Society of Cosmetic Chemist
Carolina Chapter

Society of Cosmetic Chemists
Carolina Chapter

January 2017
Volume 110

Join us for the first meeting of 2017!

HOSTED BY:

EnDev
A Division of Ei
A Pharmaceutical Solutionworks

FEBRUARY 16, 2017

4:30PM-7:00PM

NC Research Campus

150 N. Research Campus Drive
David H. Murdock Core Laboratory Event Room
Kannapolis NC, 28081

MEET OUR SPEAKER: JEAN-PHILIPPE THERRIEN, PH.D. ON PAGE 3

MEET OUR SPEAKER GIUSEPPE VALACCHI ON PAGE 4

Meeting Topics:

Jean-Philippe Therrien, Ph.D: The Use of In Vitro Human Skin Models to Evaluate Safety and Efficacy of Cosmetic Ingredients/Products

Giuseppe Valacchi PhD: Exposome skin damage: can atmo$_3$spheric aging be prevented?

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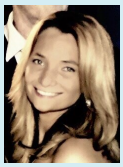

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UPCOMING MEETING DATES

April 20, 2017: Raleigh Durham

August 24, 2017: Columbia SC

November 16, 2017: Charlotte NC

If you are interested in sponsoring an upcoming meeting, contact us!

scccarolinas@gmail.com

LETTER FROM THE CHAIR: SHARI CLEMENTE

Hello Carolina SCC members and friends. I hope everyone has been off to a fantastic start in 2017! We will kick off the year with our first meeting in Kannapolis NC at EnDev Laboratories. As you make plans for this year please keep our upcoming Chapter events in mind:

April 20, 2017: Raleigh Durham

August 24, 2017: Columbia SC

November 16, 2017: Charlotte NC

Thank you for your continued support and I look forward to seeing you all on February 16th in Kannapolis.

If you are interested in presenting at a 2017 Carolina Chapter meeting please send an email to scccarolinas@gmail.com

The Carolina Chapter is also looking for people interested in submitting articles to be distributed in our newsletter. Please submit a short summary of your article if you would like to be published in our newsletter!

Contact us for more information about sponsoring an upcoming meeting.

MEET OUR SPEAKER: JEAN-PHILIPPE THERRIEN, PH.D.

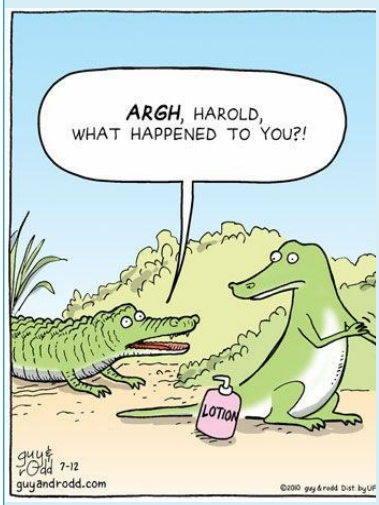
ENDEV LABORATORIES, A DIVISION OF EI A PHARMACEUTICAL SOLUTIONWORKS, KANNAPOLIS, NC

JP joined EnDev in November 2016 having held positions of increasing responsibility as Director of Skin Biology with the Dermatology Therapeutic Area at GlazoSmithKline (GSK), previously Stiefell, a GSK company and Stiefel. Prior to joining Stiefel/GSK, JP spent 6 years at the National Cancer Institute/ National Institute of Health on the Dermatology Branch as Post-Doctoral and Research fellow working on human skin gene therapy. JP received a B.S. in Biochemistry from the University of Sherbrooke (Quebec, Canada) and Ph.D. in Molecular and Cellular Biology/Photobiology from Laval University (Quebec, Canada). JP brings more than 20 years of experience in dermatological research and more than 8 years of experience in topical product development for both prescription (Rx) and consumer healthcare/cosmetic (Cx) products, where his work has been extensively published in high-impact journals, scientific presentations, patent applications, and sale aids. JP is also a member of the Board of Directors of the Society of Investigative Dermatology.

THE USE OF IN VITRO HUMAN SKIN MODELS TO EVALUATE SAFETY AND EFFICACY OF COSMETIC INGREDIENTS/PRODUCTS

The use of in vitro skin models has become the standard to evaluate safety as well as efficacy of cosmetic ingredients and products since their testing on animal is banned. There are multiple in vitro human skin models been developed and validated to evaluate safety and efficacy of not only active ingredients, but also final products. This seminar will review different in vitro skin models available, such as reconstructed human epidermis, full-thickness human skin equivalent, reconstituted human pigmented epidermis, and ex vivo skin, and their potential use to evaluate safety, delivery, and efficacy of ingredients and final products. Finally, a successful study generating scientific/marketing claims for a cosmetic product will be presented.

Enjoy a Laugh!



MEET OUR SPEAKER: GIUSEPPE VALACCHI PH.D.

ASSOCIATE PROFESSOR IN REGENERATIVE MEDICINE, NC STATE UNIVERSITY

Giuseppe Valacchi obtained his B.S. with Laude in physio-pathology and his PhD degree in Cell Physiology and Neuroimmuno-physiology at the University of Siena. During his training he has worked as "exchange PhD student" in the "Department of Molecular and Cell Biology at the University of California at Berkeley" where he started out some studies on the effect of environmental oxidative stress such as O3 and UV on skin physiology. After his PhD graduation, he continued working as Post Doc at the University of Berkeley until December 2000. Between 2000 and 2004 he was appointed as Post Doc, first in the "Department of Internal Medicine" and then in the "Department of Nutrition" at the University of California at Davis (UCD). In 2005 he become Faculty and member of the Academic Federation in the Department of Internal Medicine (UCD). At the end of 2006 he was awarded with the "progetto rientro dei cervelli", granted by the Italian Ministry of Health and returned to Italy at the University of Siena as Assistant Professor until 2011. Since 2011 he is appointed as Associate Professor in Physiology in the Dep. of Life Sciences and Biotechnology at the University of Ferrara. From 2008 to 2015 he was also Adjunct Prof. at Kyung Hee University, Seoul, South Korea. Since August 2016 he is Associate Professor in Regenerative Medicine at North Caroline State University. His research has been focused in understanding the cellular, and molecular mechanisms that define the tissues responses to redox homeostasis changes such as exposure to environmental toxicants with special focus on cutaneous tissues. In addition In the last 10 years his research has been involved also in understanding the role of oxidative stress in a rare disease, Rett Syndrome, defined as a neurodevelopment pathology and in the aging processes. He is a member of the SFRR Europe Council and he is author of more than 180 peer reviewed internationals papers, 15 book chapters, one book. He has been invited speaker to more than 80 international conferences and organizer/Chair to circa 50 international conferences. He has won several awards among them the Intelligence Award from Actelion, OCC Young Investigator Award, Science and Education Award. He is the Associate Editor of several international journals among which is Mediators of Inflammation, Frontiers in Cellular Biochemistry, World Research Journal of Biochemistry and Biomed Research International (Dermatology Subjects), Oxidative Medicine and Cellular Longevity in addition he is part of the Editorial Board of several journals such as Genes and Nutrition, Open Biochemistry Journal, Journal of Complementary and Traditional medicine, Clinical Immunology Endocrine & Metabolic Drugs, Frontiers in Inflammation Pharmacology, Clinical Anti-Inflammatory & Anti-Allergy Drugs.

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MEET OUR SPEAKER: GIUSEPPE VALACCHI PH.D.

ASSOCIATE PROFESSOR IN REGENERATIVE MEDICINE, NC STATE UNIVERSITY

Exposome skin damage: can atmo3spheric aging be prevented?

Giuseppe Valacchi, Alessandra Pecorelli, Erika Pambianchi

Plants for Human Health Institute, North Caroline State University, NC Research Campus, Kannapolis, Department of Animal Science

The term "exposome" describes the totality of exposures to which an individual is subjected from conception to death. It includes both external and internal factors as well as the human body's response to these factors. Urban pollution is now considered one of the most effective and noxious element to which humans are exposed to daily during the entire life. Therefore pollution is of main public health concern as it affects every living organism on Earth. It has been reported by the European Environment Agency (EEA) and WHO that more than 90% of the urban population breathe continuously air whose pollution levels exceed a value considered dangerous to health. The pollution impact will be amplified further in the future by the urbanization mega-trend, since 70% of the world's population is expected to be urbanized by 2050. In order of importance, the skin is the main route by which chemicals can enter the body and is the major target of liquid, solid and gaseous pollutants. Being that the skin is the interface between the body and the environment, it is chronically exposed to several forms of stress such as ultraviolet (UV) irradiation and other environmental oxidants such as cigarette smoke (CS), particular matters (PM) and ozone (O3). All these stressors have the common denominator to induce oxidative stress via the production of reactive oxygen species (ROS), either directly or indirectly. There is abundant information that ROS such as hydroxyl radicals are involved in UV-induced skin damage; but only recently, oxidative stress, induced by other pollutants such as CS, PM and O3 has on cutaneous tissues, has been investigated. It has been shown that CS and O3 do not penetrate the skin but are able to induce a cascade of bioactive molecules (derived from the lipid peroxidation) that act as 'second messengers' in the deeper layers of the skin, causing further damage. Therefore, preventing the formation of these "damaging molecule" or targeting these "second messengers" could be a good strategy to hamper pollution induced skin damage.

Most of the current strategies used by the cosmetic industry to reduce the impact of environmental aggressions are based on antioxidant compounds, such as vitamins or plant extracts for instance, that are expected to neutralize free radicals generated within the outermost layer of skin (stratum corneum). Antioxidants are often reducing agents that are expected to interact with the free radicals and other ROS generated in the skin. Such interaction terminates the chain reaction cascades, i.e. lipid peroxidation cascade induced by those oxidizing agents. The main limitation of this strategy lies in the fact that many of the compounds used have a very short life span and in the long run are not able to prevent direct interaction between pollutants and the skin. Being able to "activate" the defensive mechanism in the deeper layers of the skin would better protect skin from these insults. Literature from the last 10 years has shown Nrf2 as a key transcription factor involved in cellular defense and targeting its activation could be a good alternative strategy to protect the skin from atmospheric aging.

MIT ADDS A NEW WRINKLE TO ANTI-AGING TECHNOLOGY

BY: NAVIN GERIA, AYURDERM TECHNOLOGIES

Consumers go to great lengths to reduce the appearance of wrinkles. MIT researchers took a very scientific approach to this problem and created a cream with impressive anti-wrinkle results. This column will briefly review the chemistry and benefits of this special cream, which is know as XPL (cross-linked polymer layer) or "second skin."

The MIT research team set out to develop a protective coating that could restore the properties of healthy skin for medical and cosmetic applications. In their research, the group hundreds of siloxane cross-linked polymers (XPL). Researchers selected a safe, biocompatible polysiloxane-based material because it can be finely tuned to modulate properties such as spreadability, strength, elasticity, flexibility, elongation, contractility, adhesion and permeability. MIT published its study on CPL in the journal, Nature Materials. XPL is the result of a collaboration between MIT and two biotech companies, Living Proof and Olivio Laboratories. Now they are exploring medical uses for this cream, which not only masks wrinkles but actually mimics the properties of normal, youthful skin.

XPL is applied in two steps, First a transparent cream containing the polymer is worked into the skin, Next, a catalyst is applied that binds the cream to the skin as a transparent film. It is said to dry in a minute, withstand washing and sweating, and falls off the skin after a few days, although it can also be removed with a polymer dissolving solution. MIT Professor Robert Langer describes it as "essentially an elastic second skin."[1]

MIT's cream sounds like the sort of thing that will have aging Hollywood stars beating down the doors of the University's science lab, but the technology has its limits. The catch is that, it is only temporary. You can use it to appear flawless on the red carpet during Oscar Night. However, its application and duration characteristics are such that, it is not going to smooth your crow's feet for all eternity.

HUMAN TRIALS

Scientists conducted multiple studies to test XPL's safety and effectiveness. All product ingredients are FDA– approved and researchers say that among the 170 subjects tested, not one person reported irritation or had an allergic reaction.

Under-eye bags are essentially caused by protrusion of the fat pad underlying the skin of the lower eyelid. The researchers targeted under-eye skin due to the proliferation of sagging, puffy skin there. They selected a combination of solvents and concentrations that would provide sufficient compression to shrink the skin with minimal discomfort. The fil is tens-of-thousands less than a millimeter thick and applied on the skin as an undetectable coating.

XPL was tested on eye bags and researchers noted how the skin tightened and wrinkles disappeared for up to 24 hours. Once applied, it is resistant to water and rubbing, and it helps skin remain hydrated. Previously, results such as these were only achieved through an invasive surgical procedure called Blepheroplasty. Second skin is an invisible layer that can provide a barrier, provide cosmetic improvement, and potentially deliver a drug locally to the area that is being treated. Two hours after application, skin treated with XPL lost much less water than skin treated with a high-end commercial moisturizer. It was further determined that skin coated with petrolatum was as effective as XPL in tests done two hours after treatment but after 24 hours, the skin treated with XPL had retained much more water.

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MIT ADDS A NEW WRINKLE TO ANTI-AGING TECHNOLOGY

BY: NAVIN GERIA, AYURDERM TECHNOLOGIES

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As skin ages, it becomes less firm and elastic. To measure these properties, XPL was applied forearm skin. When XPL treated skin was stretched with a suction cup, it returned to its original position faster than untreated skin. The researchers think the same thing could work for other body parts that have lost elasticity too, such as cellulite.

According to Barbara Gilchrist MD, a dermatologist at Massachusetts General Hospital and a co-author of the paper, prior to XPL, the materials did not have the properties of being flexible, comfortable, non-irritating nor able to conform to the movement of the skin and still return to its original shape. Outside researchers are weighing in on XPL, too. Dr Thahn Nagg Tran, a dermatologist and instructor at Harvard Medical School who was not involved in this research, said that XPL has great potential for both cosmetic and non-cosmetic applications, especially if it could contain antimicrobial agents or medication. Dr Richard Glogan, a clinical professor of dermatology at the University of California, San Francisco tested a similar polymer –based product and commented that this XPL technology definitely works; thanks to its thin application, the film looks natural and feels basically like firm skin. Once applied the polymer starts tightening the skin, leading some call it "Spanx for the skin."

Dr, Samir Mitragotri studies drug delivery through the skin in his lab at the University of California, Santa Barbara. He suggested that he had never seen before any material so transparent and so effective at changing the mechanical properties of the skin. He referred to this technology as "radical and revolutionary technology."

"It can be used as soft of a Band-Aid over old and aging skin and get very significant results," Suggested Gordana Vunjak-Novakovic, a biomedical engineer at Columbia University.

The film developers also suggest that it can be used to help skin retain moisture or deliver drugs to treat eczema, dermatitis and other skin conditions.

CAUTIOUSLY OPTIMISTIC

The study looks impressive with its various potential applications, and doctors remain cautiously optimistic, as the study still requires in-depth research and experiments. One major drawback, however, is that the effects don't last more than 24 hours. Even though XPL seems to provide a more notable, immediate effect, whether it will ever become an affordable beauty aid, is another matter entirely. For now, it can't be layered on or worn under makeup, limitations that will turn off a large portion of its cosmetic customer base.

References:

1 Sci-tech, May 9, 2016. A. Kooser.

Www.happi.com/issues/2017-01-04/view_antiaging—cosmeceutical_corner/mit-adds-a-new-wrinkle-to-anti-aging-technology/

SUPPORTING ETHICAL INGREDIENT PRODUCTION

Today's eco-conscious consumer does not have to compromise on quality to buy into ethically sourced, sustainable products, according to Rob Nicol, business manager at independent European distributor Cornelius Group.

Cornelius distributes more than 70 high-quality biodegradable oils, butters and shea esters from reproducible resources to the cosmetics, pharmaceutical and food sectors in partnership with Olvea, an ethical producer of conventional, organic or Fair Trade vegetable oils (certified by EcoCert).

The quality of Olvea's oils is largely due to the company's responsible approach to sustainable development, which respects the traditional harvesting methods of native produce. Olvea's global supply chain has specialist production facilities for argan oil in Morocco and shea in Africa as well as, more recently, sesame seed.

As well as drawing on local expertise to meet the sustainable production requirements of today, Olvea invests in eco facilities to drive environmental objectives of the future. A new agro-industrial processing unit in Burkina Faso, Africa, was opened earlier this year to implement new product lines and develop new agricultural supply chains. This will boost the economic potential of the Burkina Faso supply chain.

Mr Nicol commented: "Sustainable development and ethical practices are issues that really resonate with today's consumer, who trusts that we maintain exacting standards on fair-trade and maintain a low environmental impact throughout the supply chain. Quality is no longer the only driving factor in cosmetic, pharmaceutical and food production, people expect ingredients in purchased products to be sourced responsibly.

"Cornelius is committed to ethical sourcing and sustainable development and will be issuing its first corporate social responsibility report later in 2016."

The Olvea ethos addresses social, environmental and economic issues in order to continuously improve its processes and minimise the ecological footprint of its production. As part of this commitment Olvea acts as a socially responsible employer by investing in the development of its employees.

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The company provides continuous training and best practices. Its vocational development is complemented by art-related, social and environmental initiatives in its regions via the Olvea Philanthropic Fund. This has supported several projects, including the opening of literacy centers in Africa.

Mr Nicols added: "Ethically sourced ingredients are often premium natural ingredients because the processes used to extract them respect the product, the region and the people. Often considered to be 'added value', the ethical approach is a simple concept that can benefit the whole supply chain."

http://www.personalcaremagazine.com/story/19621/supporting-ethical-ingredient-production

THE END OF SCARS: SCIENTISTS DISCOVERED HOW TO REGENERATE HUMAN SKIN

AS IF IT NEVER HAPPENED
Image Credit: Penn Medicine

The human body can do many impressive things. Despite years of evolution honing its capability to carry out the complicated mechanisms needed to ensure our survival, the body has not refined the process of healing skin. Sure, wounds inflicted on the body's largest organ can heal, but we are left with scar tissue.

A team of scientists from the Perelman School of Medicine at the University of Pennsylvania however, believe they have found a way to do the previously impossible – allow skin to regenerate using fat cells.

According to Penn Medicine News:

"Fat cells called adipocytes are normally found in the skin, but they're lost when wounds heal as scars. The most common cells found in healing wounds are myofibroblasts, which were thought to only form a scar. Scar tissue also does not have any hair follicles associated with it, which is another factor that gives it an abnormal appearance from the rest of the skin. Researchers used these characteristics as the basis for their work – changing the already present myofibroblasts into fat cells that do not cause scarring."

"Essentially, we can manipulate wound healing so that it leads to skin regeneration rather than scarring," said George Cotsarelis, MD, the chair of the Department of Dermatology and the Milton Bixler Hartzell Professor of Dermatology at Penn, and the principal investigator of the project. "The secret is to regenerate hair follicles first. After that, the fat will regenerate in response to the signals from those follicles."

"The findings show we have a window of opportunity after wounding to influence the tissue to regenerate rather than scar," said the study's lead author Maksim Plikus, PhD, an assistant professor of Developmental and Cell Biology at the University of California, Irvine.

WINDOW OF OPPORTUNITY

The scientists just had to figure out where the signals were coming from. They eventually identified a factor called Bone Morphogenetic Protein which instructs the myofibroblasts to become fat. "Typically, myofibroblasts were thought to be incapable of becoming a different type of cell," Cotsarelis said. "But our work shows we have the ability to influence these cells, and that they can be efficiently and stably converted into adipocytes."

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THE END OF SCARS: SCIENTISTS DISCOVERED HOW TO REGENERATE HUMAN SKIN

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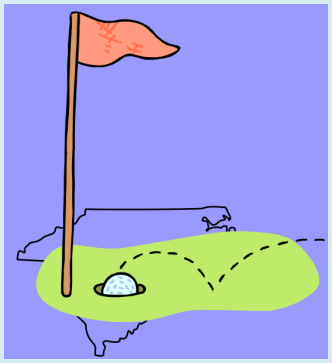
While the discovery is indeed impressive, it should be noted that the experiment is still in its early stages and serves only to demonstrate proof of concept.
Currently the process has only been proven to work in mice and human skin samples. Achieving hair follicle growth in a wound attached to a living human might prove to be more difficult. But should science find a way to do this, we may not have to worry about wounds leaving scars ever again.

Outside of obvious applications to prevent scarring, adipocyte loss is also a known side-effect of other medical conditions, including HIV treatments. The aging process leads to natural loss of these cells as well, which causes permanent wrinkling of the skin. These findings could pave the way for a safer, and possibly permanent, way to address these cosmetic concerns.

https://futurism.com/?p=67005&post_type=post



HOW TO PREVENT CONTAMINATION IN COSMETIC PRODUCTS

Article by: Perry Romanowski

This recent article about scientists discovering bacteria living in hairspray provides a good example of why cosmetic products need to be preserved. Microbes can grow almost anywhere! And these tiny organisms bring with them some distasteful product changes or even disease. As a cosmetic chemist it's up to you to formulate properly and keep these invaders at bay. You typically do that by adding preservatives to your formulas. Unfortunately, you'll have to know more than just the science as preservatives are some of the most highly regulated and restricted ingredients you will use.

WHY YOU NEED COSMETIC PRESERVATIVES

There are two primary reasons you need preservatives.

1. To stop microbes from spoiling your products.
2. To stop microbes from causing disease.

The microbes that can infect your formulas primarily include bacteria, mold, and yeast. In small quantities they don't represent much of a problem but when they multiply, look out. Bacteria like Pseudomonas can cause all kinds of health problems including skin and eye infections, toxic shock, strep throat, and even food poisoning. Yeast like Candida albicans can cause thrush. And many other bacteria can cause your products to smell awful, change color or otherwise break down. (This is what stability testing is for).

The following is a list of common preservatives used in cosmetic and personal care products. As a future (or current) formulator, you will undoubtedly be using many of them.

PARABENS

Parabens are the most commonly used preservatives. They are derivatives of p-hydroxybenzoic acid and go by names like Methylparaben, Propylparaben, and Butylparaben. They are typically supplied as powders and can sometimes be difficult to incorporate into a system due to the water solubility limitations. They are effective against a broad spectrum of bacteria and fungi. They do have pH limitations and are not effective against all microbes so you usually will need an additional preservative.

FORMALDEHYDE DONORS

Formaldehyde derivatives are the next most common preservative. These compounds interfere with membrane proteins which kills microbes. They are effective against bacteria, fungi, and mold. Bad press and real safety concerns have led cosmetic chemists to stop using formaldehyde. Instead ingredients that dissociate into formaldehyde when put in a water solution are used. These are compounds like DMDM Hydantoin, Imidazolidinyl Urea, and Gluteraldehyde. They are most often used in surfactant systems.

PHENOL DERIVATIVES

Phenol derivatives have been used in cosmetics for many years and can be effective against a range of microbes. Unfortunately, they are not as effective as the previous ingredients so their use is limited. The most common examples is Phenoxyethanol.

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QUATS

Compounds that contain nitrogen and have a positive charge when placed in solution are called quaternary compounds (or quats). Many of them demonstrate an ability to kill microbes. This include ingredients like Benzalkonium Chlroide, Methene aommonium chloride, and Benzethonium chloride. Their cationic nature makes them less compatible with anionic surfactants which limits their application & use.

ALCOHOL

Ethanol is a great preservative but you need to use it in high levels and it faces significant environmental restrictions. Other compounds like benzyl alcohol, dichlorobenzyl alcohol, and even propylene glycol all have some anti-microbial effect. In lower levels, these compounds are less effective at preserving products.

ISOTHIAZOLONES

Synthetic compounds like Methylchloro- Isothiazolinone and Methyl-Isothiazolinone are effective at incredibly low levels. They have been shown to work at a wide range of pHs and in many different formulas. There use has been stymied however, by at least one study that suggested it could cause skin sensitization.

ORGANIC ACIDS & OTHERS

Various other compounds are used as preservatives but all face some limitations not experienced to the same extent as the previous ingredients discussed. Some of the most important include Sodium Benzoate, Chloracetamide, Triclosan, and Iodopropynyl Butylcarbamate. Pyridine derivatives like Sodium pyrithione and zinc pyrithione are used to kill the bacteria that causes dandruff.

WHY COSMETIC PRESERVATIVES ARE VILIFIED

More than any other ingredient, preservatives are most often called out as the worst ingredients you can use in a formula. Even people who know nothing about chemistry have likely heard about the "evil" parabens and formaldehyde.

Preservatives are designed to kill cells. That's why they are effective. Unfortunately, that's also why they are potentially hazardous. They don't easily discriminate between good human cells and bad microbial cells. But ultimately, the risk from using preservatives is significantly lower than that of using unpreserved cosmetics. There are safe levels of "toxic" chemicals. All chemicals can be deadly if you're exposed to a high enough level. How many people die from water exposure (e.g. drowning)?

Remember, it's the dose the matters!

To be sure, cosmetic science research is ongoing in the field of preservatives since many things previously deemed safe have been reclassified as hazardous. Suppliers who can come up with even safer preservatives will likely make a lot of money. Hopefully, they'll do it soon but there do not appear to be any promising materials on the horizon.