

IN THE SPOTLIGHT

P&G Scientists Obtain Several Key Posts in the Society of Cosmetic Chemists

Greg Hillebrand, Ph.D., P&G Technology Licensing, took the helm as 2005 President of the Society of Cosmetic Chemists (SCC), the national association of 4,000 members founded to promote high standards of practice in the cosmetic sciences. He will be responsible for guiding the organization's activities and furthering the interests and recognition of cosmetic scientists, while maintaining public confidence in the cosmetic and toiletries industry. Hillebrand has numerous publications and patents in the area of skin science and was the lead inventor of P&G's Beauty Imaging System.

Salvador Pliego will serve as 2005 President of the Ohio Valley chapter of the SCC. Jim Staudigel will serve as Secretary of this chapter.

Pliego has been with P&G Beauty for three years and holds two patents on work related to crosslinked elastomeric silicones in skin care compositions. Staudigel has worked at P&G for nine years, focusing on beauty products formulations. He is the author of nine patents.



FAST FORWARD

From facial creams to deodorant preparations, P&G researchers are now using reconstituted human skin equivalent cultures to determine topical efficacy of cosmetic products, appropriate dosage levels and formulation options.

The multi-layered, differentiated full thickness cultures have allowed scientists to measure specific skin benefits previously unattainable with traditional monolayer cultures and are critical to the development of new and more effective cosmetic products. By using such samples and a uniquely modified measurement tool, for the first time ever P&G scientists have been able to perform *in vitro* transepidermal water loss measurements in a controlled-environment chamber. This

allows scientists to more efficiently measure the effects of known barrier-enhancing agents such as niacinamide. Furthermore, researchers say that the use of the multi-layer cultures and the modified measurement tool opens the door for better testing of how wounds and skin disease may respond to different agents.



DID YOU KNOW?

P&G sells about 300 million 200-ml bottles of hair conditioner per year – enough bottles to circle the entire circumference of the world!

P&G BEAUTY SCIENCE

P&G Beauty Science has more than 1,500 scientists working at five global technical centers with an unparalleled commitment to technology development. Company scientific efforts result in more than 1,400 global technology patent filings every year. This allows P&G to develop products uniquely suited for different types of hair and skin, and tailored to different cultures and climates. P&G scientists are constantly seeking new ways of turning inspiration into innovation.

Two billion times a day, P&G brands touch the lives of people around the world. P&G's beauty business had more than \$17 billion in global sales in fiscal year 2003/04, making it one of the world's largest beauty companies. The beauty business sells more than 130 different brands in over 180 countries worldwide. Its beauty brands include Pantene,® Head and Shoulders,® Olay,® SK-II,® Max Factor,® Cover Girl,® Joy,® Hugo Boss,® Herbal Essences® and Clairol Nice 'n Easy.® Please visit www.pg.com for the latest news and in-depth information about P&G and its brands.

CONTACT INFORMATION

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BREAKTHROUGHS: SCIENCE NEWS FROM P&G BEAUTY

NEW BODY LOTION BREAKS THE DRY SKIN CYCLE

Dry body skin continues to be the number one unmet cosmetic skincare consumer need around the world. In the U.S., 80% of women claim dry skin and more than 70% say they are dissatisfied with their current body lotions. Yet, the body lotion category hasn't enjoyed the same level of sophisticated research and development as the myriad technologies available to care for facial skin. Several years ago, P&G Beauty scientists set out to tackle body skin in a truly holistic manner. First, to fully understand the problem of dry skin and develop a coherent technical model to explain it; and second, to use this knowledge to create a product with excellent consumer acceptance that addresses the mechanistic principles underlying the new model.

The Dry Skin Cycle

The Dry Skin Cycle is a new model that explains the induction and propagation of the dry skin condition in otherwise normal human skin as a **cydical** model.

Once the skin has been provoked by one or more of the primary induction mechanisms, there is an inevitable sequence of events that may be described conveniently as a cycle.

The cycle is dependent on stratum corneum integrity and particularly upon barrier function and homeostasis essential for controlling stratum corneum water flux, content and enzymatic reactions within the stratum corneum. It is implicit that intervention at multiple points within this cycle is necessary to arrest the progression of this continuing downward spiral. The Dry Skin Cycle inhibits skin's ability to:

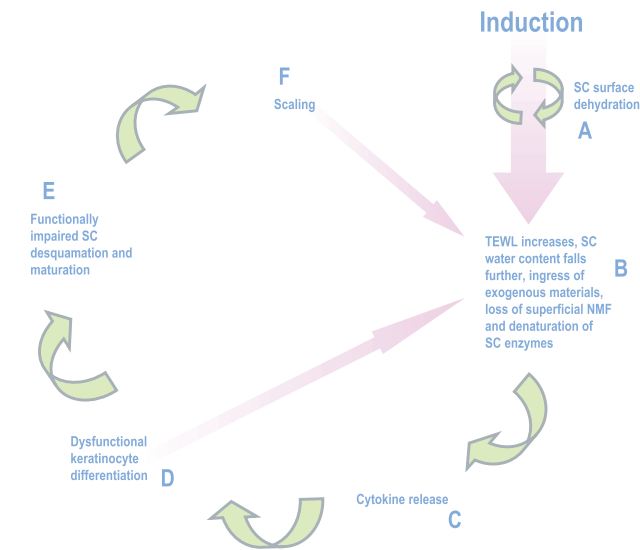
- **Hydrate** itself
- **Renew** (exfoliate) its outer layers
- **Replenish** natural moisturizing factors (NMFs)
- **Repair** its moisture barrier

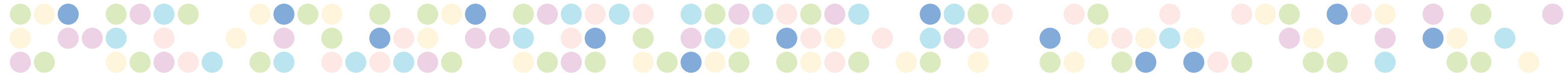
What's Inside

- The Sunscreen/Vitamin D Debate Continues
- Nanotribology Gets to the Root of Hair Problems
- Liquid Makeup Gets a Two-step Makeover

During the Dry Skin Cycle, a frenzy of skin cell overproduction takes place in an effort to compensate for the disrupted moisture barrier. The desquamation process slows, producing a thick, dull cell layer. "In the course of everyday life we move through a sequence of both outdoor and indoor environments that, over time, quietly assault the skin. If the Dry Skin Cycle is addressed at multiple points, the cycle will be attenuated, barrier function improved and desquamation normalized, leaving skin better prepared to cope with both internal and external stressors," said Dr. Peter Elias, M.D., University of California at San Francisco.

This modernized thinking has been published in the Dermatology Foundation's *Progress in Dermatology* series entitled *Stratum Corneum Moisturization at the Molecular Level: An Update in Relation to the Dry Skin Cycle*. "This publication is the first update in ten years sought to bring a comprehensive review of all that was known about the skin hydration mechanism. This new review proposed by P&G scientists brings the reader up to date with the vast amount of knowledge gained in this area, but with particular reference to the Dry Skin Cycle," said Paul Matts, Ph.D., P&G Principle Researcher.





Proprietary Formulation Breaks the Cycle

In order to break the cycle of dry skin, P&G scientists created a unique High Efficacy Body Moisturizer (HEBM) formulation that synergizes the power of niacinamide, glycerin and seven amino acids (NMFs), found naturally in skin, to help interrupt and reverse the cycle of dry skin. An innovative new delivery system using encapsulated micro-sensor particles allows for high levels of active ingredients without the traditional trade-off of heavy, sticky and tacky feel. This leads to high consumer acceptance and ongoing compliance.

In clinical tests the HEBM formula was able to target the barrier improvement itself, not merely the skin symptoms. The HEBM was able to significantly improve the skin's ability to augment the natural moisturizing factor and maintain stratum barrier structure even post-insult, indicating an intervention in the self-perpetuating dry skin degenerative process.



Dr. Paul Matts is a Principle Researcher at P&G and author of the Dry Skin Cycle. His passion is the development of breakthrough methodologies to measure skin. His work has led to improvements in the formulations of P&G's skin care products to alleviate dry skin and other skin conditions.

SUNSCREEN CLEARED FROM BEING CULPRIT IN VITAMIN D DEFICIENCY

In the past several years, there has been much public debate about the importance of sunlight exposure for maintaining adequate levels of vitamin D, versus the importance of daily protection against solar ultraviolet (UV) radiation. Vitamin D is known to play an important role in bone health and maintaining muscle control. Further studies have suggested that it plays a role in lowering blood pressure and reducing the risk of developing cancer, multiple sclerosis and arthritis. Vitamin D is provided in the diet, often at inadequate levels. The other major source of vitamin D is by the skin, following exposure to sunlight. However, it is well documented that even small amounts of solar UV can produce acute and chronic skin damage, including skin cancer. As a result of these benefits and risks, people have heard confusing advice to forego use of sunscreens and even intentionally sunbathe to avoid a vitamin D deficiency.

A new study is helping to set the record straight about sunscreen use and vitamin D. At the 2005 American Academy of Dermatology (AAD) annual meeting, P&G scientists in collaboration with Dr. Darrell Rigel, Clinical Professor of Dermatology at NYU, reported the impact of "safe sun strategy" on levels of vitamin D in humans. This study determined the average daily "dose" of solar UV in 92 female subjects from 5 geographically distinct cities throughout the U.S.

The dose of UV was used to calculate the production of vitamin D in the presence and absence of SPF 15 sunscreen.

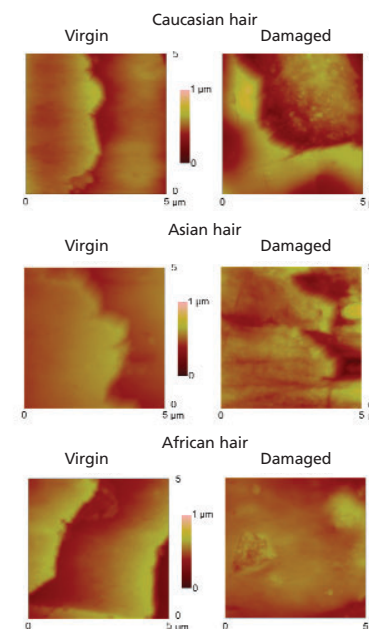
"We can estimate how much vitamin D is produced in the skin by a given dose of solar UV. Further, we know that SPF 15 sunscreen reduces the dose of erythemally weighted solar UV by 93%. Therefore, we can calculate the impact of daily use of SPF 15 sunscreen on the levels of vitamin D," said J Nash, Ph.D., a P&G Beauty scientist and study author. Using the most conservative assumptions, the estimated synthesis of vitamin D was equivalent to half the adequate intake even if SPF 15 sunscreen was applied properly. This production of vitamin D, together with current estimates of dietary intake, suggests that use of sunscreens would not produce a deficiency.

These results do not refute the benefits of a "safe sun strategy," including the use of SPF 15 sunscreen. Dr. Rigel recommends that people concerned with maintaining vitamin D levels should take a multivitamin, drink vitamin D-fortified milk or eat food rich in vitamin D, such as salmon. Daily use of SPF 15 sunscreen is strongly recommended by the AAD to diminish the long-term health effects of solar UV.



STRANGELY BEAUTIFUL

Healthy hair is sought after by people of all ethnicities. The damage posed to hair can be decreased or eliminated with a better understanding of the hair surface. With research grants from P&G Beauty and the National Science Foundation, Dr. Bharat Bhushan, Nanotribology Laboratory for Information Storage and MEMS/NEMS (NLIM), has conducted nanotribological studies using atomic force/lateral force microscopy (AFM/LFM) to characterize samples that included African, Asian and Caucasian hair. While the results are not surprising, it is known that the ability to characterize the morphological, frictional and adhesive properties (otherwise known as the tribological properties) of hair is essential to advance science in this area.



Images taken using AFM techniques demonstrate the significant differences seen between virgin and damaged samples of Caucasian, Asian and African hair, respectively. Cracking and pitting on the surface can occur even in virgin hair. In damaged hair, alternating regions of intact cuticle and severe wear are present.

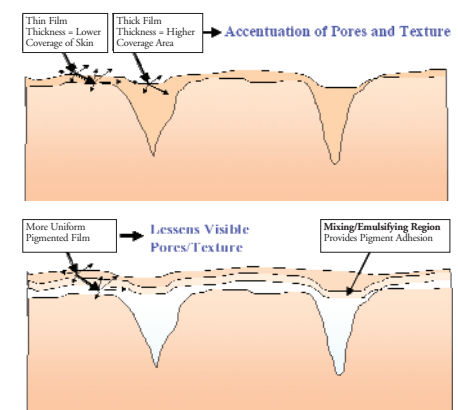
MYTHS AND FACTS

- **The majority of women in the U.S. apply a body lotion every day.** *False – According to a survey of dermatologists, the majority believe that less than half of their adult female patients apply moisturizing lotion within three minutes after showering, as is recommended for maximum moisturizing benefit.ⁱ More than 80% of the dermatologists surveyed cited inconvenience as a key factor contributing to the low compliance rate.ⁱⁱ*
- **For older women with dry skin, the type of cleanser used can impact dry skin as much as a moisturizer.** *True – Studies have shown moisturizing body washes can help restore moisture to aged skin. P&G researchers found that using a moisturizing body wash as opposed to bar soap can reduce the potential for skin drying on elderly skin.*

ⁱ, ⁱⁱ Ertel K, Farris R, Rodriguez V, Hartwig P. Body moisturizer usage compliance and its impact on dry skin improvement [abstract]. J Am Acad Dermatol. 2005; 52(3 Suppl):P85.

CLOSE-UP

A recent global study showed that 80% of women desire a long-wear benefit from their makeup. To solve this problem, P&G scientists developed a new two-step liquid makeup system that provides continuous coverage for 10 hours, even under hot and humid conditions. The moisturizing basecoat (or PrepStep) employs waterproofing polymers previously unseen in cosmetics to help



Coverage achieved by traditional foundation (top) versus two-step liquid makeup (bottom).

protect the color coat from sweat and sebum. The result is flawless color that does not fade or settle into pores and fine lines, thus evening out the skin's tone for a fresh, natural look that lasts and lasts.

LAB NOTES

Dandruff affects over 50% of the adult population, with some studies suggesting an incidence rate of up to 80%. An astounding 36% of dandruff sufferers also experience sensitive scalp. While almost all dandruff sufferers have tried an anti-dandruff shampoo, only one-third use these products regularly, citing greasy hair and sensitive scalp as common culprits for discontinued use. P&G Beauty scientists conducted extensive research to develop a dandruff shampoo with a modified PTZ (pyrithione zinc) formula without dyes or strong fragrances and with a rebalanced preservative system for individuals with perceived sensitive scalp. Consumer studies demonstrate that the new PTZ formulation is effective against dandruff and provides significant relief from dryness and itch. Clinical research shows it is as gentle to sensitive scalps as children's shampoo.

GLOBAL BEAUTY

Women worldwide are concerned with the effects of aging on facial skin, including fine lines, wrinkles, poor texture and hyperpigmentation, most of which are caused by repeated sun exposure over many years. Previous studies of niacinamide, also known as vitamin B3, revealed its benefits in treating these age-related problems. New testing shows that niacinamide can also help treat skin yellowing, a top beauty concern among Asian women, where lighter skin is considered most desirable. Niacinamide has been shown to inhibit glycation – a chemical process that deteriorates collagen in the skin over time causing yellowing – making it an effective treatment for this problem.