivitamin supplementation, leading to the need for complementary supplementation. Hence, periodic and long term monitoring is fundamental. Future studies are needed, with long follow-up times, to clarify the clinical impact of deficiencies.

- **14091 | Preliminary characterization of two novel actinobacterial strains**

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Microbial biodiversity associated with halophile environments is still not well known. From salt of Aveiro saltern, two novel Gram-positive actinobacterial isolates (AS9 and AS10) were isolated and are under taxonomic characterization. The 16S rRNA gene sequences showed that these two strains are phylogenetically very close, forming a cluster with *Nitriliruptor alkaliphilus* ANL-iso2T, the nearest relative. Using the Ribosomal Database Project database, sequence similarities between this bacterium and strains ASS9 and ASS10 are 68.5 % and 62.5 %, respectively. Preliminary tests showed a better growth of both strains at 30 °C, on marine M600 medium (their isolation medium) with slow growth rates. Microscopy observation showed that bacterial cells are non-motile, rod-shaped in the case of AS10 and presented pleomorphism (both rods and cocci) for AS9. Further morpho-physiological characterization that is under way will be presented.

- **14132 | Quality Control of Dietary Supplements**

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All over the world, consumption of dietary supplements has been increasing over the years, mainly in the last decades. At the same time, there has been a growing number of reports of mislabelling, contamination, adulteration with pharmaceutical substances and association of consume with cases of toxicity. In this context, the safety of dietary supplements and the quality control that should be required to these products has become a global topic of discussion. Scientists and food and health authorities are debating aspects of the manufacture process, quality control, commercialization and legal framework.

In United States, dietary supplements are under the jurisdiction of Food and Drug Administration (FDA), the same federal agency that regulates medicines. Also, United States Pharmacopeia (USP) has recently published the chapter <2232> "Elemental Contaminants in Dietary Supplements", the first related to dietary supplements, setting limits for these contaminants. Accordingly, to USP, the detection and quantification of these contaminants should be performed with Inductively Coupled Plasma (ICP) techniques. In Europe, the perspective is quite different, and such extensive control is not yet compulsory.

The aim of this communication is to present and compare the USA and the European Union regulatory frameworks of dietary supplements (with focus in Portugal particularities) and how ICP-based techniques can be useful for their quality control.

- **13908 | Quality control of geomembranes for application in a water reservoir**

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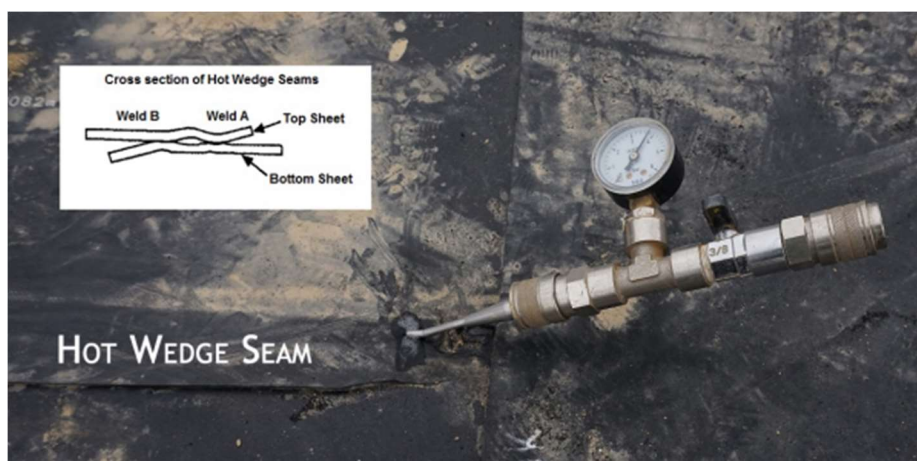
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Geomembranes are continuous flexible sheets manufactured from synthetic polymers, often high-density polyethylene (HDPE) or polyvinyl chloride. They have a very low permeability and are used as fluid barriers to prevent the migration of gases or liquids. The geomembranes can be applied in water reservoirs, water conveyance canals, tunnel sealing, foundations, asphalt pavements and waste containment. These materials arrive at the worksite in the form of rolls (width of about 6 meters) and, for being able to act as fluid barriers, they must be welded on site by a thermal process.

This work presents the quality control needed during the selection and application of a HDPE geomembrane in a water reservoir. The main goal of the work was to evaluate if the proposed geomembrane fulfilled the minimum requirements for being applied in the reservoir and if the geomembrane seams (hot wedge seams made by thermofusion) were performed correctly. For that purpose, laboratory tests were conducted to evaluate some key properties of the geomembrane and field tests were carried out to evaluate the quality of the seams. The laboratory tests included the determination of physical (thickness and mass per unit area) and mechanical (tensile, tearing and puncture behaviour) properties of the geomembrane and the analysis of seam efficiency by shear and T-peel tests. The quality control of the seams was also carried out by field air channel tests (non-destructive) (Figure 1).

The comparison of the obtained results with the project requirements allowed to evaluate the suitability of the geomembrane, and respective seams, for adequately performing the required function in the water reservoir. For being considered suitable for application, the properties of the geomembrane must be all in accordance with the project requirements.

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Field test for evaluating the efficiency of a geomembrane seam (air channel test).

- **14192 | Reactivity of the mesenteric artery to angiotensin II and hydrogen peroxide in an experimental model of inflammatory bowel disease**
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Background: Inflammatory bowel disease (IBD) is a chronic inflammatory condition of the gastrointestinal tract. There are reports of vascular morphological and hemodynamic alterations. Angiotensin II (AngII) regulates vascular physiology through vasoconstriction and production of reactive oxygen species (namely hydrogen peroxide, H₂O₂), but the vascular effects of AngII and H₂O₂ in IBD are still unknown.

Aim: To characterize the reactivity of the inferior mesenteric artery (IMA) to AngII and H₂O₂ in an experimental model of IBD.

Animals and methods: Protocols were approved by the Animal Welfare Body. Male Wistar rats (9 weeks-old) were intra-rectally instilled with TNBS 20mg/rat in a 30% ethanolic solution, or used as controls. After 7-8 days, the rats were euthanized by decapitation and IMA rings with intact endothelium were mounted in a myograph filled with Krebs-Henseleit solution at 37°C, aerated with carbogen. Cumulative concentration-response curves to AngII and H₂O₂ (this over noradrenaline-precontracted arteries) were performed isometrically. Emax and EC50 values were compared by Student's t test.

Results: TNBS-treated rats had greater IMA diameters than controls (511.3±26.88 µm vs 404.6±12.87 µm, respectively, p<0.05), but their response to Ang II (Emax: 6.33±2.23 mN vs 4.87±1.78 mN, p>0.05 and EC50: 4.02±0.92 nM vs 4.07±1.23 nM, p>0.05, respectively) and H₂O₂ (Emax: 3.68±0.79 mN vs 3.10±0.51 mN, p>0.05; EC50: 3.37±1.45 mM vs 2.46±0.96 mM, p>0.05, respectively) was similar.

Conclusions: These preliminary results suggests that although the IMA from this rat model of IBD (7 days after TNBS instillation) is structurally altered, functional responses to AngII and to H₂O₂ seem to be preserved. However, these results need to be further characterized in future experiments.

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- **14202 | Relation between oral yeast colonization and tooth decay**

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Introduction: The oral microbiome represents one of the most varied and complex aggregated of microorganisms on all human body, essential for the balance between health and disease. Although the most common oral yeast *Candida* is an acidogenic microorganism, its role on caries risk is still not clear.

Aim: To compare the oral yeast colonization between a caries-free population and a population with history or active dental caries. Materials and methods: The caries index DMFT (Decayed, Missing and Filled teeth) was evaluated in 121 participants, 22% male, with a mean age of 20.8 +/- 1.6 years old. Saliva samples were simultaneously collected and 100 µl of saliva was seeded in duplicate in Sabouraud Agar to count the colony forming units. The performed categorical variables and the continuous variables were analysed using chi-square and t-test statistical test, respectively.

Results: According to the limit of detection of the applied methodology, the prevalence of oral yeasts in caries-free participants was significantly lower than in participants with history or active dental caries - DMFT>0 (21.9% vs. 44.4%, p=0.024). Within participants with oral yeast colonization, the yeast saliva concentration did not differ between caries or caries-free participants (p=0.977). Conclusion: The results indicate that the presence of oral yeast has a positive relation with tooth decay suggesting that oral yeasts may promote the acidic conditions leading to tooth decay or the acid oral environment may potentiate the acidogenic and aciduric species overgrowth, such as oral yeasts.

- **13909 | Resistance of geosynthetics used in the base liner system of waste landfills against mechanical damage induced by different aggregates**

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Geosynthetics are polymeric materials often applied in geotechnical works of environmental nature, such as waste landfills. The base liner system of waste landfills (designed to avoid soil and groundwater contamination) is often formed by a combination of some geosynthetics: a geosynthetic clay liner, a geomembrane and a geotextile (a granular drainage layer is placed over them) (Figure 1). The installation process can induce some damage on the geosynthetics, causing unwanted changes in their properties. For the correct application of these materials, these changes must be properly quantified and accounted in the design phase.

This work studies the effect of mechanical damage under repeated loading on the behaviour of the geosynthetics used in the base liner system of waste landfills. For that purpose, the materials (a combination of a geosynthetic clay liner, a geomembrane and a geotextile) were submitted to mechanical damage tests with different granular materials (tests adapted from EN ISO 10722), being monitored the changes occurred in their short-term behaviour. The mechanical damage tests consisted in placing the geosynthetics between a rigid or flexible base (relative density of 50% or 80%) and a granular material and submitting them to dynamic loading between 5 and 500 kPa during 200 cycles at the frequency of 1 Hz. The granular materials used in the tests included a natural aggregate (gravel 14/20), a recycled ceramic aggregate (construction and demolition waste) and corundum (synthetic aggregated used in the test method described in EN ISO 10722). The damage suffered by the geosynthetics (in the mechanical damage tests) was evaluated qualitatively (by visual inspection) and quantitatively (by monitoring their tensile, tearing and static puncture properties).

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Base liner system of a waste landfill.

- **14161 | Root Morphology Adaptation to Zinc Deficiency**

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Zinc (Zn) is an essential micronutrient for all living organisms. In plants, Zn plays catalytic roles in a variety of key metabolic enzymes and is crucial in the structural motif of transcriptional regulatory proteins. Aimed at this essentiality, a situation of Zn deficiency, and its effects, is a subject of major interest in agronomy and plant biology.

Plants have evolved mechanisms to adjust the expression of genes associated with Zn homeostasis, enhancing the Zn uptake capacity when facing a shortage in supply. Previous work demonstrated that two closely related members of the *Arabidopsis thaliana* basic-region leucine zipper (bZIP) transcription factor gene family, *bZIP19* and *bZIP23*, can regulate the adaptation to low Zn supply. However, it is unknown if this adaptation involves changes in root morphology. The spatial and temporal deployment of the root system determines the efficiency with which the plant captures nutrients in soil.

This work involves a detailed characterization of root phenotypes for WT, *bzip19* and *bzip23* single mutant plants and *bzip19/bzip23* double mutant plants under complete nutrient availability and Zn deficiency. The characterization consists of quantification of root length, lateral root and lateral root primordia. It will be also quantified the stage of development of the lateral root primordia observed using the differential interference contrast (DIC) microscopy.

- 14172 | Screening new heterocyclic aromatic compounds of nitrogen and sulphur for antitumour activity

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Cancer accounted for 8.8 million deaths in 2015, according to WHO. Therefore, there is a clear need to develop novel compounds with antitumor activity. The aim of this work was to study the cell growth inhibitory activity of six new heterocyclic aromatic synthetic compounds of nitrogen and sulphur (1 to 6, Figure 1), in two different human tumor cell lines: non-small cell lung cancer (NCI-H460) and colorectal adenocarcinoma (HCT-15). The sulforhodamine B assay was carried out, following treatment with the compounds or appropriate controls, and the GI50 concentrations were determined.

Promising results were found for compounds 2 and 6. Compound 2 showed the greatest activity in the HCT-15 cell line (GI50 $8.4 \pm 0.8 \mu\text{M}$) but had no cell growth inhibitory activity in the NCI-H460 cell line, up to the maximum concentration tested (GI50 $>150 \mu\text{M}$). Compound 6 exhibited a potential growth inhibitory effect in both HCT-15 (GI50 $10.8 \pm 1.1 \mu\text{M}$) and NCI-H460 (GI50 $17.0 \pm 1.2 \mu\text{M}$) cells.

Further assays will be carried out with compound 2 since it was the compound that showed the greatest potential to inhibit cell growth. The determination of its effect on cell cycle profile will be carried out, by analyzing cellular DNA content by flow cytometry following incubation with propidium iodide. Determination of cellular apoptosis will be performed with the Annexin V-FICT and propidium iodide assay, by flow cytometry. Future work will also include the analysis of expression levels of proteins associated with cell cycle profile and apoptosis, by Western Blot.

In summary, our findings indicate that compound 2 has selectivity for some tumor cells, possibly by acting on a molecular target that is only present in such cells. Further work will confirm the toxicity of this compound to non-tumor cells. In addition, the obtained results suggest that these molecules may be promising scaffolds for the synthesis of other molecules with antitumor potential.

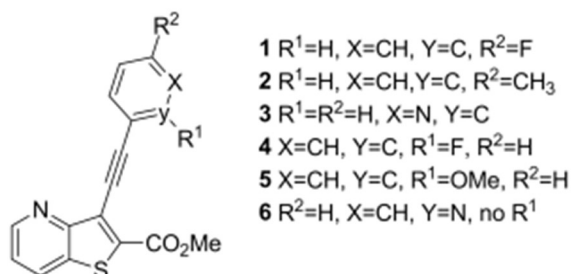


Fig1. Structures of compounds 1 to 6.

- **14099 | Seeking Species Specific Compensatory Episodes on *Mus musculus***

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Missense mutations, which damage proteins and cause a human disease-associated phenotype, are the target of this project. At first, it is expected that these deleterious mutations would also cause disease in related species, however they can occur as the wild-type allele in the homologous protein. The tolerance to these mutations is likely to be due to epistatic interactions between the pathogenic mutation and other residues, which balances the effect of the deleterious substitution, softening their negative effect. These mutations are known as compensated mutations. The structural environment, as the type of replacement itself, has a crucial role on the epistatic compensatory interaction, which are more frequent to occur within the same protein. There are numerous cases reported to date, such are mutations associated with Parkinson's disease in humans appearing as wild type in mouse, mutations leading to cystic fibrosis in rat and mouse, phenylketonuria in rhesus monkey, among many others. A series of human disease-associated mutations found as the wild-type allele in the mouse (*Mus musculus*) reported by Azevedo et. al. (2017) were analyzed in order to find the most likely compensatory residues. In this study, we examined and modeled (using homology modeling) the crystal structures for both human and mouse proteins, aiming to validate which compensatory site(s) might be the most suitable candidate(s). This information will be of great relevance in the development future therapeutic strategies and in the development of animal models of severe/lethal human diseases.

- 14093 | Selection of a microbial consortium towards the sustainable recovery of critical metals

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Over the past few years, some metals have been considered critical in Europe, since they have high economic importance but present high risk of supply shortage. Critical metals are unequally distributed, with only 3% of critical raw materials supply in Europe being produced within EU [1]. This arises the need to develop a sustainable supply of raw materials in Europe and decrease the consumption of primary raw materials. In this context, the project BIOCriticalMetals aims to apply bioleaching processes to extract critical metals mainly from mine tailings but also from primary ores. Bioleaching is conducted by microorganisms able to solubilize metals from minerals.

In the Iberian Pyrite Belt (IPB), critical metals such as Ga and In may occur in very low concentrations associated to the polymetallic sulfide ores [2]. Thereby, the main goal of this work was to select the best microbial consortium from Neves Corvo copper plant and the best growth medium to use in future bioleaching experiments with critical metals. Samples of feed and tailings from the mine were incubated with TB or DSM 670 modified media and used as source of microorganisms. The microbial consortia were used to leach sterile copper concentrate and the concentration of Cu, Zn, and Fe in the leachate was monitored throughout 70 days. As these bacteria are already adapted to the metals in higher concentrations, they might be able to recover critical metals from mineral deposits with similar composition to those of IPB.

[1] European Commission, Report on Critical Raw Materials for the EU - Report of the Ad hoc Working Group on defining critical raw material, 2014.

[2] O. C. Gaspar, Mineralogy and sulfide mineral chemistry of the neves-corvo ores, Portugal: Insight into their genesis, *Can. Mineral.*, vol. 40, no. 2, pp. 611-636, 2002.

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- **13905 | Selection process of a geotextile for protection of a pipeline**

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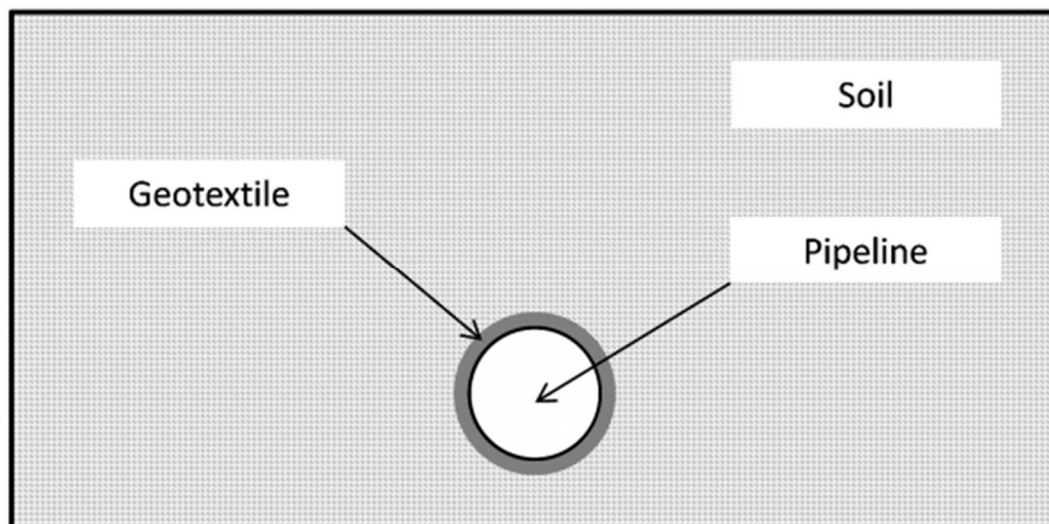
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Geotextiles are polymeric materials used in contact with soil, rocks and/or other construction materials with the functions of separation, protection, reinforcement, filtration or drainage. The geotextiles are typically made from polypropylene or polyester and, according to their structure, they are usually divided into woven or nonwoven. These materials can be applied in many different civil engineering structures due to their high versatility, ease of installation and low cost. Examples of application include: waste landfills, roads, railways, hydraulic structures or coastal protection structures.

This work describes the selection process of a geotextile for providing protection to a pipeline (Figure 1). Protection sand has become a substantial cost factor (due to the volume of sand required and associated transportation and installation costs) in the construction of pipelines and geotextiles provide a cost effective alternative to this conventional construction method. The main goal of the work was to evaluate if the geotextile fulfilled the minimum requirements for being applied in a pipeline system. For that purpose, laboratory tests (characterisation and degradation tests) were carried out in order to determine some relevant properties of the geotextile. The obtained results were compared with the minimum requirements established by the construction project and based on that it was possible to evaluate the suitability of the geotextile for performing the expected protective function. For being considered suitable for application, the properties of the geotextile must comply with the project requirements (otherwise, the material may not perform correctly the functions for which it is intended).

J.R. Carneiro would like to thank Fundação para a Ciência e a Tecnologia for his research grant: SFRH/BPD/88730/2012 (grant supported by POCH/POPH/FSE funding).



Schematic representation of the pipeline.

- **14036 | Simultaneous monitoring of maternal and fetal heart rate variability in the last two hours of labor in prediction of operative vaginal delivery**

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Introduction: Operative vaginal delivery (OVD) is a major obstetrical problem in developed countries being associated with maternal anxiety, postpartum hemorrhage, pelvic floor injury and increased resource consumption. In this study, we analyzed simultaneous maternal (MHR) and fetal heart rate (FHR) variabilities, as surrogates of the maternal and fetal autonomous nervous systems activity, in prediction of OVD.

Methods: A set of 44 MHR and FHR recordings were obtained simultaneously from an equal number of singleton term pregnancies in the last 2 hours of labor (H1 and H2) and were analyzed using linear and entropy indices. Interaction between MHR and FHR was assessed through MHR and FHR differences and analysis of cross-sample entropy (cross-SampEn). For statistical inference, nonparametric bootstrap confidence intervals, p values and areas under receiver operating characteristic (auROC) curves were used.

Results: With progression of labor there was a significant increase in most MHR and FHR linear indices, a significant decrease of entropy indices and an increase of MHR and FHR synchrony/regularity (cross-SampEn) in both the normal and OVD groups. Moreover, there was an increase of the maternal and a decrease of the fetal sympatho-vagal balance. The mean MHR, predominance of low-frequency (LF) component and sympatho-vagal balance (LF/HF) were significantly higher in the OVD group, while the opposite occurred with the high-frequency (HF) component and entropy. Regarding FHR, only a higher sympatho-vagal balance in H1 and short-term variability and entropy in H2 were observed in OVD. MHR and MHR-FHR indices let to the best prediction results, namely the balance between short and long-term variability with an auROC of 0.83 corresponding to a sensitivity and specificity of 94.1% and 70.4%, respectively.

Conclusion: Linear and non-linear analysis of simultaneous MHR and FHR recordings may help to characterize labor progression and discriminate between normal and OVD.

- **14103 | Solar saltwork ponds in Portugal: challenges and biotechnology processes**

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The salt is defined as the product of the mixture of a base and a strong acid resulting in an inorganic salt and water. Salt has been used and extracted by man for many years and can have several sources, forms and flavors with better or worse health effects. In Portugal, salinas are exploited seasonally from the traditional point of view of exploitation of NaCl through the climatic conditions, with a huge exploitation potential to be enjoyed during the remaining months. Thus, the present work has the objective of reviewing the development of salinas, their products, their uses and potential potential in Portugal between 1967 and 2017. This is the first characterization work of salinas in Portugal and its uses.

- **13870 | Spatial Variability of the Deposition Flux of Particulate Matter in Asprela University Campus**

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With this study, it was intended to develop an evaluation and characterization of the air quality in the Asprela university campus, located in the parish of Paranhos in the municipality of Porto. The main objective of this study was to analyze the spatial variability of the deposition flux of particulate matter at this site, identifying the areas where a larger amount of particles was deposited, relating this deposition, not only with the climatological variables, but also with the possible surrounding emitting sources.

The method of collecting the deposited particles was based on the French standard, NF X 43-007, as well as the laboratory work done to obtain the deposition flux. The sampling work took place in the period between April 2015 and February 2016 where 7 sampling campaigns were carried out.

After obtaining and processing the data, several techniques of classical statistics and geostatistics were used such as exploratory data statistics, the variographic analysis and ordinary kriging, with the objective of analyzing the data of the deposition flux and the data referring to the climatological variables. Based on this information, the spatial dispersion models of the deposition flux were developed for each sampling campaign, thus obtaining isocontour maps of the mass values for the deposited particulate matter. Elemental identification by scanning electron microscopy was also used in the 2nd and 3rd sampling campaigns, at the Materials Center of the University of Porto (CEMUP).

The obtained results show that the campaigns that took place during hot and dry periods, 2nd and 3rd ones, were those in which a larger amount of deposited particles were obtained with deposition flux values of 2.04 g/m²/month and 1.72 g/m²/ month, respectively. After the construction of the contour maps, it was verified that one of the sampling points where a recurrent high deposition of particles was observed, refers to the deposition plate located in the FEUP Coffee Shop.

- **14127 | Study of new therapeutic strategies to combat mammary cancer**

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Cancer is the second leading cause of death behind heart disease, accounting for 8.8 million deaths worldwide in 2015 [1]. An alarming type of cancer is breast cancer, which comprises a heterogeneous complex of diseases and consequent difficulty in the treatment. This type of cancer is the most common cancer in women [2]. Drug repurposing is a methodology to identify a new use for existing drugs. It allows lower costs and shorter time until approval than developing a drug de novo, because all phases of clinical trials have already been performed for approved drugs and the information regarding side effects, pharmacokinetics and interaction with other drugs has been collected. Cytostatic and/or cytotoxic activity for compounds within a wide range of drug classes other than cancer has been demonstrated in several studies. So, the study of the arsenal of drugs approved for non-cancer indications might offer effective treatment options for cancer patients. However, despite the growing attraction about this methodology, reports of successful repurposing of drugs as anti-cancer agents have been limited [3]. The purpose of this work consists in the study of the cancer progression using a combination of drugs, highlighting the status of drug repurposing for mammary carcinoma. To achieve these objectives, a reference cytotoxic drug in combination with drugs which are not approved for cancer conditions are being used in breast cancer cell lines, as well as respective cell structure and viability protocols. With a focus on MCF-7 cell line and using assays such as MTT, it was observed a significant reduction of cell viability, when comparing the single treatment with a reference drug or a repurposed drug and the treatment in which the combination of both drugs was applied.

[1] World Health Organization, 2017. Cancer.

[2] Zappulli et al., J. Dairy Res. 2005, 72, 98-106.

[3] Bertolini et al., Nature Reviews Clinical Oncology. 2015, 12(12), pp.732-742.

- **14101 | Study of the electrochemical behaviour of an anti-tuberculosis drug at the surface of screen-printed electrodes**

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The use of screen-printing technology in the production of disposable and versatile screen-printed electrodes (SPEs) intended to the electrochemical study of a wide range of substances is currently undergoing widespread growth [1]. Indeed, the exploitation of SPEs on the analytical determination of pharmaceutical compounds in complex matrixes can provide important advantages, such as no pre-treatment steps, great sensibility, simplicity, disposability, cost effectiveness and potential for mass production [2].

In this work, the electrochemical behaviour of rifampicin (Figure 1), a first-line anti-tuberculosis drug, is explored at the surface of SPEs with different working electrodes' materials. The drug undergoes on a complex redox process that was studied by cyclic voltammetry and square wave voltammetry techniques. Results suggest that despite their disposability, SPEs exhibited high stability, reproducibility and repeatability, allowing the detection of the drug within a large linear dynamic range, thus offering a promising alternative for its analysis in micro-volumes of complex samples. Furthermore, the produced electrodes provided excellent biocompatibility, good electrical conductivity, low electrochemical interferences and a high signal-to-noise ratio.

References:

[1] Thapliyal, N.; Karpoormath, R.V.; Goyal, R.N., *Anal Chim Acta.* 2015, 853, 59-76.

[2] Couto, R; J.L.F.C. Lima; Quinaz, M.B. *Talanta* 2015, 146, 801-814.

Acknowledgments

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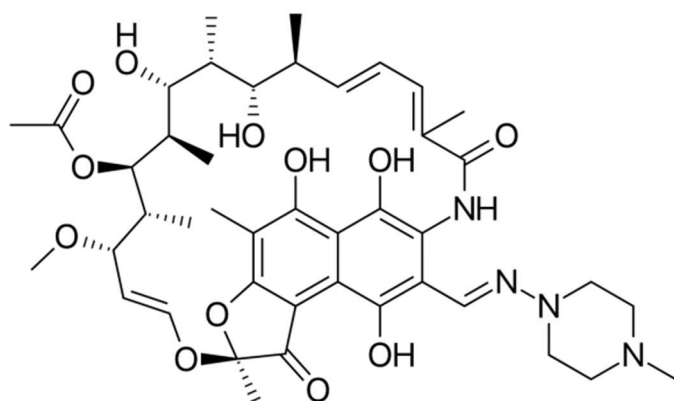


Figure 1. Chemical structure of rifampicin.

- **13936 | Synthesis and biodegradability of choline-based deep eutectic solvents**

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Deep eutectic solvents (DESs) have been described as a promising alternative to conventional organic solvents and their putative greener substitutes, namely the ionic liquids (ILs). Several studies have revealed that ILs are not intrinsically green, as was first believed. Indeed, many of them seem to be poorly biodegradable and toxic [1]. The natural origin, renewability, low toxicity and biodegradability of the raw materials of DESs suggest that these mixtures can be much greener than their relatives, besides being easier to prepare and cheaper [2]. However, the real environmental impact of these solvents must be confirmed before any assumption be made. In this context, the biodegradability of DESs prepared by thermal mixing of choline chloride and varying hydrogen-bond donors was measured by the closed bottle test [3]. The obtained results revealed differences in the biochemical oxygen demand and % biodegradation between the tested compounds, highlighting the influence of DESs' chemical structure on its biodegradability. Four of the selected compounds reached the criteria to be classified as ready biodegradable under the tested conditions and most of the others showed promising possibility of reaching the pass level within a 28-days period.

References

[1] M.C. Bubalo, K. Radosevic, I.R. Redovnikovic, J. Halambek, V.G. Srcek, *Ecotoxicol. Environ. Saf.* 99 (2014) 1.

[2] Q. Zhang, K.O. Vigier, S. Royer, F. Jerome, *Chem. Soc. Rev.* 41 (2012) 7108.

[3] OECD, *OECD Guideline for Testing of Chemicals: 301 D Closed Bottle Test*, OECD, Paris, 1992.

Acknowledgments

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*Both these authors contributed equally to the work

- **13864 | Synthesis and Evaluation of GPE lipophilic conjugates with neuroprotective amines**

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Glycyl-L-prolyl-L-glutamic acid (**GPE**, **Scheme 1**) is a neuropeptide obtained by the N-terminal cleavage of insulin-like growth factor 1 (IGF-1), which is found in brain tissue.¹ Although its modus operandi remains unknown, in vitro and in vivo studies have demonstrated that this tripeptide is capable of stimulating the release of both acetylcholine and dopamine and act as neuroprotective against several neurotoxic agents.² Therefore, **GPE** has great therapeutic potential in neurodegenerative diseases, such as Alzheimer's and Parkinson's. However, this neuropeptide displays unfavorable pharmacokinetic properties, namely low oral absorption.¹

Thus, the main objectives of this work are to synthesize and evaluate novel conjugates of **GPE** to increase its lipophilicity and also mask exposed functional polar groups (amine and carboxylic acid). Since it is known that **GPE** is metabolized by carboxypeptidases (from C-terminal to N-terminal),³ glutamate functionalization was made by peptide coupling with neuroactive lipophilic amines, which may allow the release of the neuroactive amines as well as the native **GPE** (**Scheme 1**). Our aim is to investigate a potential synergic effect of neuroprotective action and permeability across the blood-brain barrier of the conjugates, potentiating their pharmacological profiles.

The conjugates will be biologically evaluated to determine their neuroprotective potential using the SH-SY5Y neuronal cell line under conditions of H₂O₂-induced oxidative stress using MTT assay for assessing cell metabolic activity.

References: 1. Cacciatore, I. et al. Mini-Reviews in Medicinal Chemistry. 2012, 12, 13-23. 3. Costa, J. F. et al. Eur. J. Med. Chem., 2013, 69, 146-158. 4. Burgos-Ramos, E. et al. J. Neurochem., 2009, 109, 360-370.

- **14125 | Synthesis of a new xanthone by “click chemistry”**

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“Click chemistry” is a term used to describe reactions that are in general fast, simple to use, easy to purify, versatile, and regioselective. The copper-catalyzed alkyne-azide cycloaddition emerged as the first and leading example of a “click chemistry” reaction [1].

In this work, the synthesis of a new 1,2,3-triazole linked sugar xanthone by “click chemistry” is reported. The copper-catalyzed reaction using 3,6-bis(prop-2-ynoxy)-9H-xanthen-9-one (*in-house* synthesis) and 2-azidoethyl 2,3,4,6-tetra-*O*- β -D-glucopyranoside as building blocks was performed under microwave irradiation, in 20 minutes. Purification proceeded using silica flash chromatography and the product was obtained in 32% yield.

The structure elucidation of the synthesized compound was established using spectroscopic methods, namely, IR and ¹H and ¹³C NMR.

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References:

[1] Kolb, H.C., M.G. Finn, and K.B. Sharpless, *Angew. Chem. Int. Ed.*, 2001, 40, 2004-21.

- **13897 | Synthesis of a polyoxygenated xanthone with anti-aging potential**
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The use of antioxidants in the cosmetic industry is widespread in sunscreens and anti-aging formulations. Antioxidant agents are found abundantly in natural sources such as seaweed, chlorophyll-containing photosynthetic marine macroscopic algae, which possess a developed antioxidant defense system. The study of the relationship between the structure of these natural compounds and their activity allows the optimization of the efficacy of their biological activities. Such classes of antioxidants comprise xanthenes, naturally occurring polyphenolic compounds with a dibenzo- γ -pyrone scaffold. Previous structure-activity relationship (SAR) studies suggested that synthetic simple hydroxylated xanthenes with vicinal diol groups have promising antioxidant activity. In light of these findings, this project aims to synthesize new trihydroxy xanthenes and to evaluate their antioxidant properties. Herein, the synthesis of 1,2,4-trihydroxyxanthone will be presented. The approach was based on the reduction of 2,5-dihydroxy-1,4-benzoquinone with tin to afford 1,2,4,5-tetrahydroxyphenol. The condensation of 1,2,4,5-tetramethoxyphenol, previously obtained by methylation, with 2-methoxybenzoyl chloride will provide the appropriate benzophenone which will be further cyclized to give 1,2,4-trimethoxyxanthone to be submitted to demethylation to furnish 1,3,4-trihydroxyxanthone. Structure elucidations of these compounds will be performed by spectroscopic techniques.

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- **13986 | Synthesis of triazole linked chalcone derivatives by Click Chemistry**

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Chalcones are naturally occurring flavonoids with a wide diversity of biological properties, namely antimicrobial, anti-inflammatory and antitumor activities [1]. The introduction of a triazole moiety in many pharmacologically active molecules has also been of great interest in last years, especially in drug discovery. [3].

Taking this into consideration, this work describes the synthesis of several triazole linked chalcone derivatives by Click Chemistry. Firstly, chalcone derivatives were synthesized by Claisen Schmidt condensation of previously obtained propargylated acetophenones with substituted benzaldehydes in basic medium. Afterward, these compounds were submitted to microwave assisted Copper (I)-catalyzed azide alkyne cycloaddition with substituted azides in order to obtain the desired triazole derivatives. The structure of all synthesized compounds was established by NMR techniques.

#Authors contributed equally to this work.

References:

1. Singh, P. et al. (2014), Eur J Med Chem, 85, 758-777.
2. Totobenazara, J. et al. (2015), Tetrahedron Letters, 56, 2853-2859.

Acknowledgements: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, the projects PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (POCI-01-0145-FEDER-016793; Project 9471-RIDTI), and PTDC/DTPFTO/1981/2014 (POCI-01-0145-FEDER-016581) as well as by the project INNOVMAR - Innovation and Sustainability in the Management and Exploitation of Marine Resources (reference NORTE-01-0145-FEDER-000035, within Research Line NOVELMAR), supported by North Portugal Regional Operational Programme (NORTE 2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (ERDF).

- **14131 | Synthesis of xanthone derivatives with potential antimicrobial activity.**
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Antimicrobial resistance (antibiotics, antifungals, antivirals, or antiparasitic agents) can occur naturally, however, the overuse of antimicrobials greatly contributes to accelerate antimicrobial resistance [1]. Consequently, antimicrobial drugs are becoming progressively more ineffective and the need for new, safe and efficient agents is increasing.

Xanthenes are secondary metabolites commonly occurring in higher plant families, fungi, and lichen [2]. Several studies have shown that xanthenes possess significant biological activities, including antibacterial, antifungal and antiviral [3,4]. As they are isolated from Nature in low amounts, their laboratorial synthesis plays a major role for providing suitable quantities for clinical evaluation and structural diversity that allows the understanding of their mechanisms of action and the design of new bioactive molecules.

In this work, the synthesis of two new xanthone derivatives with potential antimicrobial activity is described. These xanthone derivatives were obtained *via* benzophenone in seven steps with good yields.

References:

1. W.H.O. Antibiotic-resistant priority pathogens list. 1 of December, 2017; Available from: <http://www.who.int/mediacentre/news/releases/2017/bacteria-antibiotics-needed/en/>
2. Negi, J. S., et al., (2013). J App Chem, 2013.
3. Chin, Y. W., et al., (2008). Mini-rev Org Chem, 5(4), 355-364.
4. Shan, T., et al., (2011). Curr Mol Med, 11(8), 666-677.

Acknowledgments: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020 and the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599 - Promover a Produção Científica e Desenvolvimento Tecnológico e a Constituição de Redes Temáticas (3599-PPCDT)) in the framework of the programme PT2020.

- **13874 | The effect of lidocaine on surface charge of bacteriorhodopsin purple membranes and cultured brain endothelial cells**

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Plasma membrane surface charge originating from negatively charged lipid head groups and the glycocalyx play an important role defending the blood-brain barrier. It can regulate permeability across brain endothelial cells including drug transport. Lidocaine, a cationic and lipophilic molecule used as anaesthetic and antiarrhythmic drug can change the surface charge of lipid membranes. However, the direct action of lidocaine on surface charge of endothelial cells was not yet measured. Our aim was to study the direct effect of lidocaine on the charge of purple membrane containing bacteriorhodopsin (bR), as a simplified molecular system, and the surface charge and barrier properties of brain endothelial cells.

Characteristics of bR were measured by spectroscopy. Zeta potential reflecting surface charge was tested on both models by laser Doppler velocimetry using Zetasizer Nano instrument (Malvern). Barrier properties of hCMEC/D3 human brain endothelial cells were evaluated by transendothelial electrical resistance, permeability for marker molecules dextran, lactalbumin and RNase, and tight junction integrity by immunochemistry.

We could demonstrate by direct measurements, that lidocaine makes the surface charge of both purple membranes containing bR and human brain endothelial cells more positive. This observation can be relevant to better understand the biophysical background of the anesthetic action of lidocaine.

- **14165 | The germline co-occurrence of low or moderate risk alleles in Familial Intestinal Gastric Cancer**

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Introduction: Ten percent of all gastric cancers display familial aggregation. Familial Intestinal Gastric Cancer (FIGC) has been thought of as an autosomal dominant inheritance pattern syndrome, displaying common macroscopic features observed in sporadic intestinal gastric cancer. However, no inherited mutations have been yet described, and no genetic screening is available for FIGC patients.

We aimed at identifying the germline cause of FIGC families and at characterizing the 2nd hits in potentially causative genes occurring in FIGC tumours and other somatic events.

Material and Methods: Normal and tumour DNA from 52 FIGC probands were screened using a multiplex custom-panel of 67 cancer-associated genes with Illumina's MiSeq platform. Somatic 2nd mutation and promoter methylation were searched by PCR-Sanger sequencing.

Results and Discussion: Twenty-four out of 52 FIGC families harboured germline variants. From these 24 families, 36 germline variants were found, affecting 17 genes, being the most frequently altered: MSH6, SDHD, MAP3K6, ATM and MTUS1. Of notice, 42% of the families carried co-occurrence of germline variants. Further, MSH6 and FAT4 genes were potentially inactivated at the somatic level, through a 2nd mutation, in two families. The somatic landscape revealed 115 variants, affecting 23 genes, found in 36 families. The most frequently altered genes were: TP53, MSH3, ARID1A, FAT4 and APC.

Conclusion: In conclusion, this work pinpointed FIGC as a likely polygenic rather than a monogenic disease in 42% of FIGC families, where co-occurrence of low or moderate risk alleles that interact with family history and other non-genetic factors can increase the risk of cancer.

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- **14326 | The Hummingbird Collection of the Natural History and Science Museum of the University of Porto (MHNC-UP)**

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The hummingbird (Family Trochilidae) collection of the Natural History and Science Museum of the University of Porto (MHNC-UP) is one of the oldest single collections of this family harboured in European museums. More than one thousand specimens, that encompass most of the taxonomic range of this family, were collected in the late 19th Century. They were mainly bought from the same provider to be the core of a private collection that was donated in the early 20th Century to the museum that is now the MHNC-UP. In this context there is an ongoing effort to promote the use of this collection for research and education in the near future. Here we document the main tasks to achieve these goals. More specifically, we finished the digital curation of all specimens to increase the taxonomic accuracy and dissemination of the collection.

- **14075 | The influence of atmospheric pollution in the expression of allergens in *Betula pendula* pollen**

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The study of pollen related allergies, has always been an interesting challenge for scientists due to difficulties on understanding the vast interconnections of all mechanisms responsible for these reactions. Some research groups have been focused on studying the relationships between pollen allergies and atmospheric pollution. This view is different from the traditional immunological human focused approaches, since it deals with the effect of pollution in public health, which is an emergent danger in modern societies.

The main aim of our project is to determine whether allergenic proteins expression in pollen increase due to air pollution, by means of immunological techniques and RT-qPCR.

Previous work showed that pollen exposed to different pollutants increase the reactivity of the allergens to the patient sera when tested by western-blot. We decided to corroborate this data with different techniques: electronic microscopy to determine any changes in the intracellular accumulation of allergenic proteins to different pollutant levels, and RT-qPCR to detect changes in the transcription of allergen genes.

We use *Betula pendula* pollen and focus on two major allergens Bet v1, a pathogenesis-related protein PR-10 family member, and Bet v2, a major pollen allergen, profilin. The pollutants under study are O₃ and NO₂, as previous results showed that levels below the current legal atmospheric hour-limit value of NO₂ in pollen induce an increase in reactivity of the allergen to patient sera. This could suggest that it is of public health interest to reduce the current atmospheric hour-limit value acceptable for human health protection in Europe.

We believe that our work will bring an essential insight to the allergy research and its relation with environmental changes.

- **14030 | The Influence of Contamination on the Metabolic Activity of Hediste diversicolor from Ria de Aveiro**

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During decades effluents from the Estarreja Chemical Complex were directly discharged in the Ria de Aveiro lagoon. "Esteiro de Estarreja" (EE) was the main channel receiving effluents rich in aromatic based and chlorine compounds and in metals such as As, Hg, Pb and Zn. Benthic organisms are in direct and permanent contact with sediments, which are the main sink of these contaminants, bioaccumulating them in their tissues. This provides an indication of possible risks for biota, through trophic chains transferences, as well as on ecosystem services. Therefore, the study of the potential impact of sediments contamination on the organism's health is of utmost importance. So, molecular biomarkers can provide valuable information about organism's stress responses that can be translated in effects at higher levels of organization. The use of biomarkers is becoming increasingly important as early-warning indicators of ecological stress. This study aims at evaluating the effects of sediment contamination on invertebrates, by analysing some sensitive biomarkers of exposure and effect. Four different sites along the EE channel, and a reference site (in the Vagueira channel) were selected for sediments and polychaetes (*Hediste diversicolor*) sampling. Organic contaminants (PCBs, HCB) and metals were analysed in sediments. Oxidative stress biomarkers, and biomarkers of neurological activity were determined. Very high levels of organic contaminants and metals were found in the sediments. For most contaminants, levels were higher at the beginning of the channel. Regarding biomarkers, results showed that the contamination levels are affecting the oxidative stress response system, as well as the neurological functions of polychaete. Differences between sites were observed, but due to the high levels of contaminants found in all sites, and the mixture effect, is difficult to conclude which are the ones responsible for the effects observed.

- **13948 | The potential of 3D food printing - a state of the art.**

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World population is growing at an alarming rate, implying a greater amount of resources to guaranty food security. From a nutritional point of view, consumers are also more concerned and aware about the origin, composition and health effects of the food they are eating. Therefore, the food industry is under a great pressure not only to find new food products with different resources but also to improve the nutritional value of the products already available.

In this sense, 3D food printing is a technique based in the creation of 3D food structures in a layer by layer manner, which is foreseen to create highly configurable products which can introduce the use of non-traditional food resources to battle the growing demand of food in our planet. Furthermore, the flexibility of this technique may also allow the adaptation of the nutritional content of a product to each individual, depending on their needs.

The aim of this work is to summarize the different types of 3D printing techniques used, the major factors influencing the printing stage and ultimately to describe some of the works developed in order to demonstrate the potential of this field in the near future.

- **14333 | The Red Fox (*Vulpes vulpes*) in Portugal: characterisation of the population and monitoring of the hunting effort in the 2017-18 hunting season**
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The Red Fox, *Vulpes vulpes* Linnaeus, 1758 is a game species in Portugal but hunting is under strict regulation. The fox hunting season for 2017-18 extends from the 1st October to the 28th February, but only during thursdays, saturdays, sundays and national holidays. Our aim is to monitor the hunting effort on the fox, but also to analyse the species biometric characteristics (height, length, weight) as well as to analyse some fundamental aspects of the life (age structure, longevity and reproduction). This information is crucial for a correct management of the population.

Municipal hunting zones offering fox battues are being contacted to obtain information on the hunting effort (number of accomplished battues, battues bag) and to provide the carcasses for the population's characterization (sex ratio, biometric characteristic, reproductive parameters). With statistical analysis we will look for sexual dimorphism and for possible differences related with geographical distribution.

According to the ICNF database of the MHZ notices a total of 1639 battues were offered for the 2017-18 hunting season; during the three first months (October-December) none of the battues took place, the main reasons being a big lack of hunters, deforested zones due to the fires that happened and some MHZ are stopping to do the battues because of the lack of foxes in those zones. However, most the battues are programmed to take place in January and February 2018. At this early stage of our work, as no battue took place and no carcasses were so far obtained, we were unable to start population characterization.

In spite of the present lack of data, the data collected in previous hunting seasons always points out to a bigger hunting effort in January and February. So, we are optimistic both about the monitorization plan and harvesting of a red fox carcasses sample to analyse.

- **14163 | The role of adrenergic receptors in carcinogenesis**

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Vale, Nuno, Faculdade de Ciências, Portugal

Fresco, Paula, Faculdade de Farmácia, Portugal

Adrenergic signaling has been recognized to be involved in initiation and progression of cancer: increased catecholamine levels contribute to a permissive tumor microenvironment, which facilitates cancer progression and metastasis. Previous studies have shown up-regulation of adrenoceptors, namely β -adrenergic receptors, in several types of solid tumors. Moreover, several epidemiological studies have presented compelling evidence that β -blockers cause a lower recurrence, progression and mortality in breast cancer and melanoma.

Having in mind the diversity of adrenoceptors and the mechanisms of synthesis and inactivation of noradrenaline and their impact on epithelial-mesenchymal transition (EMT). The aim of the present study is to establish the appropriate methodologies to study the mechanism linking adrenergic system and carcinogenesis.

Preliminary studies using MTT, Hoechst 33342 dye exclusion, scratch and imunocytochemistry assays are being carried out, exploring the effects of adrenergic agonists and antagonists in different melanoma and breast cancer cell lines.

- 14053 | Thermochemical studies of methoxy-indanone derivatives from biomass degradation processes

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The interest by the use of biomass in the energy production has been increasing and may contribute significantly to the future energy demand, being improved the solutions for some of the world's energy problems [1]. The energy from biomass may be obtained either directly, being released in combustion processes, or by upgrading it into a more valuable and usable fuel, in particular higher value products for the chemical industry [2]. The indanone derivatives may be derived from biomass, being used as platform intermediates on the synthesis of new products, which justifies the relevance of their thermodynamic characterization, with the knowledge of the inherent thermophysical and thermochemical properties [3].

In this context, the aim of this work is to develop an experimental and computational thermochemical study on two methoxyindanones, namely 5,6-dimethoxy-1-indanone and 6-methoxy-1-indanone (Figure 1). The massic energies of combustion of these compounds and their enthalpies of sublimation have been determined by static bomb combustion calorimetry and by Calvet microcalorimetry, respectively. The results derived from these experimental determinations, the enthalpies of formation and sublimation of each crystalline compound, allow to calculate the value of the corresponding enthalpy of formation in the gaseous state. Complementary, it is evaluated the energetic effect of the presence of a methyl or methoxy group in the indanone structure.

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References:

[1] Petrus, L.; Noordermeer, M.A. *Green Chem.* 2006, 8, 861.

[2] King, A.E.; Brooks, T.J.; Tian, Y.-H.; R. Batista, E.R.; Sutton, A.D. *ACS Catal.* 2015, 5, 1223.

[3] Freitas, V.L.S.; Lima, A.C.M.O.; Sapei, E.; Ribeiro da Silva, M.D.M.C. *J. Chem. Thermodyn.* 2016, 102, 287.

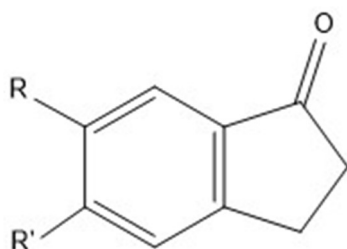


Figure 1. Structural formula of 6-methoxy-1-indanone (R = OCH₃; R' = H) and of 5,6-dimethoxy-1-indanone (R, R' = OCH₃).

- **14284 | Topology and the deleuzian fold: contributions to contemporary morphology**

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The following paper is part of an on-going investigation within the scope of my Ml.ARQ thesis (supervised by Gonçalo Furtado), and focuses on the potential of Topology within the context of architectural experimentation.

The theoretical debate is contemporarily centered, among other aspects, in managing complexity in architecture. This discussion goes back to one other, started four decades ago and focused on the idea of "conflict" and "contradiction" as an architectural response to the heterogeneous, diverse and differentiated cultural context. Today, its normative principles, nourished by the evolution of scientific and theoretical contents, find in the new systemic theories and substantially in their topological attributes an alternative to such strategies as an operative model to architecture.

This paper explores the sustained relationship between topology and the morphosyntactic and design dimensions in architecture. Such exercise, focused on the post-contradictory aesthetics of the deleuzian fold, aims to inquire the architectural productivity of the topological geometries which replace combinatorial logics of platonic forms by other principles systematizing time, connection and flexibility.

By exposing the evolution of Geometry, it frames certain concepts and values convergent to the topological theme while stressing the relationship between geometry and the evolution of the morphological landscape of architecture. It furthermore traces the correlation between the specificities of the topological discipline and the plasticity of Gilles Deleuze's discourse, drawing, as such, the architectural substance of those issues particularly regarding its productivity on the architectural thought and in morphological and morphogenetic explorations within the performative and relational realm of architecture.

- 13985 | Total synthesis of neofiscalin A: achieving the first steps

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Neofiscalin A (**1**), an alkaloid containing a pyrazino[2,1-*b*]quinazoline-3,6-dione core linked to an indole moiety, was isolated from the soil and marine fungus *Neosartorya siamensis*. This secondary metabolite showed potent antimicrobial activity against methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus faecalis* (VRE) as well as exhibited a great potential as an antibiofilm agent[1]

Herein, we present the initial synthetic steps towards the total synthesis of neofiscalin A (**1**). Our approach has to do with the preparation of the tryptophan-derived scaffold **2** [2] and further coupling with anthranilic acid (**3**) and protected L-valine (**4**) through a microwave-promoted three-component one-pot reaction. [3] Synthetic details as well as structure characterization (by 1D and 2D NMR studies) of the new synthesized compounds will be presented and discussed.

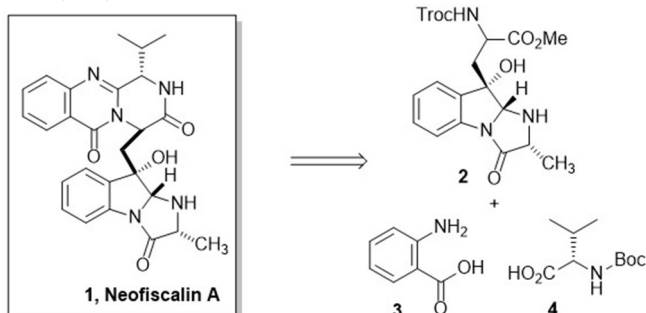
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References

[1] Bessa, L. J.; Buttachon, S.; Dethoup, T.; Martins, R.; Vasconcelos, V.; Kijjoa, A.; da Costa, P. M. FEMS Microbiol. Lett. 2016, 363, 1.

[2] Snider, B. B.; Zeng, H. J. Org. Chem. 2003, 68, 545.

[3] Liu, J.-F.; Ye, P.; Zhang, B.; Bi, G.; Sargent, K.; Yu, L.; Yohannes, D.; Baldino, C. M. J. Org. Chem. 2005, 70, 6339.



Retrosynthetic analysis of neofiscalin A

- **13911 | Understanding the impact of Siramesine on lipid monolayers: relevance for therapeutic effects**

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Siramesine is a sigma-2 receptor agonist that initially was produced to treat anxiety and depression but it was discontinued after clinical trials that showed lack of efficacy in humans. Nowadays, Siramesine has been shown to trigger death of cancer cells *in vitro* and displays potent anti-cancer activity *in vivo*. However, the mechanism of action of this molecule is still poorly understood, since some authors believe it has the ability to destabilize lysosomes but others believe it can induce dysfunction of the mitochondria. The rapid cell death, which may be accompanied by the loss of cellular integrity, may be related with interactions of Siramesine with the phospholipids of the membranes, changing their structure and their packaging.

For that reason, the objective of this project is to understand the biophysical interactions between the inner and outer lipid membranes of the mitochondria and the anti-cancer drug Siramesine in different concentrations, using phospholipid monolayers in a Langmuir trough as an *in vitro* model.

To study these interactions, we used a mimetic monolayer of the most abundant phospholipids for both the internal and external mitochondrial membranes. To mimic the internal membrane it was used phosphatidylcholine, phosphatidylethanolamine and cardiolipin and to mimic the external membrane it was used phosphatidylcholine and phosphatidylethanolamine.

To characterize the Langmuir monolayers several techniques have been used such as: Langmuir isotherms (superficial pressure /molecular area), Brewster angle microscope (BAM) and Infrared reflection-absorbance spectroscopy (IRRAS).

The results obtained suggest that Siramesine interacts with both mitochondrial membranes, which may ultimately be related with cancer cell death.

- **13979 | Unveiling the Antifungal Potential of Medicinal Plants from Guinea-Bissau**

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Fungal infections are a problem of growing importance. Their epidemiology has changed and among the humans pathogenic, *Candida*, *Aspergillus* and dermatophyte species deserve our attention. Due to the increasing number and severity of fungal infections, responsible for high mortality and morbidity, and refractory treatments the continued search for new antifungal agents is a priority [1]. Therefore, we have initiated the documentation of Guinea-Bissau's medicinal plants, many of which used to treat microbial infections, aiming to assess and validate their true therapeutic potential.

The antifungal activity was evaluated for eight extracts, obtained from the stem bark or leaves, of *Bauhinia forficata*, *Allophylus africanus*, *Cassia sieberiana* and *Terminalia macroptera* collected in Mansôa, Guinea-Bissau. Minimum inhibitory and lethal concentrations were determined against yeasts (*Candida albicans* and *Malassezia furfur*) and filamentous fungi (*Aspergillus fumigatus* and *Trichophyton rubrum*, a dermatophyte) using the reference CLSI protocols.

Antifungal activity was observed for all the hydroalcoholic extracts tested against *T. rubrum*. *Terminalia macroptera* showed a broad spectrum of activity, being active against yeasts (*C. albicans* and *M. furfur*) and exhibited the higher activity against the dermatophyte. However, no activity was observed against *C. albicans* and *A. fumigatus* for *B. forficata*, *A. africanus* and *C. sieberiana*. Leaves and stem bark extracts showed similar activity. The fungicidal activity demonstrated by *T. macroptera* confirms its potential as an antifungal agent, against a wide spectrum of fungal species frequently implicated in human mycoses, particularly candidiasis, pityriasis and dermatophytosis.

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