

## IN THE SPOTLIGHT

### Preventing the Spread of SARS in China and Pakistan

Partnering with the Beijing Health Bureau Labor Union, P&G recently donated 10,000 product packs to families of front-line health care workers who were helping prevent the spread of SARS. P&G employees worked through weekends and nights so that the product packs could reach the families before a local holiday.

Safeguard antibacterial soap also collaborated with the U.S. Centers for Disease Control & Prevention in Pakistan to clinically document the benefits of good hygiene in helping to reduce the incidence of several childhood diseases, such as impetigo, diarrhea and pneumonia that are common in many developing countries. The study results

have shown that dramatic health benefits can be obtained by simply encouraging hand washing with soap. For example, childhood diarrhea, which kills an estimated 2 million children under the age of 5 per year, was reduced by 50 percent in families that regularly washed with Safeguard. Hand washing with soap is a very cost-effective method to improve the health of the world's consumers.



## FAST FORWARD

The desire to get rid of gray hair is as primitive as the practice of using walnut dye and henna to do the job. Scientists are no longer in the dark about what to do when cells stop producing natural color—they found the on/off switch via gene analysis. Although lab experiments successfully proved that graying hair can be stopped and even reversed, consumers will have to wait to try this at home. The current challenge is to consistently pinpoint only hair cells to safely restore pigmentation.

## DID YOU KNOW?

P&G Beauty Labs conduct research and product testing on up to 200 pounds of human hair a year, making it the single largest "consumer" of human hair in 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 \$12 billion in global sales in fiscal year 2002/03, 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®. The P&G community consists of nearly 98,000 employees working in almost 80 countries worldwide. Please visit [www.pg.com](http://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 DATA OFFERS INSIGHT INTO SUNSCREEN SHORTFALL

The incidence of sunlight-induced skin cancers has risen dramatically over the past three decades, stimulating P&G Beauty scientists to develop sunscreen technology that better protects consumers from solar ultraviolet radiation (UV). They have identified at least two advancements to improve protection: (1) breadth of UV coverage and (2) pleasing product formulation.

Reducing long wavelength UV or UVA is critical since it has been implicated in chronic skin damage. Presently, close to half of the marketed sunscreen products don't provide extensive or *broad spectrum* UVA protection. In addition, consumers do not apply enough product or *dose* of a sunscreen. Applying too little sunscreen product can result in protection well below the labeled SPF. Improved product aesthetics and broad-spectrum UVA coverage will give consumers more effective UV protection.

Public education campaigns encouraging safe sun practices, including the daily use of sunscreens, may slow or reduce skin cancer rates, but without a standard test for long wavelength (UVA) efficacy, consumers may not be getting the breadth of protection implicit on current product labels. Currently, sunscreen products claiming *broad-spectrum* or *extra* UVA protection vary greatly in their ability to reduce long-wave radiation.

## Formulation Factors

P&G Beauty scientists have advocated that the FDA adopt the Critical Wavelength as a meaningful test to assess UVA efficacy and develop a simple label to communicate UVA protection. P&G Beauty is promoting Critical Wavelength as a reproducible *in-vitro* measure of broad-spectrum efficacy. This method ensures sunscreens provide consumers with broad-spectrum protection, preserving SPF as the key index of sunscreen product efficacy.

## What's Inside

- Rare photo of dandruff culprit
- High-tech moisturizing
- The dirt on cleansing via electron microscope

J. F. Nash, PhD., photobiologist, toxicologist and advocate of the Critical Wavelength argues that this method is a reproducible *in-vitro* index of

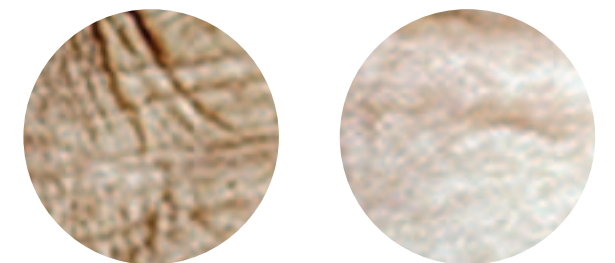
"The Achilles' heel of sunscreen application is failure to completely coat the skin. I protect my young kids with two layers of SPF 15, applied 15 minutes apart, 15 minutes before going out. Double layering ensures coverage; allowing time between applications lets the product spread and settle into place on the skin,"

P&G Beauty scientist, J. F. Nash, PhD.

the breadth of UV photoprotection, and when combined with *in-vivo* SPF provides a complete profile of sunscreen product efficacy. Further, using this *in-vitro* approach eliminates the need for additional human testing.

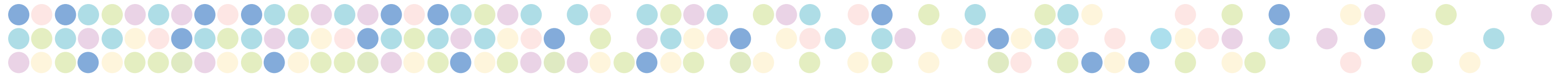
Whereas SPF should always be the principle measure of sunscreen efficacy, consumers may have a misunderstanding about high SPF numbers. Many believe application of a high SPF, such as SPF 30, provides twice the protection of SPF 15. In fact, due to the way consumers use sunscreens, they usually apply less product than required to achieve labeled SPF, mainly due to the heavy and sticky feel of the higher SPF

products. In other words, a lower SPF, such as SPF 15, used correctly, may be more efficacious than a higher SPF such as SPF 30, the way it is being used today. (continued on page 2)



Facial skin is deeply weathered, etched with UV damage, in contrast, the neck area, which is usually protected from UV exposure by collars and the chin's shadow, is baby smooth.





(SPF continued from page 1)

The cosmetics of sunscreens may seem like a secondary consideration for the rise of skin cancer rates, but P&G Beauty consumer studies show that aesthetics have a strong influence on how much and how often consumers apply sunscreen. Achieving the labeled SPF from a sunscreen is dependent on the amount applied. Lighter daily-use moisturizers may actually represent the most efficacious sunscreens, because they tend to be applied more generously and used more frequently.

“The average consumer just does not fully understand sun protection,” says UV expert J.F. Nash, PhD. Nash is a P&G Beauty scientist working to improve public health awareness for greater consumer protection and to establish a reproducible method that may be adopted by the FDA to measure and label the UVA efficacy of sun protection products.



## ITCHING TO FIND OUT

After 100 Years of Fungal Misidentification, P&G Beauty Scientists Discover the Specific Yeast that Aggravates Seborrheic Dermatitis/Dandruff.

Fungi are ancient troublemakers, but the suspicion that they might cause disease is only about 100 years old. When Louis Charles Malassez (French microbiologist: 1842-1909) first saw a yeast-like substance lurking in the scales of a patient with seborrheic dermatitis,<sup>1</sup> he was at the forefront of mycology, but the view was far from clear. Now a century later, with new resources in the scientific toolkit, genetic research has provided the means to accurately identify the precise microfloral component that Malassez first saw.

Formerly identified as *Pityrosporum ovale*, an antiquated term that is no longer used,<sup>2</sup> and later misidentified as *Malassezia furfur*, the fungus that produces seborrheic dermatitis/dandruff is *M. globosa*, which has a unique etiology.

*M. globosa* had eluded diagnosis for years because it did not culture well. However, *M. furfur* actually thrives in a Petri dish environment, multiplies rapidly and totally obscures evidence of other species. Because *M. globosa* thrives in the much more exclusive cultural niche of the disease-susceptible scalp, the species evaded discovery until gene-sequencing research revealed its presence.



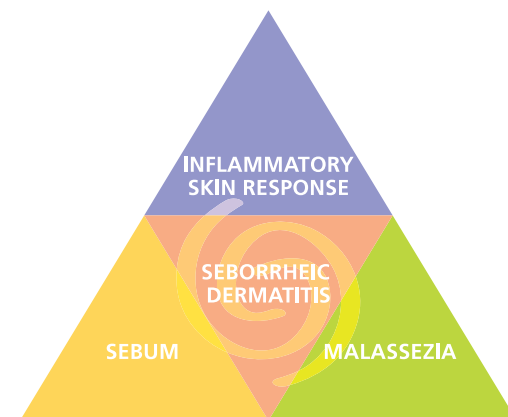
A rare close-up of the elusive *M. globosa* fungus found to be the fungal cause of seborrheic dermatitis/dandruff.

Once researchers at P&G Beauty were able to isolate *M. globosa*, its specific mode of operation was revealed and all the pieces of the puzzle fell into place. When *M. globosa* consumes sebum triglycerides, this particular species releases skin-irritating unsaturated fatty acids (i.e. oleic acid, found to induce dandruff in human subjects),<sup>3</sup> causing itch and scalp tightness that many sufferers misidentify as dry skin and stimulating excessive scalp desquamation commonly known as those embarrassing white flakes.

“P&G Beauty is pioneering the understanding of *Malassezia*, their metabolism, and the effect on humans. Understanding the role of these common skin microbes has opened the doors for genetic studies of dandruff and seborrheic dermatitis, and a multitude of other common fungal diseases that cause significant suffering and may even be fatal to patients with suppressed immune systems,” states leading medical mycologist, Aditya K. Gupta, MD, Ph.D., Fellow, Royal College of Physicians (Canada).

Nearly half the human population of our planet suffers in varying degrees—from dandruff to scalp seborrheic dermatitis. A pyrithione zinc (PTZ) containing shampoo used daily is an efficacious and cosmetically attractive way to solve the problem of itch, discomfort and excessive flaking.

And now, P&G Beauty is formulating PTZ into rinse-off conditioners and leave-in lotions to provide consistent anti-*M. globosa* coverage and inhibit recurrence in dandruff sufferers.

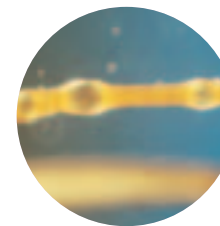


Dandruff/seborrheic dermatitis is a three-part condition that includes: sebum, *Malassezia* and an inflammatory skin response.

<sup>1</sup> Malassez, L. Note sure le champignon du pityriasis simple. Arch Physiologie 1874;1:451.  
<sup>2</sup> Gueho E, Midgley G, Guillot J. The Genus *Malassezia* with description of four new species. Antonie Van Leeuwenhoek 1996;69:337-55.  
<sup>3</sup> Boekhout T, Theelen B. Molecular Epidemiology of *Malassezia* Yeast. [n.p.] 2001;18:5332.

## STRANGELY BEAUTIFUL

- Did you know that the surface area of your hair is about the size of a small kitchen? Think about that the next time you shampoo or style.
- Common tap water contains copper – a chemical that leaves hair brittle and dry. The solution? P&G scientists engineered a “copper shield” added to hair colorants preventing the metal from sticking.
- This electron microscope image reveals a body part that is more frequently damaged because of the overuse of technology. Can you guess what it is?



Heat-caused thermal blisters on a hair shaft. Formerly only professionals used high-powered hair dryers and irons—now average consumer use is causing greater damage.

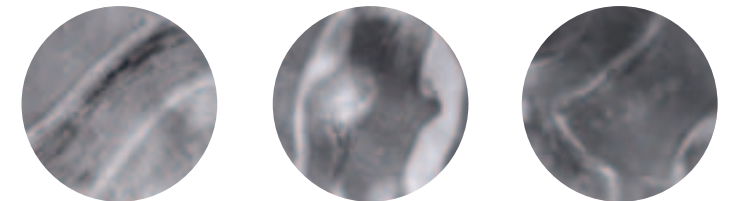
## MYTHS AND FACTS

- All sunscreen products on the market today actually protect against both UVA and UVB radiation. *False*—Sunscreen analysis of 188 lotions revealed inconsistent UVA protection in SPF 15 products—presented at the American Academy of Dermatology February 2004, Nash et al. (poster # 135).
- The way the sunscreen is applied can be more important than the SPF rating. *True*—Under-applying sunscreen seriously compromises efficacy. In-use research shows that consumers may only obtain SPF 6 from products labeled as SPF 30 because they use too little. They may get more protection from an SPF 15 product, because they apply the more aesthetically pleasing lotion more generously.



## CLOSE UP

The stratum corneum is stacked with lipid bilayers that form a physical water-retaining protective barrier. Electron microscope images show the impact on the lipid bilayers after using a daily facial lathering cleansing cloth containing petrolatum versus washing with other cleansers also characterized as gentle.



Cleansing agents impact skin health. Microscopic views of lipid bilayers that have been exposed to three different cleansing agents show how cleansers can maintain—or harm—the skin’s top layer. From left to right, bilayer remains intact after cleansing with a daily facial lathering cleansing cloth containing petrolatum (left); skin structure appears disrupted after cleansing with a mild syndet bar (center) and a “gentle” liquid cleanser (right).

## LAB NOTES

P&G Beauty scientists are currently studying a revolutionary new technology that will provide millions of dry skin sufferers with a less burdensome alternative to creams and lotions for moisturizing thirsty skin. This new concept is an in-shower body lotion that is literally applied in the shower after cleansing, while the skin is still completely saturated with water. In-shower moisturizing seals in moisture for long-lasting relief. Cleansing products can exacerbate or cause dryness by stripping the skin of the natural oils present on the surface. Moisturizers replenish protective hydration that bathing may wash away.

## GLOBAL BEAUTY

Recently, studies have shown that women worldwide have been cosmetically altering their skin tone to reflect what is considered culturally “beautiful.” Lighter-skinned women in the United States covet perfectly bronzed skin and work to achieve this through self-tanning products. Women in Asian countries work against the signs of aging, which often yellows their skin, and obtain creamier looking skin by employing skin-whitening products. These trends have become so powerful, in fact, that these products are the fastest growing new categories in the skin care market.