the science of beauty

Vol 6 No 2

October 2016

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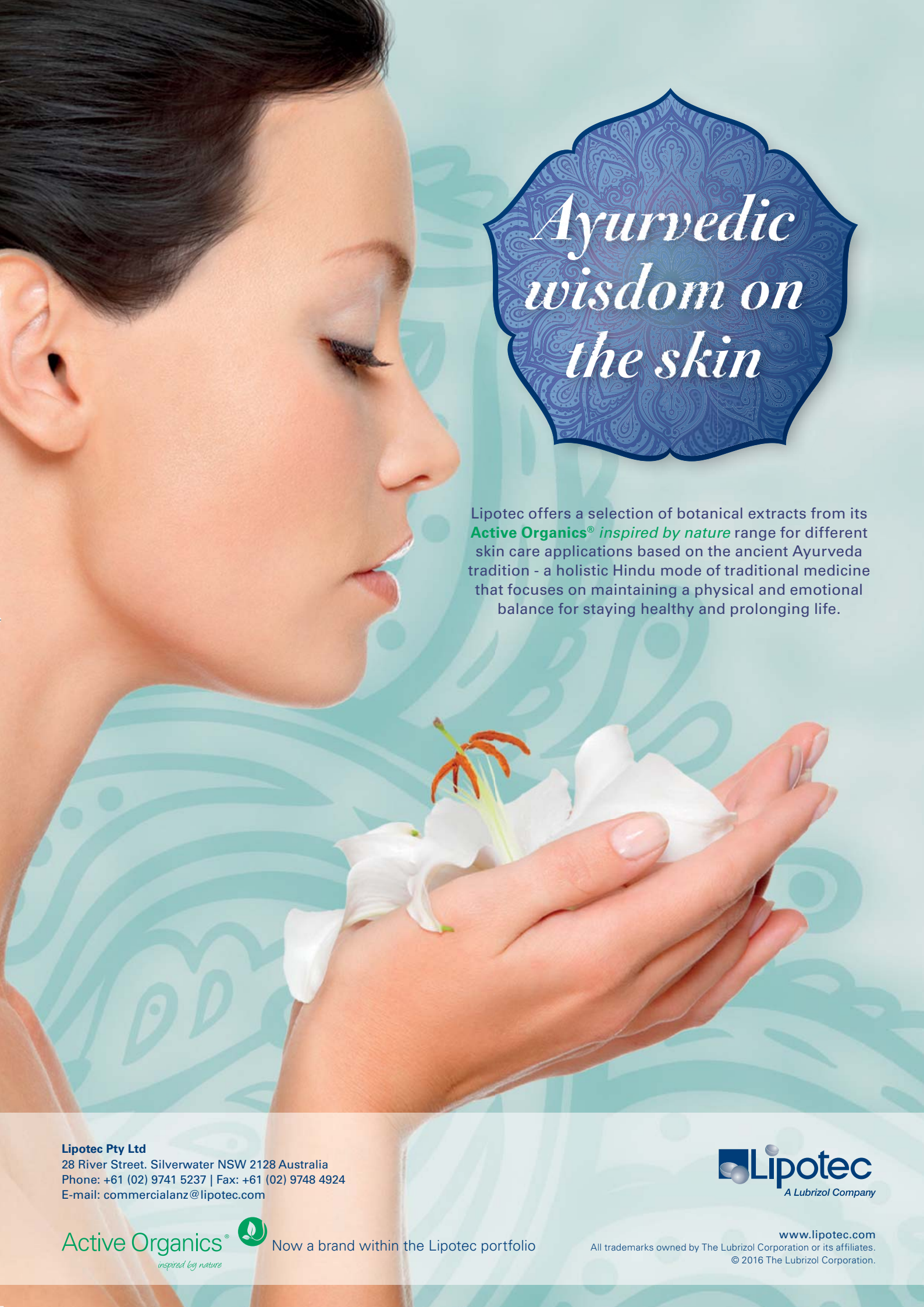

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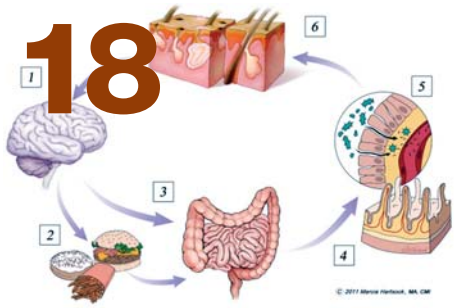

Technical

Want to find out the latest **raw material launches** and **advancements** in the cosmetic industry?

GO WILD at the ASCC Conference 2017

3rd - 5th May, Novotel Twin Waters Resort, Sunshine Coast

MINTEL

We are pleased to announce that Mintel, the world's leading market intelligence agency, will be our Conference Key Note Speaker, providing attendees with amazing insight into innovative industry trends

We are excited to announce that at the 2017 ASCC conference we will be introducing 3 new areas to let your imagination go wild! Discover a new experience at the three discovery areas:

Discover...

The **innovation displays** provides an informative area to discover the latest products and new launches. Indulge your creative side for new marketing concepts and products inspired by the latest innovation and technology in new ingredients.

Feel...

The **sensory workshop** is an interactive zone where you will have an opportunity to see, touch and smell formulations and textures. Test a variety of finished products with varying sensory attributes to feel the array of what is possible in cosmetic formulations.

Experience...

The **formulation workshop** provides possibilities to create distinct and marketable products are endless with new ingredients! Come and learn how to work with new materials and create new textures and novel products. Demonstrations will be shown by our experts with an opportunity to try finished samples for yourself.

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GO WILD! Science Without Limits
49th ASCC Conference, 3rd-5th May 2017

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meet the team...

LISA DELLA-BOSCA Lisa has been a professional skin therapist working in the industry for over 30 years.
After the first couple of years as a beauty therapist, Lisa had a driving force to understand the cause and treatment for the clients skin disorders she was managing, but at this stage could only treat superficially. The solution was to study natural therapies. For over 25 years Lisa has married the science of natural therapies especially nutrition with skin science with skin therapy to gain solutions for skin disorders and skin conditions.

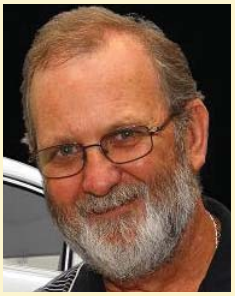
AUDREY PARATORE is a professional skin practitioner experienced in many aspects of professional, complimentary and paramedical skin care. She has more than 10 years experience as a Senior Lecturer in Vocational Education and consults for a number of leading skin care companies. Audrey describes herself as a life student of skin science and derives fulfilment in sharing information with other Skin Therapists empowering them to further their careers and bring awareness to the privilege of working hands-on with clients.

WENDY FREE has degrees in Science (B.Sc) and Technology Management (M.Tech Mngt) and is a member of a number of industry associations including Australian Society of Microbiologists, Royal Australian Chemical Institute, Association of Therapeutic Goods Consultants and is a Fellow of the Australian Organisation for Quality. With more than 25 years industry experience, Wendy's current roles include APVMA GMP auditioning, contributing to the Cochrane Collaboration and on a day to day basis, Scientific Director Quality Matters Safety Matters Pty Ltd (QMSM) that has over the last decade Wendy has provided expertise to over 400 Australian and International businesses. She specialises in regulatory compliance, commercialisation, troubleshooting and GMP systems, and considers cosmetics amongst the most challenging and enjoyable part of her work.

PAM STELLEMA is a business coach (www.salonsavy.com.au) and specialised copywriter (www.salonspacopywriter.com) for salons, spas, clinics and industry suppliers.
Her goal is to help her clients generate greater profits, which she does through her coaching, copywriting, courses, articles and books.
If you'd like to contact Pam, you can phone her on 0431 975 515 or send her an email via either website.

JOHN STATON has a background of over 40 years experience in the pharmaceutical and healthcare industries. John is a life member of the ASCC and serves in a number of industry representative roles with ASMI, ACCORD, TGA and Standards. He is the Australian representative to the ISO Committee on Sunscreen Testing-TC 217. (The committee for development of sunscreen standards). John is also in demand as a speaker on the International Conference Circuit.

MARG SMITH is the owner of Syndet Works – an Australian company established in 1984 to formulate and produce soap free skincare bars. Syndet has developed an enviable reputation for custom formulated and manufactured skincare that now extend well beyond the origins of the business.



RIC WILLIAMS was educated in Sydney obtaining his Bachelor of Science in Pure and Applied Chemistry from the University of New South Wales (1980) and a Diploma of Environmental Studies from Macquarie University in 1983.
Ric has had 40 years experience in the industry working for many companies and operating his own consultancy business for many years.
He has presented many lectures and workshops at national conferences for the Australian Society of Cosmetic Chemists (ASCC), the Association of Professional Aestheticians of Australia (APAA), Cosmetic and Pharmaceutical Special Interest Group (CAPSIG) and also beauty colleges nation wide.

TINA ASPRES has worked as a Pharmacist for almost 20 years in retail, industry and academia as well as being a Cosmetic Chemist. Currently she works in industry and has vast experience in both the pharmaceutical and healthcare arenas. In addition to this she is a casual academic at UTS, School of Health, (Faculty of Pharmacy in Pharmaceutics). Tina has a great interest in clinical research in dermatology and the treatment of skin disease and conditions and is Clinical Trial Coordinator at South West Sydney Dermatology. She is a keen researcher in transdermal drug delivery systems. Tina is a Member of the Pharmaceutical Society of Australia and a Member of the Australian Society of Cosmetic Chemists. She regularly consults pharmaceutical companies in the area of acne, eczema and skincare especially in the area of cosmeceuticals and has devised and written numerous support, training and education material for companies aimed at both professionals and consumers. Tina consults for the Eczema Association Australasia and is on their Integrity Assessment Panel and has worked with Choice Magazine on numerous reports. Tina has presented at the Annual Scientific Meeting of the Australasian College of Dermatologists and has published within the pharmacy and medical literature in the area of sun protection, Vitamin D, skin cancer prevention and eczema as well as co-authoring the book 'All About Kids' Skin – The Essential Guide' published by ABC Books

EMANUELA ELIA is the Director of Ozderm, which specialises in *in vivo* testing and clinical trials for cosmetic and personal care products. Emanuela Elia has a law degree from Rome and a Master of International Business from the University of Sydney. She had collaborated with Australia's longest serving Contract Research Organisation Datapharm for a few years before setting up a cosmetic and personal care products testing facility in 2009. Emanuela is enthusiastic about improving the quality of cosmetic and personal care products' research in Australia through science.

EMMA SUTHERLAND is a successful naturopath and TV presenter, her mission in life is to inspire women to get their "Mojo" back. She is the expert nutritionist on the Logie nominated "Eat Yourself Sexy" on LifeStyle You. She is also a key contributor and expert panellist for the recently launched Woolworths Baby & Toddler Club. With over 10 years experience working with women, Emma is the woman to turn to if you want your Mojo back!

WENDY LOCKYEAR founder and principal of Advance Massage Australasia has been in the natural and remedial therapies industry since 1972 and is an accredited member of the Australian Traditional Medicine Society, and an accredited training provider with over 26 years clinical experience and over 18 years in education, training and instructional skills, teaching a wide variety of remedial modalities from general interest and post graduate workshops to accredited units up to an Advanced Diploma level, Wendy travels extensively and delivers regular annual seminars. Wendy specialises in delivering her courses and workshops one or two on one and recommends this for any one seeking a maximum level of competency based training.

JAMES GILLARD is the Principal of Insurance Made Easy whose services include – business insurance, travel insurance and financial services. Insurance Made Easy has a client list of over 2000 businesses from all industries. The relevant major insurance schemes are – Hair and Beauty, Pharmaceutical Companies and Natural Therapists.

STEVE WELSH is a cosmetic packaging specialist with over 20 years experience across all mediums of packaging. As the director of Weltrade Packaging, Steve leads a team of designers, technicians, printers and supply chain professionals. To ensure the best exposure of your beauty, skincare or cosmetics brand. Steve's philosophy is to design your packaging correctly, right from the start, so you can elevate your brand and move more product. Steve works closely with leaders in the cosmetic industry to ensure that your packaging consistently stands out on the shelves within this highly competitive market.

5 big service menu mistakes that can damage your profits

by Pam Stellema

It's just a price list, *right?*

All you need is a basic list of every service you provide with a price beside it, *right?*

It's not worth investing too much time or money getting something really amazing, *right?*

Here's something many salon owners fail to realise. Your Service Menu is a valuable marketing tool for your salon or spa.

It not only provides information about your location, services, contact details and prices, but if done well, it also helps your readers to understand how your services can provide the perfect solution to their problems.

So, in fact, your service menu is also a tool that helps you to sell *more services, more often,* to the people who are interested in what you have to offer.

Or it should be...

After creating fresh service menu content for scores of salons and spas, I've pin-pointed five major areas where salon owners are making serious mistakes. The kind of mistakes that are preventing them from gaining new clients and selling more of the right services *(read that as more profitable services)* to their existing clients.

This is what I've discovered.

MISTAKE #1

The menu is almost impossible to read

What happens when a prospective client picks up your menu to have a look through it, but finds it too difficult to read? She puts it down and forgets about it of course.

So, what makes a menu too hard to read?

The size of the font. Tiny font may allow you to cram every service and sub-service you provide onto your menu, but it makes it exceedingly difficult for your readers to read the content, especially if your target market is anti-aging or mature.

Don't believe me? Try asking your mother to read this without searching for her glasses.

The colour of the font. Now while it's the job of your graphic designer to make your new service menu pop and try to be 'different from the rest', using a light coloured font on a dark background, makes it very difficult to read.

My suggestion is to save the fancy layout for areas on your menu that don't include important information such as – well actually, everything on your menu should be important, so don't use light font on dark backgrounds *ever.*

The style of the font. While you may just love script font with curly bits all over the place, the fact is it can be *really* hard to read – especially if it's combined with either of the two mistakes mentioned already.

Keep your font clean and easy to read without all the fussy bits. If you love the look of script, incorporate it into your logo or only for text that is large enough to still be readable with all the added swirls and curls.

The line spacing. Yup, you can definitely fit more onto your menu if you squeeze all the lines together, but it makes reading the words extremely difficult for your readers.

Instead of trying to fit every tiny little service you provide onto your menu, free up some space and give your words some breathing room instead.

MISTAKE #2

The menu doesn't include important information about salon/spa policies and etiquette

I often hear salon/spa owners complain about how their clients don't do what they should do. *Turn up on time; give enough notice for cancellations or appointment changes; turn off their mobile phones; leave their kids at home.* You know what I'm talking about here – all the little things that drag you down each day.

But here's the snag. Your clients are not mind-readers. They don't have the foggiest idea about what will make your life run more smoothly (and they probably don't spend much time thinking about it either).

The fact is that clients are much like children. They have lots of other stuff rattling around in their brains, and so if you want them to do something a specific way to make your life a little happier, then you must tell them clearly and in detail what that is and why they should do it.

> *Here's something many salon owners fail to realise. Your Service Menu is a valuable marketing tool for your salon or spa.*

Your salon policies and etiquette section serves a very important purpose (keeping your alcohol consumption for de-stressing purposes down to a minimum), *but only if your clients know about it in the first place.*

MISTAKE #3

The menu doesn't tap into the profit-producing power of pre-paid programs and packages

What feels better than selling your most profitable facial to a client? Selling them a program of pre-paid facials of course.

Let's face it; if you're not selling treatment programs to your clients, then you're missing out on a ton of opportunities to make more revenue and to lock your clients into doing business with your salon for a longer period of time.

Here's what I think.

If a client can get some benefit from having a facial, a peel, or even a pedi, then how much MORE benefit will she receive if she has a series of these treatments on a *regular basis?*

Tons more!

We all know that a single treatment makes the skin look and feel great for a short period of time, but clients who commit to regular treatments are always the ones who get the greatest benefits, therefore, programs are in fact a win-win arrangement.

And let's look at packages also. This

is where you get to sell a whole cluster of different treatments to your clients to either indulge themselves, or give as a pampering gift (just love those profit-producing Gift Certificate sales, don't you?).

Packages don't just have to be available for Christmas and Mother's Day. People are celebrating something *every day of the year,* and if you marketing your packages well, that's how often you should be selling them also.

So, maybe it's time to consider how you can harness the profit-producing-power of programs and packages in your business.

MISTAKE #4

The menu layout is just too messy to make reading easy

You've got to remember that your menu is a selling tool, and if you want to sell things, then you have to make it incredibly easy for clients to find what they want and to then buy them.

If your menu is laid out like a chook's dinner, this isn't going to happen.

You need to consider a couple of things before deciding what goes where (this is also when you have to have control of your graphic designer who is only interested in how aesthetically pleasing your menu looks, but not how functional it is).

Services you want to sell more of. Lots of salon owners tell me that they really want to do more facials and less waxing, but when I look at their menu, their waxing list takes pride of place, with facials tucked away out of sight (and mind). You have to be clear about what services you want to promote in your business and then make sure they are where they need to be to catch the eye of your readers.

The flow of the menu. Want to sell more add-on services or upgrades? Then consider where these services are placed on your menu (if they're on it at all). These extra little service sales can mount up to huge dollars over a year. Just imagine if you have just 30 clients a week and you sell just half of them an extra $20 in services. That amounts to an extra $300 per week or a gob-smacking $15,000 per year – *now wouldn't that be nice to have tucked away in your holiday account?*

And finally, the last, but biggest mistake of all...

MISTAKE #5

The service descriptions focus on service features instead of client benefits

This has to be the biggest and baddest mistake I see on nearly every menu. It screams *'Look at how good I am and what I know'* instead of *'Here's how I can help you to achieve your outcomes'.*

Telling your readers how many cleanses you intend to do and which clay mask you'll be applying, is about as meaningful to them as how to design a space rocket.

Unless your client is another qualified therapist, all they really want to know is what outcome they will achieve if they pay for a particular service.

It's called *'selling the benefits'* and it's what every description you write should focus on.

And if every facial in your menu seems to deliver the same thing i.e. soft, smooth, hydrated skin, then your readers are never going to be informed enough to make a choice. It'll simply end up in the 'too-hard' basket and get forgotten about.

Well there you have it. The top five mistakes I see when I'm re-creating a Service Menu that sells. How does your menu look? Perhaps it's time for a re-vamp to boost your sales and profits.

PAM STELLEMA is a business coach (www.salonsavy.com.au) and specialised copywriter (www.salonspacopywriter.com) for salons, spas, clinics and industry suppliers.
Her goal is to help her clients generate greater profits, which she does through her coaching, copywriting, courses, articles and books.
If you'd like to contact Pam, you can phone her on 0431 975 515 or send her an email via either website.

What to look forward to at Cosmoprof Asia 2016?

"One Fair Two Venues" will be the main theme of Cosmoprof Asia 2016 – AsiaWorld-Expo (AWE) will be the venue for the packaging, ingredients and processing equipment from 15-17 November 2016. Finished cosmetics will be showcased at the Hong Kong Convention and Exhibition Centre (HKCEC) from 16-18 November 2016.

The two venues will bring together 2,700 exhibitors, 25 national and group pavilions, and an expected 60,000 visitors in an exhibition area of more than 98,000 sqm.

This year's event promises a number of highlights and features customised for attendees to each venue.

AWE Highlights

At AWE, the spotlight event will be the first edition of Innovation Circle Awards curated by the globally-renowned trends agency Beautystreams. The Awards recognises the most innovative packaging, design and formula in the beauty industry. Exhibitors specialising in packaging solutions and contract manufacturing are invited to submit products and packaging across six award categories based on the theme "LEGENDS" (more information at www.cosmoprof-asia.com/en-us/SPECIAL-EVENTS/Attractions-in-AWE/Innovation-Circle-Awards). Finalists' products picked by a jury of top industry professionals from AmorePacific, centdegrés, L'Oreal, Marie Dalgar, Martha Tillaar Companies and NYX Cosmetics will be prominently showcased at the Innovation Circle Display at the East Lobby of AWE from 15-17 November. The Awards Ceremony will be held on 15 November 2016.

The Lipstick Factory in Hall 5 takes the visitor on a journey that showcases the manufacturing of a luxury lipstick. Visitors will be taken step-by-step through the process, from the meticulous search for raw materials, right up to the mixing and pouring into

exhibition space, thoughtfully integrated with a dedicated buyers lounge, press corner, bloggers station as well as a summit area. Visitors can expect to meet the most significant brands and suppliers offering their unparalleled brand assortment and innovative services in an elegant and minimalist atmosphere. A special edition of nail polish in three unique colours and textures jointly created by Groupe Pochet (world-leading glass maker), Fiabila (savoir-faire in nail polish) and centdegrés will be presented to visitors with interactive experience at the heart of the hall.

Close to the Extraordinary Gallery will be the Discover Trends zone featuring more than 80 companies with their latest offerings in Baby Skincare & Toiletries, Men's Care, Natural & Organic Cosmetic, as well as Natural Health.

the stick with a special design. 8,000 complimentary pieces of "Cosmoprof Asia Limited-Edition Lipstick" in four new glamourous shapes and textures will be presented to visitors during the three days of the show. The Lipstick Factory involves three Italian exhibitors who are leaders in their fields – Brivaplast (packaging), Chromavis (formulation) and Vetraco (machinery). The project is supported by the Italian Ministry of the Economic Development and ITA – Italian Trade Agency, in collaboration with Cosmetica Italia – Personal Care Association.

Spotlight on Ingredients is a new zone at AWE to help formulators, R&D and business development professionals discover new ingredients, textures and formulation. The area completes the product showcase of the entire beauty industry, offering professionals all segments of the supply chain.

HKCEC Highlights

At the HKCEC, "Extraordinary Gallery" in Hall 3G will take centre stage. The rich design by famous creative agency centdegrés offers appealing

INNOVATION CIRCLE

Also returning to Cosmoprof Asia for the 3rd year is Boutique, the "shop for charity" campaign, which will be located in Hall 1E Concourse. Visitors will have the opportunity to pick up travel size products of sponsoring companies for a suggested donation to the Hong Kong Breast Cancer Foundation.

Education & Innovation

The World Asia Forum held across both venues addresses the industry's most talked about trends and topics allowing attendees to keep pace with the latest advances across the region. Sessions in AWE will look at the latest ingredients, technologies and packaging to help drive product development, while at HKCEC visitors can discover the latest trends and development in product, branding and marketing. Visitors will have a choice of more than 30 sessions to hear from industry analysts and leaders. The updated agenda and enrolment is available at the fair website http://www.cosmoprof-asia.com/. Visitors may register online at www.cosmoprof-asia.com/en-us/VISITING/Pre-registration to obtain a free admission badge, which will allow access to the show in both venues.

accord Cosmetic & Personal Care Conference 2016
Held jointly with ASCC

Cosmetics
Innovation, communication, contemporary regulation.

Monday 5 December 2016
9.00am - 6.00pm
Amora Hotel Sydney
11 Jamison St, Sydney

Early bird registration available now

Featuring the following guest speakers

What is innovation and how can this help the Australian cosmetic industry?
Dr Margaret Hartley FTSE
CEO, Australian Academy of Technological Sciences and Engineering (ATSE)

A humble moisturiser with life-changing consequences
Paul Matts PhD FRSA FRSC
Visiting Professor, London School of Pharmacy & London College of Fashion, UK

Application of the ISO organic and natural standard for formulating products
Carmen Esteban
Technical Manager, Spanish Cosmetics and Personal Care Association (STANPA) and Project Leader, ISO TC217 WG4 Organic & Natural

Regulation convergence and the role of ISO in achieving global harmonisation of cosmetic regulation
Dr Alain Khaiat
President of the CTFA of Singapore and Chair, ISO TC 217 Cosmetics

This year's programme will also include a range of national and international experts in all fields of cosmetics.

There will be concurrent sessions addressing the latest in ISO developments on sunscreen testing methods including water resistance test methods, in vitro versus in vivo testing as well as formulating for organic and natural products and safety assessment for cosmetic products.

The day will end with cocktails and canapes. As Sydney is playing host to the 2016 annual Plenary meeting of the ISO cosmetics technical committee (TC 217), Conference delegates will be able to network with ISO cosmetic experts from around the world who will be attending on the day as our special guests.

Trade exhibitions will be on show. A limited number of sponsorship opportunities and trade exhibitions are still available.

accord hygiene, cosmetic & specialty products industry

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For Conference registration please contact Arianne Bath at abath@accord.asn.au
For Conference sponsorship and trade exhibition opportunities please contact Dusanka Sabic at dsabic@accord.asn.au

accord

hygiene, cosmetic & specialty products industry

introducing accord –

the cosmetic industry association

Accord Australasia is the respected and influential national voice of the hygiene, cosmetic and specialty products industry.

We represent the interests of the entire industry and pursue common, uniting objectives that have maximum benefits for all industry members.

We have an engaged membership of over 100 companies. This includes all leading consumer, cosmetic and personal care companies, spanning smaller Australian-owned enterprises to large multinational firms, as well as both local manufacturers and product importers.

Our industry's products play a vital role in daily life. Accord's mission is to proudly lead and promote the positive social, economic and environmental contribution of our industry's products and to promote the significant contribution of our industry to national prosperity.

Accord also acts to improve our members' business operating environment by advocating a simpler and more effective regulatory system. Other key areas of involvement are contemporary issues such as microbeads, organic and natural sunscreens, implementation of GHS and the transport of dangerous goods issues for limited quantities.

Accord's numerous community initiatives include Look Good Feel Better – the cosmetic industry charity supporting cancer patients throughout Australia; www.furphies.org.au – clarifying misconceptions about cosmetics, personal care and household products; and www.hygieneforhealth.org.au – promoting the enormous contribution of our industry and its products to promoting public health and personal wellbeing, including skin and hair care.

Accord has forged strong affiliations with sister industry associations in the USA, Canada, Europe, New Zealand and the Asia-Pacific region.

Accord members benefit from our strong, effective advocacy and from information, expertise, networks, training and events.

This year, Accord is proud to be holding its popular biennial Cosmetic & Personal Care Conference with the Australian Society of Cosmetic Chemists. The Conference is on 5 December, 2016 at the Amora Hotel in Sydney. The Conference will include a host of delegates attending the ISO TC 217 Cosmetics plenary and associated working group meetings. It will provide attendees with an opportunity to mingle with ISO experts from around the world who will be our special guest speakers and attendees at this years' Conference.

You can find out more about Accord at our website www.accord.asn.au including how to become a member of this dynamic and growing organisation.

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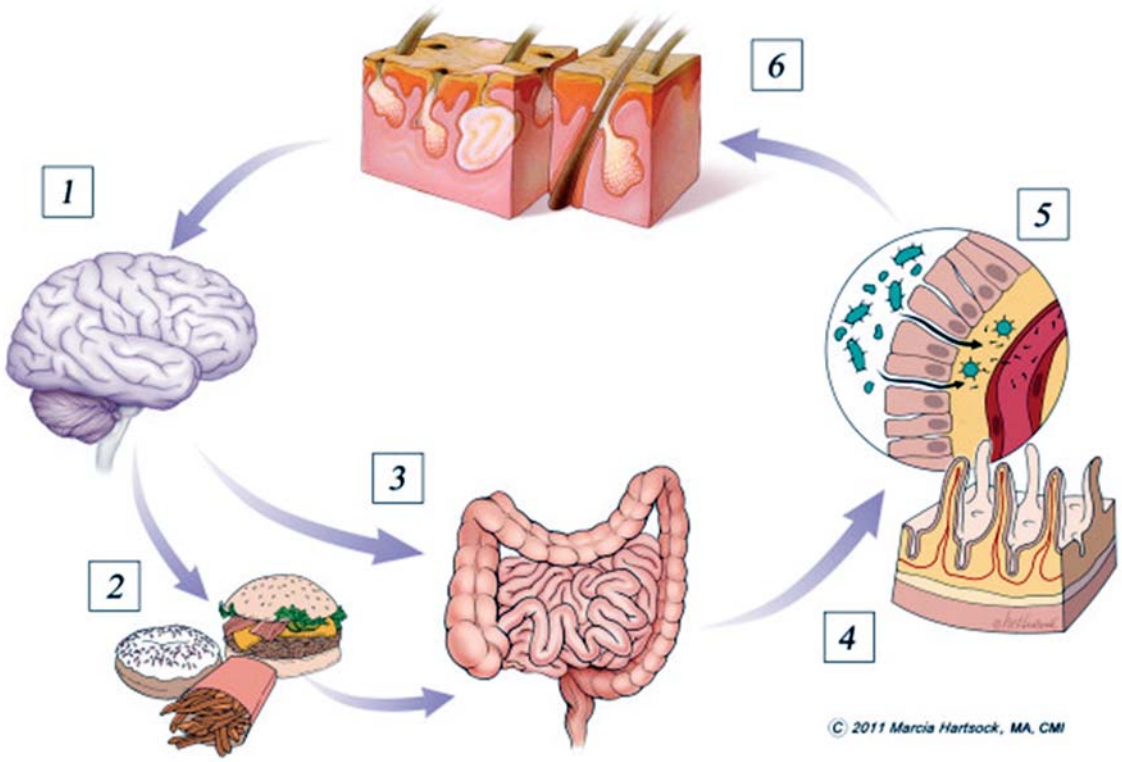

Probiotics and the skin

by Emanuela Elia

Bacteria are often thought of as microorganisms that can cause disease. However, our bodies are full of bacteria, both 'good' and 'bad'. Probiotics contain live bacteria and yeast which have been found to be beneficial to health, especially the digestive system. Probiotics are often referred to as 'good' bacteria, because they help keep the gut healthy and are believed to contribute to total wellness. Their efficacy has been demonstrated in a number of areas including diarrhoea, reduction of antibiotic-associated side effects, food allergies and lactose intolerance, irritable bowel syndrome, inflammatory bowel disease, oral and dental conditions. Moreover, use of probiotics has been associated with skin health and the improvement of certain skin disorders.

Oral intake

Several studies have looked at the effects of oral intake of probiotics on certain skin diseases. It has been suggested that probiotics may influence skin conditions such as acne and rosacea by affecting what is known as the "gut-brain-skin axis." According to this theory, stress or anxiety alone or in combination with eating processed comfort foods that lack dietary fibre can slow digestion. This in turn changes the type and number of bacteria that live in the gut to 'unhealthy' bacteria. Eventually the gut lining becomes leaky and toxins are released into the bloodstream causing inflammation throughout the body. People who are predisposed to acne or rosacea can experience flares as a result of this shift in gut bacteria and subsequent inflammation. To counteract flares of acne or rosacea associated with the "gut-brain-skin axis," it has been suggested that patients should find ways to help manage or cope with stress, change their diet or introduce 'healthy' bacteria to the gut in the form of probiotics. The probiotics will line the gut and create a 'healthy', sealed barrier that prevents inflammation reducing the incidence of acne or rosacea.

In 2014 Dr Whitney P. Bowe a

EMANUELA ELIA is the Director of Ozderm, which specialises in *in vivo* testing and clinical trials for cosmetic and personal care products. Emanuela Elia has a law degree from Rome and a Master of International Business from the University of Sydney. She had collaborated with Australia's longest serving Contract Research Organisation Datapharm for a few years before setting up a cosmetic and personal care products testing facility in 2009. Emanuela is enthusiastic about improving the quality of cosmetic and personal care products' research in Australia through science.

dermatologist and spokesman for the American Academy of Dermatology said that "while more studies are needed to identify the most beneficial aspects of probiotics and determine whether topical or oral probiotics yield the best results, I think we can expect to see some cutting-edge probiotic products for acne and rosacea in the near future,". He also recommended that in the meantime patients with acne or rosacea see their dermatologist to talk about adding foods with live active cultures, such as yoghurt, to their diets or taking an oral probiotic supplement daily. Although probiotics might not be a stand-alone treatment for acne or rosacea, he believes that they could be used as an effective combination therapy with prescription medications or over-the-counter topical treatments.

Topical application

Ceramides are lipid molecules that are found in high concentrations within cell membranes. In the top layer of the skin, ceramides hold skin cells together, forming a protective layer that plumps the skin and retains moisture. Their role has often been explained using a practical example where skin cells are referred to as the bricks and ceramides as the mortar. The effects of creams containing probiotics on skin ceramide levels have been investigated in a number of studies. One of the first *in-vivo* studies in healthy subjects found that topical application of a preparation containing probiotics (i.e. lactic acid bacterium *Streptococcus thermophiles*) led to increased stratum corneum ceramide levels. This increase was believed to possibly result in the improvement of the lipid barrier and a more effective resistance against abnormal skin dryness (xerosis).

A subsequent study involving subjects affected by atopic dermatitis (AD) was conducted to investigate the effects of a preparation containing probiotics on ceramide levels of the stratum corneum from AD patients. A reduced amount of total ceramides was thought to be responsible for functional abnormalities of the skin of AD patients. Two weeks application of the cream led to a significant and relevant increase of skin ceramide amounts as well as improvement of the signs and symptoms characteristic of AD skin (i.e. erythema, scaling, pruritus).

The demonstrated role of ceramides in both barrier and water-holding functions of healthy skin stratum corneum, suggested that the impairment of stratum corneum due to ageing or skin diseases could be caused by a ceramide deficiency. The effects of a cream containing probiotics were investigated in a study involving elderly women. Here again a statistically significant increase of ceramide levels in the stratum corneum was observed. Hydration was also higher compared to the area treated with Placebo. These results suggest that the experimental probiotic cream was able to improve the lipid barrier and to increase a resistance against ageing-associated xerosis.

The effects of topical application of probiotics have also been examined in skin affected with acne. Normal human skin can produce a range of antimicrobial chemicals that play an important part in eliminating potential cutaneous pathogens. *Lactobacillus plantarum* is a type of 'good' bacteria that produces antimicrobial peptide. When applied to the skin this probiotic can act like an anti-inflammatory but can also enhance the natural antimicrobial properties of the skin. Clinical studies were conducted to determine the effect of *Lactobacillus* extract on improvement of the skin barrier and reduction of erythema from chemical irritant, skin microflora, and acne. Results show that 5% of this probiotic was effective in reducing skin erythema, repairing skin barrier, reducing skin microflora, and exhibiting an effective reduction in acne lesion size.

Prevention

It has been suggested that over concern with high level of hygiene in western societies has caused a reduced microbial exposure in early life, which could be associated with the progressive increase in incidence of Atopic Dermatitis. The effect on AD of probiotics has been assessed in a study involving pregnant women who were given *Lactobacillus GG*, a probiotic that is safe to use in pregnant women and babies.

In a double-blind, randomised placebo-controlled trial *Lactobacillus GG* was given prenatally to mothers who had at least one first-degree relative (or partner) with atopic eczema, allergic rhinitis, or asthma, and postnatally for 6 months to their infants. The primary endpoint in this study was chronic recurring atopic eczema, which is the main sign of atopic disease in the first years of life. The results of the study showed that atopic eczema was diagnosed in 46 of 132 (35%) children aged two years. Asthma was diagnosed in six of these children and allergic rhinitis in one. The frequency of atopic eczema in the probiotic group was half that of the placebo group (15/64 [23%] vs 31/68 [46%]).Overall, the probiotic was found to be effective in prevention of early atopic disease in children at high risk. The persistence of the potential to prevent atopic eczema was further assessed once the children reached the age of four years. Atopic disease was diagnosed on the basis of a questionnaire and a clinical examination. 14 of 53 children receiving *Lactobacillus* had developed atopic eczema (26%), compared with 25 of 54 receiving placebo (46%). Results suggested that the preventive effect of *Lactobacillus GG* on atopic eczema extends beyond infancy.

Probiotics in dermatology

Probiotics in the form of live microbial food supplements or topical preparations seem to hold several health benefits when administered in adequate amounts. We have talked about oral probiotics used to treat digestive problems as well as the broader use in skin as evidenced by "gut-brain-skin axis" theory first given 80 years ago. Details regarding use of probiotics for dermatological indications ranging from atopic dermatitis to acne and xerosis are evidenced in the scientific literature. Although some findings show no effect, an overview of scientific literature suggests that probiotic may

have some therapeutic benefits for the skin and are safe to use. These initial results should encourage companies marketing probiotics to conduct more trials which include a larger population and are properly designed in order to validate the application of probiotics in prevention and treatment of skin diseases. As techniques emerge such as genetic profiling of the gut and skin microbiome, further research in this area will be possible.

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1 Image Source: Copyright ©2011 Bowe and Logan; licensee BioMed Central Ltd from Whitney P Bowe and Alan C Logan Acne vulgaris, probiotics and the gut-brain-skin axis - back to the future? Gut Pathogens 20113:1

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Dermatest

STEPS

1. Hand Washing Product

2. Hand treatment product

No. 26 Hand Irritation Studies

A number of measurements of product efficacy on the hands can be conducted. The positive effects of product treatments, and/or the lack of adverse reactions can be quantified.

- **Protects from Skin Dryness**
- **Does not damage the skin**
- **pH Balance or adjustment**
- **Reduces Irritation**
- **Reduces Itching**
- **Customised Protocols**

Subject Recruitment

A minimum of 10 test subjects are recruited, between the ages of 18 and 65.
Individuals whose race is Caucasian or Asian (first or second generation).
Individuals who have completed a preliminary medical history mandated by Dermatest.
No use of any moisturiser product or any other related product which makes claims similar to those being measured for the study.
The study is conducted according to ICH guidelines.

Time Points

Effects are usually evident after one treatment or over the course of one day, so the study is typically conducted in lab. Time points can be zero, 1 hour, 2 hours, 3 hours, 4 hours and 5 hours following a single application or washing every hour with the test products.

Evaluation of Responses

The responses post treatment with the products are measured and compared with pre treatment.

Process

Applicants are screened, before enrollment into the study, by an experienced clinical assessor. One and the same assessor is used for each individual instrumental measurement throughout the study
in order to rule out variations occurring from different gradings by different assessors.
On the day of the study test subject's hands are cleaned with warm water. Subjects remain in the environment controlled test area for at least 15 minutes in order to equilibrate with the humidity and temperature of the room. The subjects wash their hands with warm water and air dry. After a period of 15 minutes, the background of the skin is measured.
The product is then applied, or the hands are washed for 15 seconds each. At each subsequent time point, the relevant measurements are again made and the hands may be rewashed with the sample product, or the product reapplied.

More Details...

Dermatest Test Protocols

Skin Moisturisation

Trans-epidermal Water Loss

Skin pH Measurement

Anti-inflammatory

Antipruritic Efficacy

Dermatest Pty Ltd

20 to 22 King St

Rockdale NSW Australia

ph 61 2 9556 2601

info@dermatest.com.au

www.dermatest.com.au

What's this *thing* on my face?

by Audrey Paratore

It is very common for a client to ask a Skin Therapist to look at a lesion on their skin. But providing a definitive response can be tricky for the Skin Therapist because diagnosing a skin lesion is outside their scope of practice. Oftentimes, the converse happens, when the Skin Therapist notices a suspicious lesion on a client's skin that the client is completely unaware of.

Whatever the situation, it is vital that the Skin Therapist is able to easily recognise skin cancers in order to confidently start a conversation about the suspicious lesion and guide the client to seek medical advice.

A Skin Therapist is in a very unique position to be able to spot any signs of skin cancers and potentially save a life!

Skin Cancer Facts

Cancer of the skin is the most common type of cancer diagnosed in Australia.

About two out of every three Australians will be diagnosed with some form of skin cancer before the age of 70.

Each year more Australians die from skin cancer than from road accidents.

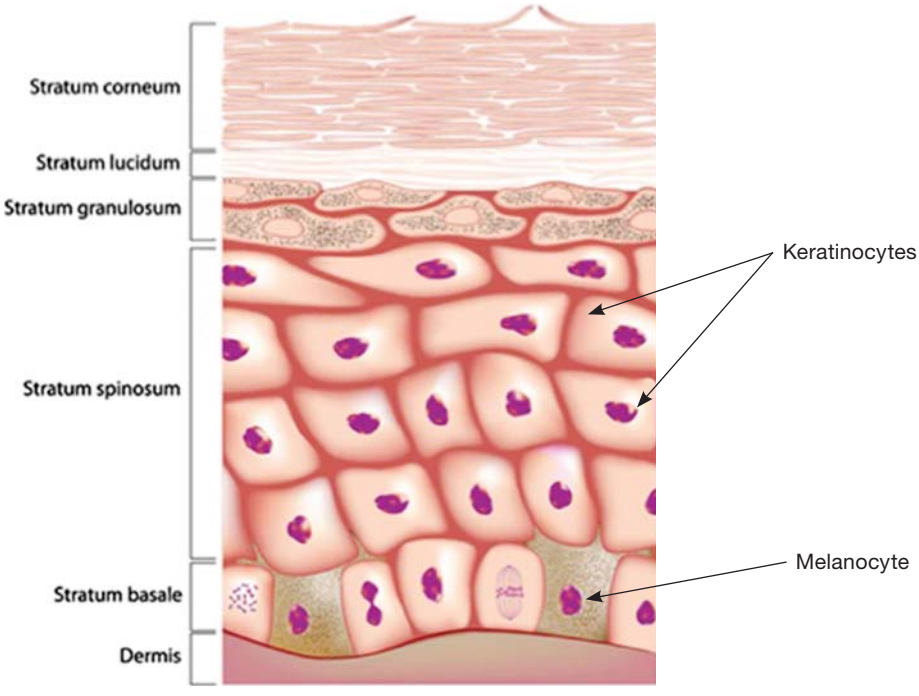
Types of Skin Cancers

There are three main types of skin cancer:

- Basal Cell Carcinoma (BCC)
- Squamous Cell Carcinoma (SCC)
- Melanoma

All three types of skin cancers begin with uncontrolled growth of abnormal cells in the epidermis. This occurs when the DNA in a cell mutates so that abnormal clones of cancerous cells are produced. The cancer becomes dangerous when it invades surrounding tissues and can potentially spread to other parts of the body (Metastasize).

Structure of the Epidermis



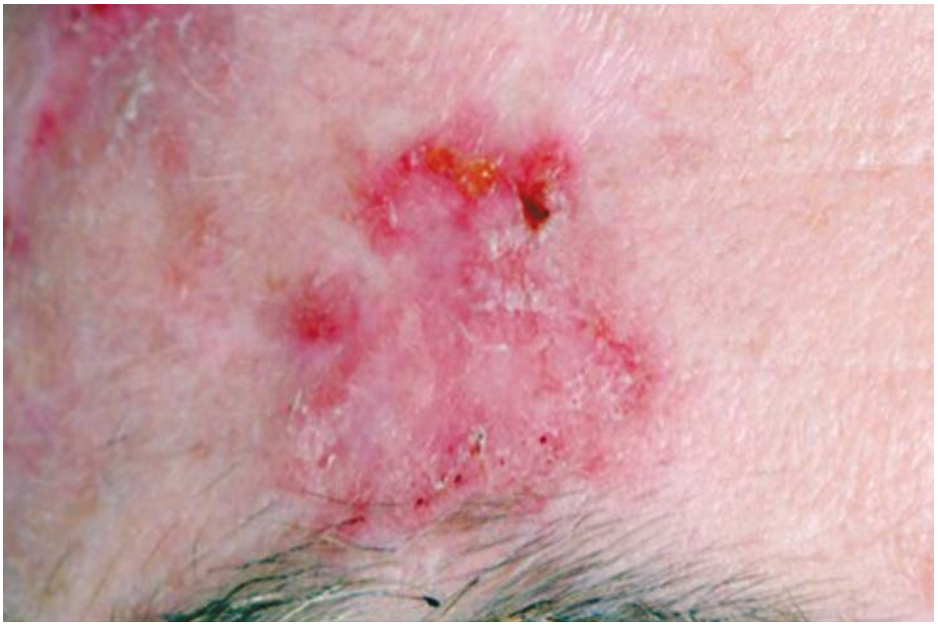
https://theraworx.com/wp-content/uploads/2012/07/Stratum-Corneum.png

BCCs and SCCs involve a skin cell called the Keratinocyte. Keratinocytes are a type of skin cell that make up most of the epidermis.

Both BCCs and SCCs are sometimes called non-melanoma or keratinocytic skin cancers.

Melanoma involves a skin cell called the Melanocyte. Melanocytes are highly specialised cells that produce melanin. Melanin is the pigment that is responsible for colouring the skin, eyes and hair.

Melanocytes are found in the skin, eye, heart, bowel, inner ear, bones and membranes of the central nervous system. When melanocyte cells are clustered together in the skin they form a mole.



Squamous Cell Carcinoma – Image kindly provided by The Skin & Cancer Foundation Inc

Basal Cell Carcinoma

Basal Cell Carcinoma (BCC) is a cancer of the keratinocytes located in the Stratum basal of the epidermis. It is the most common type of keratinocytic cancer (approx. 70%).

BCCs are generally found on areas of skin that have had high sun exposure such as the head, neck, hands, forearms and lower legs, although they can appear anywhere on the body.

BCCs may present as a pearly, shiny surfaced, pink coloured raised lump. They may also appear as a pink to red coloured, slightly scaly area of skin that can spontaneously bleed or ulcerate.

The size of BCCs may vary from a few millimetres to several centimetres in diameter.

BCCs are not tender to touch, but they may sometimes itch.

Occasionally BCCs heal and then inflame again, often in a three month cycle.

BCCs tend to grow slowly, but early detection is important so that the lesion can be treated either non-surgically with cryotherapy, or with minimally invasive surgery.

Squamous Cell Carcinoma

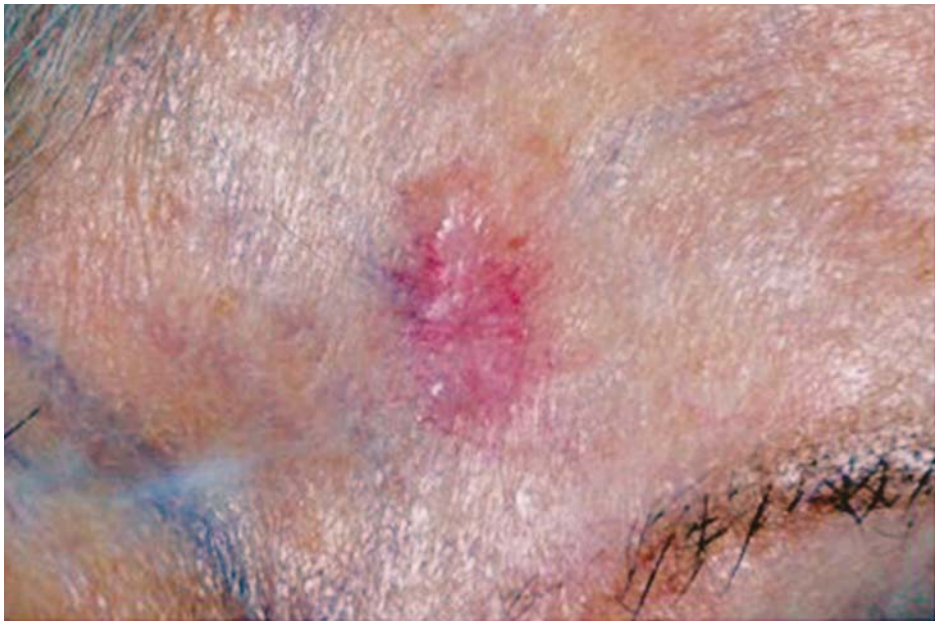
Squamous Cell Carcinoma (SCC) is cancer of the keratinocytes located in the upper layers of the epidermis. It is a less common keratinocytic cancer (approx. 30%).

SCCs commonly occur in older people and are generally found on areas of skin exposed to the sun.

SCCs may present as a thickened, scaly or crusted lump that is pale pink to red in colour.

SCCs can bleed and look similar to a sore that won't heal. They may also be tender to touch.

SCCs tend to grow over several weeks or months. SCCs found on the lips and ears are more likely to spread and should be examined by a doctor as soon as possible. Generally treatment of SCCs is by surgical excision.



Basal Cell Carcinoma – Image kindly provided by The Skin & Cancer Foundation Inc

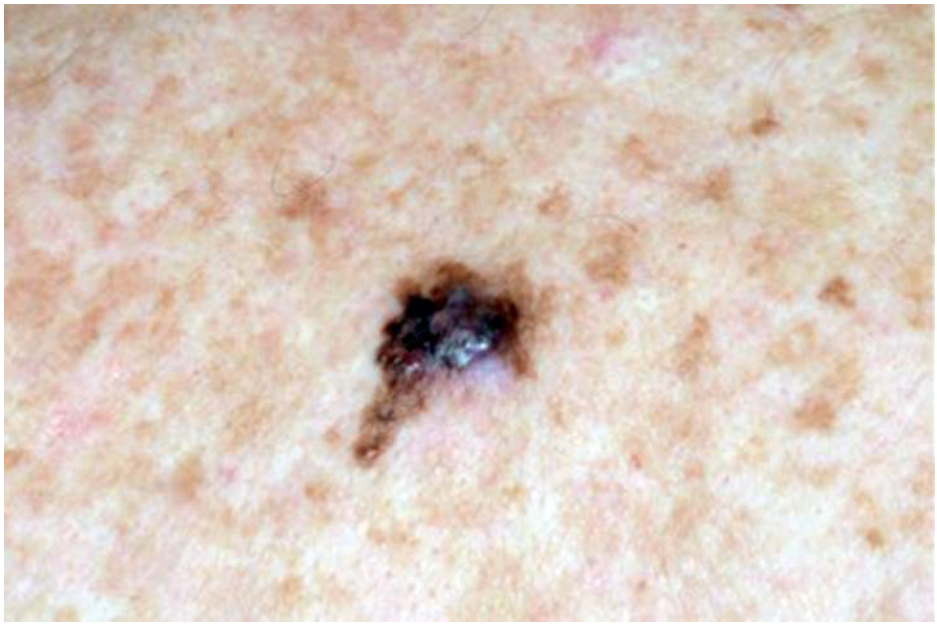
Melanoma

Melanoma is cancer of the melanocyte located in the lower layers of the epidermis. Melanoma is less common than both BCCs and SCCs but is the most serious form of skin cancer.

If left untreated Melanoma can quickly spread into the lower part of the skin – the dermis. Once in the dermis, it can enter the bloodstream or lymphatic system and then spread to other parts of the body such as the lungs, liver, brain and bones.

Like other skin cancers, a common cause of melanoma is overexposure to UV radiation.

There are however, other factors that can increase the risk of melanoma



Melanoma – Image kindly provided by The Skin & Cancer Foundation Inc

developing. These include a family history of melanoma, a high mole count, fair skin, red hair, light coloured eyes and having had multiple sunburns throughout life, especially as a child.

Melanomas can occur anywhere on the skin, even in areas that are not normally exposed to the sun.

AUDREY PARATORE is a professional skin practitioner experienced in many aspects of professional, complimentary and paramedical skin care. She has more than 10 years experience as a Senior Lecturer in Vocational Education and consults for a number of leading skin care companies. Audrey describes herself as a life student of skin science and derives fulfilment in sharing information with other Skin Therapists empowering them to further their careers and bring awareness to the privilege of working hands-on with clients.

Melanoma may present as a new or existing mole on the body that undergoes a change in shape, size or colour over a period of several weeks or months.

The colour can vary from brown, black, blue, red, white, light grey or pink. The edges are often irregular and the surface can be flat or raised.

Melanomas may be diagnosed using the ABCDE method:

A – Asymmetry – spots that are asymmetrical not round

B - Border irregularity – spots with uneven borders

C - Colour variation – spots with an unusual or uneven colour

D - Diameter (usually over 6mm) – spots larger than 6mm

E - Evolution (change and growing larger) – notice changes/take photos.

Early stage melanomas are usually excised with a wide margin around the lesion. More advanced stage melanomas are commonly treated with multiple therapies such as surgery, radiation and chemotherapy.

In summary, you don't need to be a medical professional to recognise a skin cancer. A skin cancer usually stands out as being quite different to the surrounding skin and/or other healthy spots which have smooth edges and an even colour.

If a spot strikes you as looking a little odd, take action! Remember that skin cancers don't all look the same or always appear identical to those seen in photos.

Keep a watchful eye for these 4 little warning signs – you could ultimately save your client's life.

- a spot that is different from other spots on the skin
- a spot that has changed in size, shape, colour or texture
- a sore that doesn't heal
- a spot that bleeds.

References

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Request for Company Mentors

Monash University Summer Scholarship Scheme 2016-2017

Monash Summer Scholarship is a scheme that allows students in Formulation Science (Faculty of Pharmacy and Pharmaceutical Science -Monash University) to get professional experience in industry and companies to get projects/scientific work done during summer period. The duration of the scholarship is flexible from 1 to 3 months, between the end of November and the end of February. Students are paid $250 to $500 per week (the amount is decided by the company) by the company and in effect, Monash pays the students every month and the company receives a final invoice around February. Students are covered by the Monash insurance. The objective is for students to be exposed to the real world projects and professional environment and the companies to beneficiate from students skills and knowledge. Students can work on any project, either in teams or independently as they are reasonably trained in formulation and analytical chemistry.

The number of places offered by industry is constantly raising as mentors recognise the value of having one or more job ready students for a period of 1 to 3 months. Last year, Industries in Melbourne and interstate have offered more than 30 places and the feedback from students and mentors has been very positive.

If you are interested in hosting one or several students during the summer period 2016-2017, please use the link below in your browser and complete the form. You don›t need to propose a specific project title if you do not have one at that stage or if no specific project is planned for the student(s): students can be integrated in teams to work on existing projects or help on different projects.

https://docs.google.com/forms/d/e/1FAIpQLScOaLguwnR2vhPiZUM_LZOfa26Z859AZvzeIR-EPx6XLp0CeQ/viewform

All projects need to be gathered NO LATER THAN 4th NOVEMBER as the Summer Scholarship scheme is organised centrally at Monash University. I will send reminders closer to the date.

We really appreciate your support to our course, it is invaluable for our students and we hope that you will participate (again or for the first time) this year. Please send me an email if you have any questions:

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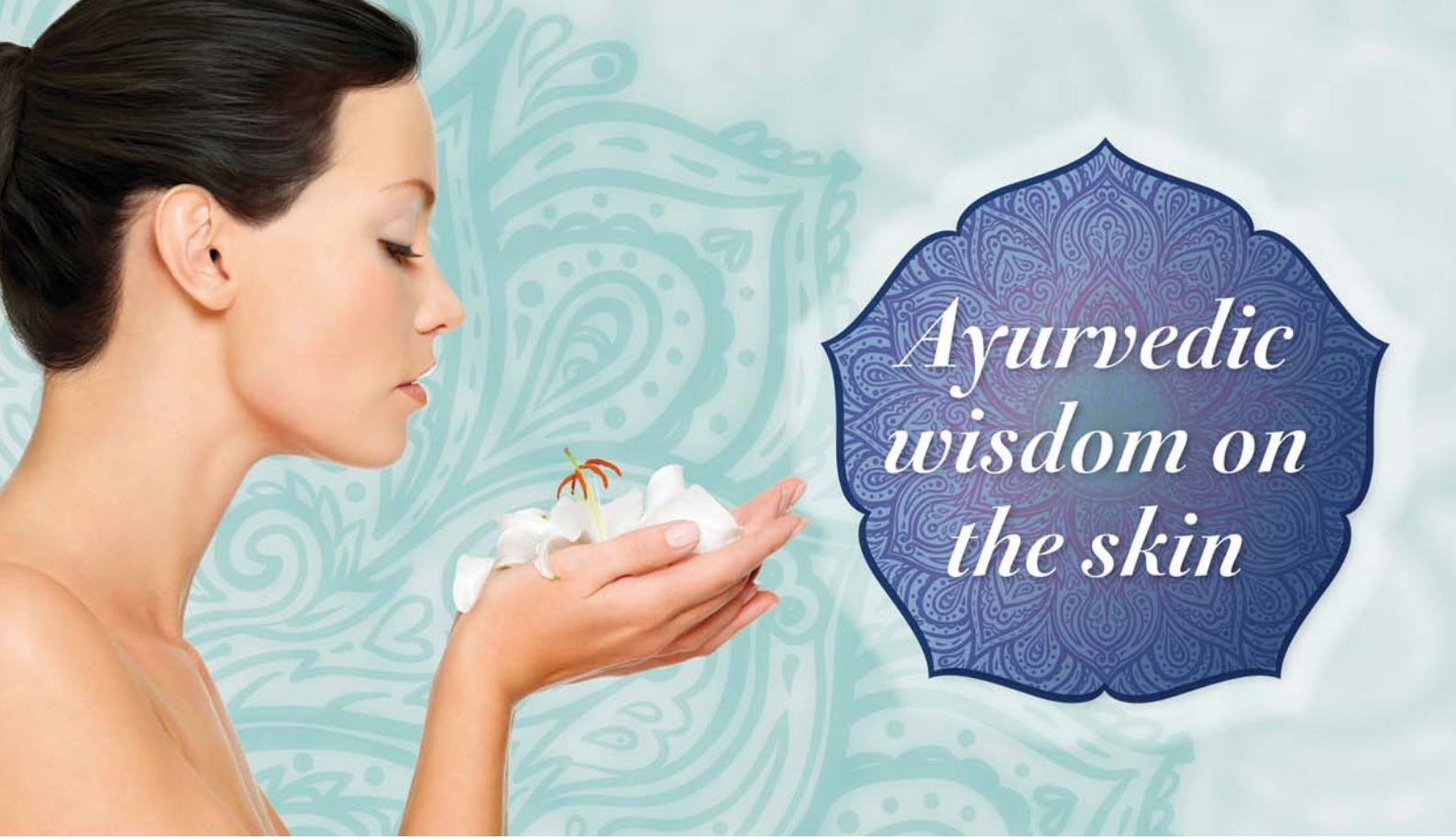

Ayurvedic wisdom on the skin

Making the most of the ancient Ayurveda tradition, Lipotec offers a selection of botanical extracts from its ACTIPHYTE™ *botanical extracts* range to address the different conditions of the skin.

Ayurveda is the ancient Hindu mode of traditional medicine that focuses on maintaining a physical and emotional balance for staying healthy and prolonging life through adjustments in diet, exercise and sleep, involving herbs, aromas, meditation and yoga. Topical applications of herbal-based remedies and oils have a long tradition in Ayurveda as a way to address beauty concerns.

Ayurveda distinguishes three mind-body types, called DOSHAS, representing the biological energy within the human body. They play a very important role in the maintenance of cellular health and longevity and can be translated into three different skin types. Skin conditions are believed to be caused by the doshas out of balance.

- VATA is the energy that controls bodily functions associated with motion. VATA skin is dry, thin, with a tendency toward premature aging and needs hydration and rejuvenation.
- PITTA is the energy responsible for the body's metabolic systems and temperature. PITTA skin is sensitive, with a very low tolerance to sun and other agents and predisposed to inflammation. It needs to be soothed and protected.
- KAPHA is the energy that regulates growth in the body and maintains the immune system. KAPHA skin is oily, prone to large pores and acne, with tendency to accumulate toxins, and needs detoxification and exfoliation.

Ayurvedic wisdom on the skin has been developed to offer remedy for the problems of each skin type with the following six ACTIPHYTE™ *botanical extracts*.

For VATA (Dry) skin:

ACTIPHYTE™ *Ashwagandha* that helps to promote cell regeneration and protection providing a rejuvenating and moisturizing effect; and **ACTIPHYTE™ *Myrrh*** that has the ability to inhibit the collagenase enzyme contributing to the aging process and as a result may help reduce the appearance of wrinkles as well as ease dry skin.

For PITTA (Sensitive) skin: **ACTIPHYTE™ *Shatavari*** that can alleviate the undesired signs of inflammation acting as an antioxidant and contributing to restoring tissue damage from irritation; and **ACTIPHYTE™ *Coriander,*** a potent antioxidant with great free radical scavenging activity that contributes to a

consisting of a single herb that present a wide range of different performance traits. According to the product claims being sought, each extract can be incorporated into specific cosmetic formulas.

For more information please contact Robert McPherson, Account Manager for Australia and New Zealand, at RMcPherson@Lipotec.com or Tel: +61 (02) 9741 5237

healthy response to allergens.

For KAPHA (Oily) skin: **ACTIPHYTE™ *Saffron,*** known to kill bacteria and flush toxins out and to possess exfoliating properties, is ideal for acneic and oily skin; and **ACTIPHYTE™ *Turmeric*** that can regulate excessive sebum secretion, control the microbial growth on the skin, prevent bacterial infection and clean up the pores.

Lipotec's ACTIPHYTE™ *botanical extracts* from the Active Organics® *inspired by nature* brand are basic extracts

Sustainable Packaging:

how to increase product sales . . .

whilst reducing waste

by Steve Welsh

When I was a child (and I'm not that old, unless you ask my daughter), it was almost the norm to see people dispose of rubbish freely without a second thought. Recycling was not heard of, or at least not a mainstream topic.

Over the last decade, the sustainability of packaging has come to now be one of the top points raised when talking with a brand decision maker about their packaging selection.

Sustainable packaging is a growing market (and increasing annually) across three distinct segments – Recycle (which covers recyclable and recycled), Reusable and Degradables.

Let's face it, looking after the environment is a no-brainer – after all, it's the air we live and breathe. Which is why, you'll be glad to know, that sustainability in packaging not only helps reduce impact on the environment but can also increase your sales and improve your bottom line – when done right.

Here's the thing, over the past decade we've seen the buying power of the eco conscious consumer grow. It's been the biggest driver in the sustainable packaging market. The 18 to 34 demographic have increased buying power for cosmetics and tend to lock in with brands that are socially responsible in their messages and their packaging. In fact in a number of studies, this demographic are shown to care more about what the product says about them than how much it costs.

Just recently in our business, we worked with a certified organic range of skin care products. We undertook to not only package their products in recyclable packaging – but also calculate the carbon footprint of the packaging, so that we could communicate this to our clients target market. Ultimately, this gave our client a clear point of difference over their competitors.

Ways you can make your packaging more sustainable:

Reduce

There are a number of ways to reduce the packaging used to present the goods to market and to ship the goods to the customer. This not only reduces cost to the manufacturer but also reduces the environmental footprint of the product.

When it comes to Skincare, there has to be a balance between reducing and maintaining the presentation of the product to meet consumer's expectations – whilst improving the product (and brand) for the entire shelf life.

Reusable

It's great to reuse parts of packaging, to reduce landfill. Whether that's a refill pack that is sold alongside a consumer reusable pack or another idea. The drawback here though, can be if cross contamination occurs. The consumer may not be so diligent washing out the previous batch, which can give a negative impact on the refilled product.

Degradable

We've all been exposed to biodegradable products, right? Over the years we've had the privilege of working with a lot with various packaging solutions that are biodegradable. What I can tell you is that some work a lot better than others. What we've found is that it depends if the degradable packaging has to come into contact with liquids, light, etc. Most importantly, what is the active element that is designed to start the degrading process.

STEVE WELSH is a cosmetic packaging specialist with over 20 years experience across all mediums of packaging. As the director of Weltrade Packaging, Steve leads a team of designers, technicians, printers and supply chain professionals. To ensure the best exposure of your beauty, skincare or cosmetics brand. Steve's philosophy is to design your packaging correctly, right from the start, so you can elevate your brand and move more product. Steve works closely with leaders in the cosmetic industry to ensure that your packaging consistently stands out on the shelves within this highly competitive market.

We've found that the degrading options still have some short term obstacles, over the next few decades – as more blending of materials that allow packaging to break down, combined with other materials that can hold the features required are perfected and processed more easily.

Recyclable

Traditional recycling is likely to remain the main target for sustainable packaging for the short to medium future. More avenues are opening up for recycled plastics, for example: to reuse recycled material in more everyday items.

At the recent Rio Olympics there was recycled material used in team uniforms, in all the Olympic medals and in various sculptures used in and around the city to promote the games.

Recyclable packaging allows product stability with important active ingredients, but still has the message that the brand is not willing to compromise on the environment to package their product.

Bottom line. There is so much information available about the environmental impact of packaging. It's even being seen in mainstream media more and more. So you really now must start to think and promote your products in a sustainable or environmentally responsible way. After all, this is what your consumers want.

Additional Resources

Over the last 20 years we've built a number of great resources on the recyclability of different plastics. I'm more than happy to share these with you – so you can move forward confidently with the packaging choices (you decide) for your product. Simply reach out on (07) 5597 0102 or info@weltradepackaging.com.au

As always, I welcome your feedback and specific requests for any packaging evaluations that our team may be able to help you with.

Cyber risk insurance?

Part 1

by James Gillard

A cyber event is a real and present threat to all Australian small and medium businesses. Owners should review their business plans and add the possibly of a cyber attack as part of their risk management plan. The number of cyber crimes is continuing to rise, and Australian businesses are becoming a juicy target for international attackers. According to www.stayonline.gov.au, 33% of businesses in Australia experienced a cyber crime in 2014. Among these, 60% were small and medium businesses.

Cyber risk is not only an issue for large organisations but also all businesses irrespective of size, along with every individual who is engaging in online business activities. The number of ransomware attacks has significantly increased in Australian over the past two years. With appropriate cyber insurance cover, an insurer can rapidly respond to the incident and with a 24/7 assistance hotline and a team of cyber experts will be able to mitigate any loss and impact aiding recovery from the incident. Every business should highly consider having Cyber risk insurance.

What is a Cyber Risk?

A cyber attack is a transmission of fraudulent or unauthorised data that is designed to modify, alter, damage, destroy, delete, record or transmit information within a system which usually involves some elements of cyber crime resulting to financial loss, business disruption or damage to the reputation of your company.

The attacker could be a person, a group of individuals, or hacktivists who are interested in the company's valuable electronic data or assets i.e. customers' information, company's intellectual property, financial records. This can be either for economic gain, nuisance activities, or employee sabotage. A cyber attack can incur tremendous costs for business. The report on www.stayonline.gov.au has revealed the cost of a cybercrime attack to a business in Australia in 2014 was $276,323, and the average cost is continuing to grow.

Small and medium businesses are attractive targets

Australian small and medium businesses in the past few years have opened up their business to opportunities with the Asian markets as a result of the growth of internet usage in Asia. The international attackers glimpse this opportunity to target these businesses as potential and vulnerable targets because small and medium businesses are usually outsourcing their IT and lack the awareness, unlike larger organisations where the IT policies and procedures are in place. The business priority of the small and medium businesses focuses on cash flow, and IT is considered a secondary or minor business issue.

Cyber Insurance

There is a misunderstanding that Cyber Insurance is designed for large organisations or companies that have large computer network systems. A cyber insurance policy can be customised to protect every business. The best option is a stand-alone policy or a secondary endorsement option extending a Profesional Indemnity Policy or Management Liability Policy. The Cyber Insurance policy is different from commercial crime insurance and is designed to suit the needs of business in the digital age.

Stand-alone Cyber Insurance policy revolves around the Protection of Privacy and Network Security Exposures and covers the First Party Losses (own) and the Third -Parties Liability (Consumer or others)

- The first-party expense coverage such as incident response costs, i.e., IT Forensic, Internal Forensic, Forensic Accountancy
- Third party liability coverage such as Privacy Liability and Network Security Liability, i.e., Legal expenses arises from the third party claim

Incidents of Cyberattack

There are some small and medium businesses which still think 'It will never happen to me', and yet some have already had an experience of a cyber incident. Following a cyber attack, some were unsure as to what occurred and decided not to notify their clients.

The following case studies are recent; we have reserved their names for privacy purposes.

Incident I

A pharmaceutical company's outsourced IT consultants detected a corrupted file which contains the company's credential information. The IT consultants immediately investigated, and it was a cyber attack and notified their client. Fortunately, the IT consultants were able to restore the files, and the pharmaceutical company responded to this incident by upgrading the level of their IT securities and notified their insurance broker.

There was no damage or any claim cost incurred to this case.

Incident II

A bookkeeper had authority from her client to pay their bills. The arrangement was for the bookkeeper to receive emails requesting payment to be made. The bookkeeper received an email from the client requesting payment to be made however the email address had been hacked, and a hacker created a requested payment to themselves under the guise of payment on behalf of the client. This was not an unauthorised request for payment. The bookkeeper immediately reported the incident to an insurance broker.

Cyber risk is now a very real threat to all businesses. We urge all business owners to contact your insurers or brokers to help investigate and review your current insurance covers.

If you are unsure about your current coverage and need a professional advisor to review your insurance policy or risk, please contact the friendly team at Insurance Made Easy for personal assistance to discuss your circumstances on 1800 641 260 or visit imeinsurance.com.au

James Gillard
Managing Director

Australian Society of Cosmetic Chemists

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A.S.C.C.
PULCHRITUDO PER SCIENTIAM

Un-ethical cosmetics

by Wendy Free

In politics there are apparently core and non-core promises, and one might have assumed that the same would apply to cosmetics; but apparently not – sometimes there appears to be no limits.

Lets' start at the beginning

In the USA it's against the law for a cosmetic to contain any ingredient that makes the product harmful ***when consumers use it according to directions on the label***. This is true whether or not there is a regulation that specifically prohibits or restricts the use of the ingredient in cosmetics …

… And there only a very few substances that are restricted/prohibited in cosmetics[1] in the USA, there are

Six Antibacterial agents: Bithionol and Halogenated salicylanilides (Photo-senstisisng, Phototoxic), Hexachlorophene[2], Mercury[3] and most recently Triclosan and triclocarban[4] (Not yet proven safe and effective); with benzalkonium chloride, benzethonium chloride and chloroxylenol now requiring new safety and effectiveness data.

Three Fragrance ingredients: Acetyl ethyl tetramethyl tetralin, 6-Methylcoumarin, Musk Ambrette

Four Propellants/ Aerosol related: CFC's, Trichloroethane, Vinyl Chloride and Zirconium

Two Solvents: Chloroform and Methylene Chloride

Two types of By-products being Nitrosamines[5] and Dioxane[6]

And **Prohibited cattle material**[7]

(Why do Dioxanes get so much popular bunk attention when the Nitrosamines miss out? More bad press for Nitrosamines I say!)

Let's look at some things that are NOT prohibited in the USA (for example products supplied as "physician-only retail skin care products")

(Refer to table overleaf.)

So note to Australian Buyers – just because its 'legal' there doesn't mean its safe or legal here. Different laws; different responsibilities.

This circumstances is not just limited to the USA; many of the products I've reviewed from Europe also contain ingredients that have *profound effects* 'aka' are pharmacologically active.

"They must be good because they're from Europe!" (This doesn't mean that they're allowed there, but consider *no restrictions on export*)… Perhaps, because our laws here are so poorly recognised, implemented and policed; these products end up in our market.

(What cost beauty? No one would consider using lead in cosmetics but they don't question other products with significantly greater risks!)

Ingredient	What applies in Australia
Epidermal Growth factor (EGF)	EGF is classified as S7 in Australia (at present). - S7 means **Dangerous Poison** – Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. - These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. - Special regulations restricting their availability, possession, storage or use may apply. *- there is an application before the Poisons scheduling committee to gain an exemption for this "in topical cosmetic preparations containing 0.0002% or less of transgenic, plant-made epidermal growth factor".*
Fibroblast Growth Factor (FGF)	is **S4 Prescription Only** and is also included in appendix D of the poisons schedules – ADDITIONAL CONTROLS ON POSSESSION OR SUPPLY OF POISONS INCLUDED IN SCHEDULE 4 OR 8; **Poisons for which possession without authority is illegal,** ie, same controls and restrictions as anabolic steroids.
Human Fibroblast Conditioned Media (HFCM/ TNS) Reputably circumcised human foreskin	In Australia **it is illegal to trade in human tissue;** (Irony? Its illegal to use cattle derived material in the USA because of disease risk but apparently not human derived material!)

Note here; just because an ingredient has an INCI *DOES NOT MEAN* its permitted for use in Europe.

Buyer beware, check safety, legality and then efficacy; *"don't expect what you don't inspect"*.

What about Green Washing?

Don't get me wrong, there are very many good, well-credentialed green brands out there, just perhaps not the ones you think. Many companies are clever not just in their product design but also in how they make you feel about their brand values and their products.

There are at least seven different ways to make you feel really good about an environmental aspect of a product, and thereby eliminate all other sins … some people call this "linguistic detoxification"; and others call it "ecopornography".

The first, and perhaps most common 'actual issue' is **Hidden Trade Off**; for example 'all natural cosmetics', with the ingredients and the packaging shipped in from all parts of the globe. Yes they are natural, but all that transport is not very eco-friendly; Another common one I see is excess packaging, a tube with minimal print inside a box printed with beautiful flowers, perhaps cello wrapping all especially to transport 50g (or less) of 'goo'.

Maybe **No Proof** is more common; "made with Antarctic Beech Sap that because, of its profoundly slow movements and cold climate, freezes the skin in a perfect state of suspended animation" (Ok I made that up; maybe I do have a future in marketing?); but honestly "bamboo is strong and flexible so its extract will make your hair strong and flexible"… Do we really believe that? The green claim (Bamboo) is made, but where's the proof?

Irrelevance "Chemical free" comes to mind here … as do claims of 'Mineral makeup' – weren't they always minerals? (Maybe I missed that class). One, not so green related, but still a favourite was "Gluten Free eye-shadow" (yes I have seen that one), *mmm possibly not many eye-shadows that use wheat products to start with and not too many people who have topical allergies to gluten*. The list of sins here is possibly endless …

Many of us can be taken in when it comes to **Vagueness**, where a 'green attribute' is implied but its not actually stated or verifiable; names of products that include the word 'organic', pretty green coloured bottles, pictures of leaves and flowers, ethereal images, you feel good about the product but you're not sure why.

Fibbing! There are three types of fibbing to my mind; the blissful, the wishful and the bloody minded all out lies. Regardless of the cause, it just not true. The blissful can come about where product design and manufacture are so far divided that neither sees the others contributions, and as a consequence, imaginary attributes are added to the outside but not the inside, or to the environment. The wishful is more inspirational, we'd like the product to be like this, and we've tried really hard … The final I'll leave to your imagination.

Lesser of two evils (strong language warning ⇨ parabens) This product is 'paraben free'; implying that the supplier is well aware to the 'dangers of parabens' and cares enough about this concern to make sure they're not included; so instead they use 'Honeysuckle extract,[8] or a whole range of other preservatives, some of which have good safety profiles, and other of which may not have any safety data at all. So in the consumers' mind there are still preservatives but they

are 'safe' ones. It's hard to get around this and I do have to admit guilt here.

False Gods – where once we had beauty queens and movie starts promoting our products (like we actually believed that they used the products and endorsed them out of a genuine belief in their effectiveness), today we have brown and green bottles, 'logos' (Like pseudo-medals on wine bottles) of bunnies and recycling symbols and framed pictures of leaves and flowers, but in many cases 'no substance'. The biggest offender here (in my mind) is 'Cruelty Free', full points for a great fund raising campaign for animal awareness, but in terms of ethical management of this issue – not too much credence. Very, very few products are ever tested on animals these days, its very expensive and un-necessary to start with; also we're not too keen to have our name added to a list that says "we're no longer cruelty free" once we stop paying your invoices.

So how to pick an ethical product?

Tip to consumers; as soon a product claims "no" – this is part of a green-washing process, however well meant. No glycols, no parabens, no sulfates, no chemicals; whatever the claim they are trying to make you feel good about their own product, without actually telling you its benefits.

There is no hard and fast rule. My (probably fruitless) suggestions are minimal packaging, tangible claims; but that's not very exciting!

References

1 http://www.fda.gov/Cosmetics/GuidanceRegulation/LawsRegulations/ucm127406.htm

2 Restrictions were enacted after 15 deaths in the United States and 39 deaths in France were reported following brain damage caused by hexachlorophene see http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(82)90225-2/abstract

3 Except for trace amount below 1 ppm and except for use as a preservative in eye-area cosmetic products at concentrations up to 65 ppm

4 http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm378393.htm

5 Cosmetics containing as ingredients amines and amino derivatives, particularly di- & triethanolamine (DEA & TEA) may form nitrosamines. The nitrosation may occur during manufacture as well as product storage; Nitrosamines cause cancer in laboratory animals and have been shown to penetrate the skin. 27 of 29 cosmetics during surveyed in 1977 contained Nitrosamines.

6 Cosmetics containing as ingredients ethoxylated surface active agents may be contaminated with 1,4-dioxane. Removed from ethoxylated compounds by means of vacuum stripping at the end of the polymerisation process without an unreasonable increase in raw material cost.

7 Due to concerns about Prion and other disease transmission.

8 A 'natural material' that appears to be chockfull of 'paraben like' substances which are very effective preservatives.

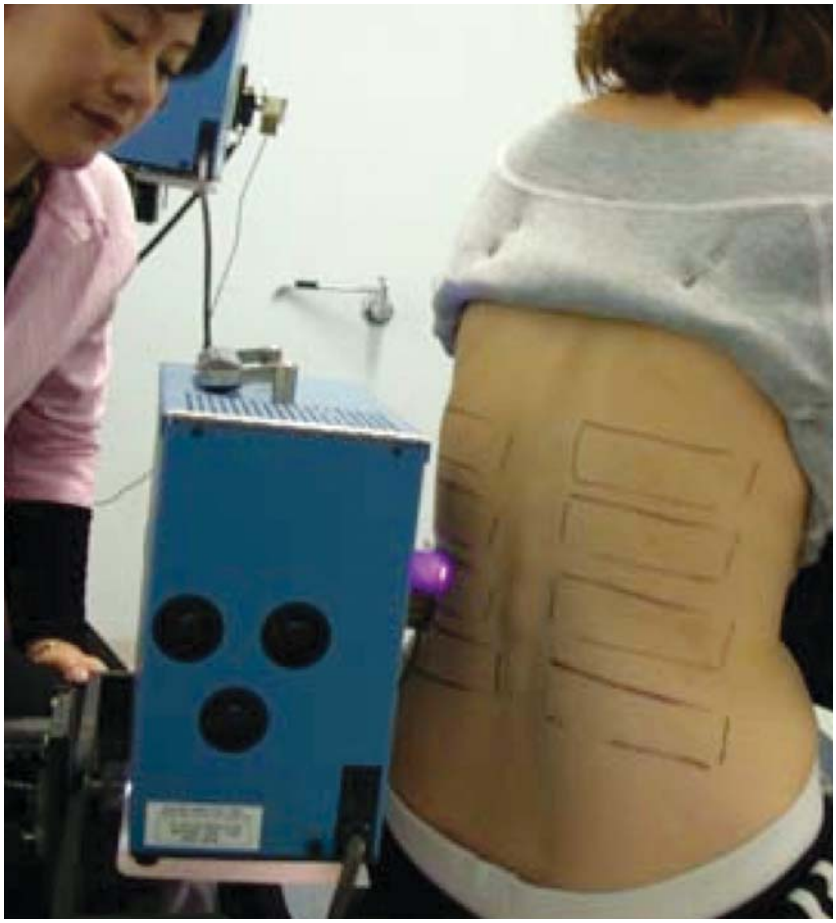
sunscreen highlights

by John Staton

Sim versus Sun – new primary reference uncovered!

In the now around 40 years since the first publication of a sunscreen SPF test method, we have relied on the Solar Simulator instrument as our model for sunlight. We calibrate, relate back to NIST[1] traceable primary references and try to run the SPF test method in a way that complies with all parts of the Standard. BUT, sometimes overlooked is the best primary reference for our testing - the REAL SUN! The implications for the relationship with the sun are in the Foreword of AS/NZS 2604 (2012)[2]. See in particular, the top of page 5 states, in an example, that an SPF 15 offers 150 minutes protection, compared with a 10 minute unprotected minimum sunburning dose. Examples of proportionate protection for SPF 30 and 50 sunscreens are shown in an accompanying graph on the same page.

Real Sun Testing



Solar Smulator Testing

Often overlooked, this implies clearly that the SPF should be "SUN" Protection Factor and not some other type of protection factor!

Consumers are these days, regularly exposed to the UV Index, which informs on sunlight intensity – even in real time. These numbers are based on standard accumulated erythemally effective UV energy – exactly what our solar sims provide onto the backs of our test subjects.

My position is that SOLAR simulator describes a device for "SUN " simulation, so the spirit of the test method is to imitate, in a controlled fashion and as closely as possible, the IN USE performance expectation of the product. The exposures from the solar sim should reflect as closely as possible, performance in use! Recently, we had the opportunity to cross-calibrate the radiometers we use to measure our own solar sims with the reference radiometer at ARPANSA[3]. This showed that the output **can** be tuned to exactly reflect natural sunlight.

Check out the App that the Cancer Council now has for download!

http://www.cancer.org.au/preventing-cancer/sun-protection/uv-alert/sunsmart-app.html

Once again, the guidance given is based on the same Accumulated Erythemally Effective Energy values as advised by the UV Indexes. These apply universally, as USA , NZ, E.U, also use the same Diffey[4] based core value – of the SED – 100 J/sqm-eff i.e. 200 J/sqm-eff for a :Type I skin etc.

The primary reference light source we can share and calibrate to is the SUN!

It would be interesting to see how we might make more use of this in the future to improve the reproducibility of SPF reporting, which is an ongoing issue for test labs.

Your chance to rub shoulders with the experts

ASCC and ACCORD have grabbed the opportunity to take full benefit of the presence of the many cosmetic experts who will be here in early December for a series of ISO meetings. On Monday 5th December, there is a full day personal care conference at Amora Hotel Sydney. As well as the speakers who will present a comprehensive programme, 50 to 100 ISO Delegates will be present in the audience. Don't miss the opportunity to network as well as hear the very latest on sunscreen technology – a 2 hour concurrent session is dedicated to this topic.

References

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2. AS/NZS 2604 (2012) Sunscreen products - Evaluation and classification
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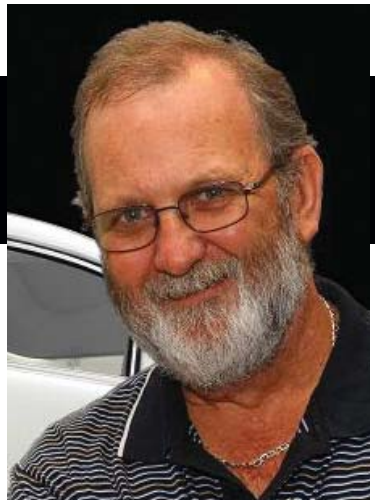

Part 31 –

by Ric Williams

Colour Cosmetics

Lipsticks & Lip Glosses

Lipsticks are dispersions of colour in a solid (or sometimes liquid) base. They are designed primarily for colouring the lips but have the secondary effect of protection of the lips from environmental conditions (wind and sun) and then prevention of cracked lips. They generally do not contain any other active ingredients, this left for Lip Balms or Lip Salves.

The primary ingredient is colour, and the main difference between the use of colours for Face Powders and Foundations and those for Lipsticks is that Staining Dyes (water-soluble and oil-soluble dyes) are recommended to provide remaining colour in the lips if the lipsticks accidentally removed.

Typical proportions of colours used are:

1 – 4% **Inorganic pigments** – Titanium Dioxide and Zinc Oxide as white bases (also to increase opacity)

0.5 – 3% **Staining Dyes** – Bromo Acids

1 – 3% **Oil-soluble Pigment Dyes**

8 – 10% **Organic pigments**

Organic lakes – are organic dyes absorbed onto insoluble Aluminium Hydroxide or Stearate bases.
Iron oxides – yellows, reds, browns & blacks
Ultramarines – green & blue
Chrome Hydrate and Chrome Oxide – greens
All of which MUST be approved by regulatory authorities in each conntry.

The dyes should be dissolved (or dispersed) in a Solvent. Common solvents used are:

Castor Oil

has good solvent properties, gloss and emollience plus it retains its viscosity at skin temperature.

Fatty Alcohols

Lauryl (C12); Myristyl (C14); Cetyl (C16), Stearyl (C18) and Oleic (unsaturated C18) Alcohols are used as dyestuff solvents and have the added advantage of contributing to the consistency of the lipstick, ie. Lauryl (C12) and Oleic (unsaturated C18) Alcohols are semi-liquids while Myristyl (C14); Cetyl (C16) and Stearyl (C18) Alcohols are waxes with increasing melting points as the carbon chain gets longer. They also contribute to water resistance (in the same order as melting point) with Lauryl (C12); being the least water resistant then Myristyl (C14); Cetyl (C16), to Stearyl (C18) Alcohols,

Esters

we usually use short chain esters as good solvents (with low emolliency) and medium to long chain esters with moderate to low solvency and medium to high emolliency in combinations.

Polyethylene Glycols

have good solvency for soluble dyestuffs but increasing solvency

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Cosmepeutics Internatiional
This column is intended not only as an education tool for non-technical people or beginners in our industry, but as a forum for those wishing to enlighten all about recent technology advances and new ideas. I hope experienced scientists will also contribute to this ideal and if you wish to do so please email me at: ric@cosmepeutics.net.au and I will publish your comments.

also means increasing water solubility. Small amounts of "balanced" molecular size materials are chosen.

Lanolin, Lanolin Fatty Acids and Lanolin Oils

are also useful due to the high content of polar organic materials and excellent emolliency.

To make the stick a solid and limit "payout" to a manageable amount Consistency additives are essential. These are mainly high melting point waxes.

Carnauba Wax

a hard vegetable wax used for raising melting point, increasing hardness and creating rigidity to the stick. As lipsticks are made in moulds Carnauba Wax also shrinks slightly when cooled hence has benefits as a mould releaser in manufacturing.

Candelilla Wax

another hard vegetable wax with the same properties as carnauba wax but has a lower melting point and is less brittle.

Okokerite Wax

an amorphous hydrocarbon (Alkane) wax from petroleum that is more pliable (less brittle) than the vegetable waxes.

Microcrystalline waxes

as per Ozokerite wax.

Beeswax

provides excellent stiffening properties to the stick while being pliable, although may create a dull appearance if high quantities are used.

Cocoabutter

A vegetable wax with a melting point around body temperature. Cannot be used alone as it does not have the stiff consistency needed but is used to modify melting point and payout.

Shea Butter

(Karite Wax) another vegetable wax similar to Cocoabutter but with a slightly higher melting point.

Other consistency factors are:

Lanolin and lanolin derivatives

a complex mixture of fatty acids, fatty alcohols and hydrocarbons from natural origin.

Petrolatum

a paste form mineral oil or paraffin wax with a melting point about 45°C, and

Silicone waxes

synthetic waxes derived from non-organic silicone technology. which are used to lower melting points and improve emolliency.

A typical Lipstick formulation is (and note that this is usually a two stage production with the colour shade and the base being prepared separately then blended just before moulding into lipstick shapes.

Wax Base

Carnauba Wax	8.00%	Wax for consistency
Candelilla Wax	30.00%	Wax for consistency
Microcrystalline Wax	8.00%	Wax for consistency
Lanolin	11.00%	Emolliency
Cetyl Alcohol	5.00%	Consistency and dye solvency
Isopropyl Myristate	37.70%	Carrier and emolliency
Butyl hydroxy Toluene	0.10%	Antioxidant (rancidity)
Propyl p-Hydroxybenzoate	0.20%	Preservative

Colour Grind

Castor Oil	61.00%	Carrier and solvent
Titanium Dioxide	8.00%	White base colour / opacity
D&C Red No.3 Aluminium Lake	8.00%	Red colour
D&C Red No.9 Barium Lake	1.00%	Red colour
Bismuth Oxychloride	20.00%	Pearlescent additive (shine)
Benzophenone-3	2.00%	UV Protectant

Final Blend

Wax base	50.00%
Colour Grind	49.00%
Fragrance / Flavour	1.00%

Recent advances in additives have seen various materials used to prevent wear or rub-off of the lipstick. These are the so-called permanent lipsticks that made Poppy King so famous. Water resistant film forming agents are the most widely used for this purpose. The most common additive is:

PVP/Hexadecene Copolymer or PVP/Eicosine Copolymer (at usage levels from 1.5 – 3.0%) – a water proofing agents developed for sunscreens but have found favour in lipsticks because they:

- extend wear properties
- improve water resistance
- enhance pigment dispersion
- provide a rich feel and improved stick integrity.

Lip Glosses are solid lipsticks or paste formulations with high levels of gloss additives. These gloss additives are mainly emollients with high smoothness characteristics, hence paste lip glosses (ie. lip glosses in small pots) are in vogue as higher content of these materials can be incorporated into pastes rather than sticks (which would be too soft). They may or may not contain colour and may contain a fragrance or flavour.

A new material specifically developed for this purpose is Castor Isostearate Beeswax Succinate – a condensation product from Castor Oil, Isostearic Acid, Beeswax and Succinic Acid.

Ingredients

	Gloss Lipstick	Lip Gloss	Function
Castor Oil	43.35%	39.60%	Carrier / Solvent
Candelilla Wax	7.50%	4.00%	Consistency factor
Carnauba Wax	2.00%	1.25%	Consistency factor
Microcrystalline Wax	3.50%	2.00%	Consistency factor
Castor Isostearate Beeswax Succinate	5.00%	15.00%	Gloss
Butyl Octyl Salicylate	6.00%	–	Emollient
Isostearyl Steraoyl Stearate	6.00%	–	Emollient
Hydrogenated Lanolin	1.00%	–	Emollient
Glyceryl Tri-isostearate	18.50%	15.00%	Emollient / solvent
Octyl Hydroxystearate	–	10.00%	Emollient
Titanium Dioxide coated Mica	4.00%	10.00%	Pearlescent agent
Ascorbic Acid	0.05%	0.05%	Antioxidant
Propyl p-Hydroxybenzoate	0.10%	0.10%	Preservative

Colour grind

D&C Red #7 Lake	0.20%		Red colour
D&C Red #33 Lake	0.33%		Red colour
FD&C Blue #1 Lake	0.12%		Blue colour
Russet Iron Oxide	0.25%		Red insoluble pigment
Castor Oil	2.10%		Solvent / carrier

Nail Lacquer or Nail Varnish

The requirements of a Nail Lacquer are

- It should not irritate nails or skin.
- It should be easy to apply
- It should be stable in storage (ie should not separate or sediment the colours), and
- The film, when applied, should be :
  - Even thickness determined by a satisfactory viscosity, good wetting properties and good flow properties.
  - Uniform colour – A fine particle size uniformly mixed throughout the product.
  - Good gloss – A smooth surface and good film forming properties
  - Good adhesion to the nail
  - Pliable so that it will not crack or become brittle.
  - Resistant to impact or scratching – be a hard, non-tacky surface which will not adhere to other surfaces or rub off onto cloth.
  - Quick drying – will take less than 2 minutes to dry to the final appearance in humid atmospheres
  - Long wearing – will last up to 1 week without degradation.

Ingredients used are:

Film Formers (5 – 20%)

Usually Nitrocellulose polymer (chemically DiNitroCellulose-Pyroxylin) made from the reaction of Nitric Acid and Sulphuric Acid with Cotton.

Advantages are waterproof, hard, tough and resist abrasion.

Disadvantages are that it has poor gloss and a tendancy to shrink and become brittle; adhesion to the nail is also moderate. Modified resins are added to add gloss and increase adhesion while new film forming compounds, such as, PVP/ Hexadecene Copolymer are improvements over Nitroclellulose now coming into common use.

Plasticisers to improve brittleness and increase flexibility are used to overcome these problems.

Resins (2 – 10%)

Polyacrylamide and Polymethylmethacrylate resins are now commonly used to impart lustre and improve adhesion.

Plasticisers (1-5%)

These plasticisers should be

- miscible with the solvent, nitrocellulose and the resin (for stability)
- non-irritant
- have low volatility
- improve adhesion and flexibility
- not discolour
- be stable, and
- be odourless.

The first type of plasticiser are the solvent type such as high molecular weight esters, Dibutyl Phthalate being the most common.

The second type of plasticiser (to be used in combination with the first type and not alone) is the non-solvent type such as Castor Oil.

Solvents (30 – 50%)

The selection of a solvent is according to boiling point and viscosity to impart the best spreading and evaporation characteristics. A selection of low-, medium-, and high-boiling point solvents is usually used for the following reasons:

- the thin low boiling point solvents give the necessary mobility to enable the lacquer to spread easily and dry quickly, but if they are present in excess the lacquer may not wet the nail and consequently may spread unevenly, or the lacquer may dry too quickly giving rise to "blushing" or "blooming" especially in humid conditions. Also quick evaporation of the surface of the film with the underneath still "wet" will result in wrinkling of the film.
- the thicker high boiling point solvents give body to the lacquer and allow time for it to adhere onto the nail surface and to flow as an even film. The disadvantages are that they delay drying and hardening times.
- preferential evaporation of one part of the solvent blend may change the composition of the remaining liquid so much as

to disturb the solvent properties, giving rise to premature or partial precipitation of the colour or resins causing an uneven effect.

Ethyl and Butyl Acetates are the most common solvents used in nail lacquers, but various lower alcohols (Ethyl, Isopropyl and Butyl), Ethers (Ethyl Ether, Petroleum Ether, Diethylene Glycol Monomethyl Ether, Diethylene Glycol Monoethyl Ether), Other Acetates (Methyl Acetate, Amyl Acetate), Cyclohexane and Ketones (Methyl Ethyl Ketone and Acetone) are also used.

Diluents (20 – 50%)

The uses of diluents are similar to solvents but usually are lower costs than solvents. They may not have all the desirable properties that a good Nitrocellulose solvent is supposed to have, it is just that they are only used as a partial replacement of good solvents for cost reasons.

The most common diluents used in nail lacquers are, lower alcohols (Ethyl, Isopropyl and Butyl), volatile silicone compounds, and Cyclohexane.

Colours (3.0 – 5.0%)

Water-soluble and oil-soluble dyes should be avoided, as they tend to stain the surrounding skin, hence the following colouring materials are recommended:

Organic pigments

Organic lakes – are organic dyes absorbed onto insoluble Aluminium Hydroxide or Stearate bases.

Inorganic pigments – Titanium Dioxide and Zinc Oxide as white bases (also to increase opacity)

Iron oxides – yellows, reds, browns & blacks

Ultramarines – green & blue

Chrome Hydrate and Chrome Oxide – greens

All of which MUST be approved by regulatory authorities in each conntry.

A colour should be :

- Non-toxic and non-sensitising
- Non-staining
- Substantially insoluble in lacquer solvents or diluents
- Free from any tendancy to "bleed"
- Compatible with other lacquer constituaents and
- At least moderately stable to light.

Pearlescent pigments are usually Titanium Dioxide coated Mica particles, Bismuth Oxychloride crystals or Guanine crystals can be used in a myriad of available colours and shapes to create pearlescent and/or nacreous effects.

Suspension agents (0.50 – 2.00%)

Usually finely divided clays, these help suspend the ingredients (particularly colours) and impart of thixotropic viscosity to the lacquer. A thixotropic viscosity is thick on standing but when physical force is applied thins down. When applied to a nail lacquer it is thick in the bottle, thin when being applied to the nail (as the brushing action imparts physical force on the liquid) and thickens instantly when application is complete.

Nail Lacquer or Nail Varnish Remover

The products used as Nail Lacquer or Nail Varnish Removers usually consist of simple mixtures of solvents, such as Acetone, Amyl Acetate or Ethyl Acetate, which may contain small amounts of fatty material to counteract any excessive drying action of the solvents on the nails or cuticle. Originally Castor Oil was used, but nowadays esters such as Butyl Stearate or Dibutyl Phthalate, fatty alcohols or soaps may be used for the same purpose. A typical example of a nail enamel remover is:

Butyl Stearate	5.0%	emollient
Diethylene Glycol Monoethyl Ether	10.0%	solvent
Acetone	85.0%	solvent

Thank you.

The next issue I will discuss *"Special Forms of Colour Cosmetics"*.

EVENTS 2016

29th IFSCC Congress
30 October – 2 November 2016
Walt Disney Centre, Lake Buena Vista
Orlando Florisa USA

In-Cosmetics Asia
8-10 November 2016
Bangkok Thailand

Cosmoprof Asia
15-17 November 2016
Hong Kong

EVENTS 2017

IFSCC Conference
23-26 October
Seoul Korea

In-Cosmetics Global
4-6 April
London

ASCC Annual Conference
3-5 May
Novotel Twin Waters Resort
Sunshine Coast Qld.

NZSCC Annual Conference
TBA

President's Report

by Matthew Martens

Nearing the end of 2016 and with the silly season upon us it is all hands on deck to finish the year with a bang. The warmer weather brings with it a renewed enthusiasm for new R&D projects and starting to prepare for what is coming in the New Year.

As most of you will be aware by now the ASCC recently introduced the Benefactors program to recognise those companies that have supported ASCC members for many years. I am delighted to report that we have already had an excellent response from the industry with a number of customers signed up as inaugural benefactors for the coming year. I would like to thank all the companies who have jumped on board already and look forward to seeing many more companies get involved. Further information on this initiative can be found through the ASCC website or by contacting Kate.

It has been pleasing to see all Chapters organising a number of events over the last few months. Both the NSW and Southern Chapters held the annual Suppliers Days with excellent turnout for both events. Queensland recently held a lecture dinner with Bianca McCarthy from IMCD speaking about using Vitamin D compounds to combat the effects of sun damage and Belinda Carli speaking about Advanced Emulsion Technology. Both NSW and Southern Chapters have upcoming lecture dinners in October with speakers from the "Made in Australia" campaign on how businesses can leverage Country of Origin branding to help break into overseas markets. These events will be followed up with the annual Christmas parties held in Brisbane, Sydney and Melbourne to round out an exciting year of events. I am sure that each Chapter is also busy preparing for what will be showcased next year.

On December 5th there is also an industry event that has been organised jointly between ACCORD and the ASCC at the Amora Hotel in Sydney. With a theme of Cosmetics – Innovation, Communication and Contemporary Regulation an excellent line up of speakers drawn from local and international sources will be present to deliver high quality presentations encompassing all areas of our industry. With global ISO meetings being held concurrently in Sydney the chance to access leading international speakers and experts in their field such as Paul Matts from P&G, UK and Dr Alain Khaiat current President of CTFA Singapore it was an opportunity too good to miss. Further details can be found on both the ACCORD and ASCC websites and I would like to thank John Staton from the ASCC and Dusanka Sabic from ACCORD as the lead organisers for this event.

Next year's ASCC Conference is already shaping up to be innovative, exciting and packed full unique experiences for those lucky enough to attend the 49th Annual ASCC Conference to be held at the Novotel Twin Waters Resort in Queensland in May 2017. I believe that the premium sponsorship packages that recently went on sale have been selling fast and further opportunities will be released shortly. With the Call for Papers also closing those whose submissions have been accepted will be notified and the anticipation will continue to build as we get closer. Belinda and her team have done an excellent job so far and I am sure many members will be looking forward to converging in Queensland next year.

I look forward to seeing many of you over the next few months whether at an ASCC function or in some other circumstance. I would love to hear your thoughts on the industry and where things are going, what the ASCC can do for you or just to have a chat about life. We are all involved in one of the most fascinating and dynamic industries and I am excited about what may be just around the corner.

Matthew Martens MASCC
ASCC President

Biotechnology, a pivotal technology to produce sustainable cosmetic active ingredients

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Abstract

This paper presents examples of biotechnological processes which produce active compounds for the cosmetic industry using a sustainable approach. Three studies are presented showcasing among Blue, White and Green Biotechnologies involving bacteria and plant cell culture. After strong works involving candidate selection and process optimisation, different bioactivities were obtained from macromolecules (Collagen and Elastin), and for one specific topic, we also demonstrated bioactivities related to mi-RNA regulation.

Introduction

Since the 1987 Brundtland report [1], the concept of sustainable development was popularised. Its most common definition reads: *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs".*

Industrial sustainability implies, using a holistic approach that production processes are economically viable, environmentally compatible and socially responsible [2].

From an historical point of view, biotechnology and its applications have existed since early civilisation, beginning with simple fermentation processes (mould-fermented foods in China; beer brewing and bread making in Egypt [3]). Biotechnology has significantly progressed over the last century, as our knowledge from a traditional use to an industrial application, from fermentation to recombinant DNA. Biotechnology has uses in different markets such as agricultural, biomedical, environmental, food and in one that is often overlooked, the cosmetic market.

Regarding the definition given in 1992 at the Conference on Biological Diversity [4], biotechnology means *"any technological application that uses biological systems, living organisms, or derivatives thereof, to make or modify products or processes for specific use".*

For the purpose of this study, we can define biotechnology as the use of cells (microbial or plant cells) as factories to produce active molecules. Active molecule production, or biomass production, is now well known for pharmaceuticals and foods (bacteria or yeasts are used, wild-type or GMO). In our approach to produce active ingredients for the cosmetic field we have not applied genome modifications. As will be further described, we have used non-GM means to encourage selected organisms to produce a molecule or a family of molecules of interest.

We can divide biotechnological process into five operations: culture choice, biomass production, target molecule improvement, process operation(s) and product recovery [5].

Cosmetic active ingredient production using biotechnology often begins by exploiting the native properties of microorganisms. The microorganisms of interest can be collected directly from biodiverse environments such as deserts, or the marine environment. Typically, the isolates are uncommon, and often possess highly efficient enzymatic tools to produce innovative molecules or to bioconvert complex molecules into active products.

More recently, Plant Cell Culture (PCC) has emerged as one of the major components of plant biotechnology. PCC

has also offered a new way to produce cosmetic active ingredients by sustainably growing plant cells capable of generating specific active molecules of interest with very low impact on the environment.

In 1999, Lievonen [6] described five methodologies that could promote applied biotechnology. The methods cited included screening, combinatorial chemistry and molecular modification. In our approach, for successful development, we focused on a specific target, either a molecule or a biological activity. Various steps such as selective screening of candidates (microbial or plant cells), activity screening and culture process design must be achieved. Usually, these developments are based on partnerships between academic and industrial research teams sharing fundamental and applied knowledge.

Biotechnology is commonly divided into Red, Blue, White and Green Biotechnology:

- Red Biotechnology concerns bioprocessing or fermentative technologies to produce pharmaceuticals for human healthcare.
- White Biotechnology or Industrial Biotechnology is primarily related to fermentation (use of bacteria, yeasts) and biocatalysis.
- Blue Biotechnology is related to the exploitation of marine or freshwater organisms to produce innovative ingredients for multi-market uses.
- Green Biotechnology is associated with agriculture and agricultural processes. Plant cell culturing belongs to Green Biotechnology by sustainably growing plant cells capable of delivering specific active molecules of interest without any impact on the environment. This technology does not require GM or the use of pesticides; the plant material is unlimited and does not require land use for crop culturing; it also minimises water usage and transportation.

The development of sustainable bioprocesses involves processes and sustainable design to ensure commercial success whilst satisfying environmental and social considerations [7].This study describes the efficacy of different sustainable routes to the production of cosmetic active ingredients using some successful examples of processes belonging to Blue, White and Green Biotechnology.

The first example will describe how a cosmetic active ingredient was developed from pioneering work with *Thermus thermophilus* a bacterium discovered in deep sea hydrothermal vents at a depth 2000m and living at 75°C and under 200 bar pressure. Extremophilic microorganisms and more particularly bacteria belonging to the *Thermus* genus are characterised by living in very constrained environments (high temperature, high salinity, high pressure, rareness or absence of oxygen, environments rich in free radicals and so on [8, 9]. As a consequence of this extreme life, strains of this genus are very adaptable and have developed and impressive and formidable enzymatic arsenal to protect themselves against stringent conditions. An innovative idea was to develop a new ingredient from marine biodiversity to protect the skin from light damage (with subsequent anti-ageing effects) by preventing damages caused by ultra-violet and infra-red radiations.

Research projects were also conducted with academic partners providing marine *Actinomycetes* strains, which are a rich potential source of unique free fatty acids (FFA). These molecules are able to regulate certain mammalian cell metabolic pathways [10]. Preliminary studies were focused on microbial isolation and biomass production, then on lipid extraction and FFA content.

Polysaccharides are involved in vital biological processes including recognition, communication, anchoring, energy formation and remodeling. For a long time, their function has remained unknown, partly due to their chemical complexity. A white biotechnological process was developed using *Rhizobium meliloti*, a strain provided by academic partners. *R. meliloti* has survived for over 60 million years in symbiosis within its host plant by fixing atmospheric nitrogen [11]. Fundamental research indicated that the recognition mechanism between both organisms involves the synthesis of extracellular signals based on specific oligosaccharides, the oligoglucuronans [12]. *R.meliloti* produces both the glucuronan (natural analogous polysaccharide of hyaluronic acid) and the enzyme glucuronan lyase required to obtain oligoglucuronans. Different experimentation and fermentation conditions were used to provide various oligosaccharide fractions, which were tested on skin cells. A family of oligoglucuronans were then selected and the process was optimised for the production of these molecules of interest.

Plantago lanceolata is a common, perennial and edible herb widely distributed all over the world. This plant has been used for its major medicinal properties since antiquity as a cure for headaches and as an antidote against poisons. More recently, wound and anti-inflammatory properties were shown [13]. The production process was developed using Plant Cell Culture technology (including elicitation, *i.e.* metabolic pathways orientation and enhancement of active molecule production) led to an innovative cosmetic active ingredient with a function to prevent skin from signs of senescence by regulating microRNA's.

Material and Methods

Thermus thermophilus culture conditions

Thermus thermophilus survives in extreme conditions by synthesising high levels of defence molecules (UV and heat stable enzymes). Using appropriate parameters, such as incubation at 70°C, stressful conditions were re-created to force the bacteria to protect themselves. Bacterial culture at 30 m^3 reactor scale, purification and concentration were performed to obtain a Thermostable Enzyme Complex (TEC) of interest for cosmetic uses. Production scale-up studies were successfully achieved in order to maintain activity of the TEC in the strain at the highest level possible.

Peroxidase activity was measured and expressed in U/mL directly on culture lysate filtered at 0.2µ.

Impact on Pro-inflammatory mediators

Calles *et al.* underlined damages effects of Infra-Red A (IR-A) [14]. Human Dermal Fibroblasts (HDF) were irradiated with IR-A. The TEC was incubated with cells 24hrs before irradiation and 24hrs after irradiation, but not during irradiation. The content of the pro-inflammatory markers PGE-2, IL-6 and IL-8 was measured in supernatant.

Impact on dermal macromolecules

HDF were incubated with the TEC for 24hrs and irradiated with IR-A. Fibroblasts cells were then incubated with the ingredient for 24hrs. A second run was carried out and after four days of culturing collagen-1 was quantified by immune-fluorescence. Cell counts were estimated with Hoechst 33258 marker.

In addition to the collagen study, we evaluated the variations of Heat Shock Protein 47 (HSP-47), a chaperone protein of collagen. Indeed, with ageing, its quantity decreases and collagen (I and IV) synthesis is reduced, making skin thinner and weaker. HSP-47 synthesis was evaluated after IR-A stress. HDF were incubated with and without 1.5% TEC. After cell lysis, extraction and immuno-preparation, HSP-47 was evaluated by Western-blot.

Fibrilin synthesis in HDF was also followed under repeated IR-A stresses.

Negative impacts of IR-A can be also demonstrated by an increase in skin Matrix Metalloproteinases (MMP). Skin explants were prepared and received IR-A (3 cycles). Then, gel containing 1.5% TEC was applied. Explants were ground and MMP's were measured using an ELISA test (5 measures / test).

ROS production was studied after IR-A irradiation and adding TEC in human keratinocytes. Cells were stressed by IR-A then they received the ingredient for 24hrs (3 cycles). ROS were quantified by fluorescence.

Actinomycetes and free fatty acids

More than 100 *Actinomycetes* strains were first selected on taxonomic criteria. Then after culturing them in an appropriate medium for each strain, a second selection was done on biomass content and growth rate. Approximately 20 strains were chosen for FFA extraction. FFA extraction methods were optimised in terms of efficacy but also in terms of protocol duration. Some extracts were tested *in vitro* for bioactivities.

Oligoglucuronan production from *Rhizobium meliloti*

At the laboratory-scale, 16 oligosaccharide fractions were obtained and first tested *in vitro* to select the most bioactive. After modification of culture conditions, new tests were conducted and a selection of the optimum culture conditions was carried out in order to perform industrial scale-up of the process for the production of glucuronan and its enzymatic cleavage products. The process integrates two steps, i) biomass and glucuronan production and, ii) the polysaccharide enzymatic cleavage by the enzyme glucuronan lyase. The acetylation ratio of the polysaccharide is a key property affecting the nature of the oligoglucuronans. Hence, the culture medium was optimised to allow a reproducible process of biomass production and polysaccharide production by finding the right components that gave an optimum acetylation ratio. The production process comprises *R. meliloti* culture and polysaccharide production, scale-up from 10L to 30 m^3 via a 600L step. Cell lysis was achieved by modifying the culture conditions, without using supplementary chemicals (such as tensio-active molecules) or mechanical devices. Oligoglucuronan recovery was achieved through a filtration and ultrafiltration cascade. Polysaccharide and oligosaccharide content was measured by the Dische method. Oligoglucuronans were then evaluated *in vivo* (data not shown) and *in vitro*.

In vitro testing of oligoglucuronan from *R. meliloti*

Monolayer human keratinocytes were incubated with 100, 300 and 500 ppm Oligoglucuronans for three days at 37°C, supplemented with 5% CO2 to evaluate Hyaluronic Acid (HA) production. For laminin release evaluation, the same protocol was applied but oligoglucuronan concentrations used were 100, 200 and 300 ppm. Elastin synthesis was also studied in HDF Cells were incubated with 200, 300 and 500 ppm oligoglucuronans for three days at 37°C, supplemented with 5% CO2. After incubation, supernatants were sampled and HA, laminin, and elastin content was measured by ELISA (N=3).

Plant cell culture of *Plantago lanceolata*

Micro-propagation was initiated from *Plantago lanceolata* (PL) leaves to grow sterile plantlets. Explants from *P.lanceolata* sterilised plant material were used to start callogenesis experiments with artificial medium modification. Calli were obtained then removed from explants and then amplified in order to be transferred into liquid suspension. Culture parameters and elicitation conditions were optimised to generate good biomass production and to select highly productive cell lines. The process was scaled-up from flask to bioreactor with defined appropriate conditions for the promotion of specific metabolic pathways and to enhance production of active phenylpropanoid glycosides (including plantamajoside).

In vitro testing on *Plantago lanceolata* cells

Collagen I is essential for firmness and elasticity in skin cells and its production falls with age. HDF were incubated with PL during six days. Collagen-I synthesis was quantified using an anti-collagen I antibody and a nucleus count was done by DNA staining (Hoechst 33258) in order to standardised data. Collagen-IV is an essential element of the skin due to its role in the Dermis Epidermis Junction. Abdominal skin explants from 53 year old woman received each day, over nine days, a cream containing 2% PL. At the end of this contact, skin was excised and the collagen-IV content was determined using a fluorescent

antibody. Examination of 30 photos (n = 10 / replicate x 3 / case) allowed the quantification and the comparison of the respective quantities of collagen-IV.

On the basis of these initial trials and knowing that miR-29 and miR-196 could control synthesis of collagens-I, IV and III and elastin [15, 16], we conducted a further study on miRNA's. HDF were incubated with PL for 3hrs and 24hrs. For each incubation time, miRNA's were extracted and studied by transcriptional analysis after verification of the RNA quality by capillary electrophoresis and determination of the percentage of miRNA.

Elastin synthesis was then studied. HDF were placed in contact with *P.lanceolata* for 21 days in a suitable culture medium. Elastin immunofluorescent staining was performed and photos were taken and analyzed to determine changes in synthesis.

Dermis proteases are induced by different stresses and ageing. MMPs are controlled by different mechanisms including tissue inhibitor of metalloproteinases (TIMP) production by the cells, which are proteins that prevent MMP activity by binding but also via miRNA. HDF were treated by an oxidative stress (H2O2). MMP-1, MMP-2, TIMP-1 and TIMP-2 production was measured by ELISA with or without contact with PL. Moreover, cells were incubated with *P.lanceolata* during 3h and 24h and miR-21 were studied.

Improvement of the anchoring of the keratinocytes at the dermo-epidermal junction was also studied by following Laminin content after incubation with *P.lanceolata*. Human keratinocytes were in contact for three days with *P.lanceolata* and laminin content was determined in culture supernatants (ELISA).

Results

Thermus thermophilus and IR protection

By modifying and optimising culture conditions, TEC peroxidase activity was improved 30 fold at industrial scale (figure 1).

In vitro studies were performed to evaluate the impact of TEC on pro-inflammatory mediators (see table 1).

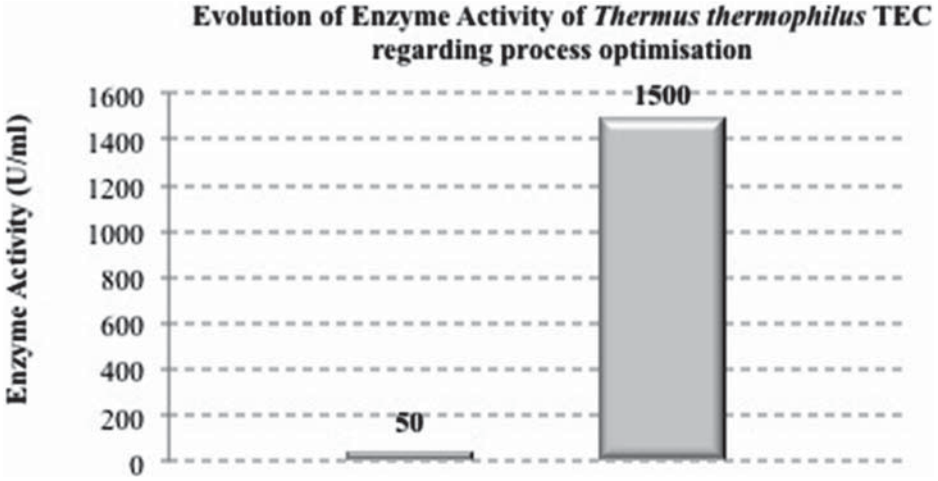


Figure 1: Improvement of peroxidase activity of *Thermus thermophilus* TEC after optimization of production process

Table 1: PGE2, IL-6 and IL-8 release in Human Dermal Fibroblasts incubated with *T.thermophilus* (N=3).

	PGE_2 (pg/10^6 cell.)	Variation (%)	
Control	7443 ± 1364	0	
IR-A	9780 ± 1546	+31%; p<0.05	0
IR-A + 1.5% TEC	4464 ± 147	-	-54%; p<0.01
	IL-6 (pg/106 cell.)	Variation (%)	
Control	1137 ± 177	0	
IR-A	1448 ± 52	+27%; p<0.01	0
IR-A + 1.5% TEC	674 ± 22	-	-53%; p<0.01
	IL-8 (pg/106 cell.)	Variation (%)	
Control	23031 ± 3478	0	
IR-A	27062 ± 1593	+18%; p<0.05	0
IR-A + 1.5 TEC	10614 ± 314	-	-61%; p<0.01

IR-A induced production of pro-inflammatory mediators as expected. But with the addition of TEC, we observed a control and a reduction of this production (PGE2: -54%; IL-6: -53%; IL-8: -61%).

We also characterised the effect of TEC on key macromolecules within the dermis (see table 2).

Collagen-I synthesis is inhibited by IR-A. After incubation with TEC we observed that Collagen-I production is stimulated by 70% compared with IR-A treatment. Results show that IR-A decreased HSP-47 synthesis (-36% vs. control). With the addition of TEC this inhibition is limited. IR-A decreased fibrilin-1 (-17.4% vs. control) and addition of TEC limited this impact. Irradiation of skin explants led to an increase of MMP but this effect is counterbalanced when TEC is added (-38% compare to IR-A effect).

Table 2: Impact of *T.thermophilus* on dermis macromolecules production.

	Collagen I (AFU*/10^4 cell.)	HSP-47 (AFU/ µg prot./ mL)	Fibrillin-1 (AFU/ 1000 cellules)	MMP-1 (ng / mL)
Control**	550 ± 111	100	70 ± 16	0.9 ± 0.1
IR-A	117 ± 91	64.4	58 ± 11	3.9 ± 0.6
IR-A + 1.5% TEC	199 ± 74	92.6	74 ± 8	2.4 ± 0.7

⋆ AFU: Arbirary Fluorescent Unit

⋆⋆ Control: no IR-A stress

We also have measured ROS after IR irradiation of keratinocytes and the effect of TEC addition (table 3).

Table 3: ROS variation in keratinocytes under IRA stress. Effect of TEC

	ROS (UFA/10^4 cell.)	Variation (%)	
Control	668 ± 21	0	
IR-A	862 ± 45	+29%; p<0.01	0
IR-A + T.thermophilus	620 ± 46	-	-28%; p<0.01

IR-A led to an increase in keratinocyte ROS content of +29% while addition of TEC reduces this effect by -28%. *T.thermophilus* therefore appears to protect skin from ROS induced by IR-A.

In conclusion, following culture process optimisation and in vitro

testing, *T.thermophilus* TEC preserves extracellular matrix protein synthesis such as collagen-1 (70%) or HSP-47 (44%), improves barrier functions (ceramides: +158%, data not shown) while reducing the IR-A induced production of pro-inflammatory mediators.

These preliminary results have been confirmed by clinical data with the protection of skin (not shown).

Marine Actinomycetes as a source of novel active ingredients

Extraction methods for efficient production of FFA from marine Actinomycetes was optimised by using saponification and lipid identification was performed by HPTLC. The qualitative results are presented in the table 4 for 20 strains from more than 100. Samples obtained were tested on mammalian cell nuclear receptors using a specific screening method to identify positive hits. Studies are on-going to reproduce results on cultures at higher volumes and to confirm activities on more complex test models.

Table 4: Lipid extraction and identification by HPTLC on *Actinomycetes* strains

Lipid EXTRACTION				HPTLC Lipids identification (Reagent - primuline + UV366nm)				
Strain	Initial Amount (mg)	Total Lipids (mg)	Total Lipids (%)	PAG	Ceramides	FFA	TG	SQ
CDI000	52	24	**47**	+	(+)	+++	-	+
CDI071	50	11	**22**	+	++	++(+)	+	(+)
CDI074	50	15	**30**	+	+++	++(+)	+	(+)
CDI076	49	8	**16**	-	+++	++(+)	-	(+)
CDI079	54	10	**19**	-	++++	++(+)	-	(+)
CDI082	51	14	**28**	++	++++	++++	-	-
CDI087	50	5	**11**	-	-	+++	+	+
CDI091	52	6	**12**	+	-	+++	-	+
CDI092	52	6	**11**	+	-	++	-	-
CDI099	51	5	**9**	(+)	-	+++	-	-
CDI106	52	4	**8**	+	-	+++	-	(+)
CDI112	48	4	**7**	(+)	-	+++	-	-
CDI113	50	8	**15**	-	-	+(+)	-	-
CDI117	54	9	**18**	(+)	+++	+++	+	(+)
CDI122	51	5	**10**	(+)	-	++	-	+
CDI124	52	9	**17**	(+)	+++	+++	-	(+)
CDI130	50	11	**21**	(+)	-	++	-	(+)
CDI134	50	10	**19**	(+)	-	+++	-	(+)
CDI135	50	15	**30**	++	+++	+++	-	(+)
CDI147	51	7	**13**	(+)	-	++	-	-

Oligoglucuronan production by *Rhizobium meliloti*

Factorial design of experiments was conducted to improve oligoglucuronan production.

Two components of the culture medium were mixed with variations in terms of nature and concentration.

For component A, we carried out trials at four concentrations (1X, 2X, 3X and 6X). For component B, we tested four origins (therefore four different compositions) and four different concentrations. In addition to trials on the culture components, we optimised the bioreactor, impeller types, air flow and oxygen regulation.

Oligoglucuronan content obtained with control conditions was considered as 1. The modifications applied to the process gave a range of oligoglucuronan concentration between 0.54 and 4.7 fold the control value.

Once process conditions were optimised, oligoglucuronan were tested in vitro on human keratinocytes (HK). The content of hyaluronic acid, laminin and elastin are presented in tables 5, 6 and 7.

Table 5: Effect of oligoglucuronan from *R.meliloti* on hyaluronic acid release by HK

	R.meliloti oligoglucuronan	
	Concentration (ppm)	% Variation Hyaluronic acid
ELISA / Keratinocytes	100	+20% ± 9%*
	300	+40% ± 12%*
	500	+85% ± 11%*

Positive control: Retinoic acid 1µM : +144% ; p<0.01; ⋆ p<0.01vs negative control

Table 6: Effect of oligoglucuronan from *R.meliloti* on laminin release by HK

	R.meliloti oligoglucuronan	
	Concentration (ppm)	% Variation Hyaluronic acid
ELISA / Keratinocytes	100	+94% ± 30%*
	200	+134% ± 69%*
	300	+219% ± 110%*

Positive control: TGF-b1 à 10-6%: +291%; p<0.01; ⋆ p<0.01vs negative control

Table 7: Effect of oligoglucuronan from *R.meliloti* on elastin synthesis by HK

	R.meliloti oligoglucuronan	
	Concentration (ppm)	% Elastin Variation
ELISA / Keratinocytes	200	+235% ± 144%*
	300	+359% ± 162%*
	500	+552% ± 150%*

Positive control: TGF-b1 à 10-6%: +209%; p<0.01; ⋆ p<0.01vs negative control

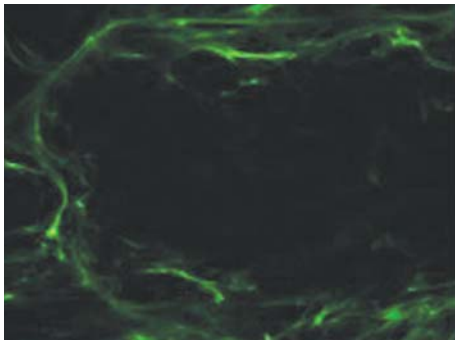
Oligosaccharides obtained from *R.meliloti* triggered significant extracellular matrix synthesis in keratinocytes in a dose-dependent manner reaching, at 300ppm, 40% for hyaluronic acid, 219% for laminin and 359% for elastin. No cell toxicity was noticed. These results indicate a possible improvement of relationships between dermis and epidermis and could make skin more resistant to mechanical stresses. In addition, clinical studies showed a restructuring of the epidermal barrier and a reinforcement of hydration (data not shown).

Oligosaccharides, obtained from *R.meliloti*.

Prevention of senescence signs by micro-RNA regulation

P.lanceola dedifferentiated cells produce phenylpropanoid glycosides (PEG;

Negative control



P.lanceolata 0,6%

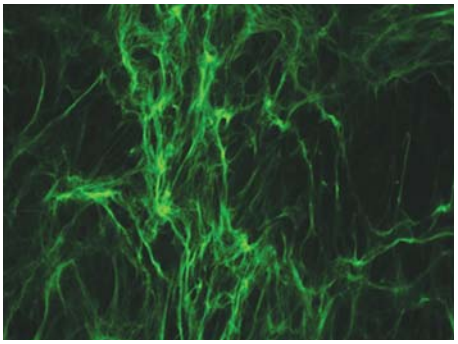
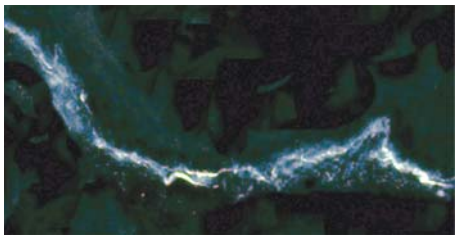


Figure 2: Collagen I stimulation by *P.lanceolata* - Immunofluorescent assay (n=3).

Negative control



P.lanceolata 0,6%

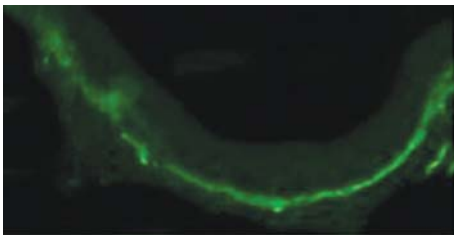


Figure 3: collagen IV stimulation by *P.lanceolata* - Immunofluorescent assay (n=3).

including plantamajoside). The PEG production yield was improved by four by modification of culture conditions and with an appropriate elicitation process.

P.lanceolata acts by reducing matrix metalloproteinase activity directly or indirectly through TIMP synthesis in dermal cells or explants. In addition, the synthesis of major dermal macromolecules is enhanced (collagen-1, collagen-IV, elastin; see fig 2 and 3).

Collagen I and Collagen IV synthesis is increased by 385% and 53% respectively compared to the control assay (in arbitrary fluorescence units).

Knowing that collagen I, III and IV synthesis could be controlled by mi-RNA (mi-R-29 and mi-R-196) we have studied mi-RNA synthesis.

Results are presented in the table 8.

Table 8: miR-29 and -196a variation in HDF incubated with *P.lanceolata* (0,6%) for 3hrs and 24hrs.

miRNAs	Negative control (AFU*)	Variation* at 3h	Variation* at 24h
miR-29	4886	0,766	0,647
miR-196a	168	0,796	0,660

* AFU : Arbitrary Fluorescent Unit

Expression of miR-29 and miR-196a is reduced. These results were strengthened by the decrease of miR-25 and miR-150 (data not shown), acting also by negative feedback on collagen and elastin synthesis.

Elastin, another dermis macromolecule was studied by immunoassay. Results are shown below in the Figure 4.

These pictures show that elastin synthesis is enhanced by *P.lanceoata*.

We know that expression of dermis proteases is also induced by different stresses and ageing. Their activity is controlled by TIMP production but also via miRNAs.

Oxidative stress leads to increased MMP-1 and -2 (+21% ; +21%) and to decrease TIMP-1 and -2 (-30% and -41%). Results after contact with *P.lanceolata* are presented in table 9:

A complementary study of miR-21 was also conducted. Results are shown in the table 10.

Table 10 : Ratio variation of miR-21 in HDF after incubation with *P.lanceolata* (0,6%) for 3 and 24hrs.

Type of miRNA	Negative control (AFU*)	Variation* at 3h	Variation* at 24h
miR-21	3609	0,757	0,657

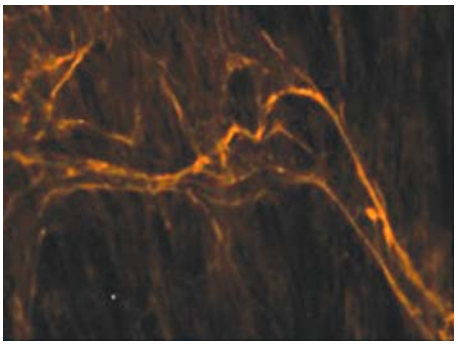
* AFU : Arbitrary Fluorescent Unit

These results show that *P.lanceolata* affects MMP-1 and MMP-2 expression by reducing production by -32% ($p<0,05$) and -23% ($p<0,01$) respectively and a stimulation of TIMP-1 and TIMP-2 production of +27 and +21% ($p<0,05$) respectively. This phenomenon is associated with a decrease in miR-21expression. Moreover, it demonstrates that *P.lanceolata* protects collagen and elastin in the dermis.

Table 11: Laminin synthesis. Incubation with *P.lanceolata* for 3 days (n=5).

	Laminins (ng/10^6 cell.)	Variation (%)
Negative control	246 ± 23	-
P.lanceolata (Equiv. 0.6%)	360 ± 13	+46% ; p<0,01

Laminin production is increased by +46% compare to the control.



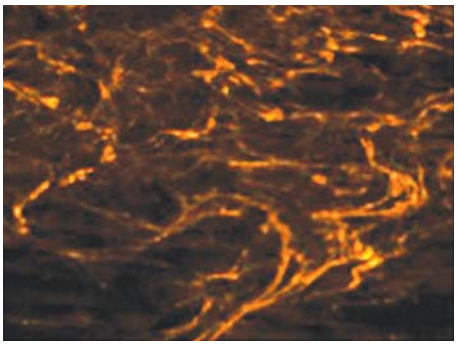


Figure 4: Elastin synthesis in human dermal fibroblasts incubation with *P.lanceolata*

Table 9: MMP-1, -2 and TIMP-1, -2 production by HDF – variation after contact with *P.lanceolata*.

	Control	*P.lanceolata*	Variation (%)
MMP-1 (ng/10^6 cell.)*	5049 ± 862	3427 ± 318	-32% ; p<0,05
MMP-2 (ng/10^6 cell.)*	952 ± 81	734 ± 61	-23% ; p<0,01
TIMP-1 (ng/10^6 cell.)**	8665 ± 664	11006 ± 1870	+27% ; p<0,05
TIMP-2 (ng/10^6 cell.)**	129 ± 12	156 ± 10	+21% ; p<0,05

Other work shows that *P.lanceolata* reinforces the epidermis barrier through keratinocytes differentiation and by promoting elements of tight junctions: ZO-1 (+42%, p<0,01) and Claudine-1 (+125%, p<0,01, data not shown).

Therefore *P.lanceolota* appears to counteract the effects of ageing by inducing epidermis production and delaying progression to senescence.

These observations were reinforced by assays on miR-30e and181a expression (known as promoters of senescence) in human dermis fibroblasts (table 12).

Table 12 : miR-30e and -181a variation in Human Dermal Fibroblasts after contact with *P.lanceolata* (0,6%) for 3 and 24h.

miRNA	Negative control (AFU*)	Variation* at 3h	Variation* at 24h
miR-30e	28	0,412	0,457
miR-181a	106	0,752	0,637

*AFU : Arbitrary Fluorescent Unit

P.lanceolata reduces miR-30e and miR-181a expression and elicits a number of effects that counter the effects of ageing in the dermis and epidermis.

In conclusion, some of these activities can be related to the inhibition of specific microRNAs involved in cellular senescence (miR-30e: -54% and miR-181a: -36%), and three miRNAs involved in extracellular matrix breakdown are also reduced by ~30% (miR-29, miR-21 and miR-196a,).

Clinical studies (data not shown) indicated that *P.lanceolata* reduces the signs of senescence. It enhances skin viscoelasticity (firmness: +30.9%, elasticity: +22.6% and recovery: +12.9%), improves skin dermis thickness by 5.6%; and brightens senile pigmented spots (-26% melanin content in the *stratum corneum*).

Discussion - Conclusion

In this study we have highlighted the potential of diverse biological organisms to produce ingredients with interesting bioactivities for different domains of Biotechnology, Blue, White and Green.

We have seen that marine environments offer a wide range of organisms. Among them, we considered extremophilic bacteria and *Actinomycetes*. *Thermus thermophilus*, living in the depths of sea, can protect human skin from Infra-Red because of a very efficient enzymatic arsenal which decreases ROS. We have also seen that the taxonomically diverse *Actinomycetes* are also chemically diverse and this necessitates the screening of high numbers of strains from a broad selection of phylogenetic groups. We have successfully developed culturing and extraction processes to allow screening of cosmetically relevant bioactivities for the first time.

With oligoglucuronans produced by *Rhizobium meliloti* in a specific biotechnological process we have described bioactivities obtained from an oligosaccharide. As mentioned, the process involves a microbial culture and an enzymatic process for the oligoglucuronan production; this process is therefore also biocatalysis process as well.

The *Plantago lanceolata* cell culture process shows very interesting activities related to senescence prevention in skin. As for previous examples, strong works of research and process optimisation were enquired to reach this target and to develop a plant material acting by an innovative mechanism through mi-RNA inhibition.

Thus, Biotechnology uses living cells or their components to produce innovative molecules in a sustainable manner independent of non-renewable resources. Based on the ability of cells to replicate, it relies on an unlimited availability of material as a source by starting with a minimal amount of matter (microorganisms, plant cell cultures). All organisms of interest, even if they are picked up in nature can be maintained in culture or storage (cryopreservation for example) using specific protocols to renew them. Biomass is therefore constantly available without negatively impacting natural biodiversity. For plant cell culture, we can also add that this technology is not dependant on seasonality or climatic conditions and does not require large areas of land for agricultural production.

In our approach, each raw material and each supplier has to meet sustainability criteria such as the use of renewable materials. By definition, cell cultures also need substrates such as sugars and aminoacids. Substrates are utilised by the cells to build new cells and to produce metabolites in a process design with low CO_2 emissions and low water consumption.

The production of plant specialised metabolites (also called secondary metabolites) is controlled and can be stimulated by elicitation process (chemical, physical or biological) offering selectivity compared to undesired molecules. We have obtained evidence that these bioactive molecules that have been used to elicit desired processes are also safe for the cells and furthermore are effective at low (micromolar) concentration.

Biotechnology is therefore considered a valuable source of a wide range of cosmetic active ingredients which can have a minimal impact on the biodiversity and ecological balance of the biosphere. These are important considerations regarding the Nagoya Protocol [17] and arguments of economical benefit versus biodiversity impacts during organism sampling.

Nowadays, companies are considering an array of approaches to achieve sustainable design. For those involved in industrial processes, Biotechnology is critically important and is an important alternative approach in situations where chemical synthesis is not feasible.

Applications given in this paper and the associated results demonstrate that biotechnology is a truly pivotal approach to the sustainable provision of cosmetic active ingredients.

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Removing cosmetic products and ingredients from industrial chemicals regulation

Introduction

Medicines Regulatory Solutions Pty Ltd has been engaged by Accord Australasia Ltd to provide advice on structural change to the regulation of cosmetics[1] under the industrial chemicals regulatory scheme.

This paper is designed to promote discussion on the manner in which cosmetics are dealt with under the current industrial chemicals regulatory scheme by examining the scheme, outlining major issues arising from these arrangements and detailing some possible approaches for future change.

Comment on the paper's evaluation of the system of controls will assist in promoting the case for changes to the current arrangements.

Limitations

The scope of this paper deals with the current regulatory framework relating to cosmetic products and their ingredients and is not intended to include consideration of current Australian control requirements for therapeutic sunscreen products. This paper does not constitute legal advice.

The Current System of Cosmetic Regulation

Current Australian controls for cosmetics primarily reside at the federal level and involve a suite of controls that are the responsibility of three regulators, the Therapeutic Goods Administration (TGA), the Australian Competition and Consumer Commission (ACCC) and the National Industrial Chemicals Notification and Assessment Scheme (NICNAS).

State and Territory involvement in the regulation of cosmetics is limited to matters that are the responsibility of State and Territory Departments of Fair Trading. However, a further important consideration are the public health access control issues in instances where products that are indicated for cosmetic purposes contain a substance included in the schedules of the *Standard for the Uniform Scheduling of Medicines and Poisons* (SUSMP). The responsibility for including substances in the SUSMP rests with the Advisory Committee on Chemical Scheduling (ACCS) as the body that provides appropriate public health risk assessment recommendations to the relevant Commonwealth delegate.

In broad terms the roles of the three federal regulatory agencies can be categorised as follows –

TGA

The TGA does not regulate cosmetics per se unless they want to make specific therapeutic claims. *The Therapeutic Goods (Excluded Goods) Order No. 1* – 2011 is the legislative instrument used by the TGA to exclude products meeting certain cosmetic requirements from its regulatory scheme.

ACCC

The ACCC is considered to be the primary regulator for cosmetics and is responsible for the consumer safety and ingredient labelling aspects of cosmetic products. These control aspects are given effect through a mandatory standard under the provisions of the *Trade Practices (Consumer Product Information Standards) (Cosmetics) Regulation* 1991 and are further enhanced through the ACCC's product safety requirements and system of adverse

1 For the purposes of this paper, cosmetics and personal care items are considered to be the same.

events reporting which are mandatory under Australian Consumer Law.

NICNAS

NICNAS is the agency responsible for the *Cosmetics Standard* 2007, a document developed under the provisions of the In*dustrial Chemicals (Notification and Assessment) Act* 1989. In terms of its objective, this standard sets out permissible claims for various types of cosmetics, as well as referencing the Australian and New Zealand Standard dealing with the evaluation and classification of sunscreen products. Cosmetic ingredients are also subject to the requirements of NICNAS's notification and assessment requirements as specified for industrial chemicals.

The Issue for Industry

On face value, it appears that each agency involved in the regulation of cosmetics has its own distinct roles and responsibilities. However, a closer examination of the current regulatory framework provides a clear indication that the scheme does not reflect a best practice control model.

Industry's view is that the current cosmetics regulatory scheme is inefficient and prohibitive in terms of its ability to facilitate the introduction of new and innovative ingredients and products. This is primarily based on the fact that cosmetic products and ingredients are subject to the requirements of the industrial chemicals regulatory framework, a scheme for which the objectives do not align with the low risk regulatory burden posed by these products and their ingredients.

While general agreement exists that cosmetics should be regulated, significant ongoing concerns have been raised by industry as to the appropriateness of the increased level of regulatory intervention that exists under the current framework of controls.

The System of Controls – Rationale

Cosmetics are a significant item of commerce in the Australian marketplace. In terms of industry statistics and market size, the Cosmetic and Toiletry Retailing Market Research Report (July 2015) states that the cosmetics and toiletries retail industry generates revenue of $4bn annually and employs approximately 18,000 people. Annual Market growth of 2.1% has occurred since 2011 which has been largely attributed to technological advances within the industry, as well as consumers' willingness to purchase an increasing range of complex formulated products and premium green products.

Globally, Australian cosmetic account for 1.3% percent of the world market.

Cosmetic control objectives are designed to mitigate risk, primarily through ensuring cosmetic products are formulated with ingredients that do not cause harm, are labelled in a manner that clearly informs the user of the product's contents and ensures that, in applicable circumstances, claims for cosmetics are regulated appropriately.

From a strategic perspective, industry considers the purpose of the current regulatory framework dealing with cosmetic products and ingredients is to ensure their safety, quality and efficacy. In circumstances where environmental concerns around cosmetic products are raised, these can be adequately managed by the Department of the Environment as they will be subject to the requirements of the Department's risk management framework.

Safety

The ACCC, as the primary regulator, possesses a sufficient suite of controls to adequately address matters that deal with the safety aspects of cosmetic products. These controls include requirements for cosmetic ingredient labelling under the *Trade Practices (Consumer Product Information Standards) (Cosmetics) Regulations 1991*, a mandatory adverse event reporting regime for cosmetic suppliers and various post-market compliance activities which can include regulatory audits, cosmetic product surveys and national surveillance programs. In terms of its approach to regulation, it is important to note that the ACCC has adopted the European Union (EU) approach to product liability and safety.

In addition, safety-related matters identified by the ACCC which are outside their legislative reach, such as matters relating to some specific public health issues, are effectively dealt with by referral to appropriate bodies. This can include committees with the appropriate risk assessment knowledge such as the Advisory Committee on Chemical Scheduling (ACCS), for relevant considerations and subsequent controls under the SUSMP.

Quality

Ensuring cosmetics incorporate a level of quality that prevents harm to the user is an integral part of the control framework. The quality aspects of cosmetics must be such that products are free from defects and contain ingredients that meet specified standards. Products that are of a sub-standard quality impact on consumer trust and undermine overall confidence in the market.

The Department of Agriculture and Water Resources also places requirements on the importation of cosmetic products and their ingredients. These biosecurity measures stipulate requirements for finished cosmetic products with an animal component of less than 20% and raw ingredients, partially manufactured products and finished products with an animal component of greater than 20%.

Efficacy

Matters concerning the efficacy of cosmetic products and their ingredients are dealt with by the ACCC under the false and misleading conduct provisions of the Australian Consumer Law. In addition, should it be required, relevant standards can be introduced by the ACCC under its legislative framework to address new or unique compliance issues.

From a strategic viewpoint, it is reasonable to assert that the main objectives of the cosmetic regulatory framework, that is, ensuring the safety, quality and efficacy of cosmetic products, can be satisfactorily achieved through

the legislative controls and post-market compliance and surveillance activities undertaken by the ACCC.

Cosmetic Products and Ingredients

Finished product that is either manufactured locally or imported is seen as the norm in terms of the Australian market sector for cosmetics. As previously stated, the safety, quality and efficacy requirements for these products are adequately controlled by the ACCC and through public health controls under the SUSMP.

If the level of regulatory oversight provided by the ACCC is seen as appropriate, then the question to be considered relates to the necessity for additional controls as provided by NICNAS through the *Cosmetics Standard 2007* and its capture of cosmetic ingredients under the industrial chemicals legislative framework.

Notwithstanding any regulatory imperative to retain the Standard in terms of its ability to add value to the legislative scheme, a major issue remains with the current regulatory arrangements. Specifically, this relates to any continued requirement for NICNAS to focus its efforts on the regulation of products, as opposed to chemical ingredients. This requirement appears entirely inconsistent with NICNAS's role as a notification and assessment agency.

Further, an argument can be mounted that, based on the risk profile of cosmetics as a class of product, there is very little justification for any form of pre-market intervention by any agency. Comparisons with other existing pre-market regulatory schemes such as those undertaken by the TGA and Australian Pesticides and Veterinary Medicine Authority (APVMA) are valid. These involve the assessment of classes of product with a significantly higher risk profile and highlight an inconsistency which supports the argument that cosmetic products and their ingredients are subject to more than minimum effective regulation.

An examination of the controls around cosmetic ingredients also highlights that the level of said controls are not commensurate with any potential risk. Removal of cosmetic ingredients from the industrial chemical legislative scheme would not undermine the overall level of regulatory oversight as these substances would be subject to the requirements of the ACCC's legislative scheme. The likelihood of a novel and unique cosmetic ingredient requiring inclusion on the Australian Inventory of Chemical Substances (AICS) is extremely low given that Australia accounts for approximately 1.3% of the world cosmetic market. If this were to occur, then referral of any such substance to the ACCS to establish any public health and access control requirements would be an appropriate risk management process.

To further assess the appropriateness of the current regulatory arrangements, a critical evaluation of the current regulatory scheme against recognised principles and performance metrics has been undertaken to gain some insight as to whether the current level of regulatory "touch" is appropriate.

The table below contains a set of best practice principles for regulators developed by the New Zealand Treasury and obtained from sources such as the World Bank, the Organisation for Economic Co-operation and Development (OECD) and the Asia Pacific Economic Co-operation (APEC).

These principles will have a varying degree of relevance to the regulatory scheme as a whole, as well as the individual agencies that are responsible for the scheme. However, an inability to clearly recognise the objectives of these principles in the day-to-day operations of the scheme's regulators indicates a lack of transparency and robustness associated with the current framework.

How Appropriate are the Current Arrangements?

An assessment of each principle against the current industrial chemical controls dealing with cosmetic products and their ingredients would seem to support ongoing concerns as identified by industry.

Proportionality

The presumption around proportionality as a principle in best practice regulation can be defined as follows. Is the burden imposed on the cosmetics industry by the requirements of the industrial chemical

Principle	Comment
Proportionality	The burden of rules and their enforcement should be proportional to the benefits that are expected to result. This would include that a regime is effective in meeting its objectives and that any change has benefits that outweighs the costs of disruption. One indicator that this principle is being met might be the presence of a cost-benefit regulatory framework and evidence of risk-based decision-making by regulators.
Certainty	The regulatory system should be predictable to provide certainty to regulated entities, and be consistent with other policies. There can be a tension between certainty and flexibility. A principles or performance- based regime that provides for safe harbours such as deemed-to-comply standards tries to resolve this tension, but ensuring both attributes are optimally reflected is a challenge.
Flexibility	A regulatory regime is flexible if the underlying regulatory approach is principles or performance-based, and policies and procedures are in place to ensure that it is administered flexibly, and non-regulatory measures, including self-regulation, are used wherever possible.
Durability	The regulatory system has the capacity to evolve to respond to new information and changing circumstances. Flexibility and durability are closely related; a regime that is flexible is more likely to be durable, so long as effective feedback systems are in place to assess how the regime is working in practice and to adjust systems and processes accordingly.
Transparency and accountability	Rules development and enforcement should be transparent. In essence, regulators must be able to justify decisions and be subject to public scrutiny. This principle also includes non- discrimination, provision for appeals and sound legal basis for decisions.
Capable	The regulator has the people and systems necessary to operate an efficient and effective regulatory regime. A key indicator is that capability assessments occur at regular intervals, and subject to independent input or review.

Source: New Zealand Treasury (2012).

control framework proportionate with any benefit (perceived or real) in establishing and maintaining said controls? Indications would suggest that the enactment of the *Cosmetics Standard* in 2007 and the capture of cosmetic ingredients in the industrial chemicals scheme unnecessarily complicates the regulatory framework by expanding the number of agencies involved in the regulation of cosmetic products and their ingredients. Further, it appears the basis for increasing the regulatory burden on industry was a result of NICNAS's interpretation of cosmetic regulation under its Low Regulatory Concern Chemicals (LRCC) reform program. This interpretation and the enactment of the Cosmetics Standard 2007, is inconsistent with the objectives of the LRCC reforms which advocated for a lighter regulatory "touch" in this area.

This was specifically identified in the Productivity Commission (PC) Research Report into Chemical and Plastics Regulation when it commented on the recognition of NICNAS's efficiency and effectiveness principles –

"The Commission accepts that some worthwhile improvements have been made in the design and administration of the scheme, which have had the effect of more appropriately balancing the costs of assessment with the benefits of reducing the risks posed by industrial chemicals. But in some cases, such as the administration of chemicals of low regulatory concern, elements of undue risk aversion are creeping back into the system."(p59).

Certainty

The enactment of the *Cosmetics Standard 2007* and the capture of cosmetic ingredients under industrial chemical framework increases the unpredictability of the regulatory scheme dealing with cosmetic products and their ingredients. The addition of a third agency into the cosmetic product regulatory arena effectively fragments the suite of controls through the development of policy in isolation, thereby increasing the compliance burden on industry. An additional consideration around the introduction of a new legislative instrument and the inclusion of an additional regulatory framework for cosmetics is the inconsistency these arrangements created in relation to other internationally recognised regulatory frameworks that deal with cosmetics. Barriers to trade with major trading partners such as the European Union, the United States, Canada, Japan, the ASEAN economies and New Zealand created by this inconsistency significantly affects the ability of the Australian cosmetic industry to effectively compete in the world market.

A direct example of the effect the current regulatory arrangements have had on industry is highlighted by the following.

A regulatory consultant advises: "Every time a cosmetic is considered for Australia, I have to assist to see if we face issues. If materials are used above 1% and/or a low volume exemption is not feasible, the product is then not considered for sale in Australia. And therefore, the Australian consumer loses."

"NICNAS and AICS have been quite a challenge for cosmetic ingredients for our business. Many times, the use levels are so low, that our ingredient suppliers have no intention to list with NICNAS. It costs more time and capital than the little business they would gain. Therefore, I am left with obtaining data and assessing whether I can use a low volume or <1% cosmetic exemption. Once that is complete, I then have to monitor EACH AND EVERY PRODUCT SKU that will be imported into Australia from Sept 1 to August 31. Then assemble the calculations and file the appropriate NICNAS exemption form with our annual NICNAS license renewal. This exercise is not value added. These cosmetic ingredients are available for use in the EU without restriction. This is not improving consumer safety. This is a cost and unnecessary burden to enter the market."

Flexibility and Durability

The introduction of the *Cosmetics Standard 2007* has decreased the flexibility of the regulatory scheme and its ability to clearly enunciate its policy objectives with respect to controls over cosmetic products and their ingredients. The piece-meal nature of the system and its associated rigid approach to regulated entities stifles innovation and the ability for industry to introduce new products. The following is an example of the current regulatory burden and its effect on industry.

One multinational company advises that: "We spend quite some time and effort meeting their (NICNAS) requirements. We have spent over the last 24 months – $140,000 on consultants fees (mostly related to NICNAS), $44,600 on NICNAS registration fees, and $46,800 on chemical assessments. It is hard to put a cost or quantity on corporate time "Regulatory Affairs and R&D" in Australia, and the US/EU in meeting our requirements under the current legislative arrangements. However we do whatever is required. Due to the changing nature of cosmetics, currently we have 16 ingredients that we have had assessed over the last 7 years (at $15,000 + expenses say $20,000 each) due to them going over the 100kgs per annum limit at some time. Of these, 6 and possibly 8, are now used much less and are under this assessment quantity level, therefore making the assessment effectively a waste of time and money. The net result is we spend a great deal of time and effort assessing ingredients that are, in the end, found to be perfectly acceptable (as we would expect) and this therefore proves that the process we follow on cosmetic ingredients in Australia, does not add any value and if anything only confirms that the safety and regulatory regime followed by the cosmetics companies (protecting their own customers), and conforming to international standards, is quite sufficient."

A major consideration concerning the rigidity of the system is the difficulty involved in moving to a more

proportionate model through processes such as the adoption of recognised standards and deemed-to-comply provisions. The use of internationally-recognised standards would increase the user-friendliness of the scheme and provide consistency with the Government's policy of Accepting Trusted International Standards. The use of internationally-recognised Standards will be discussed in more detail later in this paper.

Transparency and Accountability

The basis for the decision taken by NICNAS to amend the cosmetics regulatory scheme in 2007 remains unclear. The question that requires consideration in terms of this regulatory principle and the capture of cosmetics in the industrial chemicals framework hinges around the justification for these arrangements.

Closer examination of the content of the *Cosmetics Standard* shows that its intent is to ensure that:

- Face, nail and skin care products imported/manufactured and marketed in Australia which have a primary cosmetic purpose and which also contain a sunscreen component (secondary sunscreen products) comply with the relevant Australian and New Zealand standards for sunscreens; and
- Anti-bacterial and anti-acne skin care products, oral hygiene products and anti-dandruff hair care products imported/manufactured and marketed in Australia can only be presented in certain ways (permitted and non-permitted claims).

The question dealing with the justification for the arrangements can be examined in two parts -the first being the need for such a standard at all and, if such a need is established, the appropriateness of including the Standard as part of the industrial chemicals legislative framework.

Capable

A key indicator around the robustness of any regulatory system relates to the capabilities of the entities that are responsible for the system. This essentially translates to the efficiency and effectiveness of the regulators. Additional considerations relate to the role of the regulator in relation to the objectives of the scheme and whether the activities undertaken by the regulator are actually part of its defined core business activities.

It is clear that the role of NICNAS is that of a notification and assessment agency. This is confirmed through examination of the objectives of the *Industrial Chemicals (Notification and Assessment) Act 1989* and a review of the website dealing with the role, governance and structure of NICNAS. While the objectives of the Act make mention of standard setting and enforcement in relation to cosmetics, this role would seem inconsistent with the primary functions of NICNAS where downstream referral to regulators and/or risk managers in the areas of public health and environmental protection are the norm.

The inconsistency identified in terms of regulating cosmetic products and ingredients, together with the defined core business activities of NICNAS raise the question as to whether this is an agency that can undertake this function efficiently, effectively and transparently.

This assertion is highly relevant given the previous discussions relating to the suite of controls, as well as the compliance and surveillance activities that the ACCC utilises in its role as the primary regulator for cosmetic products in Australia.

Previous Reviews

In 2008, the PC released a Research Report into Chemicals and Plastic Regulation reviewing in detail the regulatory arrangements concerning cosmetics. As a result of this review the PC made the following comments -

"The Commission is concerned with the overlap and confusion that results from having more than one regulator involved in cosmetics regulations and, as noted, it is recommending NICNAS be reconstituted to focus solely on scientific assessment of the hazards and risks of industrial chemicals." (p 118).

"The Commission considers the most effective and efficient option is to transfer the standard to the ACCC to administer. It contains the relevant compliance monitoring and enforcement powers and mechanisms. As well, it already regulates similar issues through its consumer information standards and other regulations on product claims." (p 118).

With the following recommendation being made –

Recommendation 5.5 – The Australian Government should transfer responsibility for the administration and enforcement of the *Cosmetics Standard 2007* (Cwlth) from NICNAS to the ACCC.

Despite a detailed assessment of the regulatory arrangements being included in the final report of this major review into chemical regulation, together with a clear recommendation for change, no definitive action has been taken to progress this issue and address the inadequacies of the system of controls.

Trade and Trusted International Standards

Agreements such as the Trans-Pacific Partnership (TPP) specifically identify cosmetics as an item of commerce that are currently subject to inconsistent regulatory treatment and, as such, have been included within the provisions of the TPP that deal with Technical Barriers to Trade (TBT). Annex 8B of the TBT details the requirements to facilitate aligning the cosmetic controls of signatories while maintaining a high standard of product quality and safety. Any changes to the current Australian system of controls should reflect legislative control models that ensure trade barriers are minimised and promote innovation and ease of access to local and overseas markets. The current Australian regulatory system causes cosmetics to be treated uniquely compared to the controls imposed by Australia's major trading partners. This is detrimental to the industry and does not reflect the risk profile of cosmetic

products and their ingredients.

Adopting trusted international standards and improving regulation forms part of the Government's policy framework relating to regulatory reform. The recent release of the Government's National Innovation and Science Agenda confirms this policy position. The use of trusted standards to support a more flexible Australian system of controls for cosmetic products and their ingredients would provide a mechanism to ensure an appropriate level of legislative oversight while facilitating closer alignment with the regulatory systems of Australia's major trading partners.

Relevant examples in relation to existing international assessments of cosmetic ingredients would be the use of data from recognised international scientific authorities such as the US Cosmetic Ingredient Review (CIR) and the European Union (EU) Scientific Committee on Consumer Safety (SCCS). In addition, acceptance of verified international Standards such as those developed by the International Fragrance Association (IFRA) would improve alignment with established overseas regulatory systems.

Further, regulations based on the EU Cosmetic Regulation have been adopted by the Association of South-East Asian Nations (ASEAN), New Zealand and South Africa. Processes such at this highlight the difference in the approach to cosmetic controls taken by Australia compared to major trading partners.

From a trans-Tasman trade perspective, the PC found in its recent Research Report on Mutual Recognition Schemes that there was a case to remove the permanent exemption dealing with hazardous substances, industrial chemicals and dangerous goods so as to further reduce barriers to trade between Australia and New Zealand. This includes cosmetics.

The following specific comments by the PC concerning the current permanent exemption are relevant –

"The Commission has not received any evidence to suggest that the outcomes achieved by Australia and New Zealand's regulatory regimes for hazardous substances, industrial chemicals and dangerous goods substantially differ, or that mutual recognition of these goods would pose a real threat to public health and safety or the environment in either country." (p99).

"Significant costs could result from ignoring trans-Tasman regulatory cooperation in current ongoing reforms (chapter 7). A program of regulatory cooperation should commence immediately with the objective of removing the permanent exemption by end 2018 (by which point reforms to NZ's work health and safety regime and Australia's NICNAS will have been completed)."(p99).

Summary

The information provided in this paper on the current Australian legislative scheme dealing with cosmetic products and their ingredients indicates that there is no valid argument for treating them uniquely and that, the current level of controls imposed on this low-risk class of products translates to over-regulation.

There is clear evidence that the number of agencies involved in maintaining regulatory control over cosmetic products and their ingredients needs to be rationalised. Examination of the respective roles of each regulatory agency shows that the ACCC is considered the primary cosmetic regulator and the role of the TGA is focussed on supporting controls in relation to therapeutic goods. However, an examination of the role of NICNAS highlights the fact that regulating cosmetic products and their ingredients under the industrial chemicals legislative scheme is inappropriate.

The use of contemporary regulatory practices, such as the adoption of trusted international standards and deemed-to-comply provisions, are methodologies that can be incorporated into the legislative scheme to assist it in meeting current Government policy objectives concerning minimum effective regulation. A reduction in regulatory burden, together with streamlining the current control framework will reduce the fragmented approach of the current scheme, together with its lack of flexibility and transparency. These remedial processes will facilitate industry innovation and greatly reduce the current barriers to trade.

Issues for Consideration

This paper has identified a number of issues concerning the legislative framework dealing with cosmetic products and their ingredients. Its purpose has been to critically evaluate the current Australian cosmetic control system with the view of providing a basis for further stakeholder discussion on realistic and achievable reform measures.

To facilitate these discussions, issues which form the basis for reforming the current system of controls have been listed below.

The Cosmetics Standard 2007

Preferred Approaches

- Transfer the legislative responsibility for the *Cosmetics Standard 2007* to the ACCC.
  This is consistent with recommendation 5.5 from the PC Research Report into Plastics and Chemical Regulation.
- as an alternative, Repeal the *Cosmetics Standard 2007*.

This is the preferred option in terms of simplifying the current legislative scheme and ensuring that all requirements for cosmetic products and their ingredients reside with one primary regulator. By default, the current *Cosmetics Standard 2007* requirements are covered under the TGA's Excluded Goods Order and repealing the Standard will also preclude the requirement to continue to mirror amendments in two legislative documents. This will increase consistency within the schemes.

Cosmetic Ingredient Requirements

- Remove cosmetic ingredients from the scope of the industrial chemicals regulatory framework.
  This would result in the legislative requirements that are currently

captured by the industrial chemicals scheme defaulting to the ACCC in collaboration with any public health control requirements under the SUSMP. This maintains the mature co-operative arrangements between the Commonwealth and the States and Territories in terms of safety and public health considerations concerning cosmetic products and their ingredients.

Trusted International Standards

- Incorporate the EU Cosmetic Directive controls into the Australian legislative framework.
  In New Zealand, the Cosmetic Products Group Standard which adopts the cosmetic annexes to the EU Cosmetic Regulation is used to approve and manage cosmetics containing hazardous substances. Australian incorporation mechanisms could involve adopting these into the existing ACCC framework or inclusion in the requirements of the SUSMP.
- In addition, consideration could be given to adopting the fragrance ingredient requirements of the IFRA Code into Australia's legislative framework dealing with cosmetic products and their ingredients as above.

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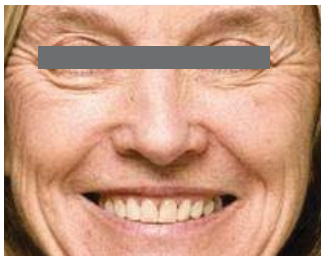

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