

IN THE SPOTLIGHT

The prestigious medical journal, *The Lancet Infectious Diseases*, has selected a study by P&G Beauty and the U.S Centers for Disease Control and Prevention (CDC) as its favorite study on infectious diseases published between September 2004 and August 2005. The study, "Effect of Hand Washing on Child Health: A Randomized Controlled Trial," was selected by the journal's editorial board from 35 articles published in medical journals like *The Lancet*, *New England Journal of Medicine* and *Clinical Infectious Diseases*.

The study, originally published in July 2005 in *The Lancet*, described a community randomized trial of an extremely simple intervention – hand washing – in a squatter village in Karachi, Pakistan. Among children in households that received soap, the incidences of pneumonia and diarrhea were reduced by 50% or more compared with controls who did not receive soap. In light of these results, one of the board members who voted for the paper called hand washing "the most important medical remedy for children in developing countries."



This study is another result of the decade-long collaboration between P&G and the CDC. "The recognition of this work illustrates the remarkable contribution of our joint efforts to public health understanding," said Dr. Stephen Luby, the study's lead investigator and a medical epidemiologist at the CDC.

FAST FORWARD

A new understanding of the optical properties of skin and hair is allowing researchers to go beyond illusions to reveal and enhance true, natural beauty. Rather than just covering up flaws, women want to reveal the real beauty of their skin and hair – to make it look healthy and luminous. Research by P&G Beauty scientists has revealed the secret for achieving this – light. Many modern beauty products contain ingredients that modify the way light is reflected from the surface, covering up imperfections and improving the appearance of hair and skin. The new research by P&G Beauty shows the importance of light reflected below the surface for true natural beauty and luminosity. The concept of light is opening the doors to a new era in beauty technology, with products that go beyond surface illusions to reveal and enhance the inherent beauty of skin and hair.

DID YOU KNOW?

The moisturizing ribbon in one 18 oz. bottle of Olay Ribbons Body Wash plus Body Butter Ribbons is actually 375.8 yards long.



P&G BEAUTY SCIENCE

P&G Beauty Science has more than 1,800 scientists and technical employees working at nine global technical centers with an unparalleled commitment to technology development. Company scientific efforts have resulted in over 3,500 active beauty care patents. 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.

P&G Beauty sells more than 130 different brands in over 180 countries worldwide that touch and improve lives daily. P&G Beauty had more than \$19 billion in global sales in fiscal year 2004/05, making it one of the world's largest beauty companies. The global leading beauty company at mass, P&G Beauty brands include: Pantene,® Head and Shoulders,® Olay,® Max Factor,® Cover Girl,® Gillette® Complete Skin Care for Men, Always,® Joy,® Hugo Boss,® Wella,® Herbal Essences,® Clairol Nice 'n Easy® and SK-II® Please visit [www.pg.com](http://www.pg.com) for the latest news and in-depth information about P&G Beauty and its brands.

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BREAKTHROUGHS:  
SCIENCE NEWS FROM P&G BEAUTY

ESSENTIAL GLUCOSAMINE COMPLEX:  
REDEFINING SKIN AGING

The study of skin aging has evolved and moved beyond lines and wrinkles to address an important new area: the impact of skin tone on appearance. By combining the best of skin imaging technology and a new understanding of the biology behind a "youthful glow," P&G Beauty scientists have developed a breakthrough glucosamine complex designed to penetrate up to 10 surface layers deep to improve the appearance of uneven skin tone caused by an overproduction of melanin from UV radiation. In addition to reducing discolorations and brown spots, this formulation also reduces the appearance of fine lines.

This advancement is important to consumers, evidenced by a global surge in the number of women looking for non-prescription ways to mitigate or fix uneven skin tone. Importantly, scientists at P&G Beauty have conducted several clinical trials involving hundreds of women utilizing the glucosamine complex to ensure the formulation can deliver results that consumers want. Nineteen internationally renowned dermatologists from around the world met in Rome in January 2006 to review these data, and determined that the glucosamine complex significantly reduces both the amount and unevenness of melanin in the skin versus a base moisturizer.

Creating the Glucosamine Complex

Understanding the unique changes that skin pigment cells undergo when exposed to UV was critical in the development of the glucosamine complex, which targets cells that over-produce melanin. Additionally, P&G Beauty scientists considered the fact that healthy skin reflects light, but skin that lacks collagen and moisture absorbs light – giving it a dull appearance. To combat these skin tone issues, the glucosamine complex includes:



Extensive clinical trials were conducted to test a glucosamine complex that improves skin tone damage caused by UV radiation. The image on the left was taken at baseline and the image on the right represents the improvement seen in pigmentation in the circled area at eight weeks.



Clinical Trials Show  
Tone Improvement

At the recent American Academy of Dermatology (AAD) meeting, P&G Beauty scientists presented data from three clinical studies that found N-acetyl glucosamine and niacinamide reduce melanin unevenness and the appearance of hyperpigmentation in UV-damaged skin cells. This combination was also effective on top of any result provided by SPF 15 sunscreen.

What's Inside

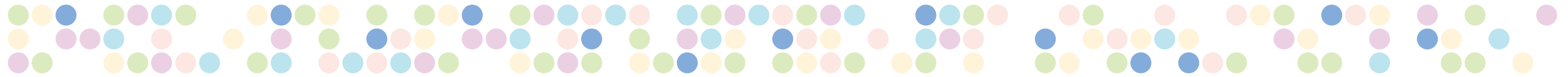
- Skin Optic Research Provides Insight to a New Make-Up
- Journal Selects P&G Beauty and CDC Study as Favorite
- Glazing Increases Overall Shine of Color-Treated Hair

• **Niacinamide:** This potent B vitamin improves the skin's condition by strengthening the moisture barrier and helping promote homogeneous collagen – both of which help to smooth the skin's texture and increase its reflectivity. It has been shown that niacinamide has an inhibitory effect on the transfer of melanin-containing melanosomes into keratinocytes having the potential to reduce pigmented spots.

• **N-acetyl glucosamine:** N-acetyl glucosamine interrupts the dysfunctional cycle of melanin overproduction in pigment-producing cells by blocking the conversion of tyrosinase, a key enzyme in melanin biosynthesis, to its active form. In combination, N-acetyl glucosamine and niacinamide work synergistically to reduce the appearance of hyperpigmented brown spots and improve the overall evenness of skin tone.

(continued on page 2)





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## In Vitro Testing Shows Barrier Improvement, Collagen Growth

Also at the AAD, P&G Beauty presented data from a study of *in vitro* human skin cultures that showed N-acetyl glucosamine and niacinamide act to stimulate hyaluronan synthesis, a key component in skin's hydration, as well as increasing collagen production.

## Consumers get more radiant skin

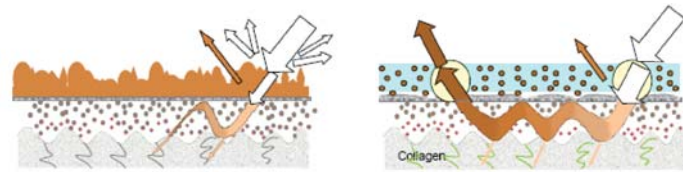
In order to assess how consumers felt about their appearance following the use of various products containing the glucosamine complex, P&G Beauty scientists conducted a blind study of nearly 200 women who tried them. Eighty-seven percent of women surveyed found the products were effective at making their skin more radiant and luminous, and 77 percent said the products made their skin's color and tone more even.

"Pigmentation is an appearance issue that many women encounter. The large base clinical data indicate that the combination of N-acetyl glucosamine and niacinamide significantly evens skin tone, reduces the appearance of age spots, increases hydration and provides an easily accessible solution to ease women's concern about aging," says Dr. Rosemarie Osborne, Principal Scientist, P&G Beauty.



Dr. Rosemarie Osborne, Principal Scientist at P&G Beauty, is an expert on the biological processes in skin that impact aging and appearance. Her study of N-acetyl glucosamine and niacinamide revealed that the complex stimulated biochemical messengers that help hydrate skin and prompt collagen growth – key aspects in skin health.

P&G Beauty used its expertise in understanding skin optics to develop an age-defying foundation formula that breaks the trade-off between radiance and coverage. P&G Beauty scientists applied the understanding that light must be transmitted into the skin, diffused laterally and reflected back out again to get a youthful glow. They induce this optically by depositing a fluid film of make-up made discontinuous by translucent elastomer particles. After application, the liquid solidifies into a soft, flexible film that locks pigments in place, preventing them from drying, caking and migrating into areas of texture. In addition, the elastomer particles act as light lenses that actively channel light into and out of underlying skin, visibly brightening the skin. The film evenly distributes these texture-masking pigments with the elastomer light lenses to allow skin radiance to shine through. In consumer testing, the enhanced brightness and even skin tone has been shown to take up to five years off the appearance of facial skin.



The image at left displays how conventional foundation prevents light from channeling through the skin. The image at right shows how translucent elastomer particles actively channel light into and out of mature skin with P&G Beauty's foundation applied, increasing the brightness and youthful look of the skin.

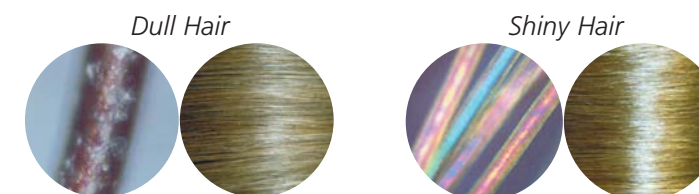
Mature skin also needs special care to enhance its health and appearance. The new foundation also leverages P&G Beauty's expertise in moisturizing skin care to nourish and improve skin health over time. The foundation includes glycerine and niacinamide to improve skin hydration, antioxidants to help fight the aging affects of free radicals, and SPF 10 to protect skin from further photoaging. In fact, *in vivo* testing shows that the new foundation increases skin hydration by more than 50% even eight hours after application.

## GLOBAL BEAUTY

Moisturization is a universal indicator of the health and well-being of hair and skin. Women of African descent in particular crave more hydration for their hair and scalp than any other ethnic group. In a recent study among 1,000 African American women, a majority were concerned about dry, brittle hair (54%) and dry scalp (51%). Half of the women felt that dryness led to hair breakage. African American women go to great lengths to prevent hair and scalp dryness, including using moisturizing shampoos (71%), rinse-off conditioners (65%), leave-in conditioners (58%) and oil-based hair dressings (59%). To meet the needs of these hydration-hungry consumers, P&G Beauty developed the world's first petrolatum-depositing shampoo for maximum moisturization.

## STRANGELY BEAUTIFUL

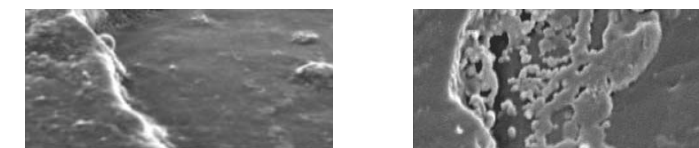
When light hits a rough, irregular surface, it scatters in all different directions in what scientists term diffuse reflection. Smooth surfaces – like mirrors – reflect light more sharply and uniformly. P&G Beauty scientists know this law of physics also applies to hair, and they have developed products that make each strand reflect light like a tiny mirror. When hair is healthy, the cuticles, which cover the surface of each strand, overlap smoothly to reflect light more clearly, resulting in shiny hair that enhances the richness and brilliance of hair color. Damaged cuticles don't lay flat, reflecting light diffusely and appearing dull. P&G Beauty has developed cuticle-protecting shampoos and conditioners that hydrate and protect color-treated hair to enable it to maximally reflect light and color expression.



The roughened cuticle of damaged hair (image, left) results in a duller shine. Uniform cuticles in healthy hair (image, right) cover the surface of every strand and reflect light more clearly and sharply, resulting in shinier hair.

## CLOSE-UP

Color-boosting glazes have been used in the salon industry to boost color and shine between salon colors. But at-home versions have traditionally not offered long-lasting color benefits. P&G Beauty researchers learned that adding a substantive amino silicon conditioner after color glazing enhances overall shine and increases color retention by recreating the hair's natural hydrophobic layer that was lost as a result of color treating.



The image on the left displays even deposits of the amino-silicon-containing formulation on the hair, while the image on the right shows uneven deposits of film from a conventional glaze, which are more susceptible to color loss during shampooing.

## LAB NOTES

Consumers have grown so accustomed to fragrances in beauty products that odorless shampoo has become a thing of the past. But transforming a fragrance-free white froth into, say, a revitalizing cucumber-melon experience is quite a complicated journey. Crafting

any marketable scent is equal parts art and science. The science comes from combining anywhere from 10 to 100 ingredients. The art comes from a variety of inspirational materials with which perfumers surround themselves. At P&G Beauty, the development process begins when a project manager briefs several internal perfumers on a new project. A design manager then guides scent development, monitors the work of the trained perfumers and evaluates the submissions. No fragrance leaves P&G Beauty without a thorough toxicological review and sensitization patch testing to ensure safety.

## MYTHS AND FACTS

### • Traditional anti-aging foundations make your skin look younger.

**MYTH** – Most traditional anti-aging foundations make your skin look younger initially. However, the look only lasts as long as the make-up stays fresh and moist. As the make-up dries out, the pigments clump together, accentuating areas of texture and making skin look older. P&G Beauty has developed a breakthrough foundation formula designed to prevent pigments from drying out and clumping, making skin look up to five years younger even eight hours after application.

### • As skin ages it seems to lose its luminescent glow.

**FACT** – New research into the optics of skin confirms that younger skin glows because it contains more collagen – which acts as a natural mirror, reflecting back more than 90% of the light entering the skin. Additionally, older skin contains more areas of hyperpigmentation, or "age spots," which absorb light and prevent light from reflecting back out of the skin.



## COSMETIC TECHNOLOGY LEADS TO BREAKTHROUGH AGE-DEFYING LIQUID MAKE-UP

Many women over 35 are looking for a make-up foundation that improves the youthful appearance as well as the underlying health of their skin. Between the ages of 16 and 35, the average woman loses 50 percent of her skin's brightness and gains five times as many contrasting imperfections, resulting in older looking skin. Unfortunately, traditional foundations either improve radiance through light-reflecting particles or cover up skin imperfections with light-diffusing pigments – but not both. Even worse, imperfection-covering pigments can clump together over time, actually accentuating the wrinkles they were designed to mask.