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Proceedings | *Resumos*

V National Congress of Dermatocosmetics Sciences
V Congresso Nacional de Ciências Dermatocosméticas

IV Congress of Portuguese Society of Science Cosmetological
IV Congresso da Sociedade Portuguesa de Ciências Cosmetológicas (SPCC)

15 May | 15 Maio
Lisboa - Universidade Lusófona

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SPCC
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ALIES – Associação Lusófona para o Desenvolvimento do Ensino e Investigação das Ciências da Saúde
CBIOS – Centro de Investigação em Biociências e Tecnologias da Saúde

Programa

Open Session | *Sessão de abertura*

Magnífico Reitor da Universidade Lusófona, Mário Moutinho
Em representação do Sr. Bastonário da Ordem dos Farmacêuticos, Helena Ribeiro
Sra. Presidente da Associação dos Industriais de Cosmética, Ana Maria Couras
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1st Session | *Sessão 1*
Cosmetics and Society | *Cosméticos e Sociedade*

Charmain | Moderador - **Adriana Gamboa**
Speakers | *Prelectores*
Ana Maria Couras
Javier Cuevas Martínez
Joana Marto

Key-note lecture | *Conferência Key-note*
Speaker | *Prelector*
Jurgen Lademann

2st Session | *Sessão 2*
State of the art I | *O estado da arte 1*

Charmain | Moderador - **Isabel Almeida**
Speakers | *Prelectores*
Barbara Valdés
Henrique Silva
Marilene Estanqueiro

Master lecture | *Conferência Magistral*
Fernanda Guedes Bahia

3st Session | *Sessão 3*
State of the art II | *O estado da arte II*

Charmain | Moderador - **Joana Nobre**
Speakers | *Prelectores*
Andreia Ascenso
Joana Duarte

4st Session | *Sessão 4*
State of the art III | *O estado da arte III*

Charmain | Moderador - **Manuel Fitas**
Speakers | *Prelectores*
Fátima Garcês
Catarina Rosado
Ana Rita Matias

Open Session

Magnífico Reitor da Universidade Lusófona, Mário Moutinho
Em representação do Sr. Bastonário da Ordem dos Farmacêuticos, Helena Ribeiro
Srª Presidente da Associação dos Industriais de Cosmética, Ana Maria Couras
Presidente da SPCC, Luis Monteiro Rodrigues (Presidente do Congresso)

1st Session | Sessão 1
Cosmetics and Society | *Cosméticos e Sociedade*

Chairman / *Moderador*

Adriana Gamboa

Resumé / *Currículo Resumido*

Adriana Gamboa coordinates the area of cosmetic products at the Health Products Directorate of INFARMED, I.P since April 2008. She is the national representative in different European Working Groups of the European Commission and Council of Europe. She has participated as a lecturer in several training activities, conferences and lectures in the areas of pharmacovigilance, medical devices vigilance, cosmetics regulation and cosmetovigilance. In 1986 began her professional career at the National Institute of Health Dr. Ricardo Jorge (INSA), having been responsible for Enteric Virus and Tissue Culture Sector of the Laboratory of Virology from 1992. In July 1998 joined the Infarmed Pharmacovigilance Department and from June 2001 to March 2008 was involved in the activities of the Health Products Vigilance Department, particularly in the establishment of the national medical devices vigilance system.
Experience
Professional training: Superior Healthcare Technician Career, INSA 1986-88
Technical responsible for the Enteric Virus and Tissue Culture Sector of the Laboratory of Virology, INSA, between 1992 and June 1998.
Pharmacovigilance Technician in Infarmed, I.P. between July 1988 and May 2001.
Medical Devices Vigilance Technician in Infarmed, I.P. between June 2001 and March 2008.
Representative of the Portuguese Competent Authority (INFARMED, I.P.) as Member of the following groups of the European Commission:
Standing Committee on Cosmetic Products; Working Group on Cosmetic Products; PEMSAC and PEMSAC Group on Market Surveillance; Sub-working group on Borderline Products; Sub-working group on Annex I.
Representative of the Portuguese Competent Authority (INFARMED, I.P.) as Member of the following groups of the Council of Europe: Steering Committee of Consumer Health Protection and Committee of Experts on Cosmetic Products.
Education
Graduated from Faculty of Pharmacy of the University of Coimbra in 1985 with a degree in Pharmaceutical Sciences (Biological and Biochemical Analysis Branch). Complementary academic graduation from Faculty of Pharmacy of the University of Lisbon in 1993 (Officinal Pharmacy Branch).
Intensive Course in Dermato-Cosmetics Sciences 2010, in Vrije Universiteit Brussel, Belgium, 13-17 September 2010.
Safety Assessment of Cosmetics in the EU – Training Course, in Vrije Universiteit Brussel, Belgium, 30 March - 4 April 2009.
Several Courses/ Seminaries in Epidemiology and Pharmacoepidemiology, Monitoring Safety in Clinical Trials, Monitoring Medicines Adverse Reactions, Signals Monitoring/Risk quantification and Benefit-risk assessment, European Cosmetovigilance System.

C.01 - Claims in cosmetic products - What's new in the regulatory framework?
Alegações em produtos cosméticos - o que há de novo no quadro regulamentar?

Speaker / *Prelector*

Ana Maria Couras

Resumé / *Currículo Resumido*

Ana Maria Proença Fonseca Couras nasceu em Lisboa em 1959. Licenciou-se em Engenharia de Produção Industrial – ramo de Engenharia Química pela Universidade Nova de Lisboa – Faculdade de Ciências e Tecnologia.

Desde 1994: Directora Geral da FIOVDE – Federação Portuguesa das Indústrias de Óleos Vegetais, Derivados e Equiparados. Nesta Federação estão filiadas 4 associações, das quais por inerência do Cargo que desempenha na FIOVDE é também Secretária Geral. Essas Associações são:
- Associação dos Industriais de Cosmética, Perfumaria e Higiene Corporal (AIC)
- Associação dos Industriais de Sabões Detergentes e Produtos de Conservaçã Limpeza (AISDPCL)
- Associação Portuguesa de Óleos e Gorduras Vegetais, Margarinas e Derivados (APOGOM)
- Associação Portuguesa de Aerossóis

Desde 1997: Presidente da Direcção da Associação dos Industriais de Cosméticos, Perfumaria e Higiene Corporal (AIC)
2005 - 2007: Vice-Presidente do Board da AISE – Associação Europeia dos Detergentes e Produtos de Conservação e Limpeza.
Desde 1998: Membro da CAGERE – Comissão de Acompanhamento da Gestão de Embalagens e Resíduos de Embalagens, representando os sectores não-alimentares da CIP.
1999-2006: Membro do Conselho Consultivo do IRAR, representando a CIP

Abstract / *Resumo da Comunicação*

• Claims are text, names, trade marks, pictures and figurative or other signs that convey explicitly or implicitly product characteristics or functions in the labelling, making available on the market and advertising of cosmetic products.
• Product claims are marketing tools that are essential to:
- help consumers/users choose a product;
- foster competition;
- promote innovation.
• Cosmetic product claims are subject to a multiple set of rules that may apply concurrently.
- In the EU, claims may be controlled by a diversity of national authorities, including non-governmental bodies, on the basis of "private" codes of practice.
- Rules applicable to claims generally pursue 2 main objectives: consumer protection (against misleading practices) and fair competition.
• Regulation 1223/2009: what has changed?
Focus on the cosmetic legislation i.e. the "lex specialis" for claims related to the characteristics and functions of cosmetic products.
- "In the labelling, making available on the market and advertising of cosmetic products, texts, names, trade marks, pictures and figurative or other signs shall not be used to imply that these products have characteristics or functions which they do not have". (Article 20)
- The PIF must include, "where justified by the nature or the effect of the cosmetic product, proof of the effect claimed for the cosmetic product". (Art.11(2)(d))
- "(….). After consulting the SCCS or other relevant authorities, the Commission shall adopt a list of common criteria for claims which may be used in respect of cosmetic products (…), taking into account of Directive 2005/29/EC. By 11 July 2016, the Commission shall submit to the European Parliament and the Council a report regarding the use of claims on the basis of the common criteria (…). If the report concludes that claims used in respect of cosmetic products are not in conformity with the common criteria, the Commission shall take appropriate measures to ensure compliance in cooperation with the Member States." (Article 20(2))
• In the future
- More harmonization
- More intervention of the authorities in enforcement policies
- Less claims "available"

1st Session | Sessão 1
Cosmetics and Society | *Cosméticos e Sociedade*

C.02 - Education in Dermatocosmetic Sciences
Educação em Ciências Dermatocosméticas

Speaker / *Prelector*

Javier Cuevas Martínez

Resumé / *Currículo Resumido*

Degree in Biological Sciences in Universidad de Salamanca.
Former Asociate Profesor in Faculté de Pharmacie, Paris V, DEA. Faculté de Medecine de Paris VI. Research fellowship at Centre National de la Recherche Scientifique(France), Hospital de la Pitié Salpétrière (Paris, France). MBA in Pharmaceutical Marketing Administration.
Executive in Centro de Estudios Superiores de Industria Farmacéutica (CESIF), Madrid. España.
Career as Marketing and Sales executive manager in the Healthcare market: BioMérieux, Dolisos, Pierre Fabre, Becton Dickinson, Cofares- Farline, Saluris Network.
CEO of Centro de Estudios Superiores de Industria Farmacéutica (CESIF) in Portugal.

Abstract / *Resumo da Comunicação*

The presentation is divided into 5 sections:
1.Background: Different international possibilities are discussed for Masters of Cosmetology and Dermopharmacy.
2.Procedures for the Master: Options available to students for the master of CESIF are detailing. There are three types: Classroom, online / classroom, or performing specialized courses.
3.Program: First, discussing the importance of knowing the legislation, an important area in CESIF's Master. In addition, different sections will be explained in a cosmetic company, based on an installation plan. And finally, will be explained the other areas of the Master.
4.Segmentation: Depending on the different types of the master, there is different target of students.
5.Conclusion: A brief conclusion about the Master.

C.03 - Formulating Green Cosmetics
Formulação de Cosméticos Verdes

Speaker / *Prelector*

Joana Marto

Resumé / *Currículo Resumido*

Joana Marto has a Masters degree in Pharmaceutical Sciences by the Faculty of Pharmacy of the Lisbon University (2010). After finishing her Masters degree she worked as a young researcher in Laboratórios Atral in the R&D department. Nowadays she is doing her PhD thesis by the iMed. ULisboa (Research Institute for Medicines) and Laboratórios Atral S.A. in pharmaceutical innovation. This program allows the students to acquire core and transferable skills in the field of pharmaceutical tecnhology. Her PhD thesis will focus on the development of new pharmaceutical dosage forms for topical application. Additionally, she is a specialist in Safety Assessment of cosmetics according to EU regulation. Also Joana taught laboratorial classes of Galenic and Dermopharmacy in Faculty of Pharmacy, University of Lisbon.

She integrates the Nanomedicine and Drug Delivery Systems (NanoDDS) group of the Research Institute for Medicines and Pharmaceutical Sciences (iMed. FFUL), and collaborates with other research teams from University of Coimbra. She has both national and international oral communications (in Brazil and Spain) and several publications in international journals with peer review.

Abstract / *Resumo da Comunicação*

The market for green and natural products is growing all over the world in a variety of cosmetics products. In order to hold on with the current trends, cosmetics companies are designing their green cosmetics to meet the demand, leading challenges for the cosmetic formulator. When it comes to innovations in the cosmetic industry the first thing to take into account is the (EC) Regulation n° 1223/2009 of the European Parliament which has been set to protect the consumer's health and to set rules how the producers should work. Green cosmetic is not easy to define, since there is no official definition for it. However, there are certain rules and regulations what to apply in order to be able to call some product as natural and organic cosmetic. Different certificates, forbidden ingredients and environmentally friendly producing process are the importance of natural cosmetics. With this green attitude and this desire to actively contribute to sustainable development, the cosmetics sector is duty to define and implement a standard for organic and natural cosmetics. This standard takes into account the current technological reality while promoting dynamism that will lead to innovative developments.
This oral communication outlines the details of the major ingredients available to formulators, the ECOCERT basic principles as well as an example of an ECOCERT product.

Key-note lecturer | Conferência Key-note

C.04 - Carotenoids as biomarkers for the antioxidative potential of human skin

Carotenóides como biomarcadores para o potencial antioxidante da pele humana

Speaker / *Prelector*

Jurgen Lademann

Resumé / *Currículo Resumido*

Graduated as a physicist from the Moscow Lomonosov State University in 1980 and received his PhD from that university in 1984. In 1991 he received his PhD in spectroscopy from the Friedrich-Schiller University of Jena. Obtained his venia legendi in electrical engineering from the University of the Armed Forces of Munich in 1995, and in biophysics from the Humboldt University of Berlin in 1996. Worked at the Central Institute for Optics and Spectroscopy of the Academy of Sciences in Berlin from 1980 to 1991 and headed the Dept. of Medical Sensor Technology at the Institute of Physics of the University of the Armed Forces, Munich, from 1993 to 1995. Since 1996 he has been heading the Center of Experimental and Applied Cutaneous Physiology at the Department of Dermatology, Venerology and Allergology of the Charité – Universitätsmedizin Berlin. In 2001, he was appointed Professor of Dermatology by the Charité. Since 2007, he has been Member of the Board of the German Society for Scientific and Applied Cosmetics (DGK) and of the Society for Dermatopharmacy (GD). In October 2014 he was elected to the Praesidium of the International Federation of Societies of Cosmetic Chemists (IFSCC). Sits on the Steering Committee to prepare the IFSCC Beauty and Lifestyle congress scheduled for January 2018 in Munich.
Authored and co-authored more than 600 articles in renowned peer-reviewed scientific journals.

Abstract / *Resumo da Comunicação*

Introduction: Skin ageing is determined by genetic aspects and by environmental factors and lifestyle. Metabolic processes, solar UV radiation, smoking and alcohol consumption can induce the formation of free radicals in human skin. Whereas these highly reactive molecules are very important to control signalling processes in the human body, they also can destroy cells and cell compartments, such as collagen and elastin fibers, if their concentration exceeds a critical threshold.
To counteract the detrimental effect of the free radicals the human body has developed a protective system consisting of antioxidants. These antioxidants are capable of neutralizing the free radicals before they start damaging the body. Antioxidants in the human body are, inter alia, the vitamins, carotenoids and specific enzymes. Most of these antioxidants cannot be generated by our organism automatically, but must be taken in with food rich in fruit and vegetables. The individual antioxidants form protective chains in the human skin to safeguard each other against the destructive action of the free radicals.
Materials and Methods: Recently it was demonstrated that spectroscopic methods like Raman spectroscopy or reflectance spectroscopy permit antioxidants, specifically carotenoids, to be detected in human skin noninvasively and online. The findings that carotenoids represent marker substances for the whole antioxidative potential have proved to be very advantageous in this context using electron spin resonance spectrometry.
Discussion: Various studies on the interaction between antioxidants and free radicals were carried out at the Center of Experimental and Applied Cutaneous Physiology at the Department of Dermatology, Venerology and Allergology of the Charité – Universitätsmedizin Berlin.
In the first phase of these investigations, the antioxidative status of volunteers had been measured daily for a period of one year. As a result, the carotenoid values turned out to represent a finger print of each volunteer, characterizing his nutritional and stress behaviour.
In the second phase of the investigations, the influence of ultraviolet and infrared radiation as well as of alcohol consumption upon the antioxidant status of human skin was analyzed under standardized conditions. Furthermore it could be shown that volunteers with high antioxidant concentrations in their skin exhibited less wrinkles and furrows than volunteers of the same age with lower antioxidant concentrations. Consequently, a healthy diet is the best strategy against skin ageing.
In summary it can be stated that application of noninvasive online methods for the detection of antioxidants in human skin will both open up new prospects for the development of care products and considerably influence the nutritional habits and stress behaviour of people

2st Session | Sessão 2
State oh the Art I | *O Estado da Arte I*

Chairman / *Moderador*

Isabel Almeida

Resumé / *Currículo Resumido*

PharmD from the Faculty of Pharmacy, University of Porto, MSc in Pharmaceutical Technology and PhD in Pharmaceutical Technology from the same institution. Assistant professor at the Pharmaceutical Technology Laboratory, Drug Sciences Department, Faculty of Pharmacy, University of Porto since July 2009. Current research interests include the formulation and characterization of semi-solid products for application on the skin; screening and characterization of antioxidants and In vitro characterization of the bioactivity and toxicity of topical ingredientes. Supervises master and doctoral students in the areas of Pharmaceutical Technology and Cosmetology. Has presented more than 60 presentations on scientific meetings and published 27 papers in international scientific journals with refereing and 3 book chapters. Member of the Portuguese Society of Cosmetological Sciences

2st Session | Sessão 2
State of the Art I | *O Estado da Arte I*

C.05 - Nail Formulations
Formulações de Unhas

Speaker / *Prelector*

Bárbara Valdés

Resumé / *Currículo Resumido*

2001 Pharmaceutical Science. University of Havana. Cuba
2009 Master in Chemical Pharmaceutical .University of Havana. Cuba
2011 Student of PhD. University of Lisbom
Quality Gesture, Implementation of ISO 9001 in Vaccine Laboratory , Register of Vaccines, Control of Quality and Production of bacilli Calmette-Guerin Vaccine. Synthesis of Polymers and Characterization.
Synthesis of derivate of sucrose, control delivered system from cellulignine and lignin, synthesis of polyurethanes. Projecto 265/2004. "Sistemas de Liberación Controlada" Cuba.
Project PTDC/QUI/72733/2006. Development of reactive polymers for new surgical adhesives. Isocyanate-terminated prepolymer as bioadhesive base material: synthesis, evaluation of biadhesion and biocompability in vitro. Portugal .
QREN Project Ecoplast Synthesis of Polyester. Instituto Superior Tecnico, Portugal.
She has several publications in international journals (Revista Cubana de Farmacia, Revista Ingeniería Química, Revista Iberoamericana de Polímeros).
She has several presentations in international congress and conference.

Abstract / *Resumo da Comunicação*

Nails are classified as accessory organs of the skin and are produced by cells in the epidermis. Some of the main nail diseases include onychomicosis and psoriasis, which are described in this presentation. Oral treatment for these diseases causes many adverse reactions, namely hepatoxicity. Topical therapy is, thus, a preferable option to these problems. The purpose of this presentation is to review some of the main currently available topical formulations, explain the nail structure and its influence, among other factors, in drug permeation and finally to establish an new approach to obtain a better drug permeation profile in nail plate.
Introduction: The nail protects the tips of the fingers and toes from physical damage. This part of our organism is used for scratching, grooming and is a prerogative of beauty. Disorders of the nail unit range from relatively innocuous conditions such as alterations in pigmentation, hypertrophy to inflammation and infections, etc. The absorption of drugs into the nail unit, following topical application, is highly desirable to treat nail disorders. The main topical formulations for nail application include creams, gels, adhesive patches, colloids and nail lacquers. However, topical therapy is limited due to the low permeability of the nail plates. To discuss the nail anatomy, nail disorders that affect its structure and factors that influence the nail permeability of topical drugs, is the aim of this review.
Material and Methods: Books, publications in journals and databases were searched for nail permeation factors and nail treatment reviews in the last 15 years.
Results: Its present one review of structure of nail, nail disorder, factor influence in the permeation of transungual systems, topical drugs delivery for treatment of disease in nail.
Conclusions: The nail is a complex system, being a highly keratinized structure with hydrophilic characteristics. This property limits the drug delivery. The summary presented addresses the major factors that facilitate nail permeation. There are many formulations in the market, with nail lacquer formulations presenting the best drug bioavailability and comfort to the patient, being the preferable treatment for fungal infections in the short term. However, the way for new optional formulations has not been sufficiently exploited and the study of vehicles in the formulations should continue to be investigated to obtain more effective topical formulations.

C.06 - Exploring Lower Limb Microvascular Reactivity With Methyl Nicotinate in Different Perfusion Conditions
Exploração da Reatividade Microvascular no Membro Inferior com o Nicotinato de Metilo em Diferentes Condições de Perfusão

Speaker / *Prelector*

Henrique Silva

Resumé / *Currículo Resumido*

Master Degree in Pharmaceutical Sciences in 2011 from Universidade de Lisboa (Faculty of Pharmacy). Currently he's a teaching assistant at Universidade Lusófona, and an invited assistant at Universidade de Lisboa, as part of the Physiology staff. He is also a student (final year) in Universidad de Alcalá – Universidade Lusófona Health Sciences PhD Program. His PhD project is centered on the analysis of peripheral microcirculatory variables with mathematical modeling, in physiological and pathological states. He is author and co-author of several papers published in international journals and has presented his results in several national and international conferences.

Abstract / *Resumo da Comunicação*

Introduction: Cutaneous microcirculation reactivity to topically applied drugs can be quantitatively described by Laser Doppler Flowmetry (LDF). Methyl nicotinate (MN) is a vasodilator drug often used for this purpose. This work focuses on the effect of local perfusion conditions on the vasodilator response evoked with MN.
Materials and Methods: MN was applied on the foot dorsum skin of 15 healthy volunteers (22.7±2.8 years old), on two different perfusion-conditioning protocols: (a) while breathing room atmosphere and then breathing a saturated oxygen atmosphere; (b) with both feet at heart position and while performing a passive leg raising (PLR) from supine. Local perfusion was recorded with LDF and the oxygen partial pressure (tcpO2) was measured with transcutaneous gasimetry. The LDF the signal was analyzed with: the wavelet transform, giving its major components (cardiac, respiratory, myogenic, sympathetic, and endothelial); and the detrended fluctuation analysis (DFA), which allowed the characterization of the self-similarity properties through its alpha (α) exponent. All statistical comparisons were done with the Wilcoxon signed-rank test ($p<0.05$).
Results and Discussion: Breathing the oxygen atmosphere created hyperoxia, which although a vasoconstrictive stimulus, did not change the vasodilation profile. While breathing the oxygen atmosphere, a significantly lower myogenic activity was noted and the alpha exponent of the respiratory activity was found to be significantly higher. The PLR technique reduced the magnitude of the vasodilation response. Significant lower activity and alpha exponents were noted for the cardiac component relative to the supine position. These results suggest the usefulness of these in vivo models, as well as the potential of the wavelet transform and DFA for the functional analysis of the skin microvascular reactivity.

2st Session | Sessão 2
State of the Art I | *O Estado da Arte I*

C.07 - Inclusion of Lipid Nanoparticles in Cosmetic Products and their Effect on Skin Hydration

A Inclusão de Nanopartículas Lipídicas em Produtos Cosméticos e os Seus Efeitos na Hidratação da Pele

Speaker / *Prelector*

Marilene Estanqueiro

Resumé / *Currículo Resumido*

Marilene Estanqueiro has a Master Degree in Pharmaceutical Sciences by the Faculty of Pharmacy, University of Porto in 2011 and has a post-graduation course in Pharmaceutical Technology, in 2014. Since 2012 she is an invited professor of Pharmaceutical Technology in the same Faculty. In the field of cosmetics, her research interests include development and technological characterization of cosmetic formulations, as well as their efficacy evaluation. During the last years she has worked with sunscreens, geomaterials, plant extracts and lipid nanoparticles containing cosmetic ingredients. She is the author and co-author of eleven peer reviewed articles on international scientific journals, twenty panel communications and twelve oral communications, including five communications by invitation.

Abstract / *Resumo da Comunicação*

In the last years lipid nanoparticles, both Solid Lipid Nanoparticles (SLN) and Nanostructured Lipid Carriers (NLC) were intensively investigated for cutaneous application, namely in the cosmetic field. Both SLN and NLC, by itself, are advantageous for skin application, because the small size of lipid nanoparticles ensures a close contact to the stratum corneum (SC). They form a dense film over the skin with occlusive properties that reduces transepidermal water loss (TEWL) and consequently, increases skin hydration. Although aqueous dispersions of lipid nanoparticles present many advantages, their inclusion in semisolid formulations for cutaneous application, such as creams or gels, is required. In recent works, lipid nanoparticles were developed and incorporated in suitable dermatological bases, allowing to obtain suitable products for skin application as evidenced by rheological evaluation and textural analysis. Additionally, in vitro and in vivo evaluation of the occlusive properties were also performed. The obtained results until now demonstrated that semisolid formulations containing the lipid nanoparticles showed higher occlusive factor compared to the formulation base without lipid nanoparticles. These formulations also improved skin hydration after repeated applications. In conclusion, the incorporation of lipid nanoparticles in cosmetic products allows an improvement of the skin barrier function, avoiding the use of typical occlusive products that may leave greasy skin.

Key-note lecturer | Conferência Key-note

C.08 - Dematatocosmetic Sciences: a reflection on paradoxes

Ciências Dermatocosméticas: uma reflexão sobre paradoxos

Speaker / *Prelector*

Fernanda Bahia

Resumé / *Currículo Resumido*

Full professor of pharmaceutical technology in Faculty of Pharmacy of the University of Porto, is retired since November 2009. Head of pharmaceutical technology department (1996-2009) and leader in the accomplishment of a common task of university-enterprise relationship that was been partial supported by FCT and IAPMEI for some interesting R&D about vehicles, cutaneous bases, cosmetics and biomaterials.
Nominated expert in Pharmaceutical Industry and Dermopharmacy (1989) by Ordem dos Farmacêuticos and expert for Cosmetic Scientific Committee (1990-93) by State Secretariat of Health. Nominated for compounding medication working group (2008) and member of the Portuguese Pharmacopoeia (1994-2011) by Infarmed. Now has been renamed to Ethics Committee of the University of Porto by University Senate.
A lot of papers and chapter books and books are included in curriculum (for exemple : A Universidade – Reflexão de dúvidas Maria Fernanda Bahia In UNIVERSIDADE, CIÊNCIA E SOCIEDADE: desafios e fronteiras éticas Ed. Jorge Sequeiros, Edição Comissão de Ética da Universidade do Porto (2014), URL http://hdl.handle.net/10216/73027 and Vaginal Drug Delivery,José das Neves, Maria Helena Amaral, Maria Fernanda Bahia In Pharmaceutical Manufacturing Handbook – Production and Processes Ed. by Shayne Cox Gad, Wiley Inter-Science,2008 and PROTECÇÃO SOLAR – ACTUALIZAÇÃO. Maria Fernanda Bahia. 2003 , Série para saber,2. Editora da Universidade do Porto.
Note: recently published a book of poetry and pictures “Momentos Gravados” , Ed.Maria Fernanda Bahia, 2015, ISBN 978-989-20-5253-3.

Abstract / *Resumo da Comunicação*

Regulatory Affairs seeking safety and controlled use of market products, have the responsibility of classifying them upon its healthcare differences and similarities. Products result defined as pharmaceuticals, medical devices or cosmetics. Nevertheless, products named as cosmeceuticals, bio products and others, appealing to consumers, fail to create consensus on how to be classified, leading to non controlled practices, thus creating a paradox. Some examples will illustrate this point considering the socio-psychological dimension of products use.
Another paradox in dermocosmetics research concerns clinical studies design, that aim to ensure the scientific validity and reproducibility of the results in order to generate data on product’s safety and efficacy. Research using the placebo comparison is particularly complex since it is difficult to isolate its effect and because it can turn itself into an ethical problem: assigning a subject to a placebo group might violate his or her right to receive the best available treatment. Assigning subjects randomly without informing them to which group they belong and doubled-blinded trials, so that researchers do not know to which group a subject is assigned, still do not prevent ethical problems in these studies.
The Declaration of Helsinki provides guidelines on this issue but still there is no consensus on the matter.

3st Session | Sessão 3
State of the Art II | *O Estado da Arte II*

Chairman / *Moderador*

Joana Nobre

Resumé / *Currículo Resumido*

Joana Nobre graduated in Pharmaceutical Sciences in 2005, in Instituto Superior de Ciências da Saúde - Norte. In 2009 she completed a Post-graduation in Dermopharmacy and Cosmetology and in 2013 a Master in Pharmaceutical Sciences in Faculdade de Farmácia da Universidade de Lisboa, with a dissertation on "Androgenetic Alopecia". Presently she is enrolled in a Business Master on Branding at the Lisbon School of Marketing – IPAM.
From 2008 she is Technical and Training Director at Ales Groupe Portugal: Lierac and Phyto.
Since 2011, she collaborates with the faculty of Pharmacy in Porto and Coimbra, in the curricular units of Cosmetology and Dermopharmacy and Cosmetics, respectively.
Her research interests are focused mainly on the study of Androgenetic Alopecia (her science training area) and Lipidic Nanoparticles in Dermopharmacy (on which she is a co-author of a scientific publication chapter).
She is regularly invited to give lectures in Master and Postgraduate programs in other Portuguese academic institutions.

C.09 - Development, characterization and skin delivery studies of related ultradeformable vesicles: transfersomes, ethosomes and transethosomes

Estudos de desenvolvimento, caracterização permeação cutânea de vesiculas ultradeformáveis próximas: transferssomas, etossomas e transsetossomas

Speaker / *Prelector*

Andreia Ascenso

Resumé / *Currículo Resumido*

Andreia Ascenso is a Professor of Pharmaceutical Technology in Faculty of Pharmacy at the University of Lisbon (FFUL) since September 2005. She has a post-graduation in Advanced Pharmacotechnics (16/20 values), Master (very good) and PhD (passed with distinction).
She integrates the Nanomedicine and Drug Delivery Systems (nanoDDS) group of the Research Institute for Medicines and Pharmaceutical Sciences (iMed. FFUL), and collaborates with other research teams from University of Aveiro and S. Paulo/ Ribeirão Preto. Her research work is related with the study of antioxidants and new drugs incorporated in nanocarriers (mainly ultradeformable vesicles) topically delivered for management of photocarcinogenesis.
She has both national and international oral communications (in Brazil, USA and Denmark).
She is the Guest Associate Editor on Carrier-Mediated Dermal Delivery: Applications in the Prevention and Treatment of Skin Disorders Book, Pan Stanford Publishing. She has several publications in international journals with peer review (e.g. Molecular Neurobiology, Medicinal Chemistry, Experimental Dermatology, European Journal of Pharmaceutics and Biopharmaceutics, Journal of Agricultural and Food Chemistry, Journal of Liposome Research, etc). She has also been invited to review several international manuscripts as well.

Abstract / *Resumo da Comunicação*

Introduction & Aims: Ultradeformable vesicles (UDV) have recently become a promising tool for the development of improved and innovative dermal and transdermal therapies with numerous advantages over the conventional delivery systems. The aim of this research work was to study three closely related UDV, Transfersomes, Ethosomes and Transethosomes in different situations, such as a high and low active incorporation efficiencies obtained with actives of distinct polarities (Vitamin E and Caffeine, respectively).
Methods: The actives were incorporated in the three UDV formulations which characterization parameters corresponded to: the mean vesicles size and polydispersity index measured by photon correlation spectroscopy; zeta potential determined by laser-doppler anemometry; viscosity; deformability evaluated by pressure driven transport; active loading and entrapment yield determined by HPLC assay of each active before and after the separation of the non incorporated fraction by ultracentrifugation, and finally, incorporation efficiency in which the lipids assay was based on an enzymatic-colorimetric test. After this characterization, topical delivery studies were performed in order to compare the selected UDV formulations regarding the release, skin permeation and penetration profiles.
Results: All UDV formulations showed size values within the expected range, except Transethosomes prepared by method A ("transfersomal" method), which size was less than 100 nm in contrast to what happened in method B ("ethosomal" method). Zeta potential was negative and higher for formulations containing sodium cholate. The Incorporation Efficiency was much higher for Vitamin E than Caffeine –loaded UDV as theoretically expected attending to the respective Log P. In general, it was obtained the following order for UDV flux: TE > E ≥ T. This result was consistent with the release and skin penetration profiles for Vitamin E- loaded UDV. However, the releasing results were totally the opposite for Caffeine-loaded UDV, which might be explained by the solubility and thermodynamic activity of this active in each formulation instead of the UDV deformability attending to the higher non incorporated fraction of Caffeine. Notwithstanding, it was obtained a high skin penetration and permeation for all Caffeine-loaded UDV.
Conclusion: Transethosomes are more deformable than Ethosomes and Transfersomes due to the presence of both ethanol and surfactant in their composition. All these UDV are suitable for a deeper skin penetration specially Transethosomes.

3st Session | Sessão 3
State of the Art II | *O Estado da Arte II*

C.10 - Encapsulation of solar filters: effect in photostability
A encapsulação de filtros solares: efeito em fotoestabilidade

Speaker / *Prelector*

Joana Duarte

Resumé / *Currículo Resumido*

Estudante do 4º ano do Mestrado Integrado em Ciências Farmacêuticas, na Faculdade de Farmácia da Universidade do Porto (FFUP). Participa no núcleo de investigação do Laboratório de Tecnologia Farmacêutica da mesma instituição de ensino desde Março de 2014. Frequentou a unidade curricular Projeto 1 desde Setembro até Dezembro de 2014, também no Laboratório de Tecnologia Farmacêutica, no âmbito da qual foi desenvolvido o trabalho experimental "Estudo do efeito da encapsulação na fotoestabilidade do filtro solar: 2-etil-hexil-4-metoxicinamato". Participou em workshops na área da Cosmetologia e frequentou congressos científicos na área da Tecnologia Farmacêutica, organizados pela FFUP. No presente ano, encontra-se a frequentar a unidade curricular Cosmetologia. Em 2014 participou nos estágios extracurriculares proporcionados pela associação de estudantes da FFUP, tendo estagiado na Farmácia Hospitalar do Hospital Militar do Porto e na Farmácia "Machico". No presente ano, integra o projeto "Escolas Uriage 2015" proporcionado pelos Laboratoires Dermatologiques d'Uriage Portugal S.A.

Abstract / *Resumo da Comunicação*

With the increasing incidence of melanoma, the protection against solar radiation has become a growing concern hence the use of sunscreens. Several studies have demonstrated the existence of a number of solar filters, such as 2-ethylhexyl-4-methoxycinnamate (EHMC), that when exposed to solar radiation exhibit a decrease of their protective ability. EHMC exerts its action by absorbing ultraviolet radiation (UV) being designated as a chemical filter. However, when exposed to solar radiation, undergoes an isomerization/ degradation reaction with consequent reduction of its photoprotection effectiveness. A previous work by our group demonstrated that sodium alginate could be used as microencapsulation agent for this UV filter. So, the possibility of using sodium alginate as coating material to prevent EHMC photoisomerization/photodegradation was studied. Microparticles (MP) were prepared by an extrusion process with aerodynamic jet assisted methodology. The MP were characterized regarding to the moisture content, the morphology, the size and EHMC-loading. The Sun Protection Factor (SPF) of a cream containing EHMC-MP was evaluated before and after UV irradiation and the presence of isomers was evaluated. It was concluded that the incorporation of EHMC in MP maintained its photoprotection properties but was not effective in preventing photoisomerization and SPF decrease.

Based on data from the literature that considered the contribution of oxidative processes to EHMC photo instability, it can be hypothesized that the co-loading of EHMC-MP with an antioxidant could improve the photostabilization effect. Thus, the co-loading of EHMC with α-tocopherol is currently being studied. The preliminary results suggest that this approach exhibits a positive effect in the photostability of the UV filter.

4st Session | Sessão 4
State of the Art III | *O Estado da Arte III*

Chairman / *Moderador*

Manuel Fitas

Resumé / *Currículo Resumido*

Research and Development Director at PhDTrials since 2014.
Invited Auxiliary Professor at Lusófona University School of Health Sciences, in Cosmetology, Dermopharmacy and Pharmaceutical Technology from 2002 to 2014.
Member of the Pharmacy Trainee Board, at Lusófona University School of Health Sciences until 2014.
Member of the Executive Board of the Portuguese Society of Cosmetic Sciences since 2010.
Pharmacy Director at Farmácia Rio de Janeiro from 2012 to 2013.
Assistant Pharmacy Director at Farmácia Reis Oliveira from 2003 to 2012.
Assistant Pharmacy Director at Farmácia Cartaxo from 1998 to 2003.
MSc in Comunity Pharmacy by the University of Lisbon School of Pharmacy in 2006.
PharmD by University of Lisbon School of Pharmacy in 1998.

4st Session | Sessão 4
State of the Art III | *O Estado da Arte III*

C.11 - The importance of hair follicle unit quality in hair transplant surgery: key issues and technological innovations
A importância da qualidade do foliculo capilar na cirurgia de transplante: aspectos chave e inovação tecnológica

Speaker / *Prelector*

Fátima Garcês

Resumé / *Currículo Resumido*

Fátima Garcês awarded her medical degree with Faculdade de Medicina da Universidade de Lisboa (Portugal) and her specialization in hair restoration surgery with DHI Global in Greece.
Pioneer in Portugal in the Follicular Unit Extraction (FUE) hair restoration technique, she is a certified specialist in trichology, hair restoration and hair transplant surgery. Since the beginning of her clinical practice, Fátima Garcês has performed thousands of hair transplants, mainly with FUE technique.
Since 2009, Fátima Garcês is the Medical Director for Clínica Saúde Viável.

Fátima Garcês is a member of the International Society of Hair Restoration Surgery – ISHRS. She is also an invited member of EuroMedicom – Promoting Science for Tomorrow.

Abstract / *Resumo da Comunicação*

Modern techniques of hair restoration surgery, like Follicular Unit Extraction (FUE), rely deeply on the experience of the medical team who performs the surgery, but also on the quality of the hair follicular units this is able to get for transplant. The harvesting and selection processes are therefore crucial to the hair transplant surgery success. Manual proceedings pose challenges and constraints, like professional's fatigue and possibility of human error. Nowadays technological innovations are helping hair restoration surgeons to overcome these constraints. The devices used in follicular unit grafts extraction are evolving fast. Robotic hair transplant is giving the first steps and may be able to bring more precision and accuracy to hair transplant, by ensuring better quality follicular unit grafts, a higher number of grafts in a shorter period of time and lower transection rates.

C.12 - In vivo assessment of antioxidant activity of topical formulations
A avaliação in vivo da actividade antioxidante deformulações tópicas

Speaker / *Prelector*

Catarina Rosado

Resumé / *Currículo Resumido*

Catarina Rosado graduated in Pharmaceutical Sciences in 1997, in the Faculty of Pharmacy of the University of Coimbra. In 2000 she completed her PhD under the supervision of Professor Jonathan Hadgraft in the Welsh School of Pharmacy, Cardiff, with the thesis "Formulation strategies in transdermal drug delivery".
In 2004, she joined the faculty of the Universidade Lusófona as a lecturer of the Faculty of Health Sciences. Catarina has established her research in the Experimental Dermatology Unit of CBIOS, but has established collaborations with other Portuguese and foreign universities. Her research interests focus mainly on the study of the impact of formulation on transdermal penetration and also in the development of non-invasive in vivo strategies to assess efficacy and safety of topical drugs and cosmetics.

To date, she has been involved in the supervision of several MSc and PhD students, and has hosted in her research lab postgraduate students from Peru, Poland, Italy and Brazil. She has regularly been invited to lecture in Masters and Postgraduate programs in other Portuguese and foreign universities.

Catarina Rosado is a founding member of the SPCC, the Portuguese Society of Cosmetological Sciences, a member society of the IFSCC. She regularly acts as a consultant to cosmetics companies.

Abstract / *Resumo da Comunicação*

In the last decade, many cosmetic products have been formulated with antioxidants that aim not to stabilize the formulation, but to exert beneficial effects on the skin. The main classes of cosmetics with this type of ingredients are anti-ageing and after sun, but even body wash formulations have started to be included in this trend. Despite the wide use of such a strategy, most of these products are only assessed by in vitro methodologies, such as the DPPH assay.
This communication aims to review the main strategies of efficacy testing of antioxidants, both in vitro and in vivo, and also to present an innovative approach to this challenge
Reactive oxygen species are known to play a relevant role in the inflammatory response. The cutaneous inflammatory response produces a visible erythema that can be non-invasively quantified with Laser Doppler Flowmetry (LDF). The new methodology aims to test the efficacy of antioxidant-containing formulations, by assessing the impact in reducing the erythemal response caused by the topical application of ethyl nicotinate (EN).

4st Session | Sessão 4
State of the Art III | *O Estado da Arte III*

C.13 - Skin colour, skin redness and melanin biometric measurements: comparison study between Antera® 3D, Mexameter® and Colorimeter®

Cor, vermelhidão da pele e medida biométrica de melanina: estudo de comparação entre os sistemas Antera® 3D, Mexameter® e Colorimeter®

Speaker / *Prelector*

Ana Rita Matias

Resumé / *Currículo Resumido*

From July 29th 2013 – to Present Researcher at: Inovapotek, Research and Development, Porto (Portugal)
From April 12th 2010 – to July 26th 2013 Hospital Pharmacist at: Grupo Trofa Saúde, Trofa (Portugal)
From January 5th 2010 – to April 4th 2010 Clinical trial phase I technician at Unidade de Farmacologia Humana BIAL Portela & Cª, S.A., São Mamede do Coronado (Portugal)
From November 2th 2009 – to December 31th 2009 Community Pharmacist at: Grande Farmácia, Espinho (Portugal)
2013: Master in Quality Control at: Pharmacy Faculty of Porto University
2009: Master in Pharmaceutical Sciences

Abstract / *Resumo da Comunicação*

The actual skin colorimeters analysis reflect values from a limited number of broad spectral bands and consequently present limited reproducibility and specificity when measuring skin colour. Here, Antera® 3D, a new device which uses reflectance mapping of seven different light wavelengths spanning the entire visible spectrum, has been compared with Mexameter® MX-18, an established narrow-band reflectance spectrophotometer and with Colorimeter® CL-400, an established tristimulus colorimetric instrument.
Thirty volunteers were exposed to a controlled ultraviolet B light. Measurements with Antera® 3D, Mexameter® MX-18 and Colorimeter® CL-400 were done before treatment and after 2, 7 and 14 days.
Antera® 3D_ showed to have a better sensitivity and specificity than Mexameter® MX-18 regarding the melanin parameter. A similar sensitivity between Antera® 3D and Mexameter® MX-18 was found for erythema determination and also for the Commission Internationale de l'Eclairage L*, a*and b* parameters between Antera® 3D and Colorimeter® CL-400. Good correlations were observed for all the parameters analysed. Repeatability of Mexameter® MX-18 and Colorimeter® CL-400 values were lower than that of Antera® 3D for all the parameters analysed.
Antera® 3D, Mexameter® MX-18 and Colorimeter® CL-400, are robust, sensitive and precise equipment for the skin colour analysis.

Panel Comunications | *Comunicações em Posters*

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P.02 **STUDY OF THE POTENTIAL FOR TOPICAL APPLICATION OF A NEW ANTIOXIDANT XANTHONE** - Rocha, V., Marques, C., Sousa, M.E., Cidade, H., Pinto, M., Sousa Lobo, J.M., Almeida, I.F.

P.03 **CORRELATION OF SENSORY PARAMETERS WITH RHEOLOGICAL PROPERTIES OF TOPICAL FORMULATIONS** - Teixeira, A., Vasconcelos, V., Costa, P.C., Teixeira, M., Almeida, V., Sousa Lobo, J.M., Almeida, I.F.

P.04 **EVALUATION OF PSORIASIS SEVERITY: SELF-PERCEPTION VERSUS CLINICAL ASSESSMENT** - Teixeira, A., Teixeira, M., Almeida, V., Rocha, J., Torres, T., Sousa Lobo, J.M. Almeida, I.F.

P.05 **SENSORY ANALYSIS OF TOPICAL SEMISOLID FORMULATIONS** - Teixeira, A, Teixeira, M, Almeida, V, Costa, PC, Sousa Lobo, J. M., Almeida, I.F.

P.06 **STUDY OF THE APPLICABILITY OF IONIC LIQUIDS AS EXCIPIENTS IN TOPICAL FORMULATIONS** – Santos de Almeida, T., Júlio, A., Caparica, R., Ribeiro, M., Rocha, F., Ribeiro, M., Araújo, M. E., Baby, A.R., Rosado, C., Portugal Mota, J.

P.07 **KETOCONAZOLE LIPOSOMAL CARRIER FOR TOPICAL DELIVERY** - Bicho J., Simões S., Salgado A., Loreau S., Ribeiro H.

P.08 **SKIN TARGETED KETOCONAZOLE MICROEMULSIONS** - Bicho J., Marto J., Salgado A., Loreau S., Ribeiro H.

P.09 **NEW INSIGHTS ABOUT SKIN AGING VISIBLE SIGNS AND ITS PRIMARY COMPONENTS – PIGMENTATION, VASCULATURE AND U.V. PHOTOAGING** – Fitas, M, Pereira, J., Contreiras Pinto, P

P.010 **NOVEL MELATONIN-BASED PICKERING EMULSION SUNSCREEN** - Marto J, Ascenso A, Gonçalves L, Gouveia L, Manteigas P, Eleutério C, Chiari-Andréo BG, Isaac V, Pinto P, Oliveira E, Almeida AJ, Ribeiro HM

P.011 **"GREEN" SUNSCREEN FORMULATION BASED ON COFFEE OILS** - Marto J, Gouveia L, Chiari BG, Isaac V, Pinto P, Lisboa PF, Paiva A, Barreiros S, Simões P, Almeida AJ, Ribeiro HM

P.012 **EFFECT OF LONG-TERM USE OF NOVEL TOPICAL DRUG DELIVERY SYSTEM ON SKIN HYDRATION AND BARRIER FUNCTION** - Marto J, Lana J, Pinto P, Oliveira E, Almeida AJ, Ribeiro HM

P.013 **EVALUATION OF THE CYTOTOXIC EFFECTS OF PROPYLENOGLYCOL (MINERAL SOLVENT) AND ZEMEA® (NATURAL SOLVENT) ON HUMAN KERATINOCYTES** – Maurício, E., Fernandes, A.S., Rosado, C., Diaz, A.

P.014 ***IN VIVO* STUDIES OF OIL/WATER EMULSIONS CONTAINING TEA AS EXTERNAL PHASE** - Pereira, M., Pereira, N., Almeida, D.P, Areias, C., Araújo, M. E., Baby, A.R., Portugal Mota, J., Santos de Almeida, T , Rosado, C.

P.015 **ASSESSING IN VIVO THE ANTIOXIDANT ACTIVITY OF TOPICAL FORMULATIONS** - Oliveira, C.A., Cotrim, C., Câncio, M., Baptista, R., Leonardi, G.R., Candido, T.M., Silva, H., Mota, J.,Baby, A.R., Rosado, C.

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P.017 **DEVELOPMENT, CHARACTERIZATION AND EFFICACY EVALUATION OF A MOISTURIZER CREAM CONTAINING CRATAEGUS MONOGYNA JACQ. EXTRACT** - Ribeiro, A.S., Estanqueiro, M., Rodrigues, F., Oliveira, B., Sousa Lobo, JM

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P.019 **COMPARING MICROVASCULAR RESPONSES FROM HEALTHY INDIVIDUALS WITH DIFFERENT AGES SUBMITTED TO THE 'OXYGEN CHALLENGE TEST'** – Silva, H., Ferreira, H., Antunes, J., Bujan, M.J., Monteiro Rodrigues, L.M.

P.020 **IMPACT FROM THE REGULAR USE OF A HAND SANITIZER ON THE EPIDERMAL BARRIER – A PILOT STUDY** - Silva, H., Ferreira, H., Silva, S., Monteiro Rodrigues, L.M.

P.021 **EVALUATION OF TOPICAL TREATMENT ADHERENCE: CHALLENGES AND PROSPECTS** - Teixeira, A., Teixeira, M., Almeida, V., Sousa Lobo, J. M., Almeida, I.F.

P.022 **EFFECT OF HYDROPHILIC CREAMS CONTAINING LIPID NANOPARTICLES ON OCCLUSION FACTOR AND SKIN HYDRATION** – Silva, S., Estanqueiro, M., Amaral, M.H., Sousa Lobo, J.M.

P1 - Novel resveratrol derivative for skin care

Rocha, V[1], Marques, C[1], Contente, S[1], Sousa, ME[2], Palmeira, A[2], Correia-da-Silva, M[2], Pinto, M[2], Sousa Lobo, JM[1], Almeida, IF[1]

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Resveratrol (RES) is a polyphenolic compound used as an active constituent in pharmaceutical and cosmetic preparations [1]. Several studies reported the beneficial effects of RES as antioxidant, anti-inflammatory and anti-aging agent [2], which have been partly associated with SIRT1-activation in the skin [3]. SIRT1 is a member of a highly conserved gene family (sirtuins) encoding nicotinamide adenine dinucleotide (NAD)-dependent deacetylase [3]. RES occurs as cis-(Z) and trans-(E) isomeric forms in nature, of which trans RES is the more photo and thermally stable, more common and the more biologically active form [4,5]. Fast trans-cis isomerization occurs after heating or ultraviolet irradiation exposure which limits RES efficacy [6,7]. This work aimed to clarify the interest of a novel synthetic resveratrol derivative (Resveratrol Glucoside Sulfate-RGS) for skin care, by conducting a preliminary study regarding its stability, safety and efficacy. These studies were conducted in comparison with the parent compound-RES. The derivative was obtained by sulfation of resveratrol glucoside with triethylamine-sulfur trioxide adduct (4 equiv/OH), in dimethylacetamide, at 65ºC. In order to evaluate photostability, hydro-alcoholic solutions of RGS and RES were exposed to natural solar radiation. UV spectrum was obtained before and after solar exposure, in the range of 200-400 nm. Cell viability was analyzed by MTT reduction assay. HaCaT cells (104 cells/well, 96 wells microplates) were incubated for 24 h in DMEM supplemented with 10% fetal bovine serum and containing RES (25-500 μM) or RGS (100-5000 μM). Cells were washed with phosphate-buffered saline 1x and incubated for 2 h with MTT solution (0.5 mg/mL). Formazan crystals were solubilized by adding DMSO and absorbance was measured at 570 nm. An in silico docking study performed using Autodock Vina [8] predicted that RGS binds more stably to SIRT1 (lower binding free energy) than the parent compound. UV absorbance of RGS is much lower than the observed for RES. In both cases the area under the UV absorption spectrum decreased more than 30% after UV exposure. Regarding to cytotoxicity assay, RGS did not promote a significant cytotoxic effect up to 1 mM, while concentrations above 100 □M RES were cytotoxic for HaCaT cells. These results support the interest of this derivative for skin care formulations. Elucidation of photostability and evaluation of in vivo safety and efficacy are essential for a more comprehensive characterization of RGS potentialities.

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P2 - Study of the potential for topical application of a new antioxidant xanthone

Rocha, V[1], Marques, C[1], Sousa, ME[2], Cidade, H[2], Pinto, M[2], Sousa Lobo, JM[1], Almeida, IF.[1]

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The xanthone scaffold comprises an important class of the oxygenated heterocycles. Many xanthones with phenolic groups have been described for their antioxidant properties. These properties have been implicated with their anti-inflammatory and cancer chemopreventive activities. From a series of oxygenated xanthones, 1,2-dihydroxyxanthone (Figure 1), was considered a hit compound preferably inhibitor of melanoma tumor cells and PHA-stimulated mononuclear cells [1].

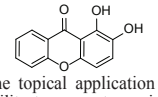

Figure 1- Chemical structure of 1,2-dihydroxyxanthone

The topical application of antioxidants has achieved great expression, owing to their ability to prevent or minimize the UV induced-deleterious effects of reactive species on the skin [2]. To elucidate the potential of this new antioxidant for topical application, herein, the evaluation of its effect as scavenger of peroxyl radicals and its cytotoxicity in human keratinocytes were described. Cell viability was analyzed using MTT reduction assay. HaCaT cells (104 cells/well, 96 wells microplates) were incubated for 24 h with DMEM supplemented with 10% fetal bovine serum and containing the xanthone (12.5-200 μM). Cells were washed with phosphate-buffered saline 1x and incubated for 2 h with MTT solution (0.5mg/mL). Formazan crystals were solubilized by adding DMSO and absorbance was measured at 570 nm.

1,2-Dihydroxyxanthone showed ability to scavenge alkylperoxyl radicals with a IC50 value of 23 μM. In the cytotoxicity assay, this xanthone did not promote a significant cytotoxic effect up to 50 μM. These results reinforce the putative application of this compound in topical formulations. Further studies are necessary to assess its potential as an antiaging or chemopreventive topical ingredient in human volunteers, after UV radiation exposure, and to establish the in vivo skin compatibility.

Acknowledgments: This research was partially supported by ERDF through the COMPETE and national funds through FCT, under the project "PEst-C/MAR/LA0015/2013.

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P03 Correlation of sensory parameters with rheological properties of topical formulations

Teixeira, A.[1,2], Vasconcelos, V[2], Costa, P.C.[2], Teixeira, M.[1], Almeida, V.[1], Sousa Lobo, J.M. and Almeida, I.F.[2]

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Introduction: The topical application procedure may be subdivided into four steps: (a) removal of a product from a container (pick-up), (b) primary sensation on the skin, (c) secondary sensation during spreading on the skin, and (d) final impression due to a residue on the skin [1]. Rheological properties are expected to influence the first 3 steps since these are related with the application of a force. Sensory attributes have been correlated with both textural parameters and flow behaviour [2,3]. Noteworthy, the use of rheological parameters as predictors of sensory attributes is advantageous considering the subjectivity, high cost and time consumption associated with sensory analysis [4]. The aim of this work was to elucidate the contribution of rheological parameters to sensory perceptions of topical formulations used in psoriasis treatment. These results could provide meaningful data with relevance for the understanding of treatment adherence.

Material and Methods: Sensory analysis was performed according to ASTM E 1490-11 for 4 topical placebo formulations (1 cream, 2 ointments and 1 gel). A panel composed by 11 assessors evaluated the skinfeel attributes of 4 categories: appearance (integrity of shape), pick-up (firmness, stickiness, cohesiveness), rub-out (thickness, spreadability) and afterfeel (stickiness, slipperiness, amount of residue).The textural analysis was performed in the compression mode in a texturometer carrying out both a penetration test (Pen) using a cylindrical probe and a spreadability test (Spr) using TTC spreadability rig. The parameters maximum force (F+) and negative area (A-) were calculated from texturograms. Flow measurements were performed in a viscometer fitted with concentric coaxial cylinder geometry at 20°C and 32°C. Power law model was fitted to the results and consistency coefficient (K) and power law index (n) were calculated. To study the inter-correlations between sensory attributes and rheological parameters, Pearson correlation factors were calculated (α=0.05).

Results and discussion: Firmness, stickiness, cohesiveness and afterfeel stickiness exhibited significant correlations with textural parameters. The Spr test mimicked more closely the application process, with correlations with higher significance and with more attributes (namely spreadability) than the Pen test. K factor at 20ºC correlated well with cohesiveness, firmness and stickiness, while at 32ºC this parameter correlated well only with cohesiveness. The latter correlated with several mechanical parameters which reflect its complexity. Several sensory attributes were found to be unrelated with mechanical features, mainly in the after-feel category. We can conclude that application of medicines on the skin is a complex process which can be partially described by their rheological behaviour. Textural analysis, in particular Spr test, can be helpful to predict sensory attributes from pick-up and rub-out categories.

Acknowledgements: to CESPU for financial support, project 04-GCQF-CICS-2011N1.

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P04 Evaluation of psoriasis severity: self-perception versus clinical assessment

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Introduction: Psoriasis is a chronic skin disease existing in different clinical types with a large severity spectrum ranging from small and located lesions to the involvement of all body. The choice of treatment depends on the type, severity and location of psoriasis, as well as of the effect on the patient's quality of life. The development of valid instruments for the assessment of psoriasis severity are important for a more comprehensive understanding of the disease, for the selection of psoriasis treatment options and for clinical research[1].The aim of this study was to examine the results of the evaluation of psoriasis severity from two perspectives: self-perception versus clinical assessment in order to validate the Portuguese version of the Self-Administered Psoriasis Area and Severity Index (SAPASI).

Materials and methods: The evaluation of psoriasis severity was performed by direct measurement of patient's perception using the translated and adapted Portuguese version of the PASI or by clinician evaluation applying the Psoriasis Area and Severity Index (PASI). These instruments assess the extent and characteristics of psoriatic lesions: color, thickness and scaliness. SAPASI includes a silhouette of a body, front and back, for subjects to shade the affected areas and three modified visual analogic scales recording the redness, thickness and scaliness of an average lesion. During a dermatology appointment the patient performed the SAPASI and the dermatologist applied the PASI. A total of 38 participants (25 men, 13 women) had paired PASI and SAPASI evaluations. The association between PASI and SAPASI scores were tested using Pearson correlation. A t test was used to test mean differences between the results of these two measures. Statistical analysis was performed with IBM-SPSS (version 22).

Results and discussion: We verified a strong and significant correlation, ($r=0.933$, $p\leq0.001$) between PASI and SAPASI results. The mean results found for PASI (M= 9.78, SD= 7.72) were lower than for SAPASI (M=12.31, SD=9.75) with statistical significance ($t=-4.203$, $p\leq0.001$). The correlation found between SAPASI and PASI supports the use of SAPASI as a measure of psoriasis severity. The results indicate that the self-perception of the disease severity was over-estimated by patients compared with the dermatologist evaluation. We conclude that the Portuguese version of SAPASI is a valid, easy to use and reliable instrument to assess severity psoriasis.

Acknowledgements: To CESPU for financial support, project 04-GCQF-CICS-2011N1. To all volunteers and the dermatologists

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P05 Sensory analysis of topical semisolid formulations

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Introduction: The sensory analysis of cutaneous formulations is an area with increasing interest in the pharmaceutical industry, owing to the recognized relevance of sensory features in the adherence to topical treatment [1]. The aim of this work was to perform a descriptive skinfeel analysis of placebo formulations for psoriasis treatment in order to gain insight knowledge about factors responsible for non-adherence in future studies.
Materials and Methods: The technical expert approach for descriptive analysis was performed according to ASTM E 1490-11 [2]. For this purpose 132 candidates were recruited from a local university community. 61 candidates were selected based on a prescreening questionnaire and participated in the acuity screening step. 11 candidates were selected for the training step that included the assessment of skinfeel attributes of 6 different standard materials. The monitoring of the panel was carried out by a complete sensory evaluation of 3 products and standard deviation was calculated to assess repeatability. The ability to discriminate the different products was assessed with ANOVA. For the final evaluation, placebos were used instead of medicines due to ethical reasons, including samples A and B (creams), C and D (ointments) and E (gel). The following attributes belonging to four categories were evaluated: Appearance (Integrity of shape, Gloss), Pick-up (Firmness, Stickiness, Cohesiveness), Rub-out (Thickness, Spreadability) and Afterfeel (Gloss, Sticky, Slipperiness, Residue). Attributes were evaluated on a 10 cm linear scale and the mean scores were calculated and plotted on a spider chart. Statistical analysis was performed with IBM SPSS Statistics for Windows version 22.
Results and Discussion: The standard deviation of the panel scores was lower than 2 for 70% of the attributes. ANOVA demonstrated significant differences between different products for more than 80% of attributes which indicates that training program and panel's performance were satisfactory. The ointment C differs significantly from all other samples in the pickup category, with higher firmness, stickiness and cohesiveness scores. The creams A and B presented similar sensory profile. In the afterfeel category, the gel showed the highest values for gloss, residue and slipperiness, but the lower value for stickiness. Although general assumptions regarding the type of vehicle are difficult to establish, sensory attributes were found to be in some degree related with the pharmaceutical dosage form. Consumer acceptance of pharmaceutical products is strongly governed by their sensory feel and therefore the sensory data obtained can be used in the interpretation of results of adherence to topical treatment of psoriasis.
Acknowledgements: To CESPU for financial support, project 04-GCQF-CICS-2011N. To all volunteers.
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P06 Study of the applicability of ionic liquids as excipients in topical formulations

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Introduction: The difficulty to incorporate poorly and sparingly soluble actives represents a challenge to the pharmaceutical and cosmetic Industries, creating a demand in new biocompatible excipients that enhance drug solubility. Ionic liquids (ILs) are salts, in which the ions are weakly coordinated, resulting in solvents that are liquid below 100 °C, or even at room temperature. They can be added to different types of solutions, emulsions and gels to increase actives solubility and/or enhance transcutaneous delivery.
This work aimed to assess the efficacy of ILs as solubility/permeation enhancers. Caffeine and salicylic acid were used as hydrophilic and lipophilic model permeants, respectively.
Materials and methods: Three imidazole-based ILs - [C2mim][Br], [C4mim][Br] and [C6mim][Br] - were investigated as solubility/permeation enhancers. Saturated solutions of the two model permeants were prepared in water and in a water:IL mixture (95: 5), and solubility studies were performed in triplicate at room temperature and at 32 ºC. In vitro permeation studies were conducted using pig ear skin, to determine the fluxes obtained from saturated solutions of caffeine or salicylic acid in water and in the different water:IL mixtures.
Discussion: An enhancement in solubility was observed for both actives in the presence of 5% IL, at both room temperature and at 32 ºC. Although caffeine solubility was improved with all ILs, the more hydrophobic [C6mim][Br], was the best solubility enhancer. Results suggest a solubility dependence on the IL's alkyl chain size. For salicylic acid, even though [C6mim][Br] seems to be, once again, the best solubility promoter, there is a less prominent difference between the three ILs.
For caffeine, the highest flux was observed with the more hydrophobic IL and, once again, a dependence on the IL's alkyl chain size was noted. The lowest flux was obtained in water. These results can be due to an increase in the partition of caffeine into the membrane and/or to an increased diffusion. The permeation of salicylic acid was slightly improved in the presence of both [C6mim][Br] and [C2mim][Br], with no significant difference between the two ILs. No change in the permeation was observed in the presence of [C4mim][Br].
This study confirms the potential use of these materials as solubility/permeation promoters. However, further studies are needed towards the tailoring of more suited, since their properties considerably depend upon the cation or anion present in these salts.

P07 Ketoconazole liposomal carrier for topical delivery

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Introdution: Ketoconazole (KTZ) is an imidazole antifungal agent used in the treatment of superficial infections, with low water solubility that can limit its incorporation in carriers 1. This active substance if not properly formulated may suffer degradation, oxidation and hydrolysis, especially in aqueous media 2. Degradation could be easily assessed by visual inspection of formulation colour change.
Liposomes are able to incorporate drugs and to increase the accumulation of the drug in the skin outermost layer, the stratum corneum 3. In order to increase the stability of KTZ, some industrial scalable lipid vesicles were used as nanocarriers for topical delivery.
The aim of this work is to incorporate KTZ into liposomal carriers to prevent the degradation of this drug.
Materials and Methods: Liposomes were prepared using Pro-lipoTM Neo (Propanediol/Lecithin) / Duo (Lecithin/Glycerol/Ethanol), Transcutol CG and water (3:88:7) under constant stirring. Different percentages (0.5 to 2.0%) of KTZ were incorporated in liposomes.
Particle size analysis of empty and drug-loaded formulations was performed by Photon Correlation Spectroscopy.
Incorporation efficiency was assessed by UV spectrophotometry using methanol as solvent.
Results and Discussion: All formulations presented yellow colour. No signs of degradation were observed.
The ready-to-use mixture of selected phospholipids already organized in lamellar bilayers were used to prepare liposomes with a mean size of 250 nm. The Pro-lipo Neo formulations showed average particle size of 120 nm while the Pro-lipo Duo presented 200 nm. On the other hand, the incorporation efficiency (IA) was much lower for Pro-lipo Neo (< 14%) when compared to Pro-lipo Duo (3% to 21%). The IA was highly influenced by the amount of KTZ.
Conclusion: The scalable liposomes offer several advantages such as low energy steps during the manufacturing process, incorporation of KTZ with enhanced stability to be used as targeted anti-fungal delivery for skin topical therapy.
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P08 Skin targeted ketoconazole microemulsions

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Introduction: Ketoconazole (KTZ) is a well established antifungal agent, which is available in a variety of formulations and remains a useful treatment option particularly in patients with fungal infections. It is a lipophilic drug with molecular weight 523g/mol and log P 4.34 and presents instability 1, 2.
Microemulsion (ME) offers several advantage for the pharmaceutical use, such as ease of preparation, long-term stability, high solubilisation capacity for the hydrophilic and lipophilic drugs and better drug delivery 1.
This project was carried out to exploit the feasibility of using ME as an alternative carrier for percutaneous delivery and elucidate the underlying mechanism of permeation enhancement.
Materials and methods: KTZ-ME was formulated using Transcutol CG as co surfactant, on the basis of solubility studies, Sisterna SP70-C (Sucrose Stearate) as surfactant, and water with 1% hydroxy propyl methyl celulose (HPCM) as aqueous phase.
The formulation of KTZ-ME was optimized and the optimal formulation was characterized in terms of particle size and size distribution by Photon Correlation Spectroscopy (Zetasizer Nano S, Malvern Instruments, UK).
In vitro release profile was determined using vertical Franz diffusion cells through cellulose membranes, with a diffusion area of 2,5cm2. The receptor phase was comprised of a mixture propylene glycol/ethanol (1:1). KTZ concentration in the receptor phase was analysed by UV spectrophotometer at 242.6 nm.
Results and discussion: The formulations were white/translucent and homogeneous.
ME-KTZ formulation presented higher release profile than KTZ commercial cream used as control. From statistical analysis (ANOVA), there were significant diferences after 6h ($p < 0.05$). This could be explained by the presence of Transcutol CG in the developed formulation. The results showed that ME enhanced drug release when compared to commercial formulation.
Conclusion: The results indicate that ME may be a promising approach for skin targeting delivery of KTZ.
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P09 New insights about Skin Aging Visible Signs and its primary components – Pigmentation, Vasculature and U.V. Photoaging

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Introduction: Skin Aging is linked to significant changes of facial morphology and appearance due to genetic background influence and environmental factors, mainly, sun exposure. For some people, especially women, these modifications are of great importance so it can influence age-perception and consequently their self-esteem. The purpose of this work was to study the aging pigmentation signs in a female causcasian population and evaluate the contribution of three main factors, melanin, vasculature and photoinduced related changes.
Material and methods: A group of 102 women was enrolled after informed written consent. A standard digital face photography (VISIA, Canfield Scientific) was performed in order to obtain data concerning Visible, Brown (hyperpigmentation), U.V. (photodamaged induced spots) and Red (vascular) spots of each subject in the left and right hemifaces. One randomly selected hemiface was choose for the analysis. A region of interest in the malar area was defined and the analysis was performed on that area. Statistical correlations were performed between the visible spots and Brown, UV or Red spots.
Results and discussion: A correlational study identified strong correlations between the number of Visible vs Brown spots ($R^2 = 0,5161$) and Visible vs Red spots ($R^2 = 0,4945$). These results seem to indicate that melanin distribution (represented by Brown spots) and vascular changes (represented by Red spots) have a strong and direct influence on the visible pigmentary aging signs, rather than melanin coagulation photoinduced spots (represented by UV spots).
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P10 Novel melatonin-based Pickering emulsion sunscreen

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Introduction: Melatonin, the main secretory product of the pineal gland, was recently found to have a protection effect against photocarcinogenesis based on its antioxidant activity. Moreover, the daily use of sunscreens is particularly recommended for patients submitted to immunosuppressive therapies.
This work aimed to develop an innovative sunscreen formulation based on Pickering emulsions concept, i.e., surfactant-free emulsions stabilized by solid nanoparticles, natural oils and physical UV filters associated to melatonin as a key strategy for achieving the UV-induced skin damage prevention.
Methods: Melatonin was incorporated in several Pickering emulsions which were characterized in terms of pH, mechanical, physical and chemical stability by a rigorous pharmacotechnical control performed in accordance with the requirements of ICH Q1A. In addition, the sun protection factor (SPF) and topical delivery were also evaluated as well as in vitro and in vivo biological properties of the final formulations (HRIPT and water resistant tests).
Results and discussion: Regarding the formulation studies, it proved to be beneficial the addition of three types of solid particles (SP), being developed a formulation that ensured a high SPF with UVA and -B protection conferred by ZnO and TiO2, respectively. Although starch particles had no photoresistance properties itself, it proved to be a SPF promoter by a synergistic effect. Green coffee oil was the selected natural oil attending to the highest SPF compared to others probably due to the synergistic effect with the physical filters present in the formulation. Besides the excellent sunscreen activity confirmed by in vitro and in vivo results, the final formulations proved to be also suitable for topical use according to the rheological assessment, topical delivery and stability throughout the study period.
Conclusion: The combination of melatonin, three multifunctional solid particles (ZnO, TiO2; Starch) and green coffee oil contributed to achieve a stable and effective innovative sunscreen with a wide range of UV radiation protection. Therefore, this safe and natural formulation would be highly recommended for people with sensitive skin.
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P11 "Green" sunscreen formulation based on coffee oils

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Introduction: Spent coffee grounds and green coffee beans, which are the industrial residues, can be used for cosmetic applications, due to the high content in lipids. Sunscreen formulations might be a suitable application for these types of residues because water-in-oil emulsions are by design very water resistant and provide greater efficacy (a higher sun protection factor, SPF) for the same concentration of sunscreen activities than oil-in-water emulsions.
This work aimed to develop an innovative and "green" sunscreen formulation based on Pickering emulsions stabilized by physical UV filters and containing coffee oils with improved sun protection performance.
Materials and methods: Water-in-oil sunscreens stabilized by physical TiO2 and ZnO were prepared using a modification of a cold emulsification process, as described elsewhere [1]. The disperse aqueous phase was composed of purified water and the continuous oil phase consisted of green coffee oil or spent coffee oil. The "green" sunscreens were characterized in terms of mechanical, rheology and skin adhesion properties. In addition, the SPF was also evaluated as well as in vivo biological properties of the final formulations (HRIPT and water resistance tests).
Discussion: Concerning the "green" sunscreens, the addition of two types of solid particles (SP) proved to be useful in the developed formulations, ensuring a high SPF with UVB and -A protection conferred by TiO2 and ZnO, respectively. Moreover, the emulsion containing 35% w/w of the oil fraction of spent coffee grounds presented promising characteristics in the improvement of water performance with a broad spectrum sun protection when compared to an emulsion containing 35% w/w of green coffee oil which improved the SPF in mineral sunscreens. The final formulations proved to be also suitable for topical use according to the rheological and mechanical assessment.
Conclusions: The use of spent coffee oil in cosmetic industry seems to be a suitable approach to recycle the wastes from coffee industry. Moreover the coffee oil presented promising characteristics in the improvement of sunscreen performance with a good acceptance by consumers.
Acknowledgments: This work was supported by FEDER, the Portuguese government (FCT; grant SFRH/BDE/51599/2011), strategic project Pest-OE/SAU/UI4013/2011, strategic project UID/QUI/50006/2013 and Laboratórios Atral S.A., Portugal.
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P12 Effect of long-term use of novel topical drug delivery system on skin hydration and barrier function

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Introduction: Pickering emulsions differ from classical emulsions because they are stabilized by solid particles instead of surfactants. This type of emulsions has been widely investigated in pharmaceutical and cosmetic fields since they present less adverse effects than the classical emulsions that are stabilized by surfactants. Thus, a suitable equilibrium between safety and efficacy is a pivotal concern before the marketing of a dermatological product. The aim of this work was to assess the safety and biological effects of a novel Pickering emulsions stabilized by starch granules.
Methods: Two surfactant-free w/o Pickering emulsions stabilized by starch granules were prepared using a modification of a cold emulsification process, as described elsewhere [1]. The emulsions contain well-known pharmaceutical excipients differing only in the lipid used: EA (lipophilic emollient - triglycerides) and EB (lipophilic occlusive - hydrocarbons). Human repeat insult patch tests were performed to study the irritancy and sensitizing potential of emulsion in 53 volunteers. The transepidermal water loss (TEWL), epidermal capacitance (hydration) and surface lipid quantity were evaluated using a Tewameter® TM 210, a Corneometer® CM 820 and a Sebumeter® SM 810 (C + K Electronics GmbH, Germany), respectively, for 28 days. The sensorial characteristics were also evaluated.
Results and discussion: The human studies confirmed that the Pickering emulsions were not skin irritant and did not induce any sensitization on the volunteers, being safe for human use. Statistical analysis presented similar epidermal capacitance values for formulations with a different oil phase. No statistical difference was observed concerning skin surface sebum and TEWL, when compared with the control area. Spreadability and application were the most quoted sensorial attributes for both Pickering emulsions.
Conclusion: Biological effects demonstrated that the Pickering increased both the skin hydration and contribute to restore the skin barrier with a good acceptance by consumers. Thus, a suitable equilibrium between safety and biological effects was demonstrated.
Acknowledgments: This work was supported by FEDER, the Portuguese government (FCT; grant SFRH/BDE/51599/2011), strategic project Pest-OE/SAU/UI4013/2011 and Laboratórios Atral S.A., Portugal.
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P13 Evaluation of the cytotoxic effects of Propylenoglycol (mineral solvent) and Zemea® (natural solvent) on human keratinocytes

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Propyleneglycol (1,2-propanediol; PG) is considered to be an excellent solvent due to its affinity for hydrophilic and hydrophobic compounds. It has been widely used in the preparation of plant extracts and topical products as a permeation promoter, emollient and humectant. According to the Scientific Committee on Consumer Safety (SCCS), propyleneglycol is considered a safe ingredient. However in recent years, natural alternative sources have been found to produce new eco-friendly ingredients in skin care products. Produced by Dupont Tate & Lyle Bio Products, Zemea® (INCI: 1,3-Propanediol), is a humectant and solvent molecule derived exclusively from corn-sugar fermentation, that has been recognized by Ecocert™ and the Natural Products Association as an ingredient of natural origin that can be used to replace petroleum based glycols such as PG.
As these solvents are intended to be used in the formulation of skin care products, the present study aims to analyze and compare the cytotoxicity of both solvents in a relevant in vitro model - human keratinocytes (HaCaT cells). Cell viability was evaluated by the MTT assay, using 96-well microplates. The two compounds, PG and Zemea®, were tested at a range of concentrations up to 20% (V/V), using a 24 h-incubation protocol.
The results demonstrate that both solvents showed a very similar concentration-response curve, with significant decrease of cellular viability for concentrations higher than 1%. The EC50 values of both solvents were also similar.
In conclusion, industrial replacement of mineral PG by the natural Zemea® should be considered, taking into account the final objectives and costs involved. It will, however, be advisable to perform additional tests to further establish the safety of this new ingredient.
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P14 In vivo studies of oil/water emulsions containing tea as external phase

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Reactive oxygen species (ROS) are formed by exposure to UV radiation, resulting in oxidative damage to cellular components such as mitochondria and nuclear DNA and thus accelerate skin aging and contribute to cancer [1].
Tea has been widely studied, since it represents a source of bioactive compounds that provide antioxidant activity, particularly polyphenols. Green tea is rich in catechins and it is demonstrated that topical application or oral intake of green tea polyphenols prevents the development of cancer [2] and the galloyl catechins, especially EGCG, confer an effective protection against oxidative stress caused by UVB [2]. Black tea has a lower content in polyphenols, but it has a considerable amount of tannins in its composition. The aim of this study was to evaluate in vivo the safety, biocompatibility and antioxidant activity of emulsions containing either green tea or black tea as external phase, as well as UV filters.
Twelve volunteers participated in this study. Formulations were prepared, containing either green or black tea, with or without the UV filters. A blank formulation (without tea) was also tested. Six 9 cm2 sites were marked on the volar surface of both subjects' forearms. Basal measurements of skin hydration, TEWL and colour were attained at day 1. Five of the sites were topically treated with the formulations, twice-daily for 7 days, with the sixth remaining none treated. The measurements of the skin properties were repeated after this 7 days period. Subsequently, an ethyl nicotinate (EN) solution was applied for 60 seconds on each site to induce an inflammatory response and skin perfusion was measured for 20 minutes with LDF (PF 5010 system, Perimed, Sweden). Onset time, area under the curve (AUC) and the slope of the curve on the hyperemic phase were chosen as comparison parameters between sites' responses.
Both formulations with tea showed good skin biocompatibility. After one week of application, no significant changes were observed in hydration and skin barrier, and no erythema was detected in the treated sites.
Additionally, the in vitro antioxidant activity of the formulations was also evaluated, using the radical scavenging DPPH radical assay. In both antioxidant activity assays (in vitro and in vivo), green tea showed higher antioxidant capacity compared to the formulation without tea. On the other hand, black tea showed no differences relative to the blank formulation. However, this fact is more evident in the in vitro assessment than in the in vivo and probably a higher number of volunteers (n) is needed for the in vivo assay.
Nevertheless, it seems clear that green tea has antioxidant capacity in topical formulations.
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P15 Assessing in vivo the antioxidant activity of topical formulations

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Introduction: Reactive oxygen species are known to play a relevant role in the inflammatory response [1]. The cutaneous inflammatory response produces a visible erythema that can be non-invasively quantified with Laser Doppler Flowmetry (LDF) [2,3]. Our aim was to test the efficacy of antioxidant-containing formulations, by assessing the impact in reducing the erythemal response caused by the topical application of ethyl nicotinate (EN).
Materials and methods: 36 subjects (± years old) participated in this study after informed consent and were divided into three experimental groups: group I (N=12; 26.6±6.4 years old) tested three sunscreen formulations containing free rutin, rutin nanoparticles (NP) or blank NP (F1, F2, F3), group II (N=12; 24.0±6.2 years old) tested three formulations containing or not vitamin E (vit E) (F4, F5, F6) and group III (N=12; 24.0±6.2) tested three formulations containing or not gallic acid or rutin ethossomes (F7, F8, F9). Four 9 cm2 areas were marked on the volar surface of both subjects' forearms. Three of these areas were topically treated with the mentioned formulations, twice-daily for 7 days, with the fourth remaining non treated. After this period, an ethyl nicotinate (EN) solution was applied for 60 seconds on each site to induce an inflammatory response and skin perfusion was measured for 20 minutes with LDF (PF 5010 system, Perimed, Sweden). Onset time, area under the curve (AUC) and the slope of the curve on the hyperemic phase were chosen as comparison parameters between sites' responses. The LDF signal corresponding to the first 5 minutes of the plateau phase of the perfusion curve was decomposed with the wavelet transform into its components (myogenic, sympathetic, endothelial). Wilcoxon signed-rank test was used as comparative statistics ($p<0.05$).
Results and discussion: Significant differences were found between the controls and the formulations tested. These results seem to suggest that the velocity and magnitude of the vasodilation response is related to the antioxidant activity. Our results suggest that topical formulations containing antioxidants show potential to inhibit the cutaneous erythema response, and that the methodology is adequate for the objectives that were outlined.
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P16 Production of a thermoreversible gel for dermatological purposes

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Introduction: A potential vector for the controlled release of drugs is thermosensitive hydrogels, which undergo thermoreversible gelation, behaving as a solution at low temperatures and as a gel above a specific temperature. Those hydrogels have been used for many different pharmaceutical applications, including parenteral, ophthalmic, rectal and topical formulations (Pereira et al., 2013).
Objective: The aim of this study was to develop and characterize two thermoreversible gels using F127 or F127 with chitosan.
Methods: Gels were prepared using "cold" methods (Nie, Hsiao, Pan, & Yang, 2011) (Cho et al., 2011). Viscosity of both gels was measured at different temperatures 4, 25 and 37ºC using Rotational Viscosimeter Brookfield.
Results: Both gels were liquid at 4ºC and turns into a gel solution at 37ºC. Rheological properties of the resultant thermoreversible gels strongly depend on the preparation method and gelling agent.
Conclusions: These results suggested the feasibility that thermosensitive gels could be used as an effective dosage form to enhance the drug absorption. Next steps will include the preparation of metallic nanoparticles and lipidic-based systems and its inclusion into the thermoreversible gel for dermatological purposes.
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P17 Development, characterization and efficacy evaluation of a moisturizer cream containing Crataegus monogyna Jacq. extract

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Nowadays, active ingredients of plant origin such as polyphenols and phenolic acids are enjoying increased acceptance in cosmetics industries due to their excellent antioxidant properties determined by in vitro assays. These properties have been used in the development of skin care formulation.
Hawthorn (Crataegus monogyna), found in northern temperate regions such as East Asia, Europe, and Eastern North America, is a specie of the Rosaceae family(1). Some studies have shown that extracts of Crataegus (from several parts of the plant including fruits) are rich in proanthocyanidins and flavonoids and many of these phenolic compounds have been shown to be cytoprotective by scavenging superoxide anion, hydroxyl radical, hydrogen peroxides, and reducing lipid peroxidation(2).
The aim of this work was the development of hydrophilic creams containing 2.5% (w/w) and 5.0% (w/w) of hawthorn fruit extract harvested in the Greater Porto region (Portugal) and its technological characterization, antioxidant capacity verification and in vivo efficacy evaluation. The formulations were characterized regarding texture properties (firmness and adhesiveness) and rheological analysis. The study of antioxidant activity was carried out by determining the content of phenolic compounds, by the Folin-Ciocalteu method, and the power of inhibiting free radical 2,2-diphenyl-1-picrilhidrazilo (DPPH •). For the evaluation of in vivo efficacy, skin hydration and Transepidermal Water Loss (TEWL) were assessed before and 30 days after daily application of the creams, using a Corneometer® CM 825 and a Tewameter®TM210 (Courage-Khazaka, Germany), respectively. The formulations presented rheology and texture properties suitable as regards the characteristics expected for cosmetic preparations. The antioxidant activity was evidenced in cream 5.0% (w/w). Regarding the in vivo efficacy, it was found that using cream 5.0% (w/w), a significant increase in skin hydration was observed, after 30 days ($p < 0.05$).
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P18 Nanoparticles Containing Methanol Extracts Of Portuguese Lavenders with Potential Skin Application

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Background: Lavenders (Lavandula species) are aromatic plants of great economic value for fragrance, food and flavor, pharmaceutical and cosmetic industries [1]. However, their biological activities can be compromised due to physicochemical instability of bioactive compounds. Therefore, nanotechnology can be used as a way of improving stabilization and efficiency. Objective: The antioxidant evaluation of different extracts from Lavandula stoechas ssp. luisieri and L. pedunculata and perform the encapsulation into PLGA nanoparticles as skin antioxidant agents, for topical and cutaneous treatment. Materials and Methods: Total phenol and flavonoids content were determined, and the antioxidant activity was assessed by free radical scavenging and lipid peroxidation inhibition methods. The cytotoxicity assays were carried out in HaCat cells. Production and encapsulation of PLGA nanoparticles were prepared according to a modified-spontaneous emulsification solvent diffusion method (mSEDM) [2,3]. Permeation studies were performed in human abdominal skin tissue from cosmetic surgery. Results: Overall, the methanol extracts in study displayed the highest antioxidant activity, phenolic content and flavonoid amounts and were selected for encapsulation. The PLGA nanoparticles, observed by SEM, showed a well-defined spherical shape, achieving a high encapsulation efficiency (>96%). Our results suggest that both extracts have low risk of cutaneous toxicity. Conclusion: This study provides encouraging results with lavenders as promising anti-aging and antioxidant agents for the development of new cosmetic or dermatological formulations.
Acknowledgments: The authors acknowledge Dr. Telmo Nunes, from FCUL, for technical support on SEM images.
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P19 Comparing microvascular responses from healthy individuals with different ages submitted to the 'oxygen challenge test'

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Introduction: Skin microcirculation is regarded as a model to study the individual's microcirculatory status. Provocation tests are often applied to characterize evoked responses under controlled conditions of local perfusion [1]. Age-dependent changes in microcirculation have been described , but clarification regarding the nature of these changes is still poor [2,3]. Our aim was to compare the microvascular responses on the lower limb of different age groups submitted to a 'oxygen stress test'.
Materials and methods: 54 healthy subjects were enrolled after informed written consent, and divided in two age groups - I (35 subjects, 22.1±3.7 yo) and II (19 subjects, 49.2±7.0). After a 30 min acclimatization period, subjects were submitted to a 'oxygen stress test' involving three phases - resting - breathing room atmosphere; provocation - breathing a 100% oxygen atmosphere; recovery - breathing room atmosphere again. Microcirculation variables were measured on the foot, involving the local perfusion on the second toe (by laser Doppler flowmetry , LDF, PF5010, Perimed, Sweden); oxygen partial pressure on the dorsum of the foot (by transcutaneous, gasimetry tc pO2, PF5040, Perimed, Sweden). Transepidermal water loss (TEWL) was also measured on the dorsum of the foot. Several parameters were calculated from the tcpO2 curve, including increment and decrement velocities (iV, dV), peak value and time to peak (t-peak). Wilcoxon signed-rank and Mann-Whitney U tests were used for phase and group comparisons, respectively, considering $p<0.05$.
Discussion: TEWL, LDF and tcpO2 baseline values were not significantly different between groups. Breathing the 100% oxygen atmosphere evoked hyperoxia, as shown by the significant increase in tcpO2 in both groups. The hyperoxia induced vasoconstriction, reducing local perfusion in both groups, statistical significant only in group I. TEWL increased, although non-significantly, during this phase. No differences between groups were found for iV and t-peak. However, group II reached a significantly lower peak, which may reflect an age-dependent reduction in tissue viability. Although the LDF and tcpO2 recovery values were not significantly different, dV was found to be significantly lower in group II. These results confirm the usefulness of this model to detect differences, even if subtle, related with vascular physiology .
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P20 Impact from the regular use of a hand sanitizer on the epidermal barrier – a pilot study

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Introduction: Hand washing is a most important intervention to prevent disease transmission [1]. Alcohol-based hand products are preferred for their high germicide effectiveness but, skin dryness is often referred on the opposite site [2]. Stratum corneum is responsible for the skin's 'barrier' function against dryness and this function is commonly assessed by measuring transepidermal water loss (TEWL). Dynamic tests, such as plastic occlusion stress test (POST), are associated to enhance the method's sensivity [3].Our aim was to evaluate the impact of the use of an alcohol-based gel on the epidermal 'barrier' function, using a dynamical assessment of TEWL fitted with a previously developed kinetic model [4].
Materials and methods: 13 young subjects (21.6 ± 2.6 years old) were enrolled after written informed consent. Subjects were asked to wash the dorsum of one randomly chosen hand for 15 days, twice a day, with an 80% (v/v) alcohol gel, while the contralateral hand remained as the control. TEWL, expressed in g/m2/h, was measured by evaporimetry (Tewameter TM300, Courage & Khazaka, Cologne, Germany) on days 1, 8 and 15 in the hand dorsal face, on an area corresponding to the middle of the second and third fingers. Additionally, a POST test was applied on days 1 and 15, which consisted on the application of an occlusive patch for 24 hours between the first and second fingers. After removal of the patch, TEWL was continuously measured for 30 min. From these fitted curves relevant kinetic parameters (evaporation half-time - t1/2 evap and dynamical water mass DWM) were calculated. Statistics involved the Wilcoxon signed-rank test ($p<0.05$).
Discussion : TEWL values increased significantly on day 15 on the treated hand relative to the control. On day 15 only t1/2 evap increased significantly on the treated hand, while DWM increased, non-significantly, on both hands. Our results have shown that, under these conditions, the regular use of the alcohol-based gel altered the epidermal barrier. This study also confirms the usefulness of this kinetic model in detecting subtle changes on TEWL dynamics.
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P21 Evaluation of topical treatment adherence: Challenges and prospects

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Introduction: Non-adherence to recommended medication regime is common and an important reason for treatment failure, resulting in extensive costs for the healthcare system and decrease of patient's quality of life. As a result, the multifactorial problem of medication adherence remains an important challenge in the management of chronic skin diseases[1]. The aim of this study was to elucidate the pitfalls of treatment adherence evaluation and design a strategy to overcome these limitations, using as model the adherence to topical treatment in psoriasis.
Methods: A systematic literature review on databases PubMed and Web of Science was done using the keywords adherence, compliance and psoriasis. Following the conclusions of this review we designed a three-fold methodology including a questionnaire, a medication diary and weighing of medicines. A pilot study was conducted to develop a preliminary version of the questionnaire, considering dermatologists expert opinion that was applied to 6 patients to test content validity.
Results and Discussion: Regarding psoriasis, the most used method was questionnaire followed by electronic monitoring, prescription record review and medication weight. These different methodologies measure different dimensions of this construct. With diaries it is assessed if the patient applied the medication in the required frequency, while medication weight assesses if the amount applied corresponds to the prescribed one, irrespective of the number of applications. The results obtained with questionnaire exhibited the highest amplitude which can be explained by the absence of a standardized instrument.
According to this review we concluded that a more reliable adherence treatment evaluation should include multiple measures and that validation of a questionnaire is mandatory. Following the feedback of the patients in the pilot study, the questionnaire was adapted to increase comprehension and clarity of instructions and items, resulting in a final version. Estimating the expected medication usage weight is troublesome due to ignorance of the prescribed dose. To overcome this issue we propose to use both the fingertip unit and the body surface area in the calculations. We prospect that using the three-fold approach will improve the accuracy of adherence treatment evaluation. However, it is noteworthy that only the application in a large study with a quantitative analysis can test the psychometric properties of the developed instruments.
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P22 Effect of hydrophilic creams containing lipid nanoparticles on occlusion factor and skin hydration

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The development of nanotechnology combined with the knowledge of lipids resulted in the creation of lipid nanoparticles. Colloidal dispersions containing lipid nanoparticles differ from the conventional oil-in-water emulsions, because the liquid lipid of the internal phase is replaced by a lipid or mixture of lipids that remain solid at room and body temperature. Solid Lipid Nanoparticles (SLN) are recognized as the first generation of lipid nanoparticles and are obtained using solid lipids or mixtures of solid lipids. Nanostructured Lipid Carriers (NLC), the second generation of lipid nanoparticles, correspond to a mixture of a solid lipid with a liquid lipid. When applied on the skin, lipid nanoparticles form a transparent film and due to its hydrophobic character, this film has an occlusive effect, which leads to a reduction of the transepidermal water loss (TEWL) with a consequent increase in skin hydration.
The main objective of this study was to evaluate the occlusion factor of hydrophilic creams containing SLN and NLC by an in vitro method and also the in vivo moisturizing efficacy of these formulations.
Both lipid nanoparticles, SLN using glyceryl behenate as solid lipid, and NLC using the same solid lipid and jojoba oil as liquid lipid in a ratio of 7:3, were obtained by high shear homogenization and ultrasound methods. The size of the nanoparticles was determined by laser diffractometry. After the incorporation of the colloidal dispersion containing the nanoparticles in a hydrophilic cream, in a ratio of 1:1, the occlusion factor was determined by the method adapted from Vringer, through the calculation of the water loss from the beakers covered with filter paper after application of the creams comparing to the reference beaker after standing in a drying oven at 37ºC for 24 and 48 hours. In vivo efficacy of the semisolid formulations was assessed by determination of skin hydration and TEWL before and after 30 days of daily application of the cream base, the cream containing SLN and the cream containing NLC, in 30 human volunteers.
The obtained lipid nanoparticles, showed a median particle size in the nanometer range. The creams containing the lipid nanoparticles showed significant higher values of occlusion factor when compared to the cream base without lipid nanoparticles. The formulations containing lipid nanoparticles showed a greater increase in skin hydration. However, only the cream with NLC presented a significant increase. Regarding TEWL, all formulations have led to a decrease of this parameter, after 30 days.
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