

## Scientific Program



**IV CBIOS Seminar**  
November 23<sup>rd</sup>, 2020  
(face-to-face and virtual)

**Auditorium Professor José Araújo**  
*Universidade Lusófona de Humanidades e Tecnologias*



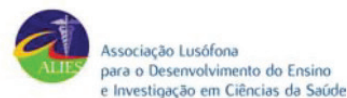
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## IV CBIOS Seminar November 23<sup>rd</sup>, 2020

**Auditorium Professor José Araújo (ULHT)**  
**Lisbon, Portugal**



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## Welcome Message

On behalf of the Organization Committee for the IV CBIOS Seminar, we are pleased to invite you to the this event, that will be held in Lisbon (Portugal), on November 23rd, 2020 at the Auditorium Professor José Araújo (Universidade Lusófona de Humanidades e Tecnologias).

The IV CBIOS Seminar is an academic event that aims to promote the presentation of scientific papers and the discussion of topics that will necessarily contribute to the promotion of Science and Research to the scientific community. Due to the current context of the SARS-Cov-2 pandemic, this year the Seminar will adopt a mixed model (face-to-face and virtual), in compliance with the rules transmitted by the DGS.

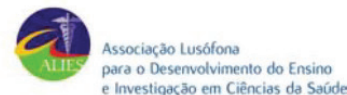
## Organization Committee

Ana Sofia Fernandes  
Catarina Rosado  
Cíntia Ferreira-Pêgo  
Luís Monteiro Rodrigues  
Maria Inês Nemésio  
Patrícia Rijo  
Tânia Santos de Almeida

## Scientific Committee

Gonçalo Calado  
Margarida Alves  
Maria do Céu Costa

## Institutional Sponsorship



## Practical Information

### IV CBIOS Seminar (November 23rd, 2020)

#### Conference venue

The conference venue will be held at the Auditorium Professor José Araújo, Universidade Lusófona de Humanidades e Tecnologias.

#### Contact details

CBIOS – Research Center for Biosciences & Health Technologies,  
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#### Language

Portuguese is the official language of the congress.

#### Zoom Meeting

Join from PC, Mac, Linux, iOS or Android: <https://videoconf-colibri.zoom.us/j/9932036007?pwd=YUw4aVlzWFJFVUpoendITE85SWd6UT09>  
Meeting ID: 993 203 6007  
Password: CBIOS2020

## Scientific detailed program

09:00-09:30	<b>Welcome and Registration</b>
09:30-10:00	<i>Opening</i> L. M. Rodrigues (CBIOS Director)
10:00-10:15	<b>OC1: Sérgio Faloni de Andrade:</b> “The potential of natural products to treat gastrointestinal inflammatory and ulcerative diseases”
10:15-10:30	<b>OC2: Patrícia Rijo:</b> “Abietane Diterpenoids from <i>Plectranthus</i> spp. as a new class of PKC modulators”
10:30-10:45	<b>OC3: Nuno Saraiva:</b> “Effect of TMBIM ion channels in Glioma Progression”
10:45-11:00	<b>OC4: Catarina Pereira Leite:</b> “On the path of innovative nanodelivery systems for cutaneous applications”
11:00-11:15	<b>OC5: João Pedro Gregório:</b> “Health services digitalization: the role of Design Science Methodologies”
11:15-11:30	<b>OC6: Pedro Faísca:</b> “Stereology in grading and prognosis of canine cutaneous mast cell tumors”
	<i>Flash Oral Communications</i>
11:30-11:35	<b>FP1: Margarida Florindo:</b> “Perfusion, Movement and Adaptive Responses”
11:35-11:40	<b>FP2: Vera Isca:</b> “Insight into P-glycoprotein inhibition of new diterpene royleanones from <i>Plectranthus</i> spp.”
11:40-11:45	<b>FP3: Íris Guerreiro:</b> “How can rocket salads stop cancer cells from moving?”
11:45-11:50	<b>FP4: Ana Júlio:</b> “Ionic Liquids: a technological approach to improve the performance of sustained drug delivery systems”
11:50-11:55	<b>FP5: Emília Alves:</b> “Assessment of the impact of kefir consumption on cutaneous health using an induced lesion model”
11:55-12:15	<b>Pause / Posters*</b>
12:15-12:30	<b>Awards and Closing Session</b>

**OC: Oral Communication; FP: Flash Presentation**

**\*Posters will be on virtual exhibition at Auditorium Professor José Araújo as of 20th of November 2020**

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#IV\_CBIOS\_Seminar**

## Oral communications abstracts

### OC1

#### **The potential of natural products to treat gastrointestinal inflammatory and ulcerative diseases**

Sérgio Faloni de Andrade<sup>1</sup>

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Gastrointestinal disorders are among the most common bothersome that affect people nowadays. Their prevalence and incidence have been on the rise during the last decade. This high prevalence and incidence are due to the contemporary lifestyle we live in, which includes bad dietary habits, consumption of drugs, alcoholic drinks, and stress. It is very common that gastrointestinal disorders are characterized by inflammatory and ulcerative processes from the stomach or gut.

The main inflammatory and ulcerative disorders associated with the gastrointestinal tract include gastritis, ulcers, colitis, Crohn's disease, and mucositis which are difficult to treat. The recurrence and side effects are very common after treatment with available drugs. Based on that, there is an urgent need for the search for more effective and safe pharmacological options for the treatment of gastrointestinal inflammatory and ulcerative disorders. Recently, plant extracts and natural products have been approached like an important possibility for the treatment of the previously mentioned disorders. Thus, a great deal of effort and research has been undertaking to find suitable natural plants and substances and to prove its potential.

## OC2

**Abietane Diterpenoids from *Plectranthus* spp. as a new class of PKC modulators**Patrícia Rijo<sup>1,2\*</sup><sup>1</sup> CBIOS – Universidade Lusófona's Research Center for Biosciences & Health Technologies, Campo Grande 376, 1749-024 Lisboa, PORTUGAL<sup>2</sup> Instituto de Investigação do Medicamento (iMed.U LISBOA), Faculdade de Farmácia, Universidade de Lisboa, 1649-003 Lisboa, PORTUGALEmail: [patricia.rijo@ulusofona.pt](mailto:patricia.rijo@ulusofona.pt)

Natural products from medicinal plants represent an important source of novel therapeutic compounds to fight severe diseases including cancer [1]. The *Plectranthus* genus (Lamiaceae family) represents a large and widespread group of species with a diversity of traditional uses for the treatment of several ailments. Diterpenoids are commonly found in *Plectranthus* spp., and have a widespread spectrum of biological activity, namely anticancer properties [2]. Considering this, several extraction methods were tested to optimize the extraction of the diterpenoid 7 $\alpha$ -acetoxy-6 $\beta$ -hydroxyroyleanone (Roy) from *P. grandidentatus* Gürke. Basic requirements approach based on polymorphism were studied for the development of pharmaceutical formulations based on Roy as a lead molecule [3].

Protein kinase C (PKC) family isoforms have been the focus of intense research and are recognized as therapeutic targets in anticancer drug development. These kinases are classified into three groups according to their regulatory domain structure and cofactors requirement for activation: classical, novel, and atypical PKCs. Considering this, a small library of abietane derivatives was studied for their ability to activate PKC isoforms from classical (alpha,  $\alpha$ ; beta,  $\beta$ ), novel (delta  $\delta$ ; epsilon,  $\epsilon$ ) and atypical (zeta,  $\zeta$ ) subfamilies, through a previously developed yeast-based screening assay to search for modulators of PKC isoforms [4]. The results obtained revealed potent activators of PKC family proteins, namely: a selective activator of PKC $\delta$ , the 7 $\alpha$ -acetoxy-6 $\beta$ -benzoyloxy-12-*O*-benzoylroyleanone (RoyBz). The patented diterpenoid RoyBz was prepared using Roy as starting material. RoyBz potentially inhibited the proliferation of colon cancer cells by inducing a PKC $\delta$ -dependent mitochondrial apoptotic pathway involving caspase-3 activation. The results indicate that RoyBz targets drug resistant cancer stem cells, in HCT116 colon cancer cells, preventing tumor dissemination and recurrence. These results point to promising activators of PKCs with high potency and isoform-selectivity that may emerge from the exploitation of this new family of abietane diterpenoids [4]. Molecular docking studies are currently ongoing to further identify new selective abietane diterpenoids as new PKC modulators.

Overall, the described results show that indeed the *Plectranthus* genus is a high potential source of lead molecules. Further studies are ongoing to use these abietane diterpenoids lead molecules, which arises from this genus, for the development of new anticancer drugs.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

## References:

- [1] *Nat Chem Biol*, 3, 351, 2007.
- [2] Ladeiras D., et al., *Curr. Pharm. Des.*, 22(12):1682-1714, 2016.
- [3] Bernardes C.E.S., et al., Rijo P. *Mol. Pharm.*, 15(4):1412-1419, 2018.
- [4] Bessa C., et al. Saraiva L., *Cell Death Dis.*, 9, 2018.

## OC3

### **Effect of TMBIM proteins in glioma cells**

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## OC4

**On the path of innovative nanodelivery systems for cutaneous applications**

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Skin delivery of bioactive compounds is highly hindered by the barrier function of this organ, particularly by the lipid matrix of the stratum corneum [1]. To overcome this limitation, various nanotechnology-based approaches have been investigated over the years. Transfersomes are particularly interesting for (trans)dermal applications as their ultradeformability allows them to reach deeper skin layers than other vesicular systems, as liposomes and niosomes [2]. At the same time, the implementation of quality-by-design strategies have been shown to be a valuable tool to obtain formulations with predefined specifications and reduced manufacturing costs [2,3]. In this sense, this project aimed at optimizing innovative transfersomal formulations for cutaneous applications using a Box-Behnken factorial design (BBD). This quality-by-design strategy is based on the production of 15 formulations considering three independent variables (factors) and at least three dependent variables (responses) to be evaluated, so that the subsequent multivariate analysis allows the definition of the optimum values for each factor to produce the desired formulation [4]. BBD was successfully implemented to optimize novel transfersomal formulations for the skin delivery of gallic acid, ibuprofen, and rutin. In the case of gallic acid, the optimum formulation was obtained using 1% (w/v) phospholipid concentration, 15:85 edge activator:lipid ratio (w/w), and 10 min sonication time. BBD was implemented to minimize the size and the polydispersity index (PDI) of the transfersomes, as well as to maximize their loading capacity (LC). The experimental data obtained for these three responses were  $107 \pm 9$  nm (size),  $0.20 \pm 0.04$  (PDI), and  $0.732 \pm 0.002$  (LC), which were in line with the theoretical prediction from BBD, validating the application of this quality-by-design strategy to optimize transfersomal formulations [5]. Ongoing studies are aiming to include functional excipients (ionic liquids and ceramides) in these innovative nanodelivery systems to improve their performance in cutaneous applications.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

## References:

- [1] van Smeden J., et al., *Curr. Probl. Dermatol.*, 49:8-26, 2016.
- [2] Fernández-García R., et al., *Int. J. Pharm.*, 573:118817-31, 2020.
- [3] Adam S., et al., *Eur. J. Pharm. Sci.*, 42(1-2):106-15, 2011.
- [4] Ferreira S.L.C., et al., *Anal. Chim. Acta.*, 597(2):179-86, 2007.
- [5] Pereira-Leite C. and Ventura C., *Biomed. Biopharm. Res.*, 17(2), 2020.



## OC5

### **Health services digitalization: the role of Design Science Methodologies**

João Gregório<sup>1</sup>, Ligia Reis<sup>1</sup>, Mariana Santos<sup>2</sup>, Melanie Maia<sup>3</sup>, Miguel Mira da Silva<sup>4</sup>, Luís Velez Lapão<sup>2,3,5</sup>

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## OC6

# STEREOLOGY IN GRADING AND PROGNOSIS OF CANINE CUTANEOUS MAST CELL TUMORS

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**Introduction:** Cutaneous Mast Cell Tumour (ccMCT)'s Patnaik and Kiupel grading schemes rely on qualitative and semi-quantitative features that are susceptible to inter-observer variability [1,2]. Stereological estimation of volume-weighted mean nuclear volume (MNV) provides information about both nuclear size and its variability and has been proven to have a prognostic value in other solid tumours [3,4]. The objective of this study was to compare MNV with ccMCT grade and biological behaviour.

**Materials and Methods:** 55 ccMCTs were graded according to Patnaik and Kiupel by consensus of three experienced pathologists. Clinical history of dogs treated with surgical excision alone was collected with a minimum follow-up period of one year (n=30). MNV was estimated using the point-intercept method on vertical sections. Animals were divided according to outcome: (OCO) when there as postsurgical resolution of disease or OC1 when dogs died or were euthanized as a result of the tumor.

**Results:** Statistical differences were observed between grade II ( $115 \pm 29 \mu\text{m}^3$ ) and grade III ccMCTs ( $197 \pm 63 \mu\text{m}^3$ ), as well as between low-grade ( $113 \pm 28 \mu\text{m}^3$ ) and high-grade ccMCTs ( $184 \pm 63 \mu\text{m}^3$ ). In terms of prognosis, MNV was not able to predict the clinical outcome in 42% of the cases; however, cases with a  $\text{MNV} < 125 \mu\text{m}^3$  had a favourable outcome.

**Conclusions:** The present study suggests that, despite having limited prognostic value, is highly reproducible and is associated with histological grade as well as with benign behaviour.

## References:

- [1] Patnaik A.K., Ehler W.J., MacEwen E.G., *Vet Pathol.*, 21(5):469-474, 1984.
- [2] Kiupel M., Webster J.D., Bailey K.L., et al., *Vet Pathol.*, 48(1):147-155, 2011.
- [3] Ladekarl M., Sørensen F.B., *Cancer*, 72(9):2602-2611, 1993.
- [4] Ladekarl M., *Cancer*, 75(8):2114-2122, 1995.

## Flash presentation abstracts

### FP1

#### Perfusion, Movement and Adaptive Responses

Margarida Florindo<sup>1,2</sup>, Sérgio Nuno<sup>1,3</sup>, Helena Silva<sup>1,2</sup>, Sérgio Andrade<sup>1</sup>, Luís Monteiro Rodrigues<sup>1</sup>

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The relationship between perfusion and movement is far from well established. In the present study, we seek to contribute to clarify the nature of some of the adaptive responses already observed in the lower limb, in static, quasi-static and dynamic movement, establishing a parallel with the same challenge presented to the upper limb. The study involved 12 healthy adults ( $31.3 \pm 11.25$  years of age) ( $ITB = 1.06 \pm 0.16$ ) of both sexes submitted to different protocols. In the lower limb (LLP) of controlled walking and unipodal displacement. In the upper limb (ULP) with repeated movements of the arm and shoulder girdle. The procedure involved baseline recording phase 1 (5 minutes), movement phase 2 (2 minutes) and recovery phase 3 (5 min). The LLP was performed from the standing position (phase 1); elevation of one of the limbs (phase 2) and again in the same standing position (phase 3). The ULP was performed in a sitting position, with the hands and forearms supported on a table. The perfusion was evaluated by LDF (laser Doppler flowmetry), PPG (photoplethysmography) and TiVi (polarized spectroscopy) systems. The results showed that in the LLP the movement involves consistent perfusion variations in both limbs between phase 1 and phase 2 detected by LDF and TiVi (both with  $p = 0.043$ ). One-leg displacement also shows a significant impact on the perfusion of both limbs. In the ULP, the differences are frankly more discreet and are only detected with TiVi in the limb in motion ( $p = 0.046$ ). This response to local or regional variations in the microcirculation that we know as prompt hemodynamic adaptive response (PAHR) seems to be present in any part of our body, even when the perfusion modification is discreet, which again suggests a high efficiency of the cardiovascular system maintenance of microcirculatory homeostasis.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

#### References:

- [1] Monteiro Rodrigues L. et al., *J Appl Physiol*, 128:1217-1226, 2020.
- [2] Nuno S. et al., *Biomed Biopharm Res.*, 17(2):1-10, 2020.
- [3] Green D.J., Hopman M.T.E., *Physiol Rev* 97:495-528, 2017.

## FP2

## Insight into P-glycoprotein inhibition of new diterpene royleanones from *Plectranthus* spp.

Vera M.S. Isca<sup>1,2</sup>, Jaime Coelho<sup>1</sup>, Epole Ntungwe<sup>1,3</sup>, Eva Domínguez-Martín<sup>1,3</sup>, Raquel Pereira<sup>1</sup>, Filipa Siopa<sup>2</sup>, Ricardo J. Ferreira<sup>2,4\*</sup>, Jelena Dinic<sup>5</sup>, Milica Pesic<sup>5</sup>, Daniel J. V. A. dos Santos<sup>2</sup>, Nuno R. Candeias<sup>6,7</sup>, Carlos A.M. Afonso<sup>2</sup>, Patrícia Rijo<sup>1,2\*</sup>

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Multidrug resistance (MDR) is one of the major obstacles in cancer chemotherapy. The most common mechanism of MDR is the overexpression of drug efflux transporters, mainly, P-glycoprotein (P-gp) [1]. *Plectranthus* genus is widely known by its traditional medicinal applications and presence of cytotoxicity compounds [2].

In this work, two diterpene royleanones, 6,7-dehydroroyleanone (1) and 7 $\alpha$ -acetoxy-6 $\beta$ -hydroxyroyleanone (2), obtained from *Plectranthus* spp. [3, 4], were investigated as potential P-gp inhibitors. Moreover, the reactivity of 1 and 2 was explored to synthesize ten new derivatives with improved P-gp activity. Cytotoxic activity of all compounds was evaluated in human non-small cell lung carcinoma NCI-H460 and its MDR counterpart NCI-H460/R through MTT and Rhodamine 123 accumulation assay. Furthermore, molecular docking and molecular dynamics studies were conducted to clarify the molecular interaction of royleanones with P-gp.

Royleanones 1 and 2 showed similar cytotoxic activity against cancer cell lines and MDR cancer cell lines. Two benzoylated derivatives showed higher P-gp inhibition than the natural diterpenes 1 and 2. Remarkably, 12-*O*-benzoyl derivative obtained from 2 exhibit P-gp activity comparable to Dexverapamil. Moreover, 6,12-*O*-benzoyl derivative obtained from 2 showed the ability to sensitize the resistant NCI-H460/R cells to doxorubicin. Furthermore, *in silico* studies suggested that the derivatives bearing aromatic moieties in position C-12 exhibit increased binding affinity towards P-gp. Based on this, future generation of royleanone derivatives will involve a selective modification of position C-12 with unsubstituted benzoyl rings and the modification of the substitution pattern at position C-6.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDP/04567/2020 and UIDB/04567/2020 projects, the Ph.D. grant SFRH/BD/137671/2018 and the COST ACTION CA17104 “New diagnostic and therapeutic tools against multidrug resistant tumours”.*

### References:

- [1] Garcia C., Isca V. M. S., et al., *Front. Pharmacol.*, in press, 2020.
- [2] Ladeiras D. et al., *Curr. Pharm. Des.*, 22:1682-1714, 2016.
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- [4] Matias, D. et al., *ACS Omega*, 4:8094-8103, 2019.

## FP3

### **How can rocket salads stop cancer cells from moving?**

Íris Guerreiro<sup>1\*</sup>, Bojana Vidovic<sup>2</sup>, João G. Costa<sup>1</sup>, Nuno G. Oliveira<sup>3</sup>, Nuno Saraiva<sup>1</sup>, Ana S. Fernandes<sup>1</sup>

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## FP4

## Ionic liquids: a technological approach to improve the performance of sustained drug delivery systems

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In the recent years, ionic liquids (ILs) have proved to be key materials to overcome some challenges in the development of drug delivery systems, due to their multifunctionality [1,3].

In fact, in previous studies performed by our group, we have already been able to display some crucial features of this salts, such as their ability to enhance drug solubility [1,2], to ensure a higher drug loading [2,3] and, more recently, as key materials in the development of new ILs-nanoparticles hybrid systems with higher performance [3,5].

Nonetheless, it is our strong believe that we are still far from fully understanding the multi-possibilities in which ILs may be decisive in the development of more efficient drug delivery systems, particularly those aimed at a controlled release.

Hence, the aim of this study was to prepare new sustained drug delivery systems, particularly lipid implants and transfersomes, and to evaluate the impact of ILs on the formulations' procedure and in the performance of the developed systems.

The physico-chemical properties of both systems were evaluated. For the lipidic implants, with and without ILs, uniformity and drug content as well as drug release studies were performed, for 90 days, and analyzed. The obtained data showed that the ILs allowed to obtain homogenous implants and were able to alter the drug release profile.

Concerning transfersomes, the size, the polydispersity index, and zeta potential were assessed as well as the association efficiency. Results demonstrated that the IL did not interfere with the stability of the lipid vesicles and the incorporation of the IL allowed a higher drug loading, that otherwise would not be possible to achieve.

In conclusion, this study reveals another relevant applicability of ILs to raise the performance of sustained drug delivery systems.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/0456/2020 project and by Universidade Lusófona/ILIND (Grant Programme FIPID 2019/2020). A.J. and R.C. would like to thank ALIES for the grant PADDIC 2018-2019 and 2019-2020.*

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## FP5

### **Assessment of the impact of kefir consumption on cutaneous health using an induced lesion model**

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## Posters abstracts

### P1

#### **Novel high sensitive catalytic material for accurate electrochemical detection of biological compounds related to most common NCD**

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Given their particular features in rapid evaluation, high sensitivity and low detection limit, electrochemical (EC) detection is currently a key technique for the determination of most of electroactive molecules found in biological fluids and whose imbalance is associated to various non-communicable diseases (NCD) [1]. The miniaturisation of aforementioned technique offers the prospect of access convoluted areas of the human body, and their portability facilitates their use in clinical applications. However, EC performance depends on the catalytic activity of the material used at the electrode surface. Owing to their high surface-area-to-volume ratio, and increased density of the active sites where electronic transference occurs, nanomaterials have been widely used on the electrode surface, becoming quite eligible for EC heterogeneous catalysts [2]. Silver nanoparticles (AgNPs) are widely used in nanotechnology for biomedical applications [3], like therapeutic purposes (wound healing), or as a diagnostic tool (as catalytic material in the EC analysis, or in optical biosensors). Nevertheless, metallic NPs conventional synthesis methods, involve unsafe intermediary compounds generally health-hazardous, which have urged the development eco-friendly alternative pathways. One of the most common alternatives is the synthesis assisted by plant extracts, where, phytochemicals has proved to be a remarkable reducing and stabilising agent of well-dispersed metal NPs [4]. The aim of this work is the design of a skilled catalytic material, for a higher sensitive and selective EC detection of multiple biological compounds. Drawbacks related to the cumulative fouling [5] of biological compounds adsorbed onto the electrode surface leading to a decrease of electroanalytic performance of the electrode, turns the implementation of modified electrodes of great importance. Thus, herein is disposed a nanostructured composite of three types of conductive nanomaterials:

- AgNPs plant-based synthesis approach, by *Plectranthus ciliatus* and *Rosmarinus officinalis* aqueous extracts

- Conductive Pyrrole NPs polymerization in confined space of a reverse micellar environment
- Vulcan XC-72R conductive carbon black NPs (commercially purchased)

This electrode development points a more “green” approach in the synthesis of metallic NPs as well as the development of a high conductive material profit from the synergistic effect of the several types of conductive NPs. In addition, to validate EC biosensor reproducibility, the loading of different NPs used in the electrode amendment, will be monitored by the electrophoretic deposition procedure.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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## P2

### The impact of academic life on habits food of university students

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The entry of students into university is a milestone that brings many changes. It is the time when independence becomes as important matter in their lives because most of them leave their own city. This population is very susceptible to incorrect eating practices, which may contribute to a lot of diseases such as obesity, type 2 diabetes and cardiovascular diseases. The aim of this study was to evaluate if academic life has an impact on the eating habits of young university students. It was realized a questionnaire, with 37 questions, about eating and lifestyle habits for university students, with an age over 17 years old. 177 students participated in this study from different universities in Portugal. After the formal analysis of the questionnaire, the students were divided into Health Sciences (SC) and Other Courses (OC) and it was observed that the SC students had a higher consumption of alcohol, soft drinks and fast food than the OC. The CS course had a higher consumption of sweets and salted/fried compared to the students of OC, in the moments of evaluation. This study concludes that the Science and Health course has shown worse eating habits when compared to the Other Courses and concludes that academic life and the eating habits of university students are related, which are influenced by many factors positively or negatively.

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## P3

### Study on knowledge and practices about Hospital Acquired Infections in the Department of Radiology

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Hospital acquired infections (HAI) are considered a current public health problem worldwide by increasing the length of hospitalization, mortality and morbidity, with very high costs for healthcare[1]. The WHO recognize that patient safety is a critical element and the foundation for delivering quality health care [2]. The risk of HAI has increased in the radiology department in part because of an increased number of patients visiting the department but also as a consequence of increased imaging modalities [3]. Radiographers thus require acceptable knowledge levels as well as adequate practices related to infection control in order to prevent the effects of HAIs on patient health and safety [4].

A cross-sectional study was carried out to evaluate the knowledge and training needs of radiographers regarding Infection Prevention and Control measurements (IPC), by submitting an original questionnaire to 120 radiographers who work in public hospitals. Results showed that most of the radiographers answered 2 or 3 correct answers (83,3%), there are very few radiographers with only 1 correct answer or with all the correct answers (only 5% each) when faced with safety requirements guidelines. 74.2% answered that they were aware of Standard Precautions for IPC, although 78.3% said that they felt the need for training in this area. Most of the participants (53.3%), affirmed that the main reason for not adhering to the measures of IPC were due to its perceived minor importance. 46.7% agreed and 29.2%% totally agreed that a manual of IPC in radiology would allow to solve/prevent many problems. In conclusion, the requirement of producing and updating protocols and carrying out regular training on the theory and practice of ICP was identified.

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## P4

**Farm-Specific Risk Factors for Displacement of Abomasum in a Large Dairy Cattle Enterprise**

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Displacement of the abomasum (DA) is a common problem among dairy cow farms. Risk factors are directly connected with nutrition and reproductive plans, environmental conditions, as well as individual characteristics of each animal. This study concerns the occurrence of DA on a 1500 milking cows' herd, in which high number of cases were recorded. The objectives of the study are to correlate the occurrence of DA with: a) length of calving intervals; b) body condition score (BCS) in the postpartum; and c) presence of diseases in the postpartum period; and to identify possible environmental predisposing factors to the condition.

A total of 90 Holstein cows, primiparous (46) and multiparous (44), not subjected to a close reproductive monitoring program, were divided in two groups: 45 animals diagnosed with DA and 45 that were not. Data regarding the health conditions of the cattle, particular, interval between calving, BCS at the time of diagnosis, and the number of diagnoses of DA used as a fixed variable, was analysed with Persons correlation tests through IBM SPSS® Statistics V.26.

Results demonstrated a significant positive correlation between the length of calving interval and the diagnosis of DA ( $r=0.343$ ;  $p=0.023$ ); presence of postpartum diseases and DA ( $r=0.353$ ;  $p=0.001$ ); and mean BCS and DA ( $r=0.269$ ;  $p=0.01$ ). There was overstocking, shortage of food trough space and insufficient number of water troughs available to the cows. In conclusion this study reflects the consequences of suboptimal environmental conditions and lack of reproductive management on the farm, predisposing to long calving intervals, high BCS and increased pathology post-partum, all associated with high number of DA, as described in many other studies. Despite DA being a well-known topic in dairy industry, it still occurs, and veterinarians play an important role in identifying farm-specific risk factors and supporting decision-making to improve animal welfare and sustainable production.

## P5

**Use of facemasks in different populations as mitigation measure of SARS-CoV-2: brief review of surveys studies**

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**Introduction:** One of the mitigation measures of SARS-CoV-2 is the use of facemask [1]. **Aim:** to characterize facemask use through populational surveys. **Methods:** Brief review. **Keywords** [COVID and masks and (questionnaires or surveys) and population] were screened in *PubMed* (31-10-2020). **Inclusion criteria:** populational studies applying surveys to study facemask use. **Exclusion criteria:** reviews and/or other topics. 20 out of 51 studies were selected. 15 studies reported the use of masks by general population: (n=number of participants and % wore mask): Brazil (n=1277; 99.1%); China (n=6910; 98.0%; n=1987; 95.9% and n=9782; 95.7%); Kenyan (n=211; 94%); Hong Kong (n=1004; 90.3% and n=352; 94.3%); Korea (n=2002; 78.8%); Lebanese (n=410; 79.3%). India (n=1531; 73%); USA (n=500; 76.4% face covering; n=1005; 7.1% and n=354; average=2.28; SD=1.53; 1="very unlikely" to 5= very likely") and New Zealand (n=1015; 33.1%). **Special groups** (n=2): Latino population, USA (n=410; 71.2% never wore) and secondary school students, Poland (n=2323; 4.4%). **Studies in more than 1 country** (n=2): 27 countries (n=72417; effect of age on wearing a mask is negative: reduction of 0.3 on a 0 to 1 scale was found between 20 and 80 years) and 1 study (Poland n=1056; 35% vs. China n=1210; 96.8%). **Significant positive associations** between wearing masks and worry about illness/pain; hypochondrial beliefs and treatment experience (n=1413; Kuwaiti). **Discussion:** Globally, facemask seems to be widely used, although some exceptions have been identified (e.g. Poland, New Zealand, USA). Importantly, older, and younger citizens are more prone to not use facemasks. These findings may support certain public health measures, namely motivating these individuals. Mask use may be related to some variables (e.g. worry about illness). This knowledge may be particularly useful to instruct citizens who are less likely to use a mask. **Questionnaire/Surveys** seems to be suitable tools to collect data about masks and/or to monitor their use.

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## P6

### Patents as an engine for development: Portugal as case study

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Introduction: Innovation is essential for economic and social development, while the number of patents is an indicator of the countries' innovation profile. Patents are related to products or processes and ensure certain rights (e.g. monopoly of commercial exploitation for 20 years) [1]. Study aim: To describe and analyze the number of patents granted, in force and international applications (PCT National Phase Entry for residents) in the last decade in Portugal (2009 to 2018). Methods: Consultation of the World Intellectual Property Organization (WIPO) patent statistics database [2]. Preliminary findings are, as follows: The number of granted patents varied between a minimum of 95 (2016) and a maximum of 151 (2018) (resident applicants). The number of patents in force has decreased between 2009 (n=39,867) and 2015 (n=35,080), increasing after that to 38,193 (2018). Regarding international applications (PCT National Phase Entry for residents), a minimum was registered in 2011 (n=45) and a maximum in 2018 (n=128).

Discussion: In general, patents indicators have slightly improved in the last decade. In this context, policies that support companies and research & development (R&D) are recommended in Portugal. As well, it seems fundamental to raise the attention of private sector on the importance of industrial propriety, including patents outputs.

*Mestrado em Administração Pública do ISCTE e Instituto Nacional da Propriedade Industrial – INPI.*

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## P7

### Leadership in Health Sector: skills and models

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Introduction: A tailored and appropriate leadership is required in health sector. Health leaders are required to manage economic resources/personnel or to take decisions based on a cost-benefit binomial, besides ensuring a proper use of therapies, as well as the completion of therapeutic guidelines [1]. Regarding health leadership, study aims were to analyze: (i) its concept, (ii) contemporary models, and (iii) leadership skills/competencies. Methods: Brief review (2015-2020). Papers were conveniently selected (*B-On, PubMed and Google Scholar*), through the screening of conveniently selected keywords. Preliminary findings are, as follows: (i) Health leadership is narrowly related to ethical issues and the well-being of populations. (ii) Several public health leadership models were identified e.g. transformational, transactional or server. (iii) The most relevant identified skill of a health leader was ethical sense. Discussion: Health leadership present unique specificities due to ethical/deontological motives. Despite some models of health leadership are recognized as more suitable and frequent e.g. transformational or servant/altruistic leadership, it seems an ideal leadership model does not exist. In this sense, the most promising model is a mixed one. Academies and research centers are advised to investigate and develop health leadership models, including the study of health leaders' skills and/or to ensure the training of future health leaders.

*Mestrado em Administração Pública do ISCTE.*

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## P8

**Study of the antibacterial efficacy of Myrtle extract as an ingredient in oral products**

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Dental caries and other oral infections are associated with pathogens such *Streptococcus mutans* and *Streptococcus mitis*. Those microorganisms can lead to pathological states, which can have tooth loss as consequence [1] So preventing and controlling dental caries has been a great challenge. Many synthetic substances have been used against those microorganisms but natural extracts can be a good option in terms of efficacy and safety. The aim of this study is to investigate the possible application of a supercritical fluid myrtle extract as an antibacterial ingredient in oral cosmetic and pharmacological formulations. *Myrtus Communis* L. is an evergreen shrub belonging to the Myrtaceae family that grows wild around all the Mediterranean region, Portugal included. Many medicinal and nutraceutical properties have been attributed to myrtle, which has been used since ancient times in folk medicine. It is traditionally used as an antiseptic disinfectant, with anti-hemorrhagic, antimicrobial and antioxidant properties. The extract was obtained using supercritical CO<sub>2</sub> at 230 bar, 45°C and a flow of 0,3 kg.h<sup>-1</sup> and using a co-solvent, ethanol, at a flow rate of 0,09 kg.h<sup>-1</sup> [2]. The conventional well diffusion and the broth microdilution methods were employed for the assessment of the antibacterial potential of the myrtle extract against oral gram positive bacteria: *Streptococcus mutans* (ATCC® 25175™) and *Streptococcus mitis* (NCIMB® 13770). The results obtained clearly demonstrated that myrtle extract possesses antibacterial activity against the tested microorganisms. The minimum inhibitory concentration (MIC) and inhibition zones values obtained showed significant inhibitory effect against the gram-positive bacteria tested. The tested extract, sourced from a wildily available plant, seems, then, a promising low-cost antibacterial agent that can be incorporated in oral rinses, dentifrices and varnishes to improve oral hygiene and cleanliness. Further studies will be conducted to address their potential use as a functional ingredient to be employed in cosmetic or pharmaceutical industries.

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## P9

**Assessment of the acceptability of kefir fermented drink in a panel of Portuguese consumers**

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P10

# **Synthesis of self-assembly nanoparticles of 7 $\alpha$ -acetoxy-6 $\beta$ -hydroxyroyleanone from *Plectranthus hadiensis* (Forssk.) Schweinf. ex Sprenger**

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The *Plectranthus* genus belongs to the *Lamiaceae* family and consists of around 300 species distributed from Africa to Asia and Australia. *P. hadiensis* (Forssk.) Schweinf. ex Sprenger contains diverse secondary metabolites such as phenolic and diterpenoid compounds. The presence of these metabolites in this plant could justify its widely use in an array of traditional and Ayurveda recipes for the treatment of diverse range of ailments like cancer [1]. Therefore, the aim of this work is to present a *P. hadiensis* study of extraction and fractionation of the aerial parts of this plant by Flash Dry Column Chromatography and Preparative Thin Layer Chromatography. These data indicate a great difference between the extracts from leaves, with those from stems, mainly in their content of the cytotoxic compound 7 $\alpha$ -acetoxy-6 $\beta$ -hydroxyroyleanone. Considering the bioactivity of this royleanone, it was employed as a starting material for the synthesis of self-assembled squalene nanoparticles [2]. The obtained compound was characterized by spectroscopic methods, mainly 1D- and 2D-Nuclear Magnetic Resonance (NMR). The HPLC profile analysis of the extracts and the biological activity is ongoing. Additionally, the nanoparticles characterization, the ability to release the drug unit and the preliminary evaluation of their biological activity in different cell lines will be also tested in the future.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UID/DTP/O4567/2019, UIDP/O4567/2020 and UIDB/O4567/2020 projects. E.M.D-M gratefully acknowledges had been the recipient of the grant UID/DTP/O4567/2019-CBIOS/BII and have, currently, a predoctoral FPU 2019 fellowship from the University of Alcalá de Henares.*

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P11

# **Natural Cytotoxic Diterpenoids, as a Potential Source of Drug Leads for cancer Therapy**

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Cancer is a major public health concern as it ranks the second-leading cause of death worldwide. Treatment of cancer remains a challenge due to multi-drug resistance and urges the discovery of novel therapies [1]. The *Plectranthus* genus (Family: Lamiaceae) represents a large and widespread group of species with a diversity of traditional uses for the treatment of several ailments. Cytotoxicity screenings have identified *Plectranthus* plants as potential sources of antitumor lead compounds mainly diterpenoids with abietane skeletons known for their anticancer activity [2,3]. *P. mutabilis* Codd. essential oil chemical constituents have been cited on its HPLC analysis that revealed the presence of Nepetoidins A and Nepetoidins B [4]. We therefore aimed to study the composition and biological activity of this plant to reinforce the low phytochemical information. In this study, dried and powdered *P. mutabilis* whole plants (1.2 kg) was extracted with acetone (10% w/v) using the ultrasound assisted extraction method. The extract residue was subjected to different column chromatography using silica, polyamide and C-18 with eluent of increasing polarity to afford compounds: Coleon U quinone (1), 8 $\alpha$ ,9 $\alpha$ -Epoxycoleon U quinone (2), Coleon U (3) and 7-hydro,14-deoxycoleon U (4). The cytotoxicity of the isolated compounds and *P. mutabilis* extract was evaluated using a model system of sensitive (NCI-H460) and MDR (NCI-H460/R) cells, along with normal human embryonal bronchial epithelial cells (MRC-5). Studies of modulation of P-gp activity are ongoing to unveil the interaction of these compounds and extract with P-gp.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects, as well as by PADDIC 2019 (ALIES COFAC) and Short Term Scientific Mission (STSM) of the COST ACTION: CA17104*

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#### P12

##### **Impact of amino acid ionic liquids on the stability of O/W emulsions containing rutin**

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The Pharmaceutical Industry has had an increasing interest in developing topical delivery systems. However, there may be some limitations in this process, due to the low solubility and/or the difficult incorporation of some drugs, or even, of the stability of these systems [1].

Ionic liquids (ILs) have been studied as valuable materials to be included in different types of formulations towards a pharmaceutical applicability. In fact, they have been described as promoters of drug solubility and incorporation into various delivery systems [1,2].

The aim of this study was to incorporate the sparingly soluble drug, rutin, in oil-in-water (O/W) emulsions, with different amounts of the emulsifier — Crodafofos<sup>®</sup> CES —, in the presence and absence of ILs. The ILs used were (2-hydroxyethyl) trimethylammonium-L-phenylalaninate [Cho][Phe] and (2-hydroxyethyl) trimethylammonium glycinate [Cho][Gly], at non-toxic concentrations [2]. Rutin was incorporated into the emulsions since it is a phenolic compound with interesting properties from a therapeutic point of view, however its low solubility limits its applicability [1,2].

Initially, solubility studies at 25 °C were carried out, and the results showed that both ILs, [Cho][Phe] and [Cho][Gly], allow a significant enhancement in rutin's solubility. Then, O/W emulsions were developed in the absence and presence of rutin, at its maximum solubility in water or in the mixtures water:IL. Our key goal was to evaluate the impact of the ILs on the stability of the developed formulations. Thus, the stability of all the prepared emulsions was evaluated by centrifugation and gradual heating (preliminary stability) and by temperature cycles (accelerated stability).

The results showed that not only the ILs facilitate the formulation procedure, but also, they allow the incorporation of higher amounts of rutin and a greater stability of the formulations reducing the amount of emulsifier Crodafofos<sup>®</sup> CES needed.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 project and by funding from Universidade Lusófona/ILIND (Grant Programme FIPID 2019/2020).*

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P13

### Critical Review of the Chemical and Biological Analytical Methods used on Medicinal Species of *Eleutherococcus*

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Species adulteration in Traditional Chinese Medicine (TCM) formulations, as a response to increasing global demand, poses severe quality and safety concerns. The use of chemical and biological analytical methods, including chromatography, spectroscopy and genomics, as a means of quality control, species identification and authentication of *Eleutherococcus* species is essential in reducing the number of adulterated herbal medicinal products (HMPs) in circulation. The task of revealing the most effective, appropriate and method-validated analytical techniques for identifying a variety of *Eleutherococcus* species is undertaken in this review. Using predetermined search terms, 85 publications, referencing analytical techniques used on *Eleutherococcus* species, were subjected to a literature review and, consequently, following specific criteria, 21 publications were selected for critical re-analysis. High performance liquid chromatography (HPLC) was found to be the preferred separation method for analysis of chemical components, especially for extracts of *Eleutherococcus senticosus* (Rupr. & Maxim) Maxim. [Araliaceae] [1]. Rapid resolution liquid chromatography (RRLC) provided faster methods of analysis with high resolution and spectroscopic techniques were vital in structure elucidation [2]. For the phylogenetic identification and comparison of species, DNA barcoding was proven effective in identifying biomarkers and assessing biological activity of secondary metabolites [3]. Modern hyphenated techniques have been used to provide in-depth plant analysis and in quality control (QC) within the production chain. The continuing development of more sophisticated, method-validated metabolomic analysis will provide further data on biochemical components and culminate in more robust QC analysis for the future.

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P14

### Bioactive abietane diterpenes isolated from *Plectranthus ecklonii* Benth.; from Past to Present

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In recent years, herbal medicinal use in the west has seen a resurgence as an alternative and complementary approach to disease prevention and treatment. Among the estimated 28,137 recorded medicinal plants, species from the *Lamiaceae* family have continued to demonstrate their therapeutic and biological activity. A member of this diverse family of plants, *Plectranthus* species have widespread ethnobotanical and traditional uses, including in southern Africa to treat listeriosis, tuberculosis-related problems and skin diseases [1]. The extensive use of these plants suggests this genus may be highly promising for the discovery of medicinal compounds, including antitumour, antimicrobial and antioxidant compounds. This work catalogues the abietane diterpene secondary metabolites, isolated to date, from the extracts of *Plectranthus ecklonii* Benth [2]. Using the search terms, '*Plectranthus ecklonii*', '*parvifloron D*', '*parvifloron E*', '*parvifloron F*' and '*sugiol*', databases, including PubMed, Web of Science and ScienceDirect, were inspected. This review focuses on the current literature on the bioactivity of the isolated active compounds, parvifloron D, E, F and sugiol, in order to expose their potential for pharmaceutical development of novel drugs [3]. Several parvifloron D works have been published on Bio.Natural lab and here we present a fully chemical and biological characterization of this bioactive compound.

*This research is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects. E.M.D-M gratefully acknowledges being the recipient of a predoctoral FPU 2019 fellowship from the University of Alcalá de Henares.*

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## P15

**Antioxidant and antibacterial activity of carob (*Ceratonia siliqua* L.) seed flour ethanolic extract**

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The carob tree (*Ceratonia siliqua* L.) belongs to the Leguminosae family and it is widely cultivated in the Mediterranean area. The two principal components of the carob fruit are the pulp and seed. The seeds represent 10% of the weight of the fruit and the pulp represents the other 90% of the fruit, and its composition depends on the variety, climate and growing [1]. This study aimed to determine the bioactive properties (antioxidant and antibacterial) of raw carob seed flour, obtained from wholegrain grinding of carob seeds from fruits sampled in the Algarve region (Portugal). The flour was extracted with ethanol (70%) and the resulting extract was characterized in terms of total phenolic content and antioxidant activity (FRAP assay and DPPH radical scavenging assay). The conventional well diffusion and the broth microdilution assays were employed for the assessment of the extract antibacterial potential against skin pathogens, namely, *Staphylococcus aureus* ATCC® 6538™, *Staphylococcus epidermidis* ATCC® 12228™, methicillin-resistant *Staphylococcus aureus* (MRSA) ATCC® 33591™ and *Propionibacterium acnes* ATCC® 6919™. The raw carob seed flour extract presented antioxidant activity in both assays and showed antibacterial activity against the three skin pathogens tested. These results suggest that the carob seed flour ethanolic extract has potential to be added in topical formulations. Further studies will be conducted to address its potential use as a functional ingredient to be employed in food or cosmetic industries.

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## P16

**Adherence to the Mediterranean Diet of a Portuguese population from 55 to 75 years of age**

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The Mediterranean diet (DM) has been associated with multiple health benefits due to the dietary pattern that characterizes it, and for this reason, this is a focus of research interest worldwide.

Since populations in the Mediterranean region have been moving away from this dietary pattern, it is natural for the prevalence of certain diseases to increase. Thus, it is necessary to check the DM adherence rate in the population and identify which dietary elements can be modified to increase adherence and improve health.

A cross-sectional observational analysis on DM was performed in 89 individuals between 55 and 75 years old. To assess adherence to the Mediterranean diet, a 100-point online validated questionnaire, MediCul, was applied.

89 individuals were analyzed, and it was found that the sample consisted mainly of women (66.29%). Approximately 1.1% of the total population had poor (<35) adherence to DM, while 92.1% of the total population had an average level (35<75) of adherence and only 6.7% had a high (≥75) adherence to DM. Women had higher levels of adherence compared to men.

Similar results in relation to adherence to DM in older individuals (≥ 65 years) showed low levels of adherence to the Mediterranean dietary pattern [1].

In agreement with the results observed during the present analysis, different investigators described that women [2], are more likely to follow a healthy eating pattern, such as DM.

The results obtained in the present study highlight the importance of food education programs aimed at this age group, since, with advancing age, it is more common to present one or more chronic diseases, such as: diabetes, high blood pressure, dyslipidemia, etc., whose management and improvement of the quality of life include, among other factors, a balanced, varied, and complete diet.

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P17

### Discussing the perfusion differences in both human lower limbs

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Intraindividual perfusion asymmetries have been described in particular for the resting lower limb. Differences between sexes have been reported probably depending on age. This is a poorly assessed and even less explained issue. Thus, our objective is to evaluate and compare those differences obtained from both lower limbs. This evaluation took place during two experimental protocols of perfusion evaluation before and after specific challenges – massage (n=56) and walking (n=14). Perfusion was measured in both feet by laser Doppler flowmetry (LDF). Our sample involved 70 individuals, 34 men and 36 women, mean age 34.15 (+16.99) years old. Age was divided into two categories (<30 years - Young; >30 years - Senior). Statistical analysis was supported by descriptive and test statistics. A choice was made for non-parametric tests (Wilcoxon test of paired samples and the Mann-Whitney U test for the independent samples), since LDF signal showed an asymmetric distribution. A 95% level of confidence was adopted. Analyzing the sign differences between lower limbs from all participants and age groups we found that differences between limbs are not significant. However, the effect of age reveals that young individuals have lower mean values of perfusion than older individuals in both feet, differences being significant (p=0.001) and more pronounced in women. In both young and senior individuals, women have shown a lower perfusion pattern than men. This difference was significant for the right foot (male 12.59; vs female 8.63; p-value = 0.020). However, considering the age group, perfusion differences between both feet in both sexes were only significant in the right foot of young individuals (male 9.76; vs female 5.77; p-value = 0.001). Our results hint at asymmetries of perfusion across age and gender, which confirm the interest of this aspect of microcirculatory physiology, probably more expressive under cardiovascular disease, that should be further investigated.

P18

### Preliminary studies to design ibuprofen-loaded transfersomes for cutaneous applications

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Time and costs economy are hot topics in the field of formulation design with the implementation of quality-by-design strategies. These approaches allow the optimization of formulations with predetermined specifications, while also minimizing the amount of experiments needed and reagents spent [1,2]. Considering the high costs of materials and production methods of nanodelivery systems, such as transfersomes [1], preliminary studies concerning the physicochemical properties of drugs, their interaction with excipients, and their stability during the pharmaceutical processes is crucial to simplify the formulation design. Thus, this work aimed at characterizing the physicochemical properties of ibuprofen sodium salt (IBU), its interaction with the excipients used to produce transfersomes, and the stability of the drug and the obtained transfersomes during the pharmaceutical processes. First, the calibration curve of IBU in phosphate buffered saline (PBS, pH 7.4) was obtained ( $y=1.5006x+0.0095$ ,  $R^2=0.9992$ ) considering the UV-Vis absorbance values at 264 nm of standard solutions of increasing concentrations of IBU (0-0.8 mg/ml). Second, the solubility of ibuprofen in PBS was determined ( $217 \pm 12$  mg/ml), by leaving supersaturated solutions of IBU under stirring at  $25 \pm 2$  °C for 72 h, followed by the determination of the IBU concentration in the filtered supernatant. Third, the formation of IBU-loaded transfersomes using Tween® 80 and Span® 80 as edge activators was tested, as well as their stability in terms of size and polydispersity index under a range of applied sonication times (0-30 min). Sonication times between 10 and 20 min were found to be ideal. Overall, these preliminary studies were crucial not only to provide the analytical tools for IBU quantification in further studies, but also to select the levels of the independent variables to be used in the Box-Behnken factorial design, as previously described [3], to ultimately optimize the IBU-loaded transfersomal formulation for cutaneous applications.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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## P19

### Helping community pharmacists to provide professional services: results of a type 1 medication review with stratification and prioritization of patients

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The process of medication review involves the identification of drug-related problems (DRPs) and making recommendations to resolve or prevent them [1]. Algorithms to prioritize patients according to their health needs are beginning to be implemented [2]. This study performed type 1 medication reviews in a sample of patients' electronic medication records (EMR), allowing the identification of cut-off points that enable the future definition of an algorithm to tailor structured pharmacy professional services.

A retrospective observational study was carried out performing a type 1 medication review on a convenience sample of EMR of a community pharmacy in Lisbon. EMR selected included patients with dispensing history between June 2017 and July 2018, using 2 or more chronic medications. Descriptive statistics and statistical analysis were performed aiming to identify common characteristics among patients. Fifty-five patient records underwent type 1 medication review. An average of 5.25 medications per patient was found. 18.2% patients had inappropriate drugs following the Beers Criteria<sup>(3)</sup> and 30.9% had moderate or major interaction potential. The medication review enabled the identification of the most frequent patterns of DRP and cut-off points. It was possible to stratify the sample into 5 levels, each corresponding to a professional pharmacy service: 4/55 (7.3%) needed basic follow-up checking adherence and new DRPs; 17/55 (30.9%) would benefit from the assessment of biomarkers; 13/55 (23.6%) might improve therapy with new Type I review up to 6 months with biomarker assessment; 15/55 (27.3%) needed Type II Review up to 1 month, and 6/55 (10.9%) had critical issues demanding a Type II review in short-term.

In order to help pharmacists in the provision of medication reviews without increasing pharmacy workload, medication review full automation is desirable and this study was a first step to develop an algorithm that automatically screens pharmacy database and suggests pharmaceutical services tailored and schedule according to patient's health needs.

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## P20

### Community pharmacy-practice research: opinions and perspectives from researchers to a pharmacy R&D unit

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The main advantages of pharmacy practice research are to translate clinical knowledge into direct application in the community providing data demonstrating the value of advanced pharmacy practice [1]. Nowadays, the involvement of community pharmacists in pharmacy practice research is less than ideal [2]. The purpose of this study was to collect perspectives of researchers concerning “community pharmacy” participation in practice research and the genesis of research and development units (R&D) within a pharmacy.

An exploratory study was carried out based on an original survey developed from a literature review and using a convenience sample of national and international researchers from different scientific fields. Data were collected during April and May 2018. The questionnaire was made available online and its access link was sent by email to 982 researchers. Statistical analysis was performed with SPSS version 23.

One hundred and seven researchers from 25 different countries participated, with a mean age of 43.8 years. 76% of researchers had a pharmacy degree. Most researchers showed agreement to the statements related to “attitudes towards research” and “barriers to research participation”. 86,7% mentioned that research studies in community pharmacy should be based in collaboration protocols, 75,6% that pharmacies should be organized in a network in order to run studies and 73,5% that there must be a body that certifies pharmacies in the context of research. 69.2% of researchers showed availability or interest to collaborate with the pharmacy R&D Unit.

Overall, the need to develop research studies in the community pharmacy practice is recognized and the idea of creating R&D Units within a pharmacy was very well received by researchers. Research studies should preferably be based on models that bring the community pharmacy/pharmacist closer to academia/research centers by setting collaborative protocols. Professional organizations should set a strategy to foster community pharmacy-practice research by changing mindsets and practices and by certifying pharmacies that conduct research studies.

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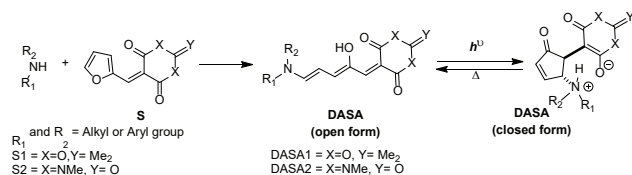
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## P21

**Study of Donor–acceptor Stenhouse adducts (DASA) stability in different solvents**Lucas Prado<sup>1,2</sup> Carlos Afonso<sup>1</sup>, Andreia Rosatella<sup>1</sup><sup>1</sup> Instituto de Investigação do Medicamento (iMed.Ulisboa),  
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Molecular photoswitches are small molecules with a chromophore, that on exposure to light can be interconverted reversibly between two states, with different photochemical and physicochemical properties. Donor acceptor Stenhouse adducts (DASA) have recently emerged as a new class of photoswitchable molecules with versatile applications, such as materials science, biology (specifically photopharmacology) and supramolecular chemistry.<sup>[1,2]</sup> They are easy to synthesize in a multigram scale from an activated furfural and a secondary amine. These compounds feature a system of three conjugated C=C bonds (triene) connecting an amine “donor” and a 1,3-dicarbonyl “acceptor”, giving rise to an intense absorption in the visible region (Scheme 1). When irradiated DASA undergo a ring closure isomerization, leading to a hydrophobic-to-hydrophilic polarity change with concomitant volume and colour change.<sup>[3]</sup> Depending on the polarity of the solvent, the irreversible cyclization can take place, limiting the molecules application.



Scheme 1. Base structure of synthesized DASA.

In this work, was studied the conversion of both forms in the presence of Ionic Liquids (IL).<sup>[4,5]</sup> ILs are a new and greener class of solvents that can be versatile solvents due to the possibility to tune the desired properties, just by combining different anions.

Using NMR as an analytical method, it was possible to quantifying the proportion of both forms (DASA open or closed form, Scheme 1) in the ILs mixture.

When DASA 1 was irradiated using Aliquat has a solvent, the closed form was favoured, although, DASA 2 an equilibrium between the open and closed form was formed. Using Phosphonium chloride ( $P_{6,6,6,14}Cl$ ) as solvent, DASA1 formed an equilibrium, and with DASA2 the product formed was in triene form. Furthermore, more studies have to be performed in a way to understand the reversibility of the isomerization.

Support for this work was provided by iMedULisboa and FCT through UID/DTP/04138/2020 and RESEARCH4COVID\_ Project n°483.

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## P22

### The unilateral proximal movement in the upper limb evokes a prompt adaptive hemodynamical response (PAHR)

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The interrelationships between muscle activity and microcirculation in the upper limb are still poorly understood. The main objective of this study is to identify the microcirculatory response of both upper limbs to a smooth unilateral movement. Ten volunteers participated (34.3±13.3 y.o), healthy and without peripheral vascular disease (ABI=1.0±0.2). The experimental design involved two sequential protocols - protocol 1 with proximal right upper limb movement (rightUL) and protocol 2 with equal movement in the left upper limb (leftUL). Each protocol consisted of 3 phases: phase 1-sitting with both hands and elbow supported on a table; phase 2-2 minutes unilateral movement in the shoulder and shoulder girdle; phase 3, 6 min with recovery control every 2 min in the same position as phase 1. The perfusion was assessed in both hands with Laser Doppler flowmetry (LDF) sensors applied to the 3rd finger and Photoplethysmography (PPG) applied to the 2nd finger. The dorsal region of both hands was followed by polarized spectroscopy (TiVi). A 95% confidence level was adopted. PPG and TiVi showed slightly higher baseline values in msE and LDF with higher red blood cell velocity and concentration (CRBC) although not significantly different. The movement increased all variables, especially in the limb under movement, observing that the contralateral (static) limb always revealed similar perfusion alterations. In phase 3 (min 4 and 6) a significant decrease in PPG values ( $p=0.005$  and  $p=0.023$ ) was observed recovering baseline values. Significant differences were recorded in rightUL for PPG ( $p=0.018$ ) and rightUL and leftUL for TiVi ( $p=0.006$  and  $p=0.020$ ) between phases 1 and 3 (first 2 min). The present study demonstrates that this prompt hemodynamic adaptation response, previously identified in the lower limb, can also be observed in the upper limb illustrating the efficiency of this response in preserving microcirculatory homeostasis.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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## P23

### Skin irritation and skin inflammation - a preliminary contribution for their objective definitions

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The skin is the largest organ of the human body, with a key role as a multifunctional “barrier”. Alterations in its efficiency or integrity always start, even in the absence of evident injury, by irritation with redness, discomfort and other symptoms eventually progressing to inflammation. However, the objective differences between inflammation and skin irritation are poorly understood and characterized. In this preliminary stage, the aim is to design an experimental procedure that will allow us to distinguish as precisely as possible these two clinical signs. Four healthy caucasoid (Fitzpatrick phototype 2-3) participants (2 men and 2 women, 41.5±3.8 years old) were selected. All principles of good clinical practice were respected. Methyl-nicotinate (MN) was chosen as the challenger, being considered by some authors as an irritant and by others as an inflammatory agent. MN (0.5%) was applied in pre-marked areas (1cm<sup>2</sup>) on the volar surface of one randomly chosen forearm and left in contact for 1 minute. Another similar area in the same forearm was used as the negative control (non-exposure). Response to MN exposure was followed by polarised spectroscopy using the Tissue Viability System (TiVi, Wheels Bridge, S) which registers the changes in regional red blood cells concentration. At the same time a well-known clinical scoring system normally used for contact dermatitis testing was applied for 5 min. at times 0, 30, 60 and 120 min. The preliminary data seems to suggest that MN in that concentration only evokes a local transient skin response with higher intensity around 30 minutes. This is only a preliminary approach which means that, besides expanding the number the participants, the experimental procedure will have to include other biometrics. High frequency sonography will be important to detect and quantify edema, while other transcutaneous variables such as Laser Doppler Flowmetry, gasometry, and transepidermal water loss, will help to look deeper into these common but difficult to understand signs.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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P24

# **Comparative study of the metallic content of *Vitis vinifera* L. flours from Portuguese regions and commercial samples**

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The revaluation of winemaking waste is one of the major goals of the wine industry. These by-products have been studied to be used in human food, due to its high nutritional value, as well as other benefits for human health [1].

Metals are fundamental constituents of living organisms. However, certain metals can generate deficit situations on the one hand or toxicity on the other. The identification and quantification of these constituents in food are fundamental. This study aims to determine the content of eleven metals and one semi-metal in flours of four *Vitis vinifera* L. varieties (Arinto, Syrah, Trincadeira from Alentejo and Talia from Ribatejo, collected in Portuguese regions and comparison with three commercial flours (Pepita de Uva Harina, Vitalfood, from Germany, Grape skin grist and Grape seed flour, Grapoila from Hungary).

The content of metals was obtained after digestion using nitric acid. Metals were analyzed by atomic absorption spectrometry by flame (Al, Cd, Cr, Cu, Fe, Li, Mn, Ni, Pb, Zn), and Hg concentrations were directly measured in samples by atomic absorption spectrometry with thermal decomposition, using a calibration curve obtained from external standards. Arsenic levels were analyzed in a hydride generator, to convert the As(III) to the volatile hydride that was then purged by a stream of argon gas [2]. For metal contents of the different samples, it was found that the most significant differences were obtained for As, Fe, Li, Mn, Pb, and Zn contents. The samples available in the market present higher levels of Li and Pb and lower levels of As, Mn and Zn than those collected in Portugal. Fe presents random results. The remaining elements present low significant levels. From the twelve analyzed elements only five have nutrient reference values recommended by the EU, namely Cr, Cu, Fe, Mn and Zn. With the exception of Zn, these elements present levels above the reference values for all analyzed samples. This can be an added value for the use of this flour as a food component, constituting a potential ingredient for nutritional supplementation. However, it is a preliminary study, to give consistency to the results, more data will be needed to complement the current ones.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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P25

# **Overexpression of the Golgi protein hGAAP/TMBIM4 promotes Cell Survival**

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P26

# **Eating habits of Portuguese university students: Comparison between normal semester, academic evaluations, and confinement period caused by COVID-19**

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## P27

**Procedures of pre-hospital medical emergency teams in the criminal investigation of homicide**

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The Pre-Hospital Medical Emergency (PME) team is almost always the first institutional team to arrive at the scene of a crime, many times before the police investigation team (PJ) (Judiciária, 2009). For this reason, they must be able to preserve traces that are found on the location (Lynch & Duval, 2010). To understand how PME relate to a crime scene, the objectives of this study were to learn about PME nurses' procedures in relation to the preservation of traces in situations of crime, and the perceptions of PJ inspectors on the preservation of evidence by PME teams.

To accomplish the study's objectives, we opted for a cross-sectional observational study, with the collection of information using an observation grid and interviews. The observation grid recorded the procedures performed by the PME teams at the location of the suspected homicide. Interviews with PJ inspectors were recorded, and content analysis was performed in the interviews' transcript, to uncover the most common PJ inspectors' perceptions of PME's on location work practices.

Twenty-seven interventions were observed. The most common tampering with evidence was touching objects in the scene, changing a victim's position, or tearing a piece (or more) of clothing. In the 15 interviews with PJ inspectors, 46.7% refer that when they arrive at the site, the PME is no longer present. However, 86.7% consider that the intervention of PME teams regarding the preservation of traces at the crime scene influences the investigation of the crime and all claimed that PME teams alter and/or contaminate the crime scene.

For this reason, there is a need to develop guidelines for PME teams, for specific situations that involve crimes, such as homicide. In this case, having knowledge in the forensic area would be a crucial contribution to the criminal investigation.

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## P28

**Influence of sex on microvascular responses to dynamic protocols**

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Human male and female have different neuronal metabolic and microcirculatory profiles. Our group has been dedicated to study movement and microcirculation relationships. Here we analyse and compare the microcirculatory response between sexes under bilateral and unilateral lower limb movements. After selection 8 participants (4 men and 4 women mean age  $24.8 \pm 5.3$  years old) were included. All healthy without peripheral vascular disease ( $ABI = 1.0 \pm 0.3$ ) taking no medication at all. Two protocols were applied - protocol 1 performing squat and protocol 2 adopting unipodal flexion. Each protocol consisted of 3 phases: phase 1 (5 minutes) - orthostatic position (baseline); phase 2 (2 minutes) the challenge phase; and phase 3 (5 minutes) - recovery (rest). Perfusion variations were assessed in both feet using laser-Doppler flowmetry (LDF) and polarization spectroscopy (TiVi). Results shows that men have slightly higher values in phases 1 and 2 in both protocols. Baseline values aren't statistically different in both sexes in both phases in the 2 protocols. However, in phase 3, women assume slightly higher values both in the evaluation in the LDF unipodal protocol ( $7.6 \pm 3.8$  vs  $7.3 \pm 4.3$ ) and TiVi ( $237.3 \pm 18.8$  vs  $231.4 \pm 28.9$ ) as in the LDF squat protocol ( $6.7 \pm 2.7$  vs  $6.6 \pm 5.3$ ) and TiVi ( $246.3 \pm 27.6$  vs  $242.1 \pm 29.7$ ). The differences in phase 3 are also not statistically significant. This was only an exploratory study, meaning that this apparent tendency for higher perfusion values in the recovery phase in women should be confirmed with larger panels.

*This work is funded by national funds through FCT - Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

P29

# **Brain metastases as first local of recurrence after neoadjuvant treatment in HER2 breast cancer patients: results from a multicentric cohort**

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According to several studies, the presence of brain metastases (BM) in HER2+breast cancer occurs in about 10-14% after a diagnosis of early-stage disease [1]. In these patients, achieving pathological complete response (pCR) after neoadjuvant treatment is correlated with improved survival outcomes [2]. The aim of this study was to assess the incidence of BM in patients who received neoadjuvant chemotherapy with trastuzumab and pertuzumab according to the pathologic response, in an Iberic cohort.

We retrospectively analysed patients with HER2+ breast cancer who were diagnosed and treated in four hospitals between Portugal and Spain from January 2017 to December 2019. Patients with HER2+ breast cancer, submitted to neoadjuvant therapy with double anti-HER2 block with trastuzumab and pertuzumab, followed by surgery were included. The following parameters were analyzed: age at diagnosis, chemotherapy regimen, pathological response, adjuvant anti-HER2 treatment, and disease-free survival.

A total of 84 patients with a mean age of 52.5 years old were included. 60 patients were treated with a chemotherapy regimen based on anthracyclines and taxanes and 24 with carboplatin and docetaxel. All patients received adjuvant anti-HER2 therapy: 76 received treatment with trastuzumab, 4 with trastuzumab + pertuzumab, and 4 with T-DM1. pCR was achieved in 49/84(58,3%) of cases and non-pCR in 35/84(41,7%). With a median follow-up time of 2.13 years, 6 (7,14%) patients have relapsed. The rate of BM as first local of recurrence was 3.6% (3/84). These 3 patients had achieved pCR after treatment.

In our cohort, neoadjuvant therapy with trastuzumab and pertuzumab was associated with a high pCR rate. pCR seems not to protect from brain relapse, however, a longer follow-up is needed to confirm this aspect.

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P30

# **The effect of phenolic compounds on human renal cancer cells and the potential combination with ionic liquids**

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Renal cell carcinoma (RCC) comprises up to 5% of all malignant tumors. Research for more effective and less toxic therapeutic agents is essential. Phenolic compounds, such as ferulic, caffeic, and *p*-coumaric acids or rutin, have shown interesting properties, including anticancer activity. Nonetheless, their impact on RCC is not established and their low solubility may hinder their applicability. Thus, this work aimed to evaluate the impact of the phenolic compounds on renal cells while considering efficacy and safety.

Since ionic liquids (ILs) can be a valuable strategy to improve the solubility and bioavailability of poorly soluble compounds, their functionality as solubility enhancers was also evaluated. The impact of four phenolic compounds (0-250 µM; 48h) and two ILs ([Cho][Phe] and [Cho][Gly]; 0-0.5%; 48h) on cell viability was evaluated in 786-O and Vero cell lines using MTT assay. The effect of rutin (50 µM; 48h) alone and in the presence of each IL at non-toxic concentrations in 786-O cells cycle distribution was also investigated by assessing the cell DNA content.

Primary results showed that only rutin was cytotoxic and in consequence was further studied. Concerning rutin's poor solubility, the studied ILs allowed an up to 13-fold increase in its solubility. Rutin induced a concentration-dependent decrease in cell viability, being most pronounced in 786-O cancer cells. Exposure to rutin induced an increase in Sub-G1 population of 786-O cells. The presence of ILs did not significantly influence the cytotoxicity of rutin.

Globally, our results suggest a potential anticancer effect of rutin since it showed higher cytotoxicity in 786-O renal cancer cells than in non-tumor Vero kidney cells. It was also shown that ILs may be a valuable strategy to improve rutin's solubility without affecting its possible anticancer effect. Further studies should be performed to further explore the anticancer properties of rutin.

*This work was funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects and through Universidade Lusófona/ILIND (Grant Programme FIPID 2019/2020). R.C. and A.J. would like to thank ALIES for the grant PADDIC 2019-2020.*

## P31

**LOXL2 inhibitory activity of ultrasound aqueous extracts from medicinal plants**Sandra Ferreira<sup>1</sup>, Patrícia Rijo<sup>1</sup>, Ana S. Fernandes<sup>1</sup><sup>1</sup> CBIOS – Universidade Lusófona's Research Center for Biosciences & Health Technologies, Campo Grande 376, 1749-024 Lisboa, PORTUGALEmail: [sandraferreira.94@gmail.com](mailto:sandraferreira.94@gmail.com)

LOX (Lysyl oxidase) and LOXL 1-4 are amine oxidases, which catalyze a reaction in the cross-linking of elastin and collagen in the connective tissue, as well as in the extracellular matrix (ECM) of tumors, facilitating the process of cell migration and the formation of metastases [1]. LOXL2 induces oncogenic transformation and affects proliferation of breast cancer cells. LOXL2 inhibitors have thus been suggested as a promising treatment to prevent metastasis and invasion of breast cancer [1]. These compounds may also have clinical interest in fibrotic diseases. BAPN ( $\beta$ -aminopropionitrile) is a phytochemical compound that was the first LOX inhibitor known. Medicinal plants are important sources of natural bioactive products and constitute a potential source of novel LOXL2 inhibitors. In this work, two aqueous extracts of *Plectranthus ecklonii* Benth [3] and a mixture of plants from Beijing Tong Ren Tang<sup>®</sup> were studied for their ability to inhibit the human LOXL2 (hLOXL2). The extracts were prepared by an ultrasound extraction method (10 % (m/v)) during 15 min. For the screening of the LOXL2 inhibitory activity of these extracts, the Amplex UltraRed (AUR) technique was used [2]. The method was validated using BAPN, and an  $IC_{50}$  value in accordance with previous reports was obtained [2]. At a concentration of 500 ng/ $\mu$ L both extracts exhibited a marked LOXL2 inhibitory activity. Further studies will be carried out to identify the extracts' compounds responsible for this activity and to explore their potential therapeutic interest. (Nicolai et al., 2020)

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects. Research is also developed with funding from Universidade Lusófona/ILIND (Grant Programme FIPID 2019/2020).*

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## P32

**Effects of essential oils from *Salvia officinalis* L. (Sage) and *Lavandula angustifolia* Mill (Lavender) on human skin: a study about barrier function and biomechanical properties**Sérgio Faloni de Andrade<sup>1</sup>, Patrícia Rijo<sup>1</sup>, Clemente Rocha<sup>1</sup>, Lin Zhu<sup>2</sup>, Kang Chen<sup>2</sup>, Luis Monteiro Rodrigues<sup>1</sup><sup>1</sup> CBIOS – Universidade Lusófona's Research Center for Biosciences & Health Technologies, Campo Grande 376, 1749-024 Lisboa, PORTUGAL<sup>2</sup> Jiangxi University of Traditional Chinese Medicine, Walin, Nanchang P.R. CHINAEmail: [sergio.andrade@ulusofona.pt](mailto:sergio.andrade@ulusofona.pt)

Essential oils from *Lavandula angustifolia* (lavender) and *Salvia officinalis* (sage) are widely used in cosmetic and dermatological formulations, however, information about its mechanism of action and efficacy is still insufficient. Thus, our objective is to contribute to understand the impact of these oils on skin's physiology. The essential oils have been obtained by hydrodistillation of the plants' aerial parts, and formulations containing 5% and 10% of each essential oil have been prepared using almond oil as vehicle. Eleven healthy volunteers were selected, and six areas (3cm x 3cm) were drawn in both forearms to test the formulations, the which were left in contact with the skin for 30 minutes. The epidermal barrier function was assessed through an evaporimeter (Tewameter TM300 CK electronics). Epidermal hydration was measured using MoistureMeters (Delphin Technologies). Skin biomechanics were assessed by the Cutometer<sup>®</sup>MPA580 system (CK electronics). High resolution sonography (HRS) images were obtained by imaging system Dermascan C. All variables were measured before and 30 min after applications. Nonparametric statistical comparisons were applied ( $p < 0.05$ ). A significant decrease of TEWL, as well as a significant increase of superficial and deep epidermal hydration, were observed for all formulations tested. The HRS showed that epidermis is more echogenic after the application of all formulations, although not statistically significant. However, in the dermis a significant echogenicity decrease was detected for all essential oils in particular for the 5% formulations. Regarding skin biomechanics, a significant increase of maximum elongation amplitude, maximum relaxation, elasticity, and viscoelastic ratio were found but only for the 5% concentration of both sources. The results showed that essential oils penetrate only in the most superficial layers of the skin, confirming their safety while promotes a significant improvement of various cutaneous properties, including the reinforcement of the epidermal barrier, deep hydration, and biomechanical behavior.

*This work is funded by national funds through FCT – Foundation for Science and Technology, I.P., under the UIDB/04567/2020 and UIDP/04567/2020 projects.*

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### P33

#### Analysis of ergogenic supplement intake in recreative athletes

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In the world of sports, the myths and the lack of knowledge can influence the intake of supplements in athletes. Talking of effectiveness and security, sometimes products not approved by several federal agencies were found in supplements. In this way, the objective of this study was to evaluate the type of ergogenic supplement that recreative athletes consumed, well as analyze how they acquired the information to start its intake.

Through an online survey, an observational descriptive quantitative study, was performed with a final sample of 306 participants, 165 men and 141 women aged between 13-84 years old. Only 118 athletes in our study consumed supplements (78 men and 41 women), inside this group we had 81 recreative and 37 federates.

We found a significant link between the intake of Whey Protein and Creatine and the incentive to start taking the supplements to gain of muscular mass. About the sources of information, most of participants were informed through a health professional, however many of them were not followed by a nutritionist. Regarding effectiveness and security, we can affirm that most of the participants idealize the accomplishment of this tests before the supplement goes to the market.

In conclusion, recreative athletes intake Whey Protein and Creatine to increase the muscular mass. Recreative athletes in this study were informed mostly through a health professional, and we can affirm that federate athletes were informed mostly by their coach.

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### P34

#### Health Literacy Assessment in Portuguese Adults

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The concept of Health Literacy first appeared in 1974 [1], and in recent years it has gained increasing prominence in the European health agenda [2-4]. Researchers and practitioners, information about the status of health literacy in Europe remains scarce. This article presents selected findings from the first European comparative survey on health literacy in populations. Methods: The European health literacy survey (HLS-EU) researchers and practitioners, information about the status of health literacy in Europe remains scarce. This article presents selected findings from the first European comparative survey on health literacy in populations. Methods: The European health literacy survey (HLS-EU). For this reason, the present study aims to assess the level of Health Literacy in a sample of Portuguese adults, using the European Health Literacy Survey in Portuguese (HLS-EU-PT). The statistical analysis was performed with the aid of the SPSS software, all results were presented in percentages and absolute values, was used Pearson's  $\chi^2$  test to compare categorical variables and the level of significance was set at  $p < 0.05$ . Information from 519 adults, aged between 18 and 64 years, was analyzed, and this study was an observational, quantitative, and cross-sectional research. After the analysis, it was found that the vast majority of the study population has an inadequate level of health literacy since 29.70% had an inadequate level of health literacy and 27.40% a level of problematic health. When the three domains of health literacy were analyzed, it was observed that they were the domains related to Health Care and Health Promotion where higher levels of inadequate health literacy were found. It was also observed that it was male individuals, with higher ages and lower educational qualifications, residing in the North of the country and who had a high BMI who presented higher inadequate health literacy values (36.2%, 35.1%, 77.8%, 52.7%, and 59.0%, respectively). It is concluded, therefore, that the study population presented, in the great majority, an inadequate and problematic level of health literacy, both in general and in the three domains described. Therefore, it is essential to apply personalized measures to promote better Health Literacy and reverse these values.

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## P35

### Perception of health professionals in the province of Cabinda on the main barriers and facilitators for integrating education systems with professional practice

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In Angola, the scarcity, and difficulties to retain health professionals are well known [1]. In the province of Cabinda, this shortage is further aggravated by the attraction factor generated by the capital Luanda [2]. One of the most common strategies to retain health workers is to increase education and professional training structures near the places where they will be needed [1]. However, little is known about how health workers view the collaboration between universities and health services. Thus, the objective of this work was to explore the perceptions of doctors and nurses in the province of Cabinda about factors that inhibit or facilitate the integration of new professionals in a health service.

To achieve the objective of this study, an observational, cross-sectional study was developed. A questionnaire containing a list of barriers and facilitators already described in the literature was developed. Physicians and nurses from all health units in the province of Cabinda were selected by convenience. Each interviewee would respond on the importance they attributed to the factor based on a Likert scale (1 - Nothing important; 7 - Extremely important). Data analysis was supported by descriptive statistics. Besides this analysis, principal components analyses (PCA) were also performed.

In total, 68 professionals from 8 health units answered the surveys (40 nurses and 28 doctors). For nurses, work overload and lack of professionals were the most important barriers. For doctors, low wages and lack of medical equipment were the most important barriers. In the PCA, 5 components were found for barriers (Collaboration; Resources; Workload; Quality management; Training) and 3 components for facilitators (Quality of resources; Financing of resources; Nationality of tutors). These 8 components emphasize the concern with quality of care, integration of teaching, and with the practice and need of national teachers, to overcome cultural and language barriers of foreign teachers.

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## P36

### Analysis of woman's food ingestion through menstrual cycle

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Large variations in the woman's food choice, related to depressed mood can be explained through the hormonal fluctuations of estrogen and progesterone, which occurred throughout the menstrual cycle. Many studies have indicated that in the luteal phase of the menstrual cycle, there is a spike in progesterone and a secondary spike in estrogen and this interaction can lead to negative emotions such as body dissatisfaction, anxiety and depressed mood, and a search for relief and well-being through food ingestion. This compensation leads to the search for foods with more palate, which release the neurotransmitter serotonin, an emotional hunger, and can lead to uncontrolled binge eating. 44 women between the ages of 15-19 and 50-54 years answered an online questionnaire with questions focused on their routine, experience during menstruation and changes in food choice. The main objective of the present analysis was to understand if there was really a bigger need for calorie intake and if sweet foods were mostly desired. After analyzing data, it was concluded that there was a superior demand for sweet foods and concerning the intake of carbohydrates, this increase was not significant. Furthermore, it was concluded that 68.2% of the participants had a stressful routine and that although 65.9% of the participants respected their desires for specific foods, guilt and weight frustration did not seem to prevail in this sample. Perhaps because 79.5% of the total sample were students and have some knowledge about emotional hunger, since 72.7% knew the difference between emotional hunger and physiological hunger.

*To my colleagues Sofia Lopes and Andreia Dinis, for the motivation, support, and encouragement in carrying out this.*

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### Impact of the time of the last daily meal on sleep quality in health professionals

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The diet-sleep relationship has been the subject of several scientific studies due, essentially, to the negative impact they may have on health in general in the long run. It is estimated that, in this relationship, more specifically, a high-calorie and high-density diet can influence the quality of sleep, with serious consequences at the psychological, physiological and social levels [1]. To assess the hypothetical relationship, a questionnaire with 36 questions was developed, to assess the impact of the last daily meal on the quality of sleep in health professionals, and the hypothesis to be studied was whether health professionals eat meals closer to bedtime, they sleep fewer hours, which was answered by 62 participants, of which only 51 were health professionals. After collecting the responses to the questionnaires, their descriptive and inferential statistical analysis was performed using the IBM® SPSS® V.25 software. After analyzing the results, it was found that most professionals who eat meals between 8 pm and 10 pm and between 11 pm and 12 am, sleep less than 6 hours. Despite the slight differences in the number of hours of sleep depending on the time of the last meal, these are not statistically significant, and there is no evidence that the time of the last meal influences or is related to the number of hours that the professionals sleep. However, further studies are needed, where the sample number is higher to clarify the diet-sleep relationship, as well as the type, quantity, and schedule of that same meal.

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### Nutrition in the Kitchen World

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The practice of healthy eating is a subject of growing importance in our society and therefore it is becoming increasingly important to understand the relationship between gastronomy and nutrition. This work presents an analysis of results obtained through a cross-sectional observational study to evaluate the knowledge of kitchen professionals.

The survey is based on an online questionnaire addressed to kitchen professionals, which assess the nutritional knowledge of these professionals, the pathologies associated with bad eating habits and the perception they have regarding their food, being them people directly linked to food. Various parameters such as weight, height, body mass index, gender, age, total of right answers of the questionnaire on nutritional knowledge and relation to health and whether they have some kind of nutritional course or not have been evaluated. It was found that most people with a good assessment correspond to those with a normal BMI and the weakest score corresponds to the youngest population and lowest weight.

In conclusion, despite the fact they are professional cooks and that more nutritional knowledge is expected, a high weight was observed in many individuals in the target population and their nutritional knowledge is scarce.

In conclusion, the population studied, although they are professionals in the kitchen and can be expectable to have greater nutritional knowledge, has been observed a BMI above normal in many individuals and their nutritional knowledge is scarce for their role in public health.

*In such work, the support and encouragement of various people and entities is inevitable. In this sense, we would like to express our sincere thanks to everyone who made it possible:*

*To Professor Carla Sá who guided us in the initiation and in the idea of the study of kitchen professionals.*

*To our colleague Sara who helped us in the initiation and ideologies of the idea and the questionnaires as well as the theme of the Study.*

*To the people who answered the questionnaire in question contributing to the elaboration of this study.*

*To the group of Tourism and Hotel Schools of Portugal for their contribution.*

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