

SOCIETY OF COSMETIC CHEMISTS

SCC

2011 SCC Annual Scientific Seminar

CosmeticBusiness 2011 is the exclusive b2b-trade fair for the international supplying industry for cosmetics

and therefore meeting point for the whole cosmetics market at the biggest market in Europe.

Date: June 2-3, 2011

Location: Bellagio Resort, Las Vegas, USA

Website:

http://www.sconline.org/website/JUN-2011_Meeting.html

SOCIETY OF COSMETIC CHEMISTS



2011 ANNUAL SCIENTIFIC SEMINAR HOSTED BY AREA III REGISTRATION MATERIAL

June 2-3, 2011, Bellagio Resort, Las Vegas

*Annual Scientific Seminar program arranged by the Society's Committee on Scientific Affairs
Karl Lintner, Ph.D., 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 are the Continuing Education courses on Wednesday, June 1st, COSA Mini Breakfasts and hotel accommodations. **A discount of \$25 off the seminar registration fee will be given if you register for the Full Seminar and a Continuing Education Course. One-Day registrations do not qualify for the discount.**

THURSDAY ONLY registration includes admission to the Technical Sessions, the Luncheon on Thursday, the Student Poster Exhibit, and the Suppliers' Cocktail Reception on Thursday evening. **FRIDAY ONLY** registration includes admission to the Technical Sessions, the Luncheon on Friday and the Student Poster Exhibit.

There will no Split Registration for the Annual Seminar.

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 (see registration form on page 15 for more information). 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 Wednesday, May 25th. Registrations received after this time will be treated as On Site and charged the higher fee. The National Office will ship all materials to Las Vegas on Thursday, May 26th and the office will be closed from May 27th through June 6th.

The Supplier's Cocktail Reception will be held on property at the Bellagio Resort.

HOTEL reservations should be made by May 2, 2011 directly with the Bellagio via phone (888)-987-6667. Please be sure to identify yourself as affiliated with the Society of Cosmetic Chemists (**Group Code: SCC11**) in order to get the group rate.

NEITHER THE SOCIETY NOR THE BELLAGIO ARE RESPONSIBLE FOR THE AVAILABILITY OF ROOMS FOR RESERVATIONS RECEIVED AFTER MAY 2nd.

ROOM RATES ARE AS FOLLOWS: Single/Double Occupancy: \$199

REGISTRANTS may pick up their registration material beginning Wednesday, June 1st 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 course registration material on Wednesday morning beginning at 8:00 a.m. outside the room scheduled for the session.

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 May 25, 2011 (see note above). Registrants will be included on the Pre-Registration List of Attendees after receipt of payment. Requests for refunds in writing and no later than May 6th will be granted, less a \$150 administrative fee. Registration fees are transferable to another registrant but not refundable after May 6, 2011.

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 IS NOT DISPLAYED, YOU WILL BE ASKED TO EITHER LEAVE THE SEMINAR SITE OR REGISTER FOR THE SEMINAR.

SCIENTIFIC SESSION A

THURSDAY'S PROGRAM, JUNE 2, 2011

9:00 a.m. – 11:30 a.m.

SKIN

Moderator — Howard Epstein, Ph.D., EMD Chemicals, Inc.

HENRY MASO KEYNOTE AWARD LECTURE SPONSORED BY THE HENRY MASO FAMILY AND SILTECH CORPORATION

Biomechanics of the Barrier Function of Human Skin: Predicting Skin Damage and the Effects of Cosmetic Treatments

Professor Reinhold Dauskard
Stanford University

The biomechanical properties of human skin are crucial in understanding the mechanical and biophysical function of skin, its cosmetic “feel” and appearance and plays a central role in skin damage processes like chapping and cracking. Daily exposure to variable temperature and moisture conditions, together with application of cleansing agents lead to the perception of skin “dryness” and “tightness”. However, the connection to the mechanical properties and stresses in the skin remains elusive due in part to a paucity of mechanical properties of the skin layers following such exposures.

Our objective has been to develop a suite of novel thin-film methodologies in which moisture and moisturizer effects on skin stiffness, stress and fracture resistance can be directly quantified. We have particularly focused on the outermost stratum corneum (SC) layer. We show how water loss determines SC drying stresses and is linked to hydration and chemical state of the SC components. Using a

combination of micro-tension, substrate curvature, bulge and delamination techniques, we show how a range of moisturizing molecules reduce drying stresses and alleviate skin damage. We show how drying stresses develop as a function of time and how they change following the application of classes of humecant, occlusive and emollient molecules. They included concentrations of the trihydroxylated humecants (glycerol) widely used as a hydrating agent, purified mixtures of occlusive hydrocarbons (petrolatum), a range of silicone homopolymers (dimethicone) at varying viscosities, and a range of ester based emollients.

We finally demonstrate how damage processes in human skin can be quantitatively modeled and predicted based on thin-film biomechanics and cracking processes. We believe that this represents a new approach to characterize and model the fundamental biomechanics of human skin.

Arabinoxylo-Oligosaccharide: A Lightening Active Ingredient with a New Mechanism of Action that Inhibits Melanogenesis Targeting Tyrosinase and TRP-1

Paolo Marchesi
Soliance US Corporation

OBJECTIVE: To study and understand the mechanisms of action of Arabinoxylo-oligosaccharide in the inhibition of melanogenesis (with an eye on the new scientific data) and validate its activity with *in vivo* results. For a long time, TRP-1, a major enzyme involved in melanogenesis was thought to have an activity DHICA oxidase and to be involved in the way of eumelanins formation. Now, thanks to new scientific data, it turns out that its activity remains true only in the murin model, but not in the human one¹.

In human model, TRP-1 seems to act on two levels of the melanogenesis:

At the level of tyrosine hydroxylation.

- This reaction is the limiting stage of the melanogenesis because it is a slow reaction. At low levels of tyrosine, TRP-1 has a Tyrosinase Hydroxylase activity that transforms tyrosine into L-DOPA. The increase of L-DOPA then activates the tyrosinase².
- At the level of the stabilization of tyrosinase. After the activation of the tyrosinase, TRP-1 forms a complex with tyrosinase to stabilize it and increase its activity³.

TRP-1 is involved in the first step of the melanogenesis: it is a key enzyme essential for the melanin synthesis.

Through this new data, the objective of our study was to understand the way of action of Arabinoxylo-oligosaccharide in the melanogenesis for the human model.

METHODOLOGY: Inhibition of melanogenesis by Arabinoxylo-oligosaccharide was initially evaluated by spectrophotometry on normal human melanocytes. The key enzymes of melanogenesis were then tested to understand which steps of melanin synthesis are inhibited by Arabinoxylo-oligosaccharides:

- tyrosinase activity was evaluated by spectrophotometry on human melanocytes in culture.
- TRP-1 activity was measured by immunolabelling on treated and irradiated skin explants

To confirm the results, skin luminosity of treated skin explants was evaluated by chromametry. Also clinical study on asian volunteers was done to observe lightening efficacy.

SCIENTIFIC SESSION A (continued)

RESULTS: Melanogenesis inhibition was measure at 80%. As a comparison, kojic acid (a reference for skin lightening) inhibits melanogenesis by 35,6%. Despite this, the inhibition of the tyrosinase appears to be quite low (25%) compared to kojic acid. At the same time, the inhibition of TRP-1 is as high as 88%. This confirms the preliminary idea on the mechanism of action of Arabinoxylo-oligosaccharide. Arabinoxylo-oligosaccharide also maintains the luminosity of the skin even when treated with UV.

The clinical study show significant and visible results, within only 28 days. *In vivo*, the molecule acts faster than arbutine to reduce mexametric index and skin pigmentation.

CONCLUSION: Arabinoxylo-oligosaccharide efficiently inhibits melanogenesis through its action on TRP-1 and tyrosinase which are involved in the first steps of melanin synthesis. This conclusion was confirmed by the new scientific data.

Soliance arabinoxylo-oligosaccharide, is also environmentally-friendly. This new lightening active ingredient combines innovation and efficiency to reduces age spots and lighten up the skin for a radiant complexion.

Imaging Quantification and Cosmetic Applications

David Boudier
Silab

OBJECTIVE: To show the different steps in our approach of the imaging quantification *in-vitro* or *in-vivo* by explaining and illustrating with concrete examples applied to the dermo-cosmetology.

METHODOLOGY: Indeed, 3 steps are essential in imaging quantification: acquisition, processing of images and statistical analysis of results.

Acquisition: recent developments in image detectors have made it possible to carry out new investigations of biological structures. Whatever the tool used, this first step has to be controlled to be sure that we are in reproducible and standardized conditions of acquisition. Illustrations will be shown regarding acquisitions by Fringe Projection, or Fluorescence microscopy.

Processing of images: the quality of acquired images gives the opportunity to analyze number of pertinent parameters. Image processing is the system of mathematically transforming an image, either to modify some characteristics or extract some feature. Image processing systems are necessary for a range of applications, such as enhancement, object detection and recognition, and noise reduction. In order for the algorithms used in this step to be maximally effective and reliable, it is indispensable to take multiple parameters into account, rarely included in standard software on the market. We thus developed, in partnership with specialists in imaging quantification of the University of Saint-Etienne, France (Professor M. Jourlin, Mr. Josselin BREUGNOT, Engineer) our own methods of image processing:

- We applied the LIP model (Logarithmic Image Processing — method discovered and published by the group of Pr M. Jourlin) to segment and quantify the rate of fluorescence in corneocytes lipids Nile Red stained.
- We also developed a processing of images acquired by Fringe Projection on the cheeks to quantify the pores size. This innovative approach is based on applying of Fourier transforms and was presented as podium at the IFSCC congress 2010.
- We investigated the quantification of parameters such as lines, wrinkles, intensity of the skin color, irregularities of brilliance, imperfections, skin clarity, and dark circles from images obtained with the VISIA CR®, enabling to set up different profiles of the skin complexion.

Statistic evaluation of results: Statistic is a mathematical science pertaining to the collection, analysis, interpretation or explanation, and presentation of data. Results presented were all analyzed and interpreted by statisticians.

RESULTS: Applying of the LIP Model and quantification of lipids covalently bound to the cornified envelop in the *stratum corneum*: this innovative, fast and non-invasive approach, enabled to evaluate the global content in lipids and the level of maturation of the *stratum corneum*. We reported that the rate of lipids decreased with age or in dry skin, leading to poor barrier repair after insults and reflecting disturbances of the epidermal homeostasis.

Quantification of pores size by Fringe Projection: the use of Fourier transforms in image processing leads to a correct repositioning between two time acquisitions. We demonstrated that this approach permits to obtain a minimal variation of 4.5% in the quantification of studied parameters, which is satisfactory and validates this novel approach.

Quantification of parameters from images obtained with the VISIA CR®: we developed methods for the quantitative assessment of lines, wrinkles, intensity of the skin color, irregularities of brilliance, imperfections, skin clarity, and dark circles. This approach enabled to define profiles of the skin complexion in accordance with sensorial evaluation of it. We have shown that age or cigarettes smoking affected differently the skin complexion and the different parameters studied.

CONCLUSION: Imaging techniques originally limited to a purely illustrative role can now be used in dermo-cosmetology in a more objective approach, especially for purposes of quantification. Recent progress involving both the quality and precision of image sensors, and the immense computer power now available on the market, are consistent with envisaging studies no merely qualitative, but quantitative. The step of image processing is essential to set up innovative approaches in imaging quantification for dermo-cosmetic purposes.

SCIENTIFIC SESSION B

Thursday's Program, June 2, 2011

1:30 p.m. – 4:00 p.m.

HAIR

Moderator — Joseph Dallal, International Specialty Products

Manipulating the Bulk Properties of Hair

Trefor Evans, Ph.D.
TRI-Princeton

OBJECTIVE: The activity of conventional hair care products is essentially restricted to the surface of the fibers. Shampoos act to clean the surface, while conditioning treatments leave behind deposits that provide lubrication. However, the size of surfactant, polymer and oils molecules likely precludes any significant penetration into the fiber bulk. Instead, manipulation of bulk properties would seem to necessitate small molecules that readily penetrate and interact with the complex internal structure.

Of course, the activity of so-called chemical treatments (e.g. permanent color, perms, relaxers, etc.) relies on the penetration of reactive materials; but the properties of hair can also be dramatically altered by non-reactive materials. By means of illustration, water is recognized to have a dramatic effect on the properties of hair, as molecules readily penetrate and adsorb into the structure to provide plasticization (softening) while also inducing swelling. As such, it appears reasonable to presume that other small molecules could have interesting effects. In 1964 Breuer published a series of papers describing the interactions of phenols with hair. Especially noteworthy was a mention (although no data was shown) that these molecules appeared to block water adsorption sites and consequently reduce the amount of moisture contained within hair. Thus, we are presented with a potential mechanism for manipulating the internal properties of hair.

The objective of this work has been to build on this earlier publication and demonstrate how small molecules can be used to produce quite dramatic changes in the internal properties of hair.

METHODOLOGY: Bulk changes in hair fibers have been tracked using well-established measurement approaches such as dynamic vapor sorption (DVS), Dia-stro tensile testing and differential scanning calorimeter (DSC). DVS allows for generation of adsorption isotherms that quantify the amount of water in hair as a function of the relative humidity. Changes in the moisture content of hair result in alteration of the mechanical properties; although the incorporation of certain small

molecules is also observed to induce plasticization. High pressure DSC experiments are frequently used to study the denaturing temperature of the crystalline alpha helical keratin within hair. This approach is often used as an indication of damage, as deleterious practices lead to a reduction in the temperature of this transition. However, unexpectedly (but consistently) we observe how soaking hair in solutions of certain small molecules can produce sizable increases in this temperature.

RESULTS: In accordance with the teachings of Breuer, soaking hair in a 5% resorcinol solution can significantly alter the adsorption isotherm for water and hair. However, the magnitude of this effect is dependent on the solution temperature and the time of soaking. As such, one concludes that penetration rates from an aqueous solution are also an important factor, where again size and functionality are expected to be important. This led to additional studies involving glycolic acid — being the smallest of the α hydroxy acids, while also being closely related to the well-known perm active, thioglycolic acid.

Results again revealed dramatic changes in the hair-water adsorption isotherms, together with significant plasticization of the hair structure and a sizable increase in the hair denaturation temperature. Therefore, there is again compelling evidence for seemingly non-reactive small molecules becoming incorporated in the hair structure and dramatically changing the internal properties. Potential mechanisms for his activity will be discussed, together with additional supporting experimental evidence.

CONCLUSION: Excluding the previously-mentioned, rather damaging chemical treatments, no current hair treatment/product actively sets out to influence the bulk properties of hair. Nevertheless, we are learning that small, seemingly-innocuous molecules are able to become incorporated into the hair structure and produce sizable effects. The ability to custom tailor these bulk properties — whether it is the fiber stiffness, water content, etc. — would seem to be novel and highly desirable.

Session B is continued on Page 5



SCIENTIFIC SESSION B *(continued)*

Maltodextrin Based Styling Polymers

*Michael Philbin, Ph.D., Anthony Adamo, Crystal Priester,
Norman Rackison, John Thomaides and Samuel Vona
AkzoNobel*

OBJECTIVE: This work is directed towards developing a styling polymer with a higher content of natural polymer, compared to the typical synthetic fixative polymers used in hair gels. Polyvinylpyrrolidone (PVP) and Polyvinylpyrrolidone/Vinyl Acetate copolymers (PVP/VA) are typically used as the fixative polymer in a hair gel. Polymerization of Vinyl Pyrrolidone in the presence of Maltodextrin was investigated.

METHODOLGY: Vinyl Pyrrolidone was polymerized under free radical conditions in the presence of two different Maltodextrins using water as the solvent. The ratio of the two Maltodextrins and VP was varied according to a Simplex Mixture Experimental Design. This included binary blends (center of edges) of each Maltodextrin with VP as well as ternary blends (axial check blends and the overall centroid) of the two Maltodextrins with VP. Hair gels containing each polymer composition were formulated in a Carbomer thickened system. Gel clarity evaluations were measured as turbidity using a Hach Turbidimeter. Stiffness on hair was evaluated by measuring the work required to bend a hair swatch treated with the hair gel using a mini tensile tester.

RESULTS: A mathematical model was determined for each response (hair gel turbidity and swatch stiffness) using Analysis of Variance (ANOVA) from the results of the hair gel testing. Based on the equation generated for each response from the ANOVA, a contour plot for each response relative to the polymer composition was generated. An overlay of the contour plots then determined polymer compositions that gave equal or better swatch stiffness, and equal or better clarity to PVP with a K value of 30. Polymer compositions meeting this performance criteria contained from 50%–68% Maltodextrin and 32% to 50% PVP.

CONCLUSION: Polymer compositions made by polymerizing Vinyl Pyrrolidone in the presence of Maltodextrin were developed that gave equivalent performance in a hair gel to PVP with a K value of 30. This indicates that a performance equivalent to commonly used synthetic polymers can be achieved from a more sustainable polymer having a natural component as a significant percentage of its composition.

Hair Setting with Hot Irons and Heat Activation

*Manuel Gamez-Garcia, Ph.D.
BASF Care Chemicals*

An analysis is made of the various factors involved in the process of hair setting with hot irons. The effects of temperature, water, solvents, and other ingredients on hair setting are evaluated. The role of moisture and the hair denaturation temperature are also analyzed. The experiments show that hydrogen bond breakage by water absorption and hydrogen bond reformation by fiber dehydration is predominant in the setting of hair at low temperatures. The low temperature setting process is fully reversible and is seen to change at high temperatures

suggesting a different hair setting mechanism. For instance, at high temperatures water is also needed for the setting of hair, however, the appearance of fiber super-contraction and the associated resistance to shape reversion indicates a different role for water. The experiments also show that the physical changes occurring in the hair cuticle sheath and cortex during the setting process do not necessarily reflect the hair setting efficiency.

Novel Cationic Cassia Polymers as Effective Conditioning Deposition Aids

*Carole Lepilleur, Duane Krzysik and Wing Li
Lubrizon Advanced Materials*

OBJECTIVE: The increased frequency of hair damage from various grooming techniques has created opportunities to design new products to improve hair conditioning.

High performance formulations are designed to provide enhanced hair conditioning through the use of cationic conditioning polymers to deliver actives. The performance of cationic conditioning polymers varies with respect to silicone and cationic polymer deposition efficiency, sensory and build-up potential. Efficacy also varies by hair type.

METHODOLOGY: Cassia hydroxypropyltrimonium chloride polymers are novel conditioning polymers that are effective deposition

aids. Cationic polymer deposition upon repeated washes was studied by a colorimetric method using Direct Red dye 80. Silicone deposition upon repeated wash cycles was studied by X-Ray Fluorescence. Multiple hair types were used in these studies.

RESULTS/CONCLUSION: The cationic cassia polymers demonstrated the ability to offer a unique sensory experience and enhanced performance, with improved silicone and cationic polymer deposition and improved wet and dry conditioning performance, regardless of hair type.

SCIENTIFIC SESSION C

Friday's Program, June 3, 2011

9:00 a.m. – 11:30 a.m.

GENOMICS

Moderator — Martha Tate, Ph.D., Kimberly-Clark Corporation

Using Human Genomic Microarrays in Personal Care

James V. Gruber, Ph.D.
Arch Personal Care Products

The advent of the mapping of the human genome and the subsequent advances in testing of skin cells using human genomic microarrays has offered opportunities to examine the influence of skin ingredients on skin cells in ways not previously seen. Current microarrays from companies like Agilent can contain upwards of 25,000 genes from the human genome. Recently, we published two studies that were efforts to look at the role of skin antioxidants on human skin cells (fibroblasts and

keratinocytes) and an opportunity to examine the influence of potent skin lighteners on melanocytes. This presentation will review the results of these studies in a comprehensive way, looking at the types of information that can be gleaned from such studies and how this information might help to design newer ingredients intended for skin and hair care applications.

The Role of Clock and sirt-1 in Chromatin Remodeling: A New Code of Entry for DNA Repair in Human Skin

Isabelle Imbert, Ph.D., C. Gondran, JM Botto, K. Cucumel,
G. Oberto, C. Dal Farra and N. Domloge
ISP Vincience

OBJECTIVE: To study and better understand the link between chromatin remodeling, metabolism and circadian control involved in gene expression and DNA repair.

METHODOLOGY: Immunocytochemistry and histochemistry to evaluate and compare expression of clock, bmal-1 and sirt1 on normal human skin and “*in vitro* aged human skin”; comet assays to study clock activity on DNA repair after UVB-induced damages; evaluation of cellular senescence by β -galactosidase staining; morphological and histological studies; clinical investigation by *in vivo* confocal microscopy.

RESULTS: Reduced clock and sirt1 expression was observed in “*in vitro* aged human skin”. Significant decrease of DNA damages (-81%) due to DNA repair activity of clock was evidenced. Reduction of sunburn cells was shown (-38%) by vivascope study. Increase of cellular longevity was observed through reduction of cellular senescence.

CONCLUSION: These studies provide new insights supporting the key role of clock and its tight modulation by sirt1 in controlling cellular functions such as DNA repair in human skin.

Global Metabolomics and Its Application in Product Development for Consumer Care

John Ryals, Ph.D.
Metabolon, Inc.

Biochemistry acts at the basal level of homeostasis and it is well known that both essential and non-essential compounds ingested or applied to the body interact with a number of metabolic pathways and functions and often influence health and wellness beyond the target. Global metabolomics is a powerful technology that provides a relatively complete picture of metabolism in biological systems. Metabolon has developed a robust metabolomics platform based on the combination of three independent chromatography platforms: ultrahigh performance liquid chromatography/tandem mass spectrometry (UHPLC/MS/MS²) optimized for basic species, UHPLC/MS/MS² optimized for acidic species, and gas chromatography/mass spectrometry (GC/MS). Following sample extraction, full scan mass spectrometry is carried out to record the retention time, molecular weight (m/z) and fragmentation spectra of all detectable ions/biochemicals present in the samples. Identification of the biochemicals in the experimental samples is achieved through automated comparison of the ion features in the

experimental samples to a comprehensive and proprietary chemical reference library. After data generation, integrated tools including statistical analysis, pathway mapping, and data visualization can rapidly provide powerful insights for understanding biological systems. The following case studies will be discussed:

Periodontal disease mechanism and biomarkers: Periodontal diseases, such as gingivitis and periodontitis, are characterized by bacterial plaque accumulation around the gingival crevice and the subsequent inflammation and destruction of host tissues. We performed a metabolomic analysis of gingival crevicular fluid (GCF) collected from healthy, gingivitis and periodontitis sites in human subjects. Statistical analysis of the data uncovered the complex host and bacterial interaction in biochemical pathways associated with inflammation, cellular defense, and tissue degradation. We further demonstrated in a clinical study that the disease associated biomarkers can be effective

SCIENTIFIC SESSION C (continued)

suppressed by triclosan containing toothpaste (Colgate Total), thus providing further confirmation for Colgate Total's therapeutic effects on gingivitis.

Aging study: To gain insight on metabolism related to aging, we analyzed plasma samples from an age- and sex-balanced cohort of 269 individuals. Of the more than 300 unique compounds that were detected, significant changes in the relative concentration of more than

100 metabolites were associated with age. Significant alterations in energy and lipid metabolism, as well as oxidative stress and amino acid catabolism were observed with increasing age. Similar metabolomic analysis was also carried out in skin biopsy samples. The biomarkers uncovered in these studies will be used in future analyses to determine the influence of topical interventions with personal care products, including skin care and hair (scalp) care formulations.

Oridonine and the Antioxydant Response Elements (ARE): A Study of the Coherence between Genomics, Protoemics and Clinical Results

Karl Lintner, Ph.D., Philippe Mondon, Ph. D.,
Nada Andre, and Emmanuel Poridot
Sederma

OBJECTIVE: To study the antioxidant and skin conditioning properties of oridonine using a combined approach of gene expression analysis, radical scavenging experiments, protein synthesis evaluation and *in vivo* skin assessment.

METHODOLOGY: Preparation and purification of oridonine from *Rabdosia rubescens*. Culture of human skin keratinocytes; full genome DNA array studies on oridonine incubated human keratinocytes. ORAC and DCFH protocols for antioxidant activity; fluorescence tagging and immunolabeling techniques (ELISA) and image analysis to detect Glutathion, MMP-1, collagen I, collagen III in both monolayer and 3D skin model protocols; quantification of melanin in human melanocytes; observation of melanosome phagocytosis in keratinocytes; evaluation of VEGF synthesis by ELISA; anti-irritant effect by HET-CAM methodology; clinical studies on 26 women to measure cutaneous melanin content, haemoglobin based redness and collagen distribution by VISIA® and SIAscope® systems and echography.

RESULTS: Oridonine (extracted from *Rabdosia rubescens*) stimulates all genes involved in the antioxidant response element (ARE). The genes coding for cell detoxification enzymes (GSTM1, GPX2, GCLC) are overexpressed. Furthermore, Nrf2 protein and MAFG expression increased which contribute to prolonging the survival of cells subjected to severe oxidative stress. All enzymes and cofactors necessary for Glutathion synthesis (the major endogenous antioxidant molecule) are stimulated by incubation with oridonine. Remarkably, also anti-inflammatory enzymes HMOX1 and NOQ1 which equally protect against oxidative stress, are augmented by oridonine. Both a-cellular

and cellular experiments on human keratinocytes confirm the strong antioxidant protective property of oridonine, the increase in glutathione (GSH) concentration and the overall anti-inflammatory effects: 40-70% reduction in VEGF, PGE2, IL6 and IL8, a 23% reduction in intracellular H2O2, 66% increase in glutathion, 43% reduction of MMP1, a strong effect on pigmentation that is usually related to oxidation and inflammation: 45% reduction in melanin, 34% reduction in keratinocyte/melanosome phagocytosis; all constitute the molecular basis (all values are $p < 0.05$ or $p < 0.01$) for the subsequent clinical observations: dermal collagen density (echography) and homogeneity increase by 13% ($p < 0.01$) and 5.15 base points (SIAscope, $p < 0.05$) respectively; melanin lentigines and superficial redness (VISIA and SIAscope methods) all decrease by roughly 10% ($p < 0.05$) in a panel of 26 subjects over 2 months. Quantitative and visible results are in good correlation and in agreement with the *in vitro* observations.

CONCLUSION: It becomes increasingly important to correlate *in vitro* data and mechanisms with clinical results of cosmetic claims with credible, coherent and logical argumentation. When a substance is shown to increase some gene expression, one expects proteomic experiments to reflect the genetic activity, at least partially, and both together should be able to explain changes in skin condition observed in a clinical trial. The above study on oridonine illustrates this approach, as both literature data plus new genomic analysis, proteomic experiments and a 26 subject panel study (vehicle controlled) with pertinent instrumental analysis lead to concordant results.

The Beauty in Synchrotron Light

Vivian Stojanoff, Ph. D.
Brookhaven National Laboratory

Synchrotron radiation facilities worldwide have contributed to the better understanding of the effects of cosmetic products to skin, hair and nails. Synchrotron light is used today to characterize, analyze, and monitor chemical components, pigments, additives, formation of gels and emulsions, storage effects, etc. In her talk Dr. Vivian Stojanoff will discuss the available techniques that are particularly well adapted to the analysis of the molecular structure, chemical analysis, and imaging. From the analysis of ancient Egyptian cosmetics to hair samples from

native Siberian tribes to today's studies of how best to prepare the most efficient emulsions synchrotron light in the form of infrared, ultraviolet and x-ray light has provided value information to the cosmetic scientists world wide. At Brookhaven National Laboratory the National Synchrotron Light Source (NSLS) will soon be replaced by a bigger and better synchrotron light source (NSLSII). This new giant machine will be 10,000 times brighter than the original NSLS and allow the study of minute details in such particles as nanoparticles.

SCIENTIFIC SESSION D

Friday's Program, June 3, 2011

1:30 p.m. – 4:00 p.m.

SUN

Moderator — Robert Bianchini, Ph.D., Merck Consumer Care

Evaluation of Photo-Toxic Effect of Fractionated Melanin: A Comparative Study between Three Different Cell Lines

Nava Dayan, Ph.D., V. Rai and Professor Bozena Michniak-Kohn
Lipo Chemicals and Rutgers University

OBJECTIVE: To investigate the *in vitro* phototoxic effect of fractionated melanin (FM, INCI name: Melanin) and chlorpromazine HCl (CPZ) (positive control) in three different cell lines: mouse embryonic fibroblast cell line (Balb/c 3T3) (the line recommended by Organization for Economic Cooperation and Development — OECD), human primary dermal fibroblasts (HDF) and primary human keratinocytes (HEK_n). The human derived cell lines were selected in order to correlate data obtained from the mouse fibroblast cell line (Balb/c 3T3) and explore the possible replacement of animal with human derived cell lines.

METHODOLOGY: Stock solutions of FM and CPZ were prepared in dimethyl sulfoxide (DMSO) and final dilutions were performed in HBSS. Cell were seeded in 96 well-plates at a density of 8×10^3 cells/well and exposed to different concentrations of FM and CPZ (2000, 632, 200, 63.2, 20, 6.32, 2 and 0.632 $\mu\text{g/ml}$) in presence (HEV/UVA+ conditions) and absence of light (HEV/UVA- conditions). HBSS containing 1% DMSO served as a negative control. After addition of the solutions, the plates were incubated for 60 minutes at 37°C and 5% CO₂. After 60 minutes, the plates were exposed to solar radiation (SOL 500 lamp equipped with a H1 filter; Honle, Martinsried, Germany) of 4.08mW/cm² (measured using a calibrated UV meter type 16501; Honle, Martinsried, Germany) for 50 minutes through the plate lid leading to a cumulative dosage of 12.24 J/cm². Cellular viability was measured using Neutral Red Uptake assay and data obtained from spectroscopic analysis was then incorporated into Phototox software version 2.0. The software generates graphs for cellular viability vs.

concentration of test compounds under light and dark conditions thereby generating values of EC₅₀, Photo Irritation Factor (PIF) and Mean Photo effect (MPE). Digital images of the cells were also taken at predetermined time intervals during the experiment.

RESULTS: The mean toxic concentration (MTC) for CPZ without light exposure conditions was found to be similar in both Balb/c 3T3 (36.25 $\mu\text{g/ml}$) and HEK_n (39.99 $\mu\text{g/ml}$) showing that cells exhibit similar responses when not exposed to irradiation. However, Balb/c 3T3 showed more sensitivity to CPZ at HEV/UVA+ conditions (MTC = 0.87 $\mu\text{g/ml}$; mean PIF= 55.33; MPE =0.395) when compared to HEK_n (MTC = 5.35 $\mu\text{g/ml}$; PIF= 7.61; MPE =0.276) suggesting that this should be the preferred cell line for phototoxicity evaluations. In HDF, the graphs for light and dark conditions due to exposure of CPZ and FM was found to be overlapping (showed little difference) resulting in low mean PIF of 1.03 and 0.54 respectively. The overall sensitivity of the HDF cells was also found to be relatively lower (lower EC₅₀ values) compared to Balb/c 3T3 and HEK_n.

CONCLUSIONS: Our results show that cell lines - Balb/c 3T3 and HEK_n showed sensitivity to phototoxicity, while HDF showed little difference between light and dark conditions for positive control, CPZ. FM did not show signs of cytotoxicity or phototoxicity in both sensitive cell lines - Balb/c 3T3 and HEK_n. Our data further support the current guidelines recommendations to use Balb/c 3T3 cell line. In order to replace it with a human derived cell line, additional work needs to be done in the more sensitive HEK_n model.

Stimulation of Skin Immunity and Langerhans Cells Protection Dramatically Reduces UV-Induced Skin Erythema and TEWL

Giorgio Dell'Acqua, Ph.D.
Induchem AG

OBJECTIVE: Skin defense and reactivity involve production by keratinocytes of innate immunity proteins. These proteins, also expressed on skin Langerhans cells, help the skin reacting to environmental aggressions and repairing damage. In order to identify natural molecules capable to stimulate and to protect skin's immunity and Langerhans cells, we followed preliminary suggestions from the scientific literature on the immune modulatory activity of low-mid MW polysaccharides and we carefully characterized a middle MW polysaccharides fraction extracted from Tamarindus Indica. We further decided to combine our polysaccharides fraction with glycoside stevioside (also know for its immune modulatory properties) and to test this combination in inducing an immune activation in normal human keratinocytes and in human Langerhans cells. We finally correlated the data with skin soothing (measured by erythema decrease) and trans-epidermal water loss (TEWL) in a UV-stressed human panel clinical study.

METHODOLOGY: Normal human keratinocytes were used to detect skin immunity markers (cathelicidin, defensin beta 4, HO-1, Toll like receptor 2, S100A7) by gene expression profiling using RT-qPCR technology. Full thickness human skin explants were used to quantify Langerhans cells protection from UV-induced depletion (UVB 1500 mJ/cm²). Langerhans cells were detected by immuno fluorescence (CD11a-FITC antibody) and counted. A double blind clinical study on human volunteers (n=25) was run to compare a water based gel placebo to the gel containing 3% of the polysaccharide fraction + stevioside complex (ingredients complex) after UV-induced erythema and TEWL at 24 hours and 48 hours after irradiation (1.25xMED). Statistical analysis of the data was performed.

RESULTS: Treatment with the ingredients complex at doses as low as 0.03% stimulated in human keratinocytes skin immunity markers mRNA synthesis (defensin beta 4 +127%, HO-1 +51%, S100A7 + 48%).

SCIENTIFIC SESSION D (continued)

This effect was dose dependent. In human skin explants treatment with the ingredients complex at 0.04% protected Langerhans cells (LS) from UV-induced depletion (63% protection vs irradiated untreated control; 3 different studies, n=42/condition). As positive controls, Beta Glucan protected LS at 51% and an SPF30 formulation at 67%. All data were statistically significant vs irradiated untreated control ($p < 0.01$, Student's t test). Finally, in a clinical study the ingredients complex reduced by 59% UV-induced erythema and by 68% TEWL after 48 hours from irradiation. These data were highly significant vs a placebo treatment ($p < 0.001$, Student's t test).

CONCLUSION: We demonstrated that by using a complex of natural ingredients it is possible to boost in cellular models skin's innate immunity markers and to protect significantly Langerhans cells from UVB-induced damage. These data confirms the properties of mid MW polysaccharides and stevioside as immune modulatory agents.

Interestingly Beta Glucan known for its effect on skin immunity was not as effective as the ingredients complex and an SPF30 reference cream was not fully protecting UV-induced LS depletion. The data suggests the possibility of this natural ingredients complex as possible booster for skin immunity stimulation and as an adjuvant in modern SPF formulation to better protect LS cells, that are essential to detect skin environmental aggressions. Our clinical data correlate this effect observed on skin models to the soothing capacity of the ingredient complex at 3% in reducing significantly and dramatically UV-induced erythema and TEWL in human volunteers. Since UV-irradiation is commonly associated to immuno suppression it is possible that the soothing effect observed is related to the immuno stimulating properties of the ingredients complex that bring an overall healing effect. The complex can therefore be suggested for day and for sensitive skin products applications and as a potential adjuvant for sun prevention treatment in modern sun care formulations.

Complimentary *In Vitro* Models to Investigate the Mode of Action of Active Ingredients on the Protection of Extracted Epidermal Stem Cells against Different Types of Stresses

Sandy Dumont, Ph.D., Laetitia Cattuzzato, Cindy Sanchez,
Ambre De Pooter and Mickaël Puginier
SEPPIC

INTRODUCTION: Epidermal stem cells (ESC) are necessary for epidermis renewing. These cells are also known to be particularly resistant to different types of apoptosis: UV-induced cell death, oxidative stress-induced apoptosis or anoikosis (a particular apoptosis resulting from loss of adhesion to extracellular matrix). However, such a resistance can be impaired under a high level of stress. Thus, some models have been developed to extract ESC from epidermis, to culture them and to investigate their specific functions such as colony-forming capacity or their sensitivity to oxidative stress.

Survivin, an anti-apoptotic protein, has been shown to be specifically expressed in the nucleus of ESC, among an extracted population composed of ESC, transitory-amplifying cells and differentiated keratinocytes.

The purpose of this study was, first, to develop new *in vitro* models to investigate ESC response after these different types of stresses and, second, to investigate the preventive effect of active ingredients. We particularly focused on Cocoyl alanine (CA), an antioxidant and anti-wrinkle cosmetic product. Indeed, previously obtained results suggested that it was able to protect elderly skin explants from *ex vivo* culture-induced decrease in survivin expression within epidermis.

MATERIALS AND METHODS: First, to confirm the phenotype of extracted and cultured cells, expression of the different ESC-associated markers was investigated by immunofluorescence.

Then, influence of H_2O_2 (50 μM , 18h) on ESC was investigated by measuring the size of ESC colony after hematoxylin-eosin staining. The protective role of CA was compared with that of α -tocopherol, a well-known antioxidant molecule which had previously shown to be able to protect ESC from oxidative stress.

Influence of UVB (200 mJ/cm^2) on ESC was investigated by calculating the proportion of p63 (transcription factor)-positive cells after immunocytochemistry experiments. The protective role of CA was compared with that of interleukin (IL)-1 β , which is known to prevent UVB-induced decrease in p63 expression. Whether such protective roles were mediated by the Nerve growth factor (NGF)-signalling pathway or not was investigated by decreasing the level of UVB irradiation (50 mJ/cm^2), while adding a Tyrosine kinase (Trk) inhibitor, K252a (200 nM).

Influence of anti-integrin $\beta 1$ blocking antibody-induced anoikosis was investigated by calculating the proportion of survivin-positive cells after immunocytochemistry experiments and the protective role of CA was also investigated.

In the three aforementioned models, TUNEL assays (cytochemistry experiments) were performed to quantify the level of apoptosis.

RESULTS AND DISCUSSION: First, as expected, extracted and cultured cells expressed the ESC-related marker MCSP (*Melanoma Chondroitin Sulfate Proteoglycan*) and showed a high level of integrin $\beta 1$ expression. Conversely, as described in the literature, they did not express the gap-junction related marker Connexin 43. Thus, taken together these results showed that the extracted cell population was actually mainly composed of ESC.

In the first model, a decrease in colony size could be observed after H_2O_2 treatment of ESC, while both α -tocopherol and CA partially limited such effects.

Continued on Page 10.

SCIENTIFIC SESSION D *(continued)*

In the second model, a decrease in the proportion of p63-positive cells could be observed after UV irradiation of ESC, while both IL-1 β and CA partially limited such effects. Conversely and as expected, when ESC were irradiated with a lower UVB dose, inhibition of the NGF-signalling pathway (K252a treatment) was necessary to induce an increase in apoptosis (TUNEL positive-cells).

In the third model, a decrease in survivin expression could be observed after anti-integrin β 1 antibody treatment of ESC.

Thus, the three models of stresses could be validated on cultured extracted ESC, the complementary analysis of apoptosis events being under process.

CONCLUSION: In conclusion, three different kinds of models could be validated to evaluate the effect of oxidative stress, UV and loss of adhesion to extracellular matrix on ESC apoptosis. Such models also enable the study of the protective ability of cosmetic active ingredients, such as CA, its effect on the last kind of stress being under investigation. Intracellular signalling pathways regulating such effects could be more precisely investigated by studying phosphorylation events and transcription factor activities. In the future, complementary experiments enabling a better understanding of the *ex vivo* culture-induced decrease in survivin expression and of the mode of action of CA would be of a great interest.

Using Light Diffusion to making Anti-Aging Claims

Nick Morante

Nick Morante Consultants

OBJECTIVE: This talk will focus on the methods by which anti-aging claims can be made by using light diffusion and other methods of alteration of visible light. It will explain that these claims can be made without the use of expensive and sometimes sensitizing active ingredients.

METHODOLOGY: The use of certain ingredients, including color additives, can alter visible light in such a way that the skin appears different and in some cases, "younger". The main function of cosmetic products is to beautify. A secondary and just as valuable function of a cosmetic is to hide unwanted skin defects, coloration, spots, etc. This can be done by using ingredients that alter the physical properties of visible light, making these undesirable skin issues less apparent.

RESULTS: Objects, color, skin defects are all stimuli that can be observed by the human eye as long as visible light is reflected off them directly to our eyes. With that in mind, a cosmetic product was prepared using an ingredient that diffuses and scatters visible light so as to reduce the actual reflection back to the observer. The observer here being the

human eye or a spectrophotometer. Control batches were also prepared and evaluated along side the test material. A spectrophotometer was used to 'qualify' (not so much quantify) the differences in spectra between bare skin and skin treated with the various cosmetic batches containing the test ingredients.

CONCLUSION: The use of light diffusing ingredients alters visible light in such a way that many of the direct rays are scattered, transmitted and diffused so as to significantly reduce the direct light reflected back to an observer. This reduction in direct reflection reduces the appearance of skin defects, spots or color (including fine lines and wrinkles) as they are not seen as much. This reduction in the appearance of skin defects is the exact claim that is being made for many anti-aging products on the market today. The significance of using a spectrophotometer is that differences in reflectance on skin can be measured and compared on untreated skin and skin with a suitable light diffusing cosmetic product showing that such a claim is justified by utilizing light diffusing techniques.



COSA MINI BREAKFAST SEMINARS

Thursday, June 2, 2011

7:30 a.m. – 8:50 a.m.

A. Quantitative Measurement of “Well Being”

Karl Lintner, Ph.D.

Kal’dees Beauty Ideas

We all agree that the use of a quality cosmetic product affords a sensation of pleasure, of feeling good. Cosmetic products, including perfumes, make-up and skin care, exert — in addition to functional and biological effects — a certain psychological impact on the users.

New techniques are now becoming available to study and quantify these benefits, over and beyond the biophysical measurements of skin moisture, wrinkle depth or elasticity. These new quantitative methods range from using sophisticated questionnaires to sleep analysis, from posture evaluation to skin electrodermal response curves (lie-detector), from brain scans to mydriasis (eye measurements), from speech analysis to Prosody and Stroop tests (vigilance), all potentially employed to determine the (positive) effect of applying make-up or using a well formulated skin care cream.

Cosmetic products, often by detractors stigmatized as useless, futile, over-hyped, can thus be shown to have mental and/or overall measurable and quantifiable health benefits that for too long time have been overlooked without any reference to physiological or pharmacological activity that might get them classified as drugs.

B. cGMPs for Cosmetics

Joseph Albanese

3V, Inc.

The intent of the mini breakfast is to introduce the basics of Good Manufacturing Practices and other issues related to product quality assurance. It is designed to assist those formulating chemists working in product development who are new to the industry. It is especially useful to persons involved with the scale-up process from lab to full production commercialization for the first time and the guidelines intended to assure first pass quality.

- History of Government Regulations — TOSCA, GMP, etc
- Code of Federal Regulations; 21 CFR — Parts 210 and 211
 - General provisions
 - Organization and Personnel
 - Buildings and Facilities
 - Equipment
 - Control of Components
 - Production and Process Controls
 - Packaging and Label Controls
 - Holding and distribution
 - Laboratory Controls
 - Records and reports
 - Returned and salvaged drug products
- Auditing
 - Internal Self-Audit
 - FDA Inspections
- Comparison of cGMP, ISO, CTFA Guidelines, GLP



BREAKFAST SEMINARS
continued on Page 12





COSA MINI BREAKFAST SEMINARS *(continued)*

Friday, June 3, 2011

7:30 a.m. – 8:50 a.m.

C. How to Do a Patent Search

Tony O'Lenick
Siltech, LLC

Patents have become an increasingly important part of the process we use to develop products in our industry. In fact most projects start with a patent search and review of the art. Established in the U.S. Constitution, patents contain information that can be used by the scientist to make streamline the development process.

Patents remain one of the most valuable documents that can be used to shape new technology. They define what can be sold and what can be subsequently patented.

WE WILL EXAMINE:

- Define what is available for searching using resources primarily the USPTO (United States Patent and Trademark Office);

WE WILL:

- Use the data base to define the history of a representative technology to illustrate how to use the data base;
- Show the steps that have been taken by various inventors through issued patents to develop technology;
- Recommend how subsequent steps might be taken.

This presentation is intended for scientists to demonstrate steps they can take using patent literature. Since the presenter is not an attorney, no opinions on patentability or freedom to operate can be offered.

STUDENT POSTERS

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.





CONTINUING EDUCATION PROGRAMS *

INTRODUCTION TO COSMETIC FORMULATIONS

Instructed by Art Georgalas

Wednesday, June 1, 2011 * 9:00 a.m. – 5:00 p.m.

COURSE OUTLINE

Who should take this course: Anyone interested in the formulation of personal care products with an emphasis on emulsions, sunscreens and surfactant based products. Both seasoned and beginning product development formulators and support scientists will benefit from the discussions.

OVERVIEW

1. Personal Care Product Categories
2. Ingredient Overview
3. Stability/Safety Parameters
4. Claims Substantiation

COMMON ELEMENTS

1. Preservation
2. Raw Material QC
3. INCI Labeling, Drug Vs. Cosmeti

EMULSIONS

1. Theory
2. HLB
3. PIT/LEE/Mfg
4. Raw Materials
 - a. Thickeners
 - b. Emulsifiers
 - c. Emollients
 - d. Humectants
5. W/O, W/O, W/O/W
6. Liquid Crystal

SUNSCREENS

1. Regulations
2. Technology
3. Chemistry
4. Evaluation
5. Formulation

TOILETRIES PRODUCTS

1. Bath Oils
2. Cleansers
3. Deodorants, Antiperspirants etc.

TOILETRIES & HAIR CARE

1. Bath Oils
2. Cleansers and Conditioners
3. Deodorants, Antiperspirants etc.

WRAP-UP & QUESTIONS

ADVANCED HAIR CARE

Instructed by Robert Lochhead, Ph.D.

Wednesday, June 1, 2011 * 9:00 a.m. – 5:00 p.m.

COURSE OUTLINE

This course will commence with a review of hair structure, chemistry and properties in order to lay a foundation for understanding the functions of hair care products and the properties that they confer. Many of today's products are multi-functional and the physical and chemical principles that underpin each of the functions will be considered in the following order:

CLEANSING SYSTEMS

1. The function and role of surfactants, cosurfactants and hydrotropes
2. The mechanisms of delivery systems from rinse-off applications.
3. Trends in cleansing systems.

CONDITIONING

1. What is conditioning and how is it manifested?
2. Fundamental mechanisms of conditioning by surfactants and polymers
3. Trends in conditioners.

HAIR STYLING:

1. A review of the forms of styling products and their relative advantages.
2. Styling polymers — the history of hair fixing polymers and the current trends

THE CHEMICAL TREATMENT OF HAIR:

1. Hair coloring
 - a. The methods and the compositions and trends in the coloring of hair
 - b. Relaxation and perming
 - Trends in the treatment of ethnic hair

MIXING IT UP!

1. A review of multi-functional systems and how they work.

The course will conclude with an overall assessment of where we have been and where we are going in hair care products and methodologies.

SPECIAL DISCOUNT — Individuals that register for a Continuing Education Course at the Bellagio as well as register for the Annual Scientific Seminar (full registration only) may deduct \$25 off the meeting registration fee.

* The course registration fee includes Continental Breakfast and lunch on the day of the course.



PLANNING YOUR TRIP

The Bellagio Resort offers close to 4,000 room accommodations and is a AAA Five Diamond Award-winning Resort in the heart of Las Vegas Boulevard. Dining selections include:

- **Circo** — Offering Upscale Tuscan from the Maccioni Family
- **Fix** — Offering American Cuisine in a magnificent restaurant of Costan Rican Padouk wood.
- **Jasmine** — Chef Philip Lo offers exotic Cantonese, Szechwan and Hunan dishes.
- **Le Cirque** — Offering French Cuisine in a whimsical atmosphere by Sirio Maccioni.
- **Michael Mina** — Offers innovative dishes from Chef Michael Mina.
- **Noodles** — Chef Patrick Lee offers authentic regional noodle dishes from Thailand, Japan, China and Vietnam.
- **Picasso** — Chef Julian Serrano's menu is inspired by the regional cuisines of France and Spain.
- **Prime Steakhouse** — Indulge in Prime Steak, seafood and lamb from famed Chef Jean-Georges Vongerichten.
- **Sensi** — Offers culinary creations of four complementary cuisines (Italian, Asian, American and Seafood) from Chef Martin Heierling.
- **Todd English's Olives** — Mediterranean Style restaurant from Chef Todd English is set against the breathtaking backdrop of Lake Bellagio
- **Jean-Philippe Patisserie** — World Pastry Champion and Chef Jean-Philippe Maury displays his artistic genius daily in this truly European-style pastry shop.

Other amenities include 5 outdoor pools, the Fountains of Bellagio, Conservatory and Botanical Gardens, exclusive shops and "O" by Cirque du Soleil.

For more information on Bellagio please visit:

www.bellagio.com

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2011 ANNUAL SCIENTIFIC SEMINAR

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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:
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Full Registration — Member	\$600.00	\$650.00	\$ _____
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Thursday Only Registration — Member	\$500.00	\$550.00	\$ _____
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Friday Only Registration — Member	\$400.00	\$450.00	\$ _____
Friday Only Registration — Non-Member	\$520.00	\$570.00	\$ _____
Student (Full-Time) Registration	\$200.00	\$200.00	\$ _____

* The Onsite Full Registration Fee will be \$750 for members and \$850 for non-members. The Thursday Only Onsite Fee will be \$600 for members and \$700 for non-members.
 The Friday Only Onsite Fee will be \$500 for members and \$600 for non-members.

CONTINUING EDUCATION PROGRAMS

Wednesday, June 1, 2011 * 9:00 a.m. – 5:00 p.m. * Courses are limited.

Cosmetic Formulations	Member	\$300.00**	\$ _____
	Non-Member	\$400.00**	\$ _____
Advanced Hair Care	Member	\$300.00**	\$ _____
	Non-Member	\$400.00**	\$ _____

** If you register for the Full Seminar and a Continuing Education Course you may deduct \$25 from the Seminar Registration Fee above. This discount does not apply to one day registrations.

COSA MINI-BREAKFAST SEMINARS

Thursday	A. Quantitative Measurement	\$45.00	\$ _____
	B. cGMPs for Cosmetics	\$45.00	\$ _____
Friday	C. Patent Search	\$45.00	\$ _____

You must register for the seminar in order to register for a mini breakfast.

PAYMENT INFORMATION

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2011 ANNUAL SCIENTIFIC SEMINAR

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