

# SOCIETY OF COSMETIC CHEMISTS

The logo for the Society of Cosmetic Chemists (SCC) features the letters "SCC" in a bold, white, sans-serif font, centered within a dark blue rectangular box. A horizontal line passes behind the box, extending across the width of the logo area.

## ANNUAL SCIENTIFIC SEMINAR REGISTRATION MATERIAL

June 4-5, 2009, Chicago Hilton

*Annual Scientific Seminar program arranged by the Society's Committee on Scientific Affairs  
Mindy Goldstein, 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 3rd, 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. 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 assigned. **All split registrants must state the day on which each registrant will be attending.** Split registration will be accepted until May 22nd. There will be no split registration accepted at the door.

**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 (\$750 for members and \$850 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 28th. Registrations received after this time will be treated as On Site and charged the higher fee. The National Office will ship all materials to Chicago on Friday, May 29th and the office will be closed from June 1st through June 8th.**

The **Supplier's Cocktail Reception** will be held on property at the Chicago Hilton.

**HOTEL** reservations should be made by May 2, 2009 directly with the Chicago Hilton online via a dedicated website link for the Society's Seminar at:

<http://www.hilton.com/en/hi/groups/personalized/CHICHHH-SCC-20090602/index.jhtml>

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

Room Rates are as follows:

Single/Double Occupancy: \$254

**SPECIAL RAFFLE:** For all attendees who pre-register for the Annual Scientific Seminar and also stay at the Chicago Hilton (reservation must be made in attendee's name), you will be eligible to win \$1,000. Names of qualifying attendees will be placed in a drum and the winner will be announced at one of the luncheons once the reservation is confirmed with the Chicago Hilton. So be sure to make your reservation to be eligible!!!

**REGISTRANTS** may pick up their registration material beginning Wednesday, June 3rd 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 mailing 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](http://www.sconline.org).

### POLICIES

Pre-Printed badges will be made available only to those who register prior to May 29, 2009 (see note above). Registrants will be included on the Pre-Registration List of Attendees as long as payment is received on or before May 26, 2009. Requests for refunds in writing and no later than May 8th will be granted, less a \$150 administrative fee. Registration fees are transferable to another registrant but not refundable after May 8, 2009.

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.**

## THURSDAY'S PROGRAM, JUNE 4, 2009

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

## ANTI-AGING

*Moderator – Mindy Goldstein, Ph.D., Estee Lauder Companies***Keynote Speaker****The Influence of Sensory Perception on Consumer Perceptions of Liking and Performance***Gail Civile  
Sensory Spectrum*

The sensory properties of personal care products, hair care, skin-care, and cosmetics, drive consumer perception of liking, benefits and performance. Descriptive Analysis panels (trained experts) provide the documentation of products, prototypes, and competition to determine the range of sensory variables that describe and differentiate products in a product category. When this descriptive documentation is tied to consumer responses - liking, efficacy, mood and performance - the product developer has clear direction to develop products that deliver sensory signals that enhance the perception of the effects of the product's active ingredients.

Claims of anti-aging or reduced wrinkles can be augmented by the correct selection of fragrance, rub out and residue properties that signal and confirm the anti-aging claims. Examples are provided of case studies that demonstrate sensory signals that reinforce a product's consumer perceived benefits.

**Phytochemical Fermentation: A Natural Way to Fuse Plant Chemistry and Microbiology to Potentiate Skin Care Activity***Smitha Rao, Judith Bernabe, James V. Gruber, Ph.D.,  
Lisa Bouldin and Maria Dominguez  
Arch Personal Care*

**OBJECTIVE:** Topical applications of botanical extracts has been and continues to be a very actively growing area of ingredient development. In addition, topical application of yeast fermentation extracts has shown a significant amount of benefits for many years. Much the way fermentation of grapes can enhance the benefits of the grape by making wine, it might be anticipated that the fermentation of unique phytochemicals such as, for example resveratrol, can synergistically potentiate the benefits of both the yeast and the botanical phytoactive.

**METHODOLOGY:** Pichia Pastoris fermentation of resveratrol was examined to see what the influence of exposing actively growing yeast cultures to an important phytoactive can have on topical benefits to skin. Yeast microarrays were employed to examine how resveratrol influences the yeast protein expression and to determine the optimum level of resveratrol to add to the growing cultures. Topical application of the fermented resveratrol to full thickness tissues was conducted and human microarrays and ELISA protein assays were employed to examine important cutaneous targets of interest.

**RESULTS:** Studies demonstrate that Pichia pastoris will employ resveratrol as a metabolite. Yeast microarray analysis demonstrates that overall protein expression from the resveratrol-treated yeast increases nearly six-fold and over 96 proteins are seen upregulated (2D-gel electrophoresis). Topical application of optimized resveratrol ferment to human full thickness tissue demonstrates, through genomic and protein assays, strong influence on the inflammatory mediator Cyclooxygenase 1 (COX1) and upregulation of a critical dermal-epidermal junction protein, Collagen IV, which is known to bind keratinocyte stem cells in the skin.

**CONCLUSION:** In vivo test results support the in vitro test results showing anti-inflammatory and anti-wrinkle benefits. Fermentation of plant bioactives appears to be a very promising way to enhance the benefits of both yeast ferments and botanical phytoactives.

## Novel High Performance Wrinkle Corrector Capable of Gene Expression Modification Related to the Causes of Cell Aging

Carla Perez, Sandy Dumont, Ph.D.,  
Laetitia Cuttuzzato and Corinne Stolz  
SEPPIC

**OBJECTIVE:** To demonstrate the unique ability of Palmitoyl Glycine (PG), a lipoaminoacid, in the rejuvenation of the cell phenotype through inflammation reduction, improvement and organization of the extra cellular matrix, and radiance boosting; and to confirm the actions of PG in slowing the aging mechanism.

**METHODS:** The efficacy of PG was studied on the in-vitro models of young and accelerated aged fibroblasts, cultured endothelial cells, skin explants and in vivo on volunteers.

In the fibroblast tests, DNA minichips (screening of 149 genes) were analyzed for gene variations and q-PCR (quantitative polymerase chain reaction) measured the effect of PG on the gene expression. These tests examined inflammatory aging through the reduction of IL-6 (interleukin-6); the construction improvement of collagen fibers with the synthesis of pro-collagen 1 and the increase of TNC and DPT (tenacin C, dermatopontin, two proteins involved in the collagen fibers organization); and the maintenance of the ECM with the reduction of MMP-1 anti-collagenase activity, and the increase of the MMP inhibitor, TIMP-2.

With the endothelial cells, the influence of PG on the formation of new blood vessels was investigated in relation to the improvement of the micro vascular network. On a skin model, the luminosity was assessed with a colorimeter after 14 days of PG treatment to see the effect of complexion radiance and redness reduction correlated to inflammation.

With in vivo studies, the effect of PG in comparison to an anti-aging lipopeptide was confirmed in a clinical trial on volunteers with 42 days treatment to gauge the number of medium to deep wrinkles using a replica of crow's feet through Silflo gel and Quantrides software.

**RESULTS:** On a molecular level, PG induced a reduction of inflammation factors, the synthesis and organization of collagen fibers, and a decrease in degradative elements to the ECM resulting in claims of 3-15 years gain on a youthful phenotype. To improve cells oxygenation, PG induced an increase in the microvascular network correlated to an increase in skin luminosity without any increase in redness. With the in vivo tests, up to 78% of the volunteers showed a positive effect with up to 35% visible wrinkle reductions as compared to a lipopeptide performance.

**CONCLUSION:** Results show that PG offers an innovative approach to anti-aging targeting the factors involved in aging on the level of the genetic code to obtain its cell rejuvenation and wrinkle correcting properties. Furthermore, PG can be effective for use in skin soothing and lightening applications.

## Bioflavonoids: Benefits for Skin and Formulating "Green"

Howard Epstein, Frank Pfluecker, Corinna Wirth,  
Rudiger Graf, Maria Prenzel, Bettina Magsaam and  
Michelle Quinn  
EMD Chemicals, Inc. and Merck KGaA

**OBJECTIVE:** Bioflavonoids are ubiquitous in the plant kingdom. Much anecdotal information is available to describe the medicinal and cosmeceutical benefits of flavonoids; little *in vitro* and even less *in vivo* data is available. The objective of this presentation is to describe the extensive *in vitro* and *in vivo* data generated by Merck KGaA, Darmstadt to support the benefits of two bioflavonoids, tiliroside and isoquercetin.

**METHODOLOGY:** *In vitro* methods included cell culture of normal human epidermal keratinocytes to measure gene expression. Other studies used a leukocyte elastase inhibition enzyme assay, measured with a spectrophotometer and fluorescent substrate. For anti-collagenase activity MMP-1 inhibition was measured using a spectrophotometer. Various antioxidant assays were conducted, examples were Rancimate®, a lipid assay, 2,2-diphenyl-2-picrylhydrazyl hydrate (DPPH), Trolox-Equivalent Antioxidant Capacity Assay (TEAC), Xanthine Oxidase and nitroblue tetrazolium (NBT). These methods have different mechanisms of antioxidant activity.

An independent test facility DERMATRONNIER GMBH conducted an *in vivo* study on twenty human volunteers with dry/atopic skin. The study measured anti-inflammatory response after UV exposure intended to induce erythema. The study test material was tiliroside formulated at 0.1% in an oil-in-water (o/w) emulsion and a 1.0% hydrocortisone cream used as a positive control. An untreated area was used as a negative control. An empty field without irradiation and without treatment was used as a reference. A Minolta Chromameter measured skin color change and a Laser Doppler Flowmeter monitored capillary blood flow in skin. Test materials were applied to the inner forearm. Prior to application of test material the test site was exposed to one MED of irradiation. The erythema threshold was determined for each test subject using different light intensities. The development of erythema was evaluated before application of test material and after 6, 24 and 48 hours post-exposure. Test material was reapplied immediately after exposure at each time point.



**RESULTS:**  $^{13}\text{C}$  NMR analytical study confirms that FFA is significantly less than 0.80 ppm at typical use levels of Imidazolidinyl and Diazolidinyl Urea. This is because ingredients (nucleophiles) present in the finished formulations react with the n-methylol group resulting in low amounts of free formaldehyde.

**CONCLUSION:**  $^{13}\text{C}$  NMR is an excellent method to determine free formaldehyde levels as it does not affect the equilibrium of formaldehyde donors.

## Techniques of Deformulation (Reverse Engineering)

*Christopher Palazzolo  
Chemir Analytical Services*

**OBJECTIVE:** Deformulation, also known as reverse engineering, is the separation, identification and quantitation of ingredients in a formulation. With the proper instrumentation and techniques, analytical chemists can create a working "recipe" that yields valuable information.

**METHODOLOGY:** Multiple analytical techniques are employed to result in a quantitative deformulation. Separations techniques utilized are Liquid Chromatography/Mass Spectrometry (LC/MS) and Gas Chromatography/Mass Spectrometry (GC/MS). Spectroscopy techniques used include Fourier Transform Infrared Spectroscopy (FTIR) and Nuclear Magnetic Resonance Spectroscopy (NMR). Wet chemical techniques are also employed, such as Karl Fischer.

**RESULTS:** A personal care product formulation will be deformulated using the above methodology. The surfactant system and preservative system will both be identified. A product is analyzed to identify non-labeled ingredients, as well as to verify label claims.

**CONCLUSION:** Multiple analytical techniques are utilized in order to deformulate (reverse engineer) a personal care product.

## Improved HPTLC Separation of Lipids and Phospholipids in Cosmetics by Using Automated Multiple Development (AMD)

*Ingo Schellenberg, Ph.D. and Kathrin Kabrodt  
Anhalt University of Applied Sciences and Institute of  
Bioanalytical Sciences*

**OBJECTIVE:** By using Automated Multiple Development (AMD), a TLC method with an easy gradient was developed for separation of lipids and phospholipids in cosmetics and for determination of major stratum corneum lipids. The aim was to show the suitability of HPTLC as a good tool for qualification and quantification of the above mentioned substances in cosmetics.

The used automated multiple development technique has a proven track record in the separation of lipids. Given the inherent problems associated with these analyses by HPLC like lacking UV absorbance of the lipids or less robustness of normal phase HPLC to matrix components from biological (cosmetic) lipid extracts, the AMD technique should be given even greater consideration. AMD affords a reproducible gradient on silica gel that produces not only greater resolution between less or unresolved components but separation for some lipids that were previously not separated at all.

**METHODOLOGY:** By using AMD lipids and phospholipids in cosmetics e.g. Cardiolipin, Oleic acid, Cholesterol, Oleylstearate, Cholesteryloleate, Sphingomyelin, Glyceryltriolate, Squalene, Phosphatidylcholine and Ceramides were separated and quantified with a 7 step gradient composed of toluene and Methanol. The derivatization was done by using a mixture of copersulfate-phosphoric acid. For detection and quantification a densitometric scanner was used.

**RESULTS:** The densitometric chromatogram of an only 7-step gradient shows a successful separation and quantification of the above mentioned substances. In the first step of development non polar substances such as Cholesterol oleate, Oleylstearate and Squalene were resolved. The solvent of the second step consisted only of methanol and was mainly used for the elution of more polar substances. With the third step of development (solvent: methanol: toluene = 95: 5) the phospholipids Phosphatidylcholine and Sphingomyelin were separated. The development steps 4 to 7 allowed the separation of the less polar substances. With development distance of 68 mm in step 7 Oleic acid was better focused.

By using the 7-step gradient a better separation of lipids and phospholipids was achieved compared with the 26-step gradient of Bonté et al.

Especially oleic acid was much more focused. In addition, only with the 7-step gradient a resolution of the substances Phosphatidylcholine and Sphingomyelin was achieved. With the 26-step gradient of Bonté et al. (1995) these two substances were not separated.

**CONCLUSION:** Besides the better separation of the above mentioned substances the 7-step gradient has additional benefits. On the one hand, the total development time is significantly reduced from 6.48 h [Bonté et al., 1995] to 1.36 h. On the other hand due to the limited number of only 7 steps also the solvent consumption is significantly lower. The new method also reduces the secondary solvent fronts (accumulation of additives from the solvents) which can interfere with the evaluation.

## SCIENTIFIC SESSION B (cont'd.)

### Thickness of the Liquid Film Left Behind a Moving Wet Wipe: Theoretical and Experimental Study

**OBJECTIVE:** While the major initial use of nonwoven wipes in skin care was for cleansing, applications for care have been growing rapidly. For sun protection, moisturization, anti-aging and other systematic benefits the formulator would benefit from the ability to engineer the thickness of the deposited layer. We have undertaken a study of the physics of deposition from a wipe with the goal of understanding the engineering parameters of deposition and the result that deposition is surprisingly engineerable, having consistent layer thickness over a variety of consumer behaviors for a given combination of porous structure of non-woven (geometry) and rheology of a benefit formulation. Experiments designed to validate these results have been planned and executed helping to show the range of applicability of this equation.

**METHODOLOGY:** The theoretical construct combines the flow in porous material, governed by the Darcy equation, with flow in the benefit film within a lubrication approximation. The experiments were performed putting in contact a partially saturated fibrous material, with a rotating glass disk of variable speed. The mean film thickness was determined from the weight and area of the liquid left behind.

*Gerardo Callegari, Ph.D., I. Tyomkin, A. Baker, K. Zwick, P. Kaplan and A. Neimark  
TRI/Princeton, Kimberly-Clark Corporation and Rutgers University*

**RESULTS:** The equation predicts a steep increase of thickness with velocity, followed by a region of almost no variation, which is of practical importance. Those regions were also experimentally observed. The agreement between the experimental data and the theory is very good, with the adjustment of only one free parameter closely related to the partial permeability of the medium.

**CONCLUSION:** The agreement between experimental data and the equation developed shows that a predictive engineering approach to non-woven structure, formulation and packaging is realizable. Future work will refine the model to handle non-Newtonian rheology, transport of particulates, dry-out of the wipe and deformable rough substrates such as skin.

## SCIENTIFIC SESSION C (concurrent)

### THURSDAY'S PROGRAM, JUNE 4, 2009

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

#### FORMULATIONS

*Moderator – Jim Vlastic, Greenway Research Lab*

### Boosting of Glycerin Hydration and Desquamometry in the Stratum Corneum

**OBJECTIVE:** Glycerin has been proven to be an excellent skin hydrating moisturizer, but can also contribute to poor aesthetics because high levels are required for best skin hydration, and thus could lead to low compliance of use. The objective of this study was to evaluate the skin hydration performance of reported humectants in different emulsion systems and in synergy with glycerin. As part of the presentation, data will be shown to demonstrate the statistical improvement possible through synergistic combination of hydrating moisturizers and glycerin.

**METHODOLOGY:** Various different emulsion types were explored [cationic, gel-emulsion, W/Si, and microemulsions] against and in combination with glycerin (4, 6 & 10%) against various hydrating moisturizers to see how they would affect in-vivo moisturization on the skin. The tests were run in-vivo; measuring Observer Dryness, Conductance, Tactile Sensor, Desquametry, barrier restoration/ erythema patch testing 24 hrs and 7-day regression studies. Most studies had panel sizes between 12– 20 & between the age of 18 – 60. As part of the presentation, the methodology will be outlined.

**RESULTS:** Approximately 20 reported hydrating moisturizers were compared in different emulsion systems [e.g., monomeric cationic, Gel Emulsion, W/Si Emulsion, Microemulsion] against

both Glycerin and untreated skin for their ability to improve the appearance of skin and increasing skin hydration. Designed in-vivo experiments on both 24 hr hydration studies and 7-day regressions studies comparing untreated skin control versus 4, 6 & 10% Glycerin against hydrating moisturizers and combinations with Glycerin; performance was benchmarked based on conductance, observer dryness, desquamation.

Key observations:

1. Cationic emulsions >> Gel Emulsions > W/Si or Microemulsions
2. Glycerin >= Acetamide MEA and Lactamide MEA >> NaPCA >>> Hydroxyethyl Urea >all other humectants
3. Small amounts of Acetamide MEA or Lactamide MEA with Glycerin significantly enhanced conductance and reduced skin flaking (desquames)
  - a. Addition of 1% A-MEA or L-MEA with 10% Glycerin = 21% Glycerin

**CONCLUSION:** Based on the findings from these studies, it has been demonstrated that one can either boost the efficacy (improved skin hydration and reduced flaking) of glycerin or allow for the reduction of glycerin to enhance aesthetic, without sacrificing performance. In particular, one class of ingredients, alkylamide MEA (e.g., Acetamide MEA, Lactamide MEA) demonstrated synergistic improvements with Glycerin at improving moisturization (skin hydration), skin barrier repair, improved tactile properties, and reduced flaking better glycerin.

*Eric Abrutyn*

*TPC2 Advisors Ltd., Inc.*

## New Formulation Capabilities Using Water-in-Silicone Emulsifiers

*Joanna Newton, Beatrice Durand, Veronique Kowandy, Sylvain Masse and Ingrid Vervier  
Dow Corning Corporation*

**OBJECTIVE:** To identify the key parameters that influence the performance of water-in-oil emulsifiers and define the characteristics of emulsions. To translate these findings on basic emulsions to fully-formulated cosmetic emulsions.

**METHODOLOGY:** This study investigated the influence of emulsifier structure and its active level, phase ratios, oil phase composition, and process conditions on final emulsion characteristics. Droplet size using an optical microscope, texture via an experienced sensory panel, and rheology profiles were determined together with emulsion stability. Sensory impact was characterized on more sophisticated formulations using paired comparisons.

**RESULTS:** Important parameters that impact emulsion quality included the molecular weight of the oil phase, phase ratio, emulsifier active level and process conditions. Based on the selected W/Si phase ratio, preferably 30/70, we determined the optimum emulsifier level was 2% to ensure emulsion stability. These data allowed preparation of several fully-formulated, stable cosmetic emulsions with a range of different sensory profiles, from liquid to very rich consistency.

**CONCLUSION:** Results from this study can help formulators achieve optimal formulations based on key market trends.

## SPF Retention via Silicone Derivatives

*Stacy Mundschau, Corey Cunningham and Scott Wenzel  
Kimberly-Clark Corporation*

**OBJECTIVE:** Investigate ingredients that may increase the retention of the static sun protection factor (SPF) following water immersion of sunscreen compositions.

For alcohol-based sunscreen sprays, the choice of water-resistance ingredients is somewhat limited compared to emulsion systems. To compensate, many products increase the total percentage of active ingredients as they are inherently water resistant. A product that employs a reduced level of actives and an efficient water-resistance system to minimize the loss of actives upon immersion is most desired.

**METHODOLOGY:** In vitro SPF measurements were conducted by IMS, Inc. Final performance was confirmed with a clinical study following the sunscreen monograph guidelines. Retention values were calculated as a percentage of the reported SPF after immersion divided by the SPF prior to immersion.

**RESULTS:** A base set of active ingredients (23.3% by weight) was found to deliver an in vitro SPF value of 50+ following immersion. Water-resistance efficiencies of greater than 95% were routinely obtained and could be controlled. Dimethicone derivatives that were both ethoxylated (PEG) and propoxylated (PPG) were found to be superior to either modification alone. Specifically, PEG-20/PPG-23 Dimethicone was found to be efficacious at even lower concentrations when combined with Acrylates/Octylacrylamide Copolymer. Commercial product showed only 63% retention.

**CONCLUSION:** Water soluble and water dispersible silicones can form extremely effective water-resistant films alone or in conjunction with other polymers.

## A Better Understanding of Structure-Properties Connections of Thickening-Stabilizing Polymers

*Alicia Roso, Stephanie Bassett, Olivier Braun and Paul Mallo  
SEPPIC*

**OBJECTIVE:** To investigate the correlations between molecular structure of thickening polymers and their final properties in formulations: the thickening effect in challenging pH situations, resistance to UV exposure, and other benefits such as emulsifying-stabilizing capacity of oils without any additional surfactant, texture and sensory profile.

In today's competitive cosmetic market, one of the main challenges is to speed up the product development while maintaining a high quality of work. One way to predict the results and allow a quicker development time is to take advantage of previous experience and develop a better knowledge of the structure-activity connections.

**METHODOLOGY:** The properties of several inverse emulsion polymers (liquid, pre-neutralized, ready-to-use polymers) with various types of monomers, oils and surfactants were analyzed comparatively to a reference polymer in powder form with the same polymer structure.

*Tested monomers:* Acrylamide, Acryloyldimethyltaurate, Acrylic acid, Hydroxyethylacrylate  
*Tested oils:* Dicaprylyl Ether, Hydrogenated polyisobutene, Isohexadecane, Polyisobutene, Squalane  
*Tested surfactants:* PEG-40 Castor oil, Polysorbate 20, Polysorbate 60

Performances of these polymers were then compared in equivalent formulation situations (identical level of active substance or same viscosity):

- Thickening performance was measured as a function of pH in water
- Compared viscosity drop (in %) of the aqueous gels was calculated after UVA and UVB irradiation (20 mJ/cm<sup>2</sup> for each with a sun simulator (Bio-Sun from Vilbert Lourmat Company).

- Maximum % of oil that can be stabilized in a simple cream gel without addition of extra-surfactant (stability after 3 months at R.T. & 1 month at 45°C)
- Gel texture profiles (consistency, pick-up ability) were determined by texturometry analysis using a TEC texture analyzer (from Lamy) following the energy during a compression/traction cycles protocol modeling the action of pick up the product in a standardized packaging).
- Appearance of the gels, ease of picking up, ease of spreading, quick break effect, softness, fresh to rich skin feel & sticky effect were evaluated by sensorial analysis methodology.

**RESULTS:** Studied properties were influenced by the polymer structure: the monomers, the oil, and the polymer type (inverse emulsion polymer or powder). The surfactant chemistry did not appear as a significant parameter in this study.

The monomer choice was found as the key parameter to get a constant thickening effect in a wide pH range and an improved resistance of the gel to UV exposure: using Acrylamide and Acryloyldimethyltaurate as major monomers allowed to formulate from pH 3 to 10 and the gels keep stable after UV exposure while formulation below pH 5.5 was not permitted with acrylic acid and the gels were destabilized by UV irradiation.

Conversely, the ability to stabilize high levels of oils without addition of extra-surfactant mostly depends on the polymer type (liquid or powder): polymers in inverse emulsion stabilize high quantity of oils: 40 to 45% of C8/C10 triglyceride and more than 15% of mineral oil whereas the reference powder polymer only allowed to stabilize respectively 10% and less than 5%. The nature of the oil present in the inverse emulsion polymer had also a high impact with respect to paraffin oil stabilization: Isohexadecane gave the best result.

For some other properties, such as texture and sensorial profile, the connections were found to be more complex and would require further investigations. For instance, polymers in inverse emulsion provided globally supple and easy to pick up gels as the reference powder polymer gave stiffer and less easy to pick up gel. Once again, a better pick up ability was achieved when using Acrylamide or Acryloyldimethyltaurate as major monomers compared to Acrylic acid.

**CONCLUSION:** The study of the structure-properties connections gave very interesting tools for the development of new thickening polymers with improved technical performances and tailored sensory profiles.

## SCIENTIFIC SESSION D

### FRIDAY'S PROGRAM, June 5, 2009

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

#### HAIR: NEW METHODOLOGIES

*Moderator – Robert Lochhead, Ph.D., University of Southern Mississippi*

#### Characterization of Hair Damage and its Effect on Hair Color Fading and the Routes for Color Protection from Shampoo Stripping

*Yan Zhou, Linda Foltis, David Moore, Ray Rigoletto, Wosson Solomon, Grise Tummul and Xin Qu  
International Specialty Products*

**OBJECTIVE:** Hair damage through chemical and thermal-mechanical treatments is significant factors that contribute to hair color fading of dyed hair. Faster color fading of damaged hair leads to more frequent re-coloring cycles which leads to further damage and accelerated fading. Therefore there is a market need for a treatment solution that is effective for preventing fading or increasing color longevity of damaged hair which consumers often have when they frequently use chemical treatments such as coloring or bleaching. To meet this market need, knowledge on understanding of the chemical and physical changes of damaged hair is needed. The objectives of this work then are to understand the damaged hair substrate using a number of physical tools and the effect of hair damage on color fading and then develop a mechanism for color protection for damaged hair.

**METHODOLOGY:** A novel technique, FTIR spectroscopic image analysis, was used to characterize compositional changes of chemically damaged hair fibers and the dye content inside hair fibers with and without anti-fading treatment. Water contact angle measurement, AFM, and other surface measurement were used to measure surface property changes of damaged hair.

Measurement techniques for evaluating color change of dyed hair samples from color fading tests include colorimetric measurement and quantitative digital image analysis on color darkness. These instrumental techniques are correlated with Salon tests with mannequins of human hair and subjective panel studies that link to consumer perceivable changes.

**RESULTS:** FTIR image analysis of hair fiber cross sections indicates that there is significant protein and lipid reduction in both bleached hair and alkaline treated hair (over 26%) compared to virgin hair. FTIR image analysis also indicates that cysteic acid increases 59% and 33% for bleached hair and alkaline treated hair, respectively, compared with virgin hair. AFM analysis shows that the damaged hair (triple bleached) surface contains micropores. The measured contact angle of the triple bleached hair is 41°, compared with 81° for the normal hair.

Continued on Page 9

These structural changes promote color fading, i.e. color fading increased by two times from one hour to two hour bleached hair and by additional 25% with 3 hour bleaching. The antifading approach is then designed for damaged hair with the mechanism of which is to seal or reduce the micropore openings and increase the hair surface hydrophobicity. Towards this approach, Polyquaternium-55 is found to be most effective and its color protection effect for damaged hair increases with the increase of hair damage degree, providing as high as 48% color protection over the untreated control.

**CONCLUSION:** The degree of hair color fading of oxidatively dyed hair is directly related to the extent of the hair's damaged state. Hair damage is determined quantitatively through various developed instrumental techniques. Approaches for color protection of damaged hair are designed based on the understanding of the nature of damaged hair and its effect on fading. The anti-fading system containing Polyquaternium-55 is proven to be most effective in preventing color fading of damaged hair in both leave in and rinse off treatment systems and provides significant less "off shade" fading than the existing commercial benchmarks.

## Flow Cell Microscopy: A Novel Method to Visualize Product Deposition on Hair

*Renee Bolden, Ph.D., Dirk Domaschko, Julie Lubbers, Marge Peffley, Jian Yang, Yujun Li and Mark Brown  
Procter & Gamble*

**OBJECTIVE:** In this paper, we describe a novel, state of the art Flow Cell Microscopy method, developed to visualize and understand the deposition of hair care ingredients from shampoos and conditioners onto hair in real time. This is the first technique where the deposition mechanism of action can be visualized directly instead of theorized from bulk deposition values. Cosmetic ingredients (e.g. coacervate, silicone, and cationic surfactants) deposit onto hair via a filtration or adhesion mechanism or a combination there-of, and the amount and type of deposition is influenced by the structural properties of the hair substrate, including fiber thickness, curvature and surface charge.

**METHODOLOGY:** Flow Cell Microscopy is a novel method, utilizing a commercially available Focht Flow Cell to visualize deposition of shampoo and conditioner ingredients onto a hair fiber. Product usage is simulated by passing a solution of diluted formula through the flow cell (shampoo or conditioner usage phase) followed by distilled water (rinse phase). Single or multiple hair fibers are trapped within two gaskets located in the flow cell. It is important to separate the hair fibers from the cover slip in order to enable laminar flow across the hair fiber and to avoid deposition via entrapment between the coverlip and hair. The interaction of ingredients with hair is captured via a Zeiss compound microscope used in bright field mode at a magnification between 50-200x. Dynamic videos showing real-time deposition on hair are created using a digital camera with streaming capture capability.

**RESULTS:** Flow cell microscopy was used to evaluate the shampoo deposition polymers (guar hydroxypropyltrimonium chloride, poly-DADMAC and AM:Triquat) and conditioner ingredients (behtrimonium chloride, stearyl ethylhexyl dimonium methosulfate, behtrimonium methosulfate, PDMS and bisaminopropyl dimethicone) on hair in order to understand the deposition mechanism and the amount of deposition.

Three results were observed for shampoos: 1) ingredients adhere to the hair during the treatment phase and remain adhered during rinsing (deposition via adhesion), 2) ingredients adhere to the hair during the treatment phase and are released during the rinse phase (deposition via filtration) and 3) no ingredient interaction with the hair during treatment or rinsing phase (deposition via filtration). The AM:Triquat polymer was unique in that it interacts with PDMS to deposit on the hair via adhesion. Both the guar hydroxypropyltrimonium chloride and poly-DADMAC polymer deposit on the hair via filtration. Understanding these differences has help to design products targeted for specific hair types (e.g. thick hair has a lot of interaction between hair fibers which lends to deposition via filtration).

Two results were observed for conditioners: 1) ingredients adhere to the hair during the treatment phase and increase during rinsing (heavy deposition via adhesion) and 2) ingredients adhere to the hair during the treatment phase and mostly rinse away during rinse phase leaving a thin layer on the hair (light deposition via adhesion). Mechanistic understanding of light and heavy depositing conditioner formulas has help design appropriate products for fine hair needing light conditioning versus thick and curly hair, which often needs heavier conditioning.

**CONCLUSION:** In this paper we have described a novel and versatile flow cell microscopy method that quickly visualizes deposition mechanisms of action (filtration versus adhesion), which enables technology screening and selection to meet the needs of specific hair types. The flow cell microscopy method can be applied to industries beyond hair care, such as personal cleansing and laundry, where understanding how active ingredients deposit onto a substrate is critical for product development.

## Effects of Natural Proteins and Protein Hydrolyzates on Hair Electrokinetics and Wettability

*Susan Daly, Robert Bianchini, Ph.D., Thomas Polefka and Janusz Jachowicz, Ph.D. Johnson & Johnson Consumer Products and Better Cosmetics, LLC*

**OBJECTIVE:** The present work concentrates on the analysis of protein-hair interactions by using surface techniques such as streaming potentials and contact angles.

**INTRODUCTION:** Peptides, proteins and their hydrolyzates are widely used in hair and skin care formulations. The most commonly used materials are hydrolyzates derived from animal and vegetable sources such as keratin, collagen, elastin, silk, soy, corn, wheat, etc. Natural, unadulterated proteins are used less frequently.

**METHODOLOGY:** By using electrokinetic measurements one can follow protein adsorption/desorption from hair and quantify protein affinity to hair in terms of change in the zeta potential value of hair before after treatment. Durability of adsorbed proteins and differences in desorption kinetics could be demonstrated for wheat and soy hydrolyzates as well as for intact natural proteins such as Lysozyme, Avidin, and Albumin. The results of electrokinetic analysis of hair are complemented by the measurements of contact angles, which can detect variations in hydrophilicity/hydrophobicity of various types of hair as a result of adsorption of proteins.

**RESULTS:** Natural cationic proteins (lysozyme, avidine) were shown to bind strongly to intact hair, reverse the sign of streaming potential, and make the surface hydrophilic by reducing the advancing contact angle. In contrast, the investigated protein hydrolyzates minimally bind to hair as evidenced by steaming potential and contact angle data.

**CONCLUSION:** Streaming potential and wettability are convenient techniques to study adsorption of proteins and protein hydrolyzates on hair.

## Quantification of Fiber Fragmentation of Hair through Combing as a Measure of Thermal Protection

*Ray Rigoletto, Jean Karolak and Don Koelmel International Specialty Products*

**OBJECTIVE:** Styling appliances have grown in popularity in recent years especially hot flat irons which are used to achieve straight hair styles. Based on the damaging effects of these excessive heat treatments, exemplified by the increase in the number of products in the market that claim thermal protection, there is a need to have ingredients that provide thermal protection as well as viable methods in determining their efficacy. The objective of this study is to demonstrate the thermal protective effects of two polymers, namely VP/DMAPA Acrylates Copolymer and Polyquaternium-55, against the thermal insult during styling with a hot flat iron using an evaluation technique consisting of quantification of broken hair fibers after combing. The reduction in weakening of hair using the polymer pretreatments to hot flat ironing are substantiated by instrumental techniques.

**METHODOLOGY:** Thermal protective efficacy is done through measuring the reduction in fiber fragmentation after a controlled procedure of pretreatment with the thermal composition, application of heat with a hot flat iron, and combing. The stresses that hair fibers encounter during the combing process is described which shows the importance that combing plays in the test method as a valid way to assess the reduction of weakening. The data derived from this method is substantiated through auxiliary experiments utilizing Spectrofluorimetry, Differential Scanning Calorimetry, and Scanning Electron Microscopy.

**RESULTS:** Reduction in hair breakage during combing was achieved by the polymer pretreatments both from simple as well as formulated systems. Results from instrumental techniques on these same polymer pretreatments substantiate thermal protection by a reduction in Tryptophan degradation using Spectrofluorimetry, a reduction in changes of the denaturation enthalpy and denaturation temperature using Differential Scanning Calorimetry, and noting the absence of severe morphological changes of the fiber surface using Scanning Electron Microscopy.

**CONCLUSION:** The results of the quantification of hair fiber fragments after combing demonstrated that it is a practical and viable method that can be easily used to test the thermal protective effects of pretreatment compositions. This is based upon showing the reduction in hair breakage to hot flat ironing utilizing the two test polymers that have been documented in the past to impart thermal protective effects, as well as validating data from analytical techniques.

## FRIDAY'S PROGRAM, June 5, 2009

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

## MULTICULTURAL HAIR CARE

*Moderator – Colleen Rocafort, CIBA Corporation*

### Synchrotron X-Ray Tomography of African-American Hair Reveals a Reduction in Fiber Density as a Result of 2.5% NaOH Relaxer Treatment

*Guive Balooch, Ph.D., Crystal Porter and Harold Bryant  
L'Oreal Institute for Ethnic Hair and Skin*

**OBJECTIVE:** The local mechanical properties and composition of hair fibers are critical determinants of a hair fiber's ability to resist fracture or breakage, although most techniques measure bulk properties of hair. In this study, we utilized the high resolution (750 nm) technique of synchrotron x-ray tomography to assess the matrix material properties and composition of virgin African-American hair fibers and as a result of 2.5% NaOH treatment. The exploration of this novel technique to understand the effect of relaxer treatment on African-American hair fibers has allowed us, for the first time, to visualize the differences in the 3-dimensional fractography and compositional density of hair fibers as a result of treatment with nanometer spatial resolution. This ultimately allows a more in-depth study of the effect of relaxer treatment on the African-American hair fiber.

**METHODOLOGY:** Synchrotron XTM studies were used to assess density of n=5 hair fibers per group and were performed at the Advanced Light Source (ALS) on Beamline (8-3-2) at the Lawrence Berkeley National Laboratory. This was done by obtaining two-dimensional radiographs as the specimens were rotated through 180° in 0.5° increments, with a 750 nm pixel resolution. Virgin hair fibers were imaged first, then subsequently relaxed with 2.5% NaOH solution, and imaged again to investigate differences.

**RESULTS:** Synchrotron X-ray tomography revealed a significant reduction in fiber matrix density, both seen in cuticle (48%,  $p < 0.001$ ) and cortex (43%,  $p < 0.01$ ) regions, as a result of 2.5% NaOH treatment. This decrease in density as a result of relaxer treatment is consistent with other physical property measurements observed in the literature, such as a decrease in tensile properties as well as a decrease in thermal properties. Three-dimensional tomographic reconstructions demonstrated longitudinal and cross-sectional crack formation in the treated fibers. Furthermore, geometric differences were also observed, where 2.5% NaOH treatment induced morphological surface deformations to the hair fiber compared to virgin.

**CONCLUSION:** This study suggests, for the first time, a significant role of relaxer treatment in regulating density and nano-structural properties of African-American hair fibers, ultimately leading to changes in macroscopic fracture properties

### Hair Breakage for the African-American Consumer: Causes and Consumer Perception

*Bradford Pistorio, Ph.D., Grace Yang, Crystal Porter,  
Felicia Dixon and Harold Bryant  
L'Oreal Institute for Ethnic Hair and Skin*

**OBJECTIVE:** Consumer related research conducted at the Institute for Ethnic Skin and Hair in Chicago confirmed that the most prevalent hair concern for the African-American female is hair breakage for either natural or chemically treated hair. To combat this issue, it is important to understand what the consumer considers breakage and the causes of fracture.

**METHODOLOGY:** Consumers were asked a series of questions to determine what the term "breakage" meant to them. Following this, hair samples were collected from individuals with breakage concerns and were analyzed in an effort to understand breakage from mechanical and microscopic perspectives. Specifically, the fibers were examined using a miniature tensile testing (MTT) and cyclic fatigue. Fibers were analyzed also using an environmental scanning electron microscope (ESEM) equipped with a tensile stage to determine and observe modes of fracture imposed along the hair. In order to meet the needs of African-American consumer, hair samples were treated with new molecules.

**RESULTS:** In general, hair breakage has several contributing factors including properties inherent to curly hair and hair-care grooming practices. In fact, comparisons of curl and ethnicity of virgin hair showed that as the curl in hair increased, so did fragility. In addition, treatments, such as relaxing, can compromise the integrity of hair, thereby increasing breakage. ESEM images from the collected hair demonstrated cracking and wearing patterns as a result of breakage, validating consumer concerns. Real-time video images of fibers were also examined using a tensile stage in the ESEM to verify stepwise fibrillations and propagation of cracks along the hair shaft.

**CONCLUSION:** The consumers' perspectives on breakage may be influenced by their curl typology and their grooming practices, as demonstrated by mechanical data and microscopic images. New molecules to reduce breakage have demonstrated anti-breakage behavior that may benefit the consumer.

Quantifying Differences in the Propensity for Breakage in Afro and Caucasian Hair

*Trefor Evans, Ph.D.  
TRI/Princeton*

**OBJECTIVE:** The objective has been to use fatigue testing as an alternative means of probing hair strength.

The generation of stress-strain curves is commonly used to characterize the strength of individual hair fibers. However, it can be argued that such experiments are not necessarily representative of consumer practices. It is proposed that repeated applications of smaller forces, as used in fatigue testing, represents a better simulation of wear and tear that results from everyday grooming.

**METHODOLOGY:** Experiments are performed using the commercially-available Diastron CYC800 instrument. Information will be presented that illustrates the influence of experimental variables, such as the magnitude of the fatiguing force and hair type/condition. While this approach uses a novel and pertinent form of mechanical agitation, the proposed method of data analysis is also unique – in that it treats breakage as a statistical variable rather than a mechanical property. In doing so, the output from such an approach is a prediction regarding the likelihood of fiber breakage under a given set of conditions.

**RESULTS:** Breakage data can be visualized via a plot of cycles-to-break versus the applied stress – an approach often termed an S-N Plot. However, a still more useful approach involves fitting a Weibull distribution to the data, then using the resulting Weibull parameters to recreate the probability distribution curve that predicts the likelihood of failure.

Results show Afro hair having a much high propensity for early failure – a conclusion that agrees well with known consumer experiences. It is well-recognized that the highly-fragile nature of Afro hair is such an issue that it demands very different habits and practices. This is a conclusion that would not seem to be reflected in a relatively meagre 13% reduction in break stress and break extension – as observed by conventional constant rate extension experiments

**CONCLUSION:** It is hoped that this presentation will demonstrate that fatigue testing is a useful compliment to other mechanical testing techniques in that it provides a very different perspective when considering hair strength.

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.

If you are a student interested in presenting a poster, please contact the National Office for more information.



Thursday, June 4th - 7:30 a.m. - 8:50 a.m.

### A. Aging Skin

*Zoe Diana Draelos, MD, Dermatology Consulting Services*

Understanding mechanisms of aging skin and intervening in the aging process are important considerations when developing skin care and cosmeceutical formulations for the appearance market. Aging encompasses a breadth of skin changes that begin in childhood only to be visually apparent after age 30, depending on cumulative damage exposure. New theories abound regarding the cause of common age associated findings such as dyspigmentation, wrinkling, facial proportion changes, and skin texture anomalies. This mini-breakfast will review how and why skin ages identifying key factors that can be altered through creative intervention. The goal of the session is to link observations to underlying causes to methods for improvement in appearance enhancement.

Thursday, June 4th - 7:30 a.m. - 8:50 a.m.

### B. Natural Chemistry – The Green Jungle

*Karl Lintner, Ph.D., SEDERMA*

This Mini Breakfast will address, somewhat provocatively, the questions of "natural", "green", "bio", "organic", "ecological" as opposed to "chemistry", "synthetic", "aggressive", "polluting" etc. Furthermore, the increasingly crowded field of certificates (Ecocert, Oasis, NaTrue, BDIH and others) will be discussed with respect to their aims, their methods and rules, their similarities and differences, their perceived and real impact on the market; the role of the media and the authorities in this "jungle" is also not negligible. A suggestion for a different, rational and responsible approach to "chemistry" (in general and of cosmetic ingredients in particular) will be presented.

Friday, June 5th - 7:30 a.m. - 8:50 a.m.

### C. Ethnic Products Categories Versus Today's Style and Technology

*Patrick Obukowho, Advantage Research Lab, LLC*

It is no longer a secret in the ethnic industries to see that products, style and technology are drifting apart and consumers are wondering if innovation and new formulation are no longer the cornerstone of new products. We will try to examine the relevance of products formulated two or more decades ago to today's market demand. There are few products categories that are taking advantage of innovative ingredients in this industry and new technological display. Discussions will be on methods of approaching today's market demand. Like the food industry, the cosmetic industry has a place in the consumer's budget even with tough economic times.

Friday, June 5th - 7:30 a.m. - 8:50 a.m.

### D. Strategies for High Throughput Formulation

*Robert Y. Lochhead, Ph.D., The Institute for Formulation Science*

Consider the following two scenarios:

1. Innovation in formulation is often hampered by the lack of information on systems concerning wide composition ranges of interest, and the lack of ability to attain that information economically and in sufficient time.
2. New raw materials are discarded or not investigated because they did not perform adequately when 'dropped into' an existing formula chassis. However, opportunities may have been missed because the chassis could not be adjusted.

Both of these situations are well-known to experienced formulators, and they persist because the acquisition of vast data sets eludes the conventional formulator and the practitioners of our industry do not have access to unlimited resources.

High throughput formulation is directed towards solving this issue by utilizing, robotics, informatics, graphical representations and an educated scientific workforce to greatly accelerate the investigation of formulation compositions from both material and process aspects. In some cases, the high throughput formulation laboratory can do as much in a day as is done in a year by conventional techniques.

This seminar will survey the progress of high throughput formulation from the standpoints of hardware available, software and informatics considerations and the necessary education of the new scientific workforce to practice these new skills.

We can expect that the high throughput approach will transform the art and science of cosmetics and personal care, making it possible to screen and optimize new compositions and new materials at rates up to 1000 times faster than current conventional techniques.

**Note: You must register for the seminar in order to register to attend a COSA Mini Breakfast.**

# CONTINUING EDUCATION PROGRAMS

## SCALE UP & PROCESSING COSMETIC FORMULATIONS

Instructed by David Yacko (Estee Lauder Companies)

Wednesday, June 3, 2009 \* 9:00 a.m. - 5:00 p.m.

### COURSE OUTLINE

This course will give students a basic understanding of scale-up and process variables so the first production batches can be manufactured more easily and with meaningful input on the part of the compounder. In the cosmetic industry it is imperative that new products get from the bench to manufacturing as quickly as possible. This is the job of the Process Development Engineer and the process is called scale-up. The talk will discuss the different aspects of scale-up: heat transfer, addition rates and energy input as it pertains to batch size and different equipment.

Topics to be covered include:

#### I. Scale Up Introduction

#### II. Cosmetic Processing Equipment

- A. Vessels
- B. Mixers
- C. High Shear Mixers
  - Batch
  - Inline
- D. Pumps

#### III. Scale Up Parameters and Variables

- A. Liquids-Emulsions-Emulsions/Solids
  - Batch
    - Heating/Cooling
    - Mass Transfer
    - Controlling Shear
  - Continuous
    - Heating/Cooling
    - Mass Transfer
    - Controlling Shear
- B. Emulsions/Solids
  - Shade Matching

#### IV. Procedure Requirements

- A. Terms
- B. Equipment List/Details/Controls
- C. Filling Concerns/Requirements

## ETHNIC HAIR CARE

Instructed by Patrick Obukowho (Advantage Research Lab, LLC)

Wednesday, June 3, 2009 \* 9:00 a.m. - 5:00 p.m.

### COURSE OUTLINE

This course is best suited for: Formulating Chemists, Marketing, Sales Representatives and Ethnic Product Business Development Personnel.

This Course Will Focus On The Following Topics:

- Relaxer Concept
- Relaxer Definition
- Types of Relaxers
- Relaxer Then and Now
- Emulsion Design Approach for Relaxer
- Characteristics of a Good Relaxer
- Ingredient Selection
- Types of Emulsifiers
- Conditioning Agents in Relaxer
- Conditioning Definition
- The Ethnic Market in General
- Future Trend in Ethnic Products

**SPECIAL DISCOUNT:** Individuals that register for a Continuing Education Course at the Chicago Hilton as well as register for the Annual Scientific Seminar (Full Registrations Only) may deduct \$25 off the Seminar registration fee.

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

# 2009 ANNUAL SCIENTIFIC SEMINAR

## REGISTRATION FORM

2009 ANNUAL SCIENTIFIC SEMINAR

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JUNE 4-5 \* CHICAGO HILTON

Type or print your name 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.scconline.org](http://www.scconline.org)

NAME (Full Registration only) \_\_\_\_\_  
(First name) (Last name)

Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

NAMES (Split Registration only):

Thursday Participant \_\_\_\_\_ Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Friday Participant \_\_\_\_\_ Phone ( ) \_\_\_\_\_ Fax ( ) \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

Address \_\_\_\_\_

	REGISTRATION FEE On/Before May 8	REGISTRATION FEE After May 8*	
Member	\$600.00	\$650.00	\$ _____
Non-Member	\$720.00	\$770.00	\$ _____
Split Registration-MEMBER	\$700.00	\$750.00	\$ _____
Split Registration-NON-MEMBER	\$800.00	\$850.00	\$ _____
Full Time Student	\$200.00	\$200.00	\$ _____

\*Onsite Registration Fee will be \$750 for Members and \$850 for Non Members.

### CONTINUING EDUCATION PROGRAM

Wednesday, June 3, 2009 \* 9:00 a.m. - 5:00 p.m.\* Courses are Limited

Scale Up:	Member - \$300.00**		\$ _____
	Non-Member - \$400.00**		\$ _____
Ethnic 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 split registrations.*

### COSA MINI-BREAKFAST SEMINARS

**THURSDAY**

A. <i>Aging Skin</i>	\$45.00	\$ _____
B. <i>Natural Chemistry</i>	\$45.00	\$ _____

**FRIDAY**

C. <i>Ethnic Products</i>	\$45.00	\$ _____
D. <i>High Throughput Formulations</i>	\$45.00	\$ _____

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

Payment Information

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Circle Choice:    Check (made payable to SCC)                      Visa                      MasterCard                      American Express

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SAVE THE DATE

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2009 SCC Annual Scientific Meeting & Technology Showcase  
December 10-11, 2009  
New York Hilton

2010 SCC Annual Scientific Seminar  
June 3-4, 2010  
Long Island Marriott  
Hosted by Area I

2011 SCC Annual Scientific Seminar  
June 2-3, 2011  
Mandalay Bay Resort, Las Vegas  
Hosted by Area III

