

SOCIETY OF COSMETIC CHEMISTS

SCC

ANNUAL SCIENTIFIC SEMINAR REGISTRATION MATERIAL

May 10-11, 2007, Anaheim Marriott

*Annual Scientific Seminar program arranged by the Society's Committee on Scientific Affairs
Wil Hemker, Chair*

REGISTRATION INFORMATION

FULL registration includes admission to the Technical Sessions, the Luncheons and Student Poster Exhibit on Thursday and Friday, and the Suppliers' Cocktail Reception on Thursday evening. **STUDENT** registration includes Technical Sessions only. **NOT** included in base registration is the Joint Symposium (see page 11) to be held on Wednesday, May 9, 2007 and hotel accommodations. **A discount of \$50 off the seminar registration fee will be given if you register for the Full Seminar and the Joint Symposium. Split registrations do not qualify for the discount.**

SPLIT registration allows one individual to attend sessions on Thursday and one individual to attend sessions on Friday. **SPLIT** registration includes access for only those events scheduled on the day on which each individual registrant is attending. **All split registrants must state the day on which each registrant will be attending.** Split registration will be accepted until May 3rd. There will be no split registration accepted at the door. There are no one day only registrations.

UNEMPLOYED members are invited to attend the technical sessions free of charge; please report to the SCC Registration Desk for your name badge.

ON SITE registration will be available, however, the registration fees will be much higher (\$700 for members and \$800 for non members). It is highly recommended that you pre-register to avoid waiting and to save money.

ALL Pre-registration Forms must be received at the National Office by Noon on Thursday, May 3rd. Registrations received after this time will be treated as On Site and charged the higher fee. The National Office will ship all materials to Anaheim on Friday, May 4th and the office will be closed from May 5th through May 14th.

HOTEL reservations should be made by April 11, 2007 directly with Marriott reservations by calling 1-800-228-9290 or 714-750-8000. Please remember to indicate that you are attending the SCC Annual Seminar. **NEITHER THE SOCIETY NOR ANAHEIM MARRIOTT ARE RESPONSIBLE FOR THE AVAILABILITY OF ROOMS FOR RESERVATIONS RECEIVED AFTER APRIL 11th.**

Room Rates are as follows: Single/Double: \$169.00

The **Supplier's Cocktail Reception** will be held on property at the Anaheim Marriott.

REGISTRANTS may pick up their registration material beginning Wednesday, May 19h at the SCC Registration Desk between 5:00 p.m. and 7:00 p.m. Those registered for Wednesday's Program may pick up their registration material on Wednesday morning beginning at 8:00 a.m. at the registration desk.

HOW TO REGISTER

COMPLETE the enclosed form and mail (with check made payable to the SCC or credit card payment information) to Society of Cosmetic Chemists, 120 Wall Street, Suite 2400, New York, NY 10005-4088. **Type or print your name and company as you wish it to appear on your badge.** Please make sure to include your telephone number and company address. **You must mail your check to the SCC office with a copy of the Registration Form so that proper credit can be issued. Faxed registrations are only acceptable with credit card payment information included (212-668-1504). The Society cannot be held responsible for forms lost in the mail. Registrants may also register for the seminar online. For more information, please visit the SCC Website, www.sconline.org.**

POLICIES

Pre-Printed badges will be made available only to those who register prior to April 30, 2007. Registrants will be included on the Pre-Registration List of Attendees after receipt of payment. Requests for refunds in writing and no later than April 13th will be granted, less a \$150 administrative fee. Registration fees are transferable to another registrant but not refundable after April 13, 2007.

The Society of Cosmetic Chemists cannot be held responsible for forms lost in the mail. • The Dress Code for the Seminar is Business Casual.

SECURITY

BADGES AND WRISTBANDS MUST BE WORN TO ALL TECHNICAL SESSIONS, LUNCHEONS, EXHIBITS AND SOCIAL EVENTS. IF THE PROPER SCC BADGE AND WRISTBAND IS NOT DISPLAYED, YOU WILL BE ASKED TO EITHER LEAVE THE SEMINAR SITE OR REGISTER FOR THE SEMINAR.

THURSDAY'S PROGRAM, May 10, 2007

9:00 a.m. - 11:30 a.m.

SKIN & COLOR TECHNOLOGY

Moderator – Barbara Wolf, Ph.D., Estee Lauder Companies

The Role of Surface-Active; Active Ingredients on Cream Stability

Lorraine E. Pena, Ph.D. and Pamela J. Secrest - Pfizer, Inc.

Surface-active, active ingredients are known to adversely affect emulsion stability. Instability is visually manifested by conversion to a thinner, stringy cream. The active ingredient, TEA-ibuprofen was identified as the primary factor in the phase separation of a model cream. The mechanism by which this surface-active, active ingredient destabilizes the model cream is the subject of this study.

Surface tension measurements of a 5% aqueous solution of TEA-ibuprofen using the DuNouy ring method showed a highly elastic interfacial film. During the measurement, it was noticed that the meniscus had an extraordinary amount of deformation

and resiliency prior to breaking. Most surfactant solutions undergo only a slight deformation before breaking. Using a recording tensiometer, common surfactant solutions demonstrate a peak maximum defined as the surface tension followed by a steep drop when the meniscus breaks. However, the TEA-ibuprofen solution exhibited an extended tailing after the surface tension peak that could be correlated with the highly elastic meniscus and could be quantitated in chart divisions as the "relative tensile strength". A chemical structure approach is used to search for a surfactant with a lower surface tension and stronger interfacial activity than TEA-ibuprofen so as to overcome its interfacial dominance and improve cream stability.

Optimization of Surfactant Concentration in Topical Microemulsion Formulations

Jessica S. Yuan, Alice Yip and Edgar Acosta University of Toronto

Alcohol-free lecithin microemulsions have been formulated with food-grade linker molecules and proved to be effective vehicles for topical delivery of cosmeceutical actives. It is important to study the effect of surfactant concentration on the vehicle efficacy and to investigate the minimum surfactant concentration required in these systems to achieve the desired performance. This could lead to the most cost-effective formulations and lower side effect. In this work, we have examined *in vitro* permeation and absorption

of lidocaine (a poorly water-soluble ingredient used in acne treatment) from linker microemulsions through pig skin as a function of surfactant concentrations. The results have shown that the cumulative amount of lidocaine delivered increases as the surfactant concentration increases up to a point where a plateau is reached (saturation). These findings suggest that there is an optimum dosage effect in linker-based microemulsion delivery systems, in which the minimum amount of surfactant mixtures is required.

Rheomorphological Changes in Mascara Texture Related to Filling Stress

Yelena Loginova Coty, Inc.

This study attempts to characterize the rheomorphological changes in mascara texture associated with filling. The corresponding images of product performance on false lashes made of human hair illustrate the influence of rheomorphological changes on makeup results.

The obtained information makes a valuable contribution in understanding of mascara evaluation throughout R&D development, marketing assessment and product industrialization.

Materials and Methods:

Rheomorphological data were obtained with a Brookfield rotational speed and stress controlled R/S – CPS Rheometer with a plate measuring system (plate - C25-2), using software 2.6 in conjunction with an Olympus BH2 microscope with a digital camera. Total image magnification with a 17" screen was 800X.

Mascara samples were filled manually according to a routine lab procedure and with a GRISO NA MA pump filling machine.

The mascara bulk was studied before the filling. Then samples were evaluated immediately after the filling, then 24 hrs and 72 hrs later.

False lash images with the applied product were captured with a digital camera.

Results and Conclusion:

Comparison of obtained data shows the following:

- Evaluation of rheomorphological changes under a different filling stress helps to understand changes in mascara performance during industrialization of the product
- This technique allows identification of filling sensitive formulas during the product development stage
- The method can be relevant to various areas of cosmetic product development

Complex Effect Pigments: Technology in Support of Beauty & Fashion

*Leila S. Song, Ph.D. and Gabriel E Uzunian, Ph.D.
BASF Corporation*

The objective of this paper is to elucidate how the unique optical characteristics of complex effect pigments can be designed to capture the appearance of beauty and fashion.

As the fashion trends and new design influences emerge every year, new materials and formulations are developed to support these trends and influences. The early single-oxide-coated mica pigment has simple structures. As new pigments are made, the structures become more complex. More than merely

reflecting light, complex effect pigments actually manipulate light to create visual impression and dramatically improve the cosmetic and personal care products.

The incorporation of complex effect pigments into cosmetic and personal care formulations will be discussed in terms of pigment structure, particle size and substrate. The different optical appearances using complex effect pigments will also be illustrated.

Skin Tryptophan and Cross-Linked Collagen Levels are Significantly Reduced by Hydroxycinnamic Acid

*Nava Dayan, Ph.D.
Lipo Chemicals, Inc.*

Levels of crossed-linked collagen in the skin are known to increase with age. Photo-aging results in changes in skin tone and increased pigmentation in the form of age spots. Tryptophan is one of the precursors for melanin and a marker for skin aging. SkinScan, is a noninvasive fluorescent methodology that can quantify levels of crossed-linked collagen and tryptophan *in vivo* by measuring fluorescence excitation at 370nm and 295nm, respectively.

An 8-week study conducted on an Asian panel compared the effects of hydroquinone, magnesium ascorbyl phosphate (MAP) and hydroxycinnamic acid (HCA) on tryptophan and crossed-linked collagen levels.

HCA, a radical scavenger and a tyrosinase inhibitor, was shown to be superior to both hydroquinone and MAP in reducing tryptophan and crossed-linked collagen levels.

The presentation will focus on the properties of HCA, its skin penetration and the unique simultaneous activity of improving skin condition by reversing signs of aging both in terms of skin tone and elasticity.

SCIENTIFIC SESSION B

THURSDAY'S PROGRAM, May 10, 2007

1:30 p.m. - 4:00 p.m.

POLYMERS

Moderator - Mindy S. Goldstein, Ph.D., Estee Lauder Companies

Enhancement of Skin Permeation of Actives by Novel Bioadhesive Polymer Delivery System

*Kishore Shah¹, Ph.D., Bozena Michniak²
and Rashmi Thakur²
¹Polytherapeutics, Inc.*

²Rutgers - The State University of New Jersey

Novel bioadhesive polymer [dimethylacrylamide/acrylic acid/polystyrene ethyl methacrylate copolymer, PharmaDur™] is marketed as a long lasting delivery system for actives. Its aqueous dispersions and emulsions form an invisible and imperceptible hydrogel film on skin, which is retained for 24+ hours. This study was to evaluate effect of the copolymer upon rate of skin permeation of actives contained therein.

Clear aqueous dispersion, containing 2 % copolymer and a model compound (caffeine, at saturation) with and without an enhancer (oleic acid), was allowed to dry on dermatomed human cadaver skin. Permeation of caffeine was studied using Franz diffusion cells with phosphate buffer as receptor phase. Concentration of caffeine in the receptor phase, at selected time points, was determined by HPLC.

The skin permeation rate of caffeine (Flux, $\mu\text{g}/\text{cm}^2/\text{hour}$) with and without the copolymer, was 5.6 and 6.5, respectively. Flux with 2 % enhancer with and without the copolymer was 18.2 and 9.8, respectively. Flux with 5 % enhancer with and without the copolymer was 30.1 and 17.2, respectively.

The study revealed that the copolymer greatly increased skin permeation of caffeine/enhancer formulations. This phenomenon can be very useful in maximizing performance of cosmetic and other dermatologically active agents.

Investigation of the Effects of Polymer Microstructure on the Rheologies of Polyelectrolyte Thickeners: The Importance of Chain Rigidity, Branching, Hydrophobic Modification and Polymer-Particle Interaction

*Robert Y. Lochhead, Ph.D.
The University of Southern Mississippi*

Recently scaling theories have been developed to explain the role of hydrophobic 'multistickers' on the formation of gel networks by polyelectrolytes. Also, the naïve coupling mode theory has been developed to dispersions of particles that interact with short-range Yukawa potentials and this has allowed prediction of both the critical particle concentration required for gelation and also estimation of the shear modulus of the resulting network. We have applied these theories in our investigation of polyelectrolyte and hydrophobically-modified polyelectrolyte thickeners, as well as networks formed by polymer-particle interaction and polymer-surfactant interaction.

Our results show that the polymers exist as isolated molecules in dilute solution. Network formation is favored by blocky substitution of the hydrophobes and chain flexibility. However, associative phase-separation and gel syneresis occurs beyond a threshold level of hydrophobic substitution. Increase in chain backbone stiffness delays the onset of phase-separation to higher polymer concentration. Polymers with random placement

of hydrophobes and stiff backbones are less likely to form hydrophobically-associated networks in pure polymer-water solutions. However, in the presence of surfactant micelles many of these trends are reversed; blocky substitution of hydrophobes tends to give rise to phase-separated polymer/surfactant compositions, whereas random substitution tends to favor polymer-surfactant networks that traverse the entire volume of composition. Similarly, random interaction of polymers with dispersed particles causes an extensive gel network to be formed but polymer/particle co-operative interaction resulting from the short-range Yukawa potential can cause syneresis of the gel. These effects are exacerbated by increase in micelle or particle sizes.

This paper will summarize our recent comprehensive experimental investigations of the interaction of hydrophobically-modified polyelectrolytes with nanoparticle dispersions and surfactant micelles and their interpretation on the basis of the recently-developed 'multisticker polyion' and 'naïve mode coupling' theories.

Use of Film Forming Polymers for Increased Efficacy in Sunscreens

*Jennifer A. Davis, Doreen Petersen
and Daniel Li
National Starch Personal Care*

It has been well established that in order to optimize the efficacy of sunscreens and achieve higher SPF values, the sunscreen film must be uniform on the skin as well as water resistant. Additionally, this market is now filled with a variety of product forms, so the film-forming technology needs to be utilized in a variety of formulations, and compatible with both organic and inorganic UV filters as well as combinations of the two. Most recently, the explosion of alcohol-based aerosol and non-aerosol pumps and sprays has posed an interesting challenge to formulators trying to waterproof these types of systems.

This paper will discuss how the water resistance capability of film-forming polymers is impacted in formulation by properties such as concentration, neutralization level, and, in light of the recent challenge stated above, solvent choice. Additionally, performance data including in-vitro and in-vivo SPF testing will be given demonstrating efficacy in a variety of systems, including emulsions with both organic and inorganic UV actives, as well as alcohol based systems.

Designing Polymers for Use in Aqueous Hair Sprays: Routes to Improve Spraying, Setting and Dry Time

*Matthias Laubender, Ph.D.
BASF Corporation*

Since the low VOC regulations have spread throughout the United States there was a fast progress in understanding how to prepare stable aqueous aerosol and pump spray formulations within the given rules. Several attempts were made to develop polymers for specific use in low VOC aerosols which provide the right balance between all the designated properties of a capable and well accepted hair spray. Spraying behaviour, high setting power and not least the dry time have been the most challenging properties for low VOC hair spray polymers.

This study provides theoretical and physical data about developing styling polymers for aqueous hair sprays by using specific test methods, e.g. like gravimetry, rheology and tack measurement. Correlations between polymer characteristics

and properties of respective hair spray formulations will be presented. The mobility of the polymer chain, chemical functionality as well as polymer architecture are key factors in designing and using polymers for water containing hair sprays. The polymer structure can be tailor-made to balance contradictory targets and optimize properties such as spray behavior, setting, and dry time.

The investigations show structure relationship of polymer properties and behaviour of the respective polymers in water containing low VOC hair spray formulations as well as application. The main focus layed on improvements in spraying behavior, setting, and dry time in order make the properties of water containing low VOC hair spray formulations coming closer to former high VOC hair sprays.

Thickeners: From Chemistry to Cosmetic

Paul Mallo, Ph.D.
SEPPIC

Polymeric thickeners are widely used in several industries particularly in the personal care industry. These thickeners are key products to build formulations such as creams, gel-creams, lotions, etc. to give them long-term stability. These thickeners have to work to retain their properties in conjunction with a large range of chemical additives. For example, they must be able to thicken different media such as extreme pH, high salt levels, reactive molecules like dihydroxyacetone, and also stabilize high amounts of oil.

The target of this paper is to set up correlations between chemistry (types of monomers, cross-linkers), the physical

characteristics (molecular weight, cross linking density, level of pending chains, particle size distribution, inter/intra macromolecular interaction) and the final properties of these thickeners in cosmetic formulations.

In addition, the involved manufacturing processes will be addressed since a good understanding of the macromolecular structure polymers requires processing knowledge. Finally, some indications regarding the most appropriate process versus the necessary thickener property required will be discussed.

SCIENTIFIC SESSION C (concurrent)

FRIDAY'S PROGRAM, May 11, 2007

9:00 a.m. - 11:30 a.m.

BACK TO BASICS: EMULSIONS

Moderator - Ken Klein, Cosmetech Laboratories, Inc.

General Overview of Siloxane Chemistry in Emulsions

Eric Abrutyn
Kao Brands Company

Emulsions in the personal care industry in the United States are primarily oil-in-water (O/W) emulsions using traditional monomeric and polymeric organic emulsifiers. Over the past 15 years, the industry has slowly embraced the use of Silicone-in-Water (Si/W) and Water-in-Silicone (W/Si) emulsions to deliver actives more effectively in Sunscreen, Liquid Make-up, and Antiperspirants. One of the reasons for this increasing popularity is more effective emulsifiers and more consumer appealing aesthetics.

This presentation will explore the chemistry of functional siloxanes, different class of siloxanes, and how they are formulated and processed in emulsions. Examples will be shown to demonstrate how they are employed in personal care applications.

Back to Basics: So You Want to Preserve Your Emulsions

David C. Steinberg
Steinberg and Associates

After you have formulated your emulsion, it is time to preserve it. This paper will review the regulations of preservation of emulsions, and than go through a simple set of steps so that when you add your preservative(s) you will successfully preserve

your product the first time. Steps include such critical areas as water activity, preservative efficacy testing, regulatory requirements of preservatives and finally how to add them.

Solving Manufacturing Problems in Emulsion Products

T. Joseph Lin, Ph.D.

Cosmetic Manufacturers today are faced with increasing global competition and the ability to produce a wide range of products at a consistently high level of quality is extremely important. To reduce costs, manufacturers have increased batch sizes, and manufacturing failures are more costly than ever in terms of lost materials and failure to meet scheduled delivery dates. The pressures and time demands on cosmetic chemists have never been greater.

Emulsion-based products remain very popular as cosmetic preparations, but are often troublesome to manufacture due to their susceptibility to many process variables, which can affect

product quality and stability. The key to solving manufacturing problems quickly and preventing recurrences is investing the time to investigate and find their true cause or causes. Depending on the formulation and manufacturing process involved, the cause may be obvious or extremely difficult to pinpoint. This presentation will focus on fundamental principles and techniques for investigating causes and solving problems in manufacturing cosmetic emulsions.

The Use of Polymers in Emulsions

*Robert Y. Lochhead, Ph.D.
The University of Southern Mississippi*

Cosmetic oil-in-water lotion emulsions have conventionally depended upon primary emulsion stabilization by surfactants and have relied upon polymeric rheology modifiers, such as Carbomers, to prevent creaming, sedimentation, and syneresis, during storage. In cosmetic lotions, correct choice of rheology modifier is necessary to optimize sensory properties and proper functioning of the product. Hydrophobic modification of hydrophilic polymers gave rise to polymeric emulsifiers that served the dual function of both primary and secondary emulsifiers and made it possible to design rugged, stable systems that could be triggered to release their oil phase when they were applied to the substrate. Associative thickeners are also hydrophobically-modified hydrophilic polymers. There are three basic types of associative thickeners; namely hydrophobically - modified alkali-swellable thickeners, hydrophobically modified ethoxylated urethanes and aminoplast, and hydrophobically-modified cellulose ethers and polysaccharides.

All known polymeric emulsifiers are associative thickeners, but the reverse statement is not necessarily true. This type of chemistry can be tailored to produce systems that are fluid at room temperature but which exhibit thermo-gelation when they rise above a critical temperature. Such stimuli-responsive systems have been disclosed as useful for the formation of multiple emulsions.

Water-in-oil emulsions can be sterically-stabilized by amphipathic polymers. Polymers are also used in color-cosmetic emulsions to structure the oil-phase, to act as film-formers and to confer transfer-resistant qualities. Polymers are essential components of the emulsion formulator's toolkit and today's formulator has an impressive and diverse array of polymers from which to choose, to deliver the appropriate desired product attributes from cosmetic emulsions.

SCIENTIFIC SESSION D (concurrent)

FRIDAY'S PROGRAM, May 11, 2007

9:00 a.m. - 11:30 a.m.

METHODOLOGY

Moderator – Colleen Rocafort, Ciba Specialty Chemicals Corporation

True Porosity Measurement of Hair: A New Way to Study Hair Damage Mechanisms

*Yin Z. Hessefort, Brian T. Holland, Richard Cloud and Jobiah J. Sabelko
Nalco Company*

Numerous studies of hair damage have been undertaken in the past three decades. Many of these studies show that hair damage results in increased hair swelling. Although much of the literature uses the terms "swelling" and "porosity" interchangeably, most of the methods developed to determine hair damage are geared toward measuring swelling rather than porosity. There has been no study to date revealing the details of pore size, pore volume and surface area that defines hair damage through the

measurement of the hair porosity. The objective of our research is to develop a novel method using gas sorption to study porosity characteristics of damaged hair produced by different damage mechanisms. The results are correlated with other analytical tools such as SEM, tensile strength and hair color measurement. This research provides important insights that serve as cornerstones to better understand hair damage and ultimately its prevention and/or repair.

An Analysis of the Wet-Dry Transition Combing Forces of Hair and of the Tangling Peak Force Asymmetry

*Manuel Gamez-Garcia, Ph.D.
Ciba Specialty Chemicals Corporation*

A study has been made of the different adhesive and friction processes involved in the transition of combing forces from wet to dry in virgin and bleached hair. The analysis shows that the wet and dry tangling peaks can be separated into two main components, namely: one asymmetric and the other symmetric with respect to the maximum force value. For various degrees of tangling the ratio between the areas of these two peak components appears to be constant for a particular hair treatment. Furthermore, the analysis shows that both peak components

contain important information about variations in adhesion, friction, and number of tangled fibers. The experiments also show that the irregularities frequently observed in the plateau and tangling peak forces of wet and dry hair are due to a stick-slip mechanism that arises from decreasing differences between the static and dynamic friction coefficients as the hair dries. Amonton's law of friction via a modified Capstan equation are considered when analyzing the effect of cuticle sheath visco-elasticity on the observed differences between the static and dynamic friction coefficients of the drying hair surface

SCIENTIFIC SESSION D cont'd

DMA Study Hair Viscoelasticity and Effects of Cosmetic Treatments

Miyoun Jeong, Ph.D., Vimal Patel, Jun-Mei Tei and
Timothy Gao, Ph.D.
Croda, Inc.

A Dynamic Mechanic Analyzer (DMA) was used to study hair storage and loss modulus of different types of hair fibers (Caucasian, Asian, and bleached) before and after cosmetic treatments at various relative humidity levels. A Miniature Tensile Tester (MTT) was used to determine Young's modulus of the same hair fibers at the same humidity levels for comparison.

DMA and MTT results showed that hair storage modulus (E') and Young's modulus decreased and loss modulus (E'') increased with an increase in environmental humidity for all tested hair fibers.

It is observed that Asian hair showed lower storage and Young's modulus but higher values of loss modulus and $\tan(E''/E')$ compared to Caucasian and bleached hair. This implies that Asian hair is less elastic and more viscous (damping). Experimental results also indicated that hair elasticity decreased and hair damping increased after bleaching.

The average storage modulus of Asian hair fibers decreased and the loss modulus increased after a shampoo treatment. Therefore, DMA can be used as a very useful tool to evaluate effects of cosmetic treatments on hair viscoelasticity.

Infrared Micro-Spectroscopic Imaging of Changes in Natural Moisturizing Factor (NMF) in Human Stratum Corneum

David J. Moore, Ph.D.
International Specialty Products

The recent commercial development of infrared (IR) imaging spectroscopy has provided a powerful new biophysical tool for the investigation of *ex vivo* biomedical samples including skin and bone sections. To date we have applied this technique to imaging endogenous protein and lipid distribution in skin, the distribution of penetration enhancers in skin, the molecular distribution of UV absorbing actives in films, and the penetration of liposomes into stratum corneum (SC). The current study extends this work to investigate the process of corneocyte maturation in the SC and particularly to utilizing IR imaging to

monitor changes in natural moisturizing factor (NMF) within the SC. NMF provides the SC with its water holding capacity and is therefore critical to skin health and hydration. Using IR imaging we were able to directly measure changes in NMF both as a function of corneocyte maturation i.e., depth within the SC, and after skin cleansing protocols. This presentation will describe our new application of IR imaging to SC biochemistry and its relationship to evaluating skin health.

SCIENTIFIC SESSION E

FRIDAY'S PROGRAM, May 11, 2007

1:30 p.m. - 4:00 p.m.

DISRUPTIVE TECHNOLOGY

Moderator - Art Georgalas, TRI-K Industries, Inc.

Modulating MC1R Activity through the Use of Biomimetic Peptides

Kristen Potts, P. Dow, S. Kautz, C. Murphy
and C. Zorzopian
Active Concepts, LLC

Novel analogs of the Alpha-Melanocyte Signaling Hormone (alpha-MSH) and Agouti Signal Protein (ASP) have been isolated from strains of *Lactobacillus acidophilus*. These analogs have key amino acid sequences that should induce changes in skin pigmentation through interactions with the melanocortin receptor MC-1 R. To verify this, the analogs and liposomal compositions thereof were tested using a standard MatTek MelanoDerm Assay. This skin model consists of layered, differentiated tissue from co-cultured epidermal keratinocytes and melanocytes. We

found that the liposomal dispersion with the alpha-MSH analog stimulates melanin production as well as alpha-MSH. The ASP analog decreases melanin synthesis and lightens skin better than the kojic acid used as a positive control. This lightening occurred in tissue samples exposed to a media containing alpha-MSH. Biomimetic peptides promise an efficacious route for the modification of melanogenesis, without the cytotoxicity or formulation limitations commonly seen in this area.

All that Glitters is Gold

Gary Agisim, Richard Kenny, Sara Magee and
Bhalchandra Patel
Wyeth Consumer Healthcare

In today's highly competitive global economy, the cosmetic chemist is constantly searching for innovative strategies. Green Chemistry, focusing on quality products whose composition and manufacture are environmentally friendly, resonates powerfully with the modern consumer as exemplified by Walmart's strong commercial success with "green products" representing manufacturing processes with minimal environmental footprint.

Functionalized aminobenzenes (anilines) are important intermediates for the manufacture of pharmaceuticals, cosmetics, dyes, pigments, and polymers. The manufacture of anilines involves the reduction of aromatic nitro compounds through a hydrogenation reaction which, for simple aromatic nitro compounds, can be carried out in large scale by an efficient catalytic process. However, when other reducible groups are present on the molecule, selective reduction of the nitro group is difficult,

and involves non-catalytic manufacturing processes with large amounts of potentially toxic waste.

Gold catalysts, for which there is no precedent for nitro group reduction, have been found to promote selective reduction of aromatic nitro compounds to anilines, providing an exciting innovative way to synthesize these important ingredients / intermediates with sharply reduced environmental effects.

This paper will describe the Gold catalyzed synthetic chemistry of anilines; and the Midas Touch will be further explored with a report on microorganisms that can pull dissolved Gold from their surroundings and deposit this precious metal as grains. While buried treasure appears by magic in fairy tales, the combination of this microbiological and synthetic chemical approach represents disruptive technology with a potential of great reward.

Strategies for Controlling Moisture Flux in Skin Cells

James V. Gruber, Ph.D., Lisa Bouldin,
Suzanne Wilford and Robert Holtz
Arch Personal Care

It is well established that human skin, which comprises about 70 microns of the outer protective cover for humans, is the principal barrier against the body's dehydration. Within the confines of the stratum corneum, epidermis and dermis lies a water gradient that is low at the surface of the skin and increases quickly as one probes deeper into the skin. This water gradient can be modified by topical applications of various moisturizers and occlusive barrier enhancers, glycerin and water being the most fundamentally basic. However, to actually control water flux, i.e., the movement of water across cellular membranes, a more detailed strategy of water control is required. For instance, keratinocyte cellular membranes contain proteins called aquaporins which control the movement of the highly polar water and glycerol molecules through the non-polar lipid membrane. Inside the cell, osmolytes are created that bind water and hold it inside the cell, particularly during highly dehydrative events.

A strategy for controlling water flux must address elements of all of these events. This talk will address efforts to develop a unique mixture of ingredients that includes a keratinocyte aquaporin-3 (AQP3) upregulator and specific osmolytes and moisture binding sugars to maintain water content within dehydrating cells. To test the strategy, a new *in vitro* testing technique was developed in which treated cells were slowly dehydrated and the rate of dehydration shrinkage was monitored over time by measuring average cell size. In addition, the technique allows for the creation of animated movies which demonstrate clearly the shrinking behavior of the keratinocytes in the dehydrating environment and the benefit of treatment of the cells with the product mixture described. *In vivo* assays employing Confocal Raman spectroscopy were used to further establish whether this strategy of moisture control modified the moisture gradient compared to glycerin.

Does Melanin Have an SPF Value and Can It be Measured?

Howard Epstein^{1,3}, Prashiela Manga²,
Anthony Simion³, David Story³, and Raymond E. Boissy²
¹Union Institute and University
²University of Cincinnati
³Kao Brands Company

The Food and Drug Administration describes Sun Protection Factor Value (SPF) as the UV energy required to produce a minimal erythema dose (MED) on protected skin divided by the UV energy required to produce an MED on unprotected skin. An accepted protocol measures SPF value of sunscreen products after application of 2 milligrams per square centimeter of sunscreen product is applied to skin *in vivo* and exposed to UV irradiation.

A few investigators have suggested that the SPF of *in vivo* melanin ranges from SPF 2-13. We report on the results of a protocol developed to measure the SPF of melanin extracted from cultured human melanocytes. The SPF of the melanin has

been determined using an SPF-290S Analyzer System manufactured by Optometrics LLC. Various melanin extraction methods will be compared to test the ability of the Analyzer to estimate potential SPF of melanin. The paper will review various melanin preparation methods, results obtained for SPF values of melanin obtained from donors with light and dark skin and conclude with a brief discussion of the potential influence of proteins associated with melanin that may enhance or reduce SPF values of melanin.

Thursday, May 10th - 7:30 a.m. - 8:50 a.m.

A. Demystifying INCI Nomenclature

Mindy S. Goldstein, Ph.D. (Estee Lauder Companies) and Robert Y. Lochhead, Ph.D. (University of Southern Mississippi)

Cosmetic labeling laws require that the ingredients in a preparation must be displayed clearly on the label. The accepted ingredient names are those that are monographed in the CTFA's dictionary of cosmetic ingredients, under the guidelines for International Nomenclature of Cosmetic Ingredients (INCI). There are about 14,000 distinct INCI names in the 2006 11th edition of the Cosmetic Ingredient Dictionary. It is desirable for raw material suppliers to obtain an INCI name for each new cosmetic raw material as an integral part of commercialization.

This mini-seminar will explain the rules of INCI nomenclature and the processes that are followed in assigning INCI names. We will describe the application procedure, typical topics of INCI committee deliberation, the assignment of an INCI name, and the stages that lead to publication of the ingredient monograph. We will address frequently asked questions, myths and common errors that are made in applying for INCI names.

Participants can expect to gain useful insight into the operations and conventions that must be followed to expedite the assignment of an INCI name.

B. SB 484: The California Safe Cosmetics Act of 2005 - To Register or Not to Register

Janet Winter Blaschke, International Cosmetics & Regulatory Specialists, LLC

In 2005, a landmark Bill was passed in the California Legislature. The California Safe Cosmetics Act requires companies to register their cosmetic products with the State of California if they contain certain ingredients. This legal requirement began on January 1 of this year.

However the administrative portion of the law is still in process and being defined. But since the law requires compliance by January 1, 2007, what do companies legally have to provide? Are companies responsible for complying with the law? What are the penalties of non-compliance? How is this requirement being enforced?

Other states are already introducing the same kind of legislation which would require registration as well. This session will cover up-to-the-minute developments on this important law and its ramifications for our industry, now and in the future.

S T U D E N T P O S T E R S

During the Annual Scientific Seminar, a Student Poster Session will be held from 9 a.m. - 5 p.m. on Thursday and 9 a.m. - Noon on Friday. Students from across the Nation will present their exhibits relating to the cosmetic industry. The posters are judged and awards are given to First, Second, Third and Fourth Place. The awards are sponsored by DD-Chemco and are presented to the winners at the Friday Luncheon. This is a great opportunity for students to present their ideas and findings. Be sure to check out their posters and give them your support.

C A L I F O R N I A C H A P T E R S O C I A L E V E N T

The California Chapter is planning a social gathering for Wednesday evening, May 9th, from 7 to 10 p.m. at the House of Blues in Downtown Disney. More detailed information will be sent to individuals who register for the Seminar with their confirmation statement.

2007 ANNUAL SCIENTIFIC SEMINAR

REGISTRATION FORM 2007 ANNUAL SCIENTIFIC SEMINAR MAY 10-11* ANAHEIM MARRIOTT

Type or print your name and company as you wish it to appear on your badge, complete and mail with check or credit card information to:

SCC, 120 Wall Street, Suite 2400, New York, NY 10005-4088, (212) 668-1500, Fax: (212) 668-1504

Participants may register for the Seminar online. For more information, please visit the SCC Website, www.sconline.com

NAME (Full Registration) _____

Phone () _____ Fax () _____

NAMES (Split Registration):

Thursday _____ Phone () _____ Fax () _____

Friday _____ Phone () _____ Fax () _____

Company _____ Email _____

Address _____

	REGISTRATION FEE On/Before April 13th	REGISTRATION FEE After April 13th*	
Member	\$575.00	\$625.00	\$ _____
Non-Member	\$695.00	\$745.00	\$ _____
Split Registration-MEMBER	\$650.00	\$700.00	\$ _____
Split Registration-NON-MEMBER	\$750.00	\$800.00	\$ _____
Full Time Student	\$200.00	\$200.00	\$ _____

*Onsite Registration Fee will be \$700 for Members and \$800 for Non Members.

JOINT SYMPOSIUM

Wednesday, May 9, 2007 * 9:00 a.m. - 5:00 p.m.* Symposium is Limited

*Registration Fee**:* \$300.00 \$ _____

** If you register for the Full Seminar and the Joint Symposium, you may deduct \$50 from the Seminar Registration Fee above.
This discount does not apply to split registrations.

COSA MINI-BREAKFAST SEMINARS

THURSDAY

A. *Demystifying INCI Nomenclature* \$45.00 \$ _____

B. *SB 484* \$45.00 \$ _____

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SYMPOSIUM

THE SOCIETY OF COSMETIC CHEMISTS (SCC)
&
THE COSMETICS, TOILETRIES AND
FRAGRANCE ASSOCIATION (CTFA)

PROUDLY ANNOUNCE A ONE-DAY SYMPOSIUM

WEDNESDAY, MAY 9, 2007
ANAHEIM MARRIOTT

Program arranged by Barbara Wolf, Ph.D. (SCC 2006 COSA Chair) and John Bailey, Ph.D. (CTFA)

REGISTRATION INFORMATION

FULL registration includes admission to both Technical Sessions and the Luncheon on Wednesday, May 9, 2007. Registration will be limited to the first 150 registrants. Please use the registration form for the SCC Annual Scientific Seminar to register for this symposium. The fee to attend is \$300. **There will be no onsite registration for this symposium.** Pre-Printed badges will be made available only to those who register prior to April 30, 2007. Registrants will be included on the Pre-Registration List of Attendees after receipt of payment. Requests for refunds in writing and no later than April 13th will be granted, less a \$50 administrative fee. Registration fees are transferable to another registrant but not refundable after April 13, 2007.

SCIENTIFIC SESSION 1

9:00 A.M. - 11:30 A.M.

UPDATES

Moderator - Barbara Wolf, Ph.D., Estee Lauder Companies

Consumer Commitment Code and CIR Update

*John Bailey, Ph.D.,
CTFA*

This presentation will provide an overview of the new CTFA Consumer Commitment Code. At a time when the cosmetic industry is being challenged by NGOs and at the legislative level, the CTFA Consumer Commitment Code is the next step in the industry self-regulation programs that have worked well over the years to ensure that cosmetic products are safe and that FDA has the necessary information to do their job.

Dr. Bailey will discuss -

- the key elements of the consumer commitment code
- the key elements of the ingredient and product information file that you must maintain to comply with the code.
- what information can be used to meet the intent of the ingredient and product information file.

- interpretation of what adverse product experiences fall under the "serious and unexpected" section of the code and must be reported to the FDA.
- the mechanism that FDA will follow when requesting to examine your consumer commitment ingredient and product information file.

Dr. Bailey will also discuss the new CTFA Consumer Information Website introducing the concept and overall structure.

Finally, Dr. Bailey will discuss important revisions to the Cosmetic Ingredient Review procedures. The CIR has never been more important than it is now and plays a critical role in the Consumer Commitment Code. The CIR has also emerged at the most credible cosmetic ingredient program in the world. The revisions to the procedures will reinforce the transparency of the program and the role that it plays in ensuring ingredient safety.

Cosmetic Issues Update: An Update on What is Going on in Sacramento and Congress

*Mike Thompson
CTFA*

This talk will review changes in the Congress and California State Legislature that will affect the cosmetic industry. Issues will include the California Safe Cosmetics Act implementation,

UC Berkeley Green Chemistry report and other pending and emerging legislative and regulatory issues.

Canada: New Regulatory Enforcement at the Border

Janet Winter Blaschke
International Cosmetics & Regulatory Specialists, LLC.

New regulations affect products marketed in Canada. This affects U.S. - made products, and preparation can avoid the pain of enforcement and disruption of a company supply chain. These new regulations which cause product to be detained or

removed from the shelf will be examined. Possible solutions to these problems will be discussed, along with other pending regulations affecting products in Canada. These will include Cosmetics, Drugs and Natural Health Products.

Harmonization for Sun Care Product Testing and Labeling: What's Possible?

J. Frank Nash, Ph.D.
The Procter & Gamble Company

Sun care products represent an important part of a safe sun strategy aimed at reducing skin damage produced by chronic exposure to solar ultraviolet (UV) radiation. The primary measure of sunscreen product efficacy is the SPF or Sun Protection Factor Test. The conduct of this *in vivo* test is basically the same in all geographies.

Likewise, the labeling is similar although there are regional variations. Efforts are ongoing to standardize testing for long wavelength UVA protection of sunscreen products. A summary of *in vitro* and *in vivo* UVA tests together with possible labeling will be presented.

SCIENTIFIC SESSION 2

1:30 P.M. - 4:00 P.M.

ISSUES

Moderator - John Bailey, Ph.D., CTFA

Grey Goo on the Skin?
Nanotechnology, Cosmetic and Sunscreen Safety

Gerhard J. Nohynek, Ph.D.
L'Oreal Worldwide Safety Evaluation

Many modern cosmetic or sunscreen products contain nano-sized components. Nanoemulsions are transparent and have unique tactile and texture properties; nanocapsule, nanosome, noisome or liposome formulations contain small vesicles (range: 50 to 500 nm) consisting of traditional cosmetic materials that protect light - or oxygen-sensitive cosmetic ingredients. Transdermal delivery and cosmetic research suggests that vesicle materials may penetrate the *stratum corneum* (SC) of the human skin but not into living skin. Nano-sized formulations may enhance or reduce skin penetration. Sunscreens contain insoluble titanium dioxide (TiO₂) or zinc oxide (ZnO) nanoparticles (NPs), which are colorless and reflect/scatter UV more efficiently than larger particles. Most available theoretical and experimental evidence suggests that insoluble NPs do not penetrate into or through normal or compromised human skin. Oral and topical *in vivo* toxicity tests suggest that TiO₂ and ZnO NPs have low systemic toxicity and are well tolerated on the skin. *In vitro* cytotoxicity, genotoxicity and photo-genotoxicity studies on TiO₂ or other insoluble NPs reporting uptake by cells, oxidative cell damage or genotoxicity

should be interpreted with caution, since toxicities may be secondary to phagocytosis of mammalian cells exposed to high concentrations of insoluble particles. Caution needs to be exercised concerning topical exposure to other NPs which have characteristics enabling either some skin penetration and/or have inherent toxic constituents. Studies on wear debris particles from surgical implants and other toxicity studies on insoluble particles support the traditional toxicology view that small particle toxicity is mainly defined by the intrinsic toxicity of particles as distinct from their particle size. There is little evidence supporting the principle that smaller particles have greater effects on the skin, other tissues increase or produce novel toxicities relative to micro-sized materials. Overall, the current weight of evidence suggests that nano-materials such as nano-sized vesicles or TiO₂ and ZnO nanoparticles currently used in cosmetic preparations or sunscreens pose no risk to human skin or human health. Other NPs may have properties that warrant safety evaluation on a case-by-case basis before human use.

REACH - To Panic or not to Panic?

Janet Winter Blaschke
International Cosmetics & Regulatory Specialists, LLC

European REACH is arguably the greatest industry-changing landmark legislation to affect our industry and the chemical industry in many years. While there can be differing interpretations, there is no question that the Cosmetic industry will have many new, very involved responsibilities.

New partnerships with suppliers will be a necessity, and that is only the beginning. This is a true situation that will require "thinking outside the box" by R&D, Quality Assurance, Regulatory Affairs and Management alike. Stay current on this ever-changing and complex topic by attending this latest update.

An additional presentation is scheduled but not finalized at this time.