**V National Congress of Dermatocosmetics Sciences**

**V Congresso Nacional de Ciências Dermatocosmeticas**

**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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**Programa**

**Open Session | Sessão de abertura**

Magnífico Reitor da Universidade Lusófona, Mário Moutinho

Em representação do Sr. Bastonário da Ordem dos Farmacêuticos, Helena Ribeiro

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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

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**Key-note lecture | Conferência Key-note**

Speaker | Prelector

Jurgen Lademann

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**2st Session | Sessão 2**

**State of the art I | O estado da arte I**

Charmain | Moderador - Isabel Almeida

Speakers | Prelectores

Barbara Valdés

Henrique Silva

Mariene Estanqueiro

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**Master lecture | Conferência Magistral**

Fernanda Guedes Bahia

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**3st Session | Sessão 3**

**State of the art II | O estado da arte II**

Charmain | Moderador - Joana Nobre

Speakers | Prelectores

Andrea Ascenso

Joana Duarte

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**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

Magnifico 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 Informed 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
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 (Official Pharmacy Branch).


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
- Associação dos Industriais de Cosmética, Perfumaria e Higiene Corporal (AIC)
- Associação dos Industriais de Sabões Detergentes e Produtos de Conservação Limpeza (AISDPCL)
- Associação Portuguesa de Òleos e Gorduras Vegetais, Margarinas e Derivados (APOGOM)
- Associação Portuguesa de Aerosóis


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 or 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))
- “…(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

Resumo / Currículo Resumido
Degree in Biological Sciences in Universidad de Salamanca.
Former Associate Professor 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 Salpêtrière (Paris, France). MBA in Pharmaceutical Marketing Administration.
Executive in Centro de Estudos 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 Estudos 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

Resumo / 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 technology. 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

Carotenoides 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.

Author 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 antioxidative potential 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.

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.

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 ingredients. 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.
C.05 - Nail Formulations

Formulações de Unhas

Speaker / Prelector
Bárbara Valdés

Resumo / Currículo Resumido

2011 Student of PhD. University of Lisboa
QREN Project Ecoplast Synthesis of Polyester. Instituto Superior Técnico, 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 onychomycosis and psoriasis, which are described in this presentation. Oral treatment for these diseases causes many adverse reactions, namely hepatotoxicity. 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, hypertrrophy to inflammation and infections, etc. The absorption of drugs into the nail plate, 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

Resumo / 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 Universidade 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.
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.
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 ultra deformable vesicles: transfersomes, ethosomes and transethosomes

Estudos de desenvolvimento, caracterização permeação cutânea de vesículas ultra deformáveis 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 Pharmaceutics (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 ultra deformable 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: Ultra deformable 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

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.
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 de formulações 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

Abstract List | Lista de Resumos Submetidos


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

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

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


P.12 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.13 EVALUATION OF THE CYTOTOXIC EFFECTS OF PROPYLENOGLYCOL (MINERAL SOLVENT) AND ZEMEA® (NATURAL SOLVENT) ON HUMAN KERATINOCYTES – Maurício, E., Fernandes, A.S., Rosado, C., Díaz, A.


P.16 PRODUCTION OF A THERMOREVERSIBLE GEL FOR DERMATOLOGICAL PURPOSES - Neves, A., Rijo, P., Nicolai, M., Borralho, T., Martins, G., Pinto Reis, C.


P.19 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.20 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.22 EFFECT OF HYDROPHILIC CREAMS CONTAINING LIPID NANOPARTICLES ON OCCLUSION FACTOR AND SKIN HYDRATION - Silva, S., Estanqueiro, M., Amaral, M.H., Sousa Lobo, J.M.
Resveratrol (RES) is a polyphenolic compound used as an active constituent in pharmaceutical and cosmetic products. Several studies have highlighted the beneficial effects of RES on 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 photochemically stable, more common and the more biologically active form [4, 5]. Fast tran-cis isomerization occurs in nature, and irradiation exposure conditions enhance this process [6, 7]. RES efficacy has been repeatedly 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 triethylammonium-sulfur trioxide adduct (4 equiv/OH). In dimethylacetamide, at 65°C. In order to evaluate photostability, hydroalcoholic 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 calf 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. A model for the photodegradation of RES was performed using Autodock Vina [8] predicted that RES binds more stably to SIRT1 (lower binding free energy) than the parent compound. The absorption of RES is much lower than the parent compound for RES. In both, 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 µM, while concentrations above 100 µM RES were cytotoxic for HaCaT cells. These results support the interest of this derivative for skin care formulation. Elucidation of photostability and evaluation of in vivo safety and efficacy are essential for a more comprehensive characterization of RGS potentialities.

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

References:

Figure 1 - Chemical structure of 1,2-dihydroxystilbene

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

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

References:

P03 Correlation of sensory parameters with rheological properties of topical formulations


CESPUS, Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde, Rua Central de Gandra, 1317, 4585-116 Gandra PR, Portugal;
Laboratório de Tecnologia Farmacêutica, Departamento de Ciências do Medicamento, FFFP, Rua Jorge Viterbo Ferreira, 228, 4605-313 Porto, Portugal; Email: ifalmeida@if.pt

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 of these substances 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 during the subjective evaluation of these sensory properties, 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 1400-11 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 afterfeeling (stiffness, 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 the TTV-disk rig. The parameters maximum force (F+) and negative area (A-) were calculated from texturomaps. 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 some correlations were calculated. To study the inter-correlations between sensory attributes and rheological parameters, Pearson correlation coefficients were calculated (r=0.05).

Results and discussion: Firmness, thickness, cohesiveness and afterfeel stiffness 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. A high correlation coefficient was well supported with high significance 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.

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

Teixeira, A.1,2, Teixeira, M.1, Almeida, V.I, Rocha, J. 1, Torres, T.3, Sousa Lobo, J. M.2 and Almeida, I.F.2

CESPUS, Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde, Rua Central de Gandra, 1317, 4585-116 Gandra PR, Portugal;
Laboratório de Tecnologia Farmacêutica, Departamento de Ciências do Medicamento, FFFP, Rua Jorge Viterbo Ferreira, 228, 4605-313 Porto, Portugal;
Serviço de Dermatologia, Centro Hospitalar do Porto, Hospital de Santo António, Rua D. Manuel II, Ex. CICAP, 4090-001 Porto, Portugal; Email: ifalmeida@if.pt

Introduction: Psoriasis is a chronic skin disease existing in different clinical types with a large severity spectrum ranging from small and localized 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 patient’s perception of the quality of life. The development of valid instruments for the assessment of severity is 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 evaluate 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 (PASI).

Method and methods: The level of severity of psoriasis 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. PASI includes a silhouette of a body, front and back, for subjects to shade the affected areas and three modified visual analog scales recording the redness, thickness and scaliness of an average lesion. During a hospital appointment the patient performed the PASI and the dermatologist applied the PASI. A total of 38 participants (25 men, 13 women) had paired PASI and PASI evaluations. The association between PASI and PASI scores were tested by Pearson correlation test. The last mean difference between the results of these two measures. Statistical analysis was performed with IBM SPSS software (version 22).

Results and discussion: We verified a strong and significant correlation (r=0.933, p<0.001) between PASI and PASI results. The Pearson correlation coefficient for the most important lower than for PASI (r=0.719, p<0.001) were calculated. These results found between PASI and PASI support the reliability of the assessment 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 self-perception version of PASI is a valid, easy to use and reliable instrument to assess severity psoriasis.

Acknowledgments: To CESPUS for financial support, project 04-GCQF-CICS-2011/1.

References:
P07 Ketoconazole liposomal carrier for topical delivery
Bicho J.1, Simões S.2, Salgado A.1, Loreau S.2, Ribeiro H.1

1Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal
2Laboratórios Edol, Portugal
joana.bicho@tecnico.ulisboa.pt

Introduction: 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. 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.


P08 Skin targeted ketoconazole microemulsions
Bicho J.1, Marto J.1, Salgado A.1, Loreau S.2, Ribeiro H.1

1Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal
2Laboratórios Edol, Portugal
joana.bicho@tecnico.ulisboa.pt

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 1.

Materials and methods: KTZ-ME was formulated using Transcutol CG as co-surfactant, on the basis of solubility studies, Sistena SP70 (C10-12-succinic anhydride) as surfactant, and with 1% hydroxy propyl methyl cellulose (HPMC) 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 (ANOV A), there were significant differences in the release of KTZ.

Conclusion: The results indicate that ME may be a promising approach for skin targeting delivery of KTZ.


P096 Study of the applicability of ionic liquids as excipients in topical formulations
Santos de Almeida, T.1,2, Júlio, A., 1 Caparica, R. 1, Ribeiro, M. 1, Rocha, F. 1, Araújo, M. E. 1, Baby, A.R., 1 Rosado, C., 1 Portugal Motia, J.1

1CBIOS - Research Center for Biosciences and Health Technologies, U. Lusofona, Campo Grande 376, 1749-024 Lisboa, Portugal
2Centro de Química e Biologia, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal
3School of Pharmaceutical Sciences, University of São Paulo. São Paulo, SP, Brazil
joana.bicho@tecnico.ulisboa.pt

Introduction: The difficulty to incorporate poorly and sparingly soluble actives into creams and ointments is a challenge to the pharmaceutical and cosmetic industries, creating a need for new excipients to improve the delivery of these actives.

Materials and methods: Three imidazole-based ILs - [C2mim][Br], [C4mim][Br] and [C6mim][Br] - were investigated as solubility/permeation enhancers. Saturated solutions of both actives in propylene glycol/ethanol (95: 5) and solubility studies were performed in triplicate at room temperature and at 32 ºC.

Results and Discussion: An enhancement in solubility was observed for both actives in the presence of ILs. The most hydrophilic actives, caffeine and salicylic acid, showed an improvement in solubility with all ILs, the more hydrophobic [C6mim][Br], was the best solubility promoter, there is a less prominent difference between the three ILs. Incorporation efficiency was assessed by UV spectrophotometry using methanol as solvent.

Conclusion: The results indicate that ME may be a promising approach for skin targeting delivery of KTZ.

P90 New insights about Skin Aging Visible Signs and its primary components – Pigmentation, Vasculature and U.V. Photaging

Fitas, M., Pereira, J., Contréiras, P.,
1 Núcleo de Investigação e Desenvolvimento, PhD Trials Lda, Campo Grande 286, Lisboa, Portugal
2 Departamento técnico, PhD Trials Lda, Campo Grande 286, Lisboa, Portugal
Email: mftitas@phdtrials.com

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 Caucasian 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 chosen 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, U.V or Red spots.

Results and discussion: A correlational study identified strong correlations between the number of Visible vs Brown spots (R² = 0.5161) and Visible vs Red spots (R² = 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 pigimentary aging signs, rather than melanin coagulation photoinduced spots (represented by UV spots).

References: (FCT; grant SFRH/BDE/51599/2011), strategic project Pest-OE/SAU/UI4013/2011

P10 Novel melatonin-based Pickering emulsion sunscreen

Marto J, Ascenso A1, Gonçalves L1, Gouveia L1, Manteigas P1, Eleuterio C1, Chiari-Andrèo BG1, Isaac V1, Pinto P1, Oliveira E1, Almeida AJ1, Ribeiro HM2
1Research Institute for Medicines and Pharmaceutical Sciences (iMed.ULisboa), Faculty of Pharmacy, University of Lisbon, Portugal
2UNESP – Univ. Estadual Paulista, Faculdade de Ciências Farmacêuticas, c.p. 355; zip code: 14801-902, Araçariguama, Brazil
Email: jmmarto@ff.ulisboa.pt

Introduction: Melatonin, the main secretory product of the pineal gland, was recently found to have a protective effect against photocarcinogenesis based on its antioxidative 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 the type of solid particles (SP), being developed a formulation that ensured a high SPF with UVA and B防护 protected by ZnO and TiO2, respectively. Although starch particles had no photostability properties itself, it proved to be a SPF booster 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 U.V radiation protection. Therefore, this safe and natural formulation would be highly recommended for people with sensitive skin.

Acknowledgments: This work was supported by FEDER, the Portuguese government (FCT, grant SFRH/BD/51599/2011), strategic project Pest-OE/SAU/UI4013/2011 and Laboratórios Atral S.A., Portugal.

P11 “Green” sunscreen formulation based on coffee oils

Marto J1, Gouveia L1, Chiari BG1, Isaac V1, Pinto P1, Lisboa PP1, Paiva A1, Barreiros S1, Simões P1, Almeida AJ1, Ribeiro HM2
1Research Institute for Medicines and Pharmaceutical Sciences (iMed.UL) Faculty of Pharmacy, University of Lisbon, Lisbon, Portugal
2Faculdade de Ciências Farmacêuticas, UNESP – Univ Estadual Paulista, DFM – Laboratório de Cosmética – LaCos, São Paulo, Brazil
Email: jmmarto@ff.ulisboa.pt

Introduction: Spent coffee grounds and green coffee beans, which 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 dispersive 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 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.


P12 Effect of long-term use of novel topical drug delivery system on skin hydration and barrier function

Marto J1, Lana J1, Pinto P1, Oliveira E1, Almeida AJ1, Ribeiro HM2
1Research Institute for Medicines and Pharmaceutical Sciences (iMed.ULisboa), Faculty of Pharmacy, University of Lisbon, Portugal
2Laboratórios Atral S.A., Lisbon, Portugal
Email: jmmarto@ff.ulisboa.pt

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® potential of emulsion in 53 volunteers. The transepidermal water loss (TEWL), epidermal capacitance (hydration) and surface lipid quantity were evaluated using a Tewameter®...
Propyleneglycol (1,2-propylene glycol; 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®, 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, 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.

**References:**


**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 erythematous response caused by the topical application of ethyl nicotinate (EN).

**Materials and methods:** 36 subjects (17 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 ethosommes (F7, F8, F9). Four 9 cm² areas were marked on the volar surface of both subjects’ forearms. Three of these areas were treated once a day 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, sympathetically, 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 vasodilatation 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.

**References:**


**P16 Production of a thermoreversible gel for dermatological purposes**

Neves, A.; Rijo, P.; Nicolai, M.; Borralho, T.; Martins, G. and Pinto Reis, C.

3. Universidade de Lisboa, Instituto de Investigação do Medicamento (iMed.ULisboa), Faculdade de Farmácia, Av. Prof. Gama Pinto, 1649-003 Lisboa, Portugal.
4. IBEB, Biophysics and Biomedical Engineering, Faculty of Sciences, Universidade de Lisboa, Lisboa, Portugal.

**E-mail:** catarinapintoreis@ulusofona.pt

**Shared authorship**

**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 37°C using a rotational Viscosimeter Brookfield.

**Results:** Both gels were liquid at 4°C and turns into a gel solution at 37°C. Rheological properties of the resultant thermoreversible gels strongly depends 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.

**References:**

P17 Development, characterization and efficacy evaluation of a moisturizer cream containing Crataegus monogyna Jacq. extract
Ribeiro, AS1, Estanqueiro, M1, Rodrigues, F1, Oliveira, B1, Sousa Lobo, JM1
1 Laboratory of Pharmaceutical Technology, Department of Drug Sciences, Faculty of Pharmacy, University of Porto, Rua de Jorgo de Barrio Ferreira, 228, 4050-313 Porto, Portugal
2Department of Chemical Sciences, Faculty of Pharmacy, University of Porto, Rua de Jorgo de Barrio Ferreira, 228, 4050-313 Porto, Portugal
Email: asofiamachado@hotmail.com

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 formulations. Hawthorn (Crataegus monogyna), found in northern temperate regions such as East Asia, Europe, and Eastern North America, is a specie of the Rosaceae family1. 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 polyphenolic compounds have been shown to be cytoprotective by scavenging superoxide anion, hydroxyl radical, hydrogen peroxides, and reducing lipid peroxidation2. 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 Transdermal Water Loss (TEWL) were assessed before and 30 days after daily application of the creams, using a Coronemeter® 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 the hydration and in the water content was observed, after 30 days of treatment (p<0.05).


P18 Nanoparticles Containing Methanol Extracts Of Portuguese Lavenders with Potential Skin Application
Pereira, F1, Baptista, R1, Ladeiras, D1, Madureira, A.M.1, Teixeira, G.1, Rosado, C.1, Fernandes, A.S.2, Ascenso, L1, Silva, C.O.1, Nicolai, M1, Reis, C.P.1 and Rijo, P1
1 Shared senior authorship
University of Lisboa (CBIOS – Research Center for Biosciences & Health Technologies), Campo Grande 376, 1749-024, Lisboa, Portugal
2 Faculdade de Medicina, Nova University of Lisbon, Rua de Saldanha, 1, 1749-051 Lisboa, Portugal

Background: Lavender (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. lauisieri 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 inhibition of xanthine oxidase methods. The cytotoxicity assays were carried out in HaCat cells. Production and encapsulation of PLGA nanoparticles as skin antioxidant agents, for topical and cutaneous treatment. The PLGA nanoparticles, observed by SEM, showed a well-defined spherical shape, achieving a high encapsulation efficiency (>95%). Our results suggest both extracts have low risk of cytotoxicity. Conclusion: This study provides encouraging results with lavenders as promising anti-aging and antioxidant agents for the development of new cosmetic or dermatological formulations.

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P19 Comparing microvascular responses from healthy individuals with different ages submitted to the ‘oxygen challenge test’
Henrique Silva1,2, Hugo Ferreira1, Joana Antunes2, MJ Bajjan1 and L Monteiro Rodrigues1,2
1 CBiOS – Universidade Lisboa’s Research Center for Biosciences and Health Technologies (UDE), Campo Grande 376, 1749-024, Lisboa, Portugal
2 Pharmacol. Sc Dept – Universidade de Lisboa, School of Pharmacy, Lisboa, Portugal
Email: henrique.silva@ulusofona.pt

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 changes were measured on the foot, involving the local perfusion on the second toe (by laser Doppler flowmetry, LDF, PF5910, Perimed, Sweden); oxygen partial pressure on the dorsum of the foot (by transcutaneous, gasmetry tc pO2, PF5400, Perimed, Sweden). Transdermal 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 (dV, t-peak), peak value and time to peak (t1/2). Wilcoxon signed-rank and Mann-Whitney U tests were used for phase and group comparisons, respectively, considering p<0.05.

Results: 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 vasocostriction, reduction on local perfusion in both groups, and a statistical significant increase in TEWL was observed, although non-significantly, during this phase. No differences between groups were found for tcPO2 and tcPO2–peak. However, group II reached a significantly lower peak, which may reflect an age-dependent change 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 correlated with vascular physiology.

P21 Evaluation of topical treatment adherence: Challenges and prospects

Teixeira, A.¹,², Teixeira, M.¹, Almeida, V.¹, Sousa Lobo, J. M.³ and Almeida, I.F.²

¹CESPU, Instituto de Investigação e Formação Avançada em Ciências e Tecnologias da Saúde, Rua Central de Gandria, 1317, 4585-116 Gandra PRD, Portugal;
²Laboratório de Tecnologia Farmacêutica, Departamento de Ciências do Medicamento, FFUP, Rua Jorge Viterbo Ferreira, 228, 4050-313 Porto, Portugal;
Email: ifalmeida@ff.up.pt

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 improve 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 help 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

Sara Silva¹, Marilene Estanqueiro¹, M. Helena Amaral¹, José Manuel Sousa Lobo¹

¹Laboratory of Pharmaceutical Technology, Department of Drug Sciences, Faculty of Pharmacy, University of Porto, Portugal

Micf10031@ff.up.pt, marestanqueiro@ff.up.pt, hamaral@ff.up.pt, slobo@ff.up.pt.

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 37°C 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.