the science of beauty

Vol 10 No 1

August/September 2020

FORMULATING SOLID, MILD COSMETICS

Pureact TR-L90

A unique, sodium chloride-free version of Sodium Methyl Lauroyl Taurate that is naturally derived from vegetable sources and is readily biodegradable.

NEW TECHNOLOGY

- ✓ Easy to handle Taurate
- ✓ Solid formulating possible
- ✓ Naturally derived from vegetable sources

FREE FROM ALL THE THINGS THAT MATTER

- ✓ Sulphate free
- ✓ Salt free
- ✓ Preservative free

PRODUCT APPLICATIONS

- ✓ Combo bars
- ✓ Shower gels
- ✓ Shampoos
- ✓ Opaque body washes

Pureact TR-L90 is an anionic surfactant that is compatible with non-ionic, anionic, and amphoteric surfactants.

Unlike most cocoyl taurates, the Pureact TR-L90 is available in flake or chip form which allows for ease of use and transfer of this material during manufacture. Additionally, there can be a reduction in transportation costs because of this high activity. Pureact TR-L90 is preservative free.

Refer to our article "Formulating Solid, Mild Cosmetics" in this issue.
Learn more about the A S Harrison & Co range of personal care ingredients –
Contact us for more details, starting formulations and samples.

HARRISON

Established 1923

enquire now

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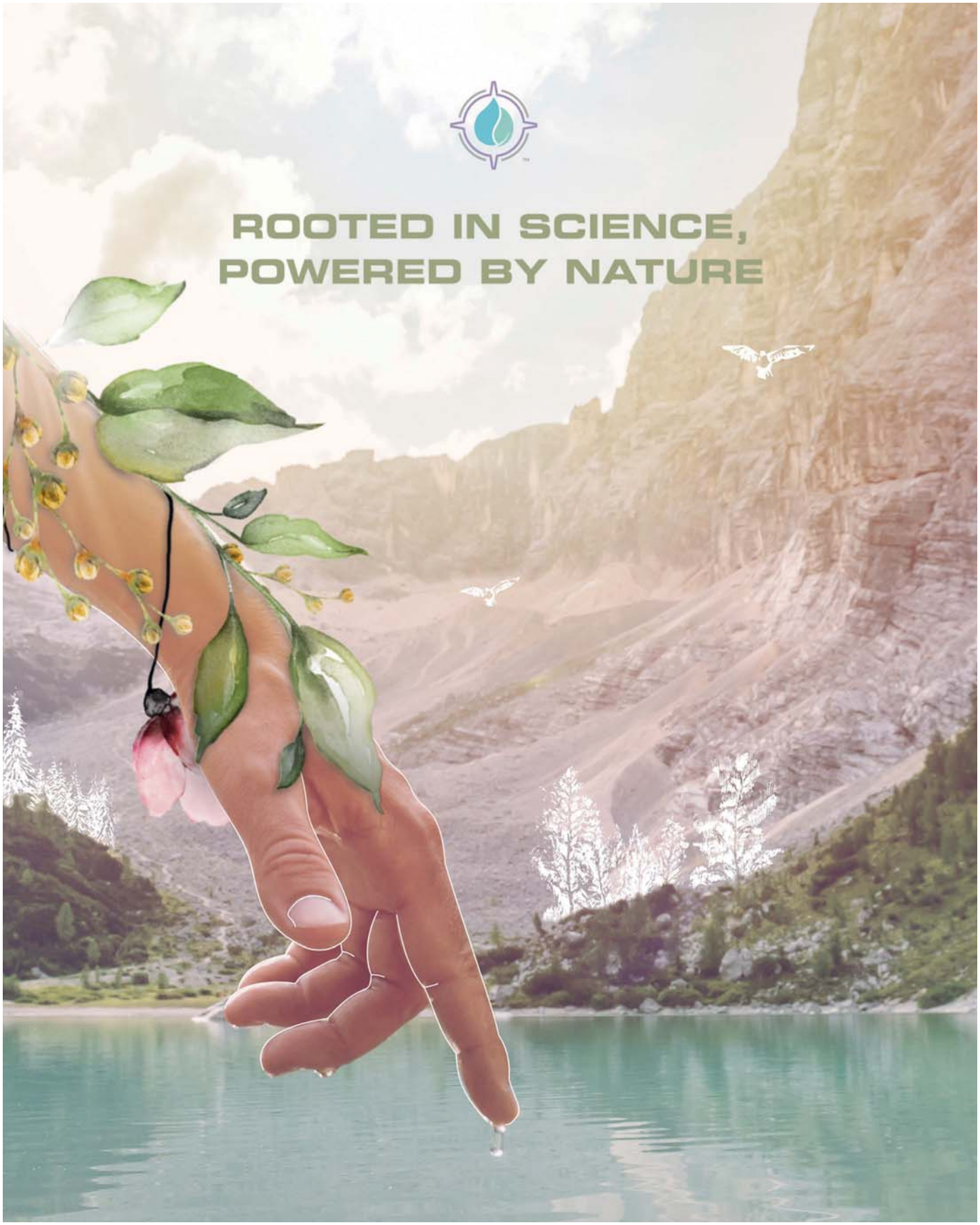

Our Nature-Based Portfolio offers high-performance, aesthetically-pleasing ingredients that check every box on your customers' "must have" list - effectiveness, sensory experience and ecological awareness. Take the natural next step with Lubrizol Life Science.

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LUBRIZOL
LIFE SCIENCE

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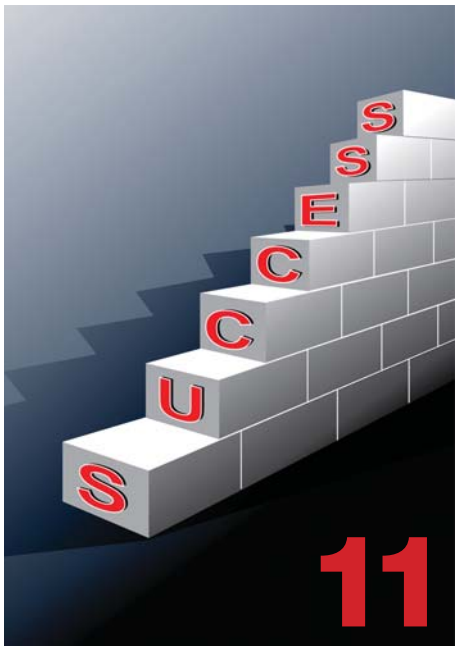

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VALE

JOHN MORTON REECE

08/01/1931 – 07/06/2020

John lived a full and rewarding life in his 89 years. After leaving North Sydney Boys High, John started work at DHA. He joined the ASCC in the early 1960s and I first met him at the Terrigal Conference in the latter part of that decade. In the ensuing years we became firm friends both personally and professionally. When I met him he was a keen sportsman – golf, tennis, athletics and rugby – and having fathered four sons he coached junior teams in the sports that his sons had chosen.

At the time I met him he was working at Keith Harris where he was honing his skills in the perfumery division. Whilst at KH he also met and married Colleen Ford and had two more sons, and finally a daughter. After leaving KH he ventured into the tea tree industry for a number of years and travelled extensively to USA, Canada, Europe and Asia connecting with numerous corporations promoting Australian products. Over the years he became regarded as an expert in the essential oil industry.

The ASCC benefited by his expertise when he served on the Technical Committee as well as representing the ASCC on an essential oils sub-committee in Standards Australia.

In his latter years John had a consultancy role in the essential oil industry and traded in a range of ingredients sought by the industry. He was highly regarded by his friends and business associates and we will all be hard pressed to replace the knowledge on essential oils that John accumulated over his long career.

During his last few weeks of ill health he was telling the nurses he wanted to last long enough to celebrate his 50th wedding anniversary with Colleen but sadly he fell short in this by four months. Our thoughts are with Colleen and the Reece family in the hope they will rejoice in John's achievements throughout his lifetime. – *Henry King*

The Science Of Beauty
ISSN: 1837-8536
Published Bi-monthly
(January March May July
September November)

www.thescienceofbeauty.com.au

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ABN 32 002 617 807

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The Subscription Manager
(PO Box 487 Gulgong NSW 2852)
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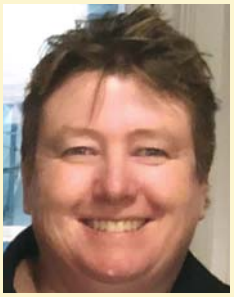
meet the team...

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.

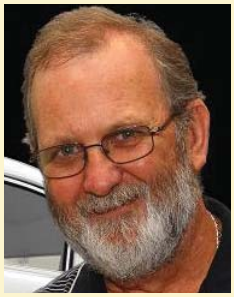
JULIAN JONES, the founder and Managing Director of ikonsulting Pty/Ltd, is Passionate about the Personal Care Industry in Australia and Globally.
Julian has been an active member of the ASCC for over thirty years. During this time he has served as President and Chairman of the Victorian Chapter of the ASCC. He is widely known and well respected both nationally and internationally for his knowledge and skills in developing and marketing the best Personal Care Products.

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.

MICHELLE KANE is the managing director of PharmaScope Pty Ltd, a privately owned contract manufacturer established in 2004. Michelle has over 30 years experience in the pharmaceutical and personal care industry, being involved at many levels from procurement, product development, manufacturing, financial management and staff training and development, to name a few... Being based on the West Coast always brings the added challenge of seeking niche product development solutions and working creatively to achieve manufacturing outcomes in a competitive marketplace for our clients global demands.



PAM JONES has worked in the Personal, Homecare and Pharmaceutical markets for more than 30 years. She has been working out of Asia since 1996 and is well versed and connected with the Asia Market.
Her experience covers technical, sales, marketing, management and training roles. She has qualifications in Chemistry, Marketing and Management. Her company PCA Consulting is well known for its training programmes. Pam has worked with and consulted to companies such as ICI, Croda, Ashland, Huntsman, Reed Exhibitions (in Cosmetics) and Connell to name a few. She is currently serving on the ASCC Technical Committee and volunteers as Technical Editor for this magazine.



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.

JEN SEMPLE is Innovation & Education Manager at Accord Australasia, the peak national body for formulated chemical products. She is passionate about communicating the benefits of our industry's products to wider society and has authored a number of public education websites such as furphies.org.au, sunsible.org.au and hygieneforhealth.org.au. Jen also manages Accord's sustainability initiatives and seeks opportunities to build relationships between industry and academia. She has a PhD in Chemistry and Graduate Diploma in Education, and is a member of the Royal Australian Chemical Institute.

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.

GINT SILINS is a registered patent and trade marks attorney, and a principal of Spruson & Ferguson Patent & Trade Mark Attorneys (incorporating Cullens). He holds a Bachelor of Science degree in chemistry with honours in biochemistry, and a Doctor of Philosophy degree in biochemistry. Gint specialises in protecting branding and innovations largely in the health care, personal care, animal health, food and beverage, biotechnology, industrial chemical, clean energy and agricultural sectors. His practice includes: conducting brand and innovation availability and registrability searches; IP audits; registering patents, trade marks and designs worldwide; enforcing intellectual property rights; resolving IP disputes; and, providing infringement and validity advice.

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.

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.

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.

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

DESTINATION GOLDCOAST.™

ASCC 2021 11-13 MAY

ASCC 2021

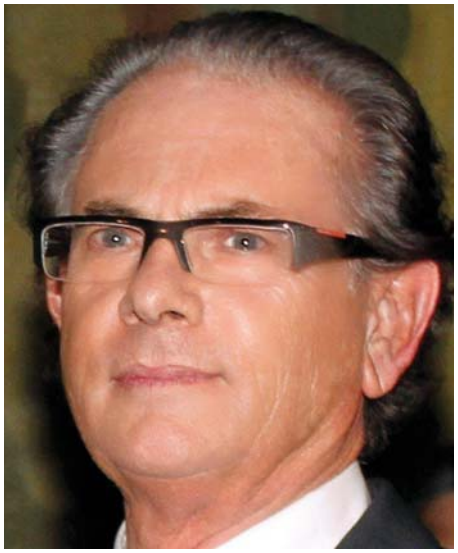
RIDING THE ROLLER COASTER OF A-BEAUTY INNOVATION

conference announcement

Set in the heart of the Broadbeach the Gold coast Conference and Exhibition center will be the location of the ASCC 53rd annual conference on 11th -13th May 2021 themed "Riding the rollercoaster of A-beauty Innovations". Our theme has three main pillars: **"A-Beauty"**, a play on the term K-Beauty, A-Beauty, or Australian beauty, is the minimal skincare movement based around combination routines, simplified formulations and innovative Australian native ingredients and products made in Australia. **"Riding the roller coaster"** will take us through the emotions of using a cosmetic, with a focus on neuro-cosmetics and how product makes the consumer feel. Finally, **"Innovations"** we will showcase the best cutting-edge science the cosmetics and home care sector has to offer. The 53rd Annual ASCC Conference is looking to capture the interests of all our industry's greats, whilst enjoying the beautiful backdrop of the Gold Coast.

The Call for papers is now open, papers will be accepted in the areas of Cosmetics, Toiletries and Therapeutics, and this year the inclusion of home care. With the new focus and increased demand for cleaning products not only on the body but in the home, The ASCC has decided that next year's conference will have a section dedicated to the home care market please go to our website https://ascc.com.au/ for more information.

We are proud to Introduce our two guest Speakers



Dr. Partice Bellon: President, Cosmetoscent

Dr. Bellon completed his PhD's in Pharmacy at University of Pharmacy in Paris and in Pharmaceutical Process at University of Pharmacy of Lille and is currently the President at COSMETOSCENT July 2015. Prior to working with Cosmetoscent Dr Bellon worked as RnD Head manager at Shisedio in Paris and spent over 15 years as Vice President of innovation applied research at Symrise.

Dr. Bellon has a long experience in innovation management such as Director-General, Head Pharmacist, Research & Development Manager in Cosmetic and Vice President Innovation and Applied Research in Perfumery.

Over 44 years' experience, first in pharmaceutical and cosmetic formulations and then in Neurosciences, including implementation of data acquisition measurement methods in order to define the emotional benefits of fragrances and cosmetics, by psychophysiological parameters and behavioral assessments.

Dr. Bellon is certified scientific expert in cosmetology by the French Ministry of Research and is Honorary Professor at various French Universities.

Dr Bellon will help us explore just how a cosmetic product can cause an elevated change in emotion and how the contribution of Neurosciences can enhance the users experience of a product.

Ben Lazzaro: Chief Executive, Australian Made Campaign Ltd

Mr Lazzaro was appointed in 2018 as Chief Executive of the Australian Made Campaign Ltd – the not-for-profit organisation responsible for promoting and administering the nation's iconic green-and-gold Australian Made, Australian Grown (AMAG) logo – Mr Lazzaro has been a key contributor to the success of the organisation and the Australian Made logo for many years.

He has an engineering and communications background with more than 15 years' experience across a variety of management, sales, marketing and communications roles in consultancy, agency and in-house capacities. His experience includes integrated strategic marketing communications programs and full-spectrum branding campaigns optimised to deliver successful business outcomes.

Mr Lazzaro joined AMCL in 2011 as Marketing & Communications Manager and in 2016 took on the role of Deputy Chief Executive. In his new role at Australian Made, Mr Lazzaro oversees the administration and promotion of one of Australia's most recognised and trusted brands.

AUSTRALIAN MADE®

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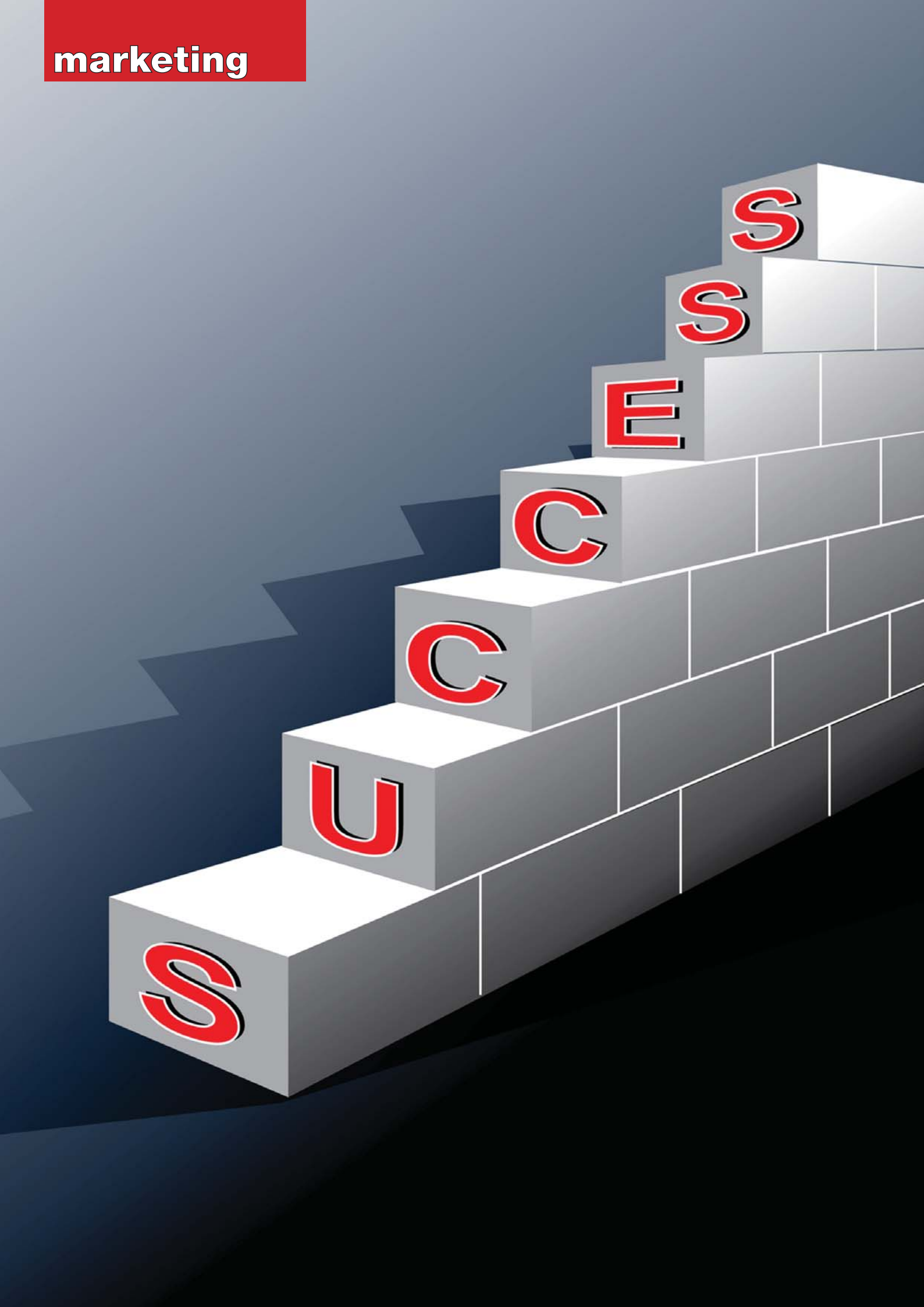
We look forward to hearing from both Dr Bellon and Mr Lazzaro at our annual conference.

Finally, we are also pleased to announce and acknowledge our destination sponsor, Destination Gold Coast. https://www.destinationgoldcoast.com/

We look forward to riding the rollercoaster of A-beauty innovations with you next May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Vitamin P. . .

the essential ingredient!

by Julian Jones

Whether you call it Focus, Effort, Commitment or Bloody Mindedness, the essential ingredient in every successful plan is Persistance!

Over my nearly forty years in the Personal Care Industry I have come into contact with all sorts of interesting people. Many of them have been business owners. Some are brand owners, some are contract manufacturers, some are chemists or formulators, some are ingredient importers. As I've got to know them and learn from them, one attribute has shown itself time and again ... persistence.

It's been said by people far smarter than me that a goal without a plan is just a dream. Don't get me wrong, dreams are an essential part of everyone's life and they're cheap so make them big, amazing and inspiring! But to turn a dream into reality, you need to refine that dream into a goal and then put a plan together to achieve it. Time frames vary, sometimes determined by the size of the dream but they all require something that will determine the likelihood of achieving that dream, persistent effort that continually drives you towards your end goal.

Persistent effort is very powerful because you can vary the amount of it you deliver each day to adjust for life! Sometimes you can work towards your goal all day and all night and come out feeling an amazing sense of achievement. Other times, the kids have a school concert and the car needs servicing and there's no food in the fridge so a diversion from the plan is required. That's fine – because every amount of effort put into your plan takes you closer to your goal!

Another powerful attribute of persistence is it's a constant. Sometimes goals shift a bit, requiring plans to be adjusted, but persistence keeps you going, chipping away a bit more each day. The amazing thing is doing a bit each day very quickly starts to look like huge change!

At the start of any big project, the amount of effort required to achieve your goal can seem insurmountable. Seen from a distance, the challenge looks too big. But zoom in a bit, get closer to the day to day effort required, and each step isn't that big. All you have to do is keep climbing and don't look down till you get to the top!

Persistent people tend to share their goals, particularly with other persistent people! The behaviours of these people are quite common. They aren't easily distracted, they are passionate about their goals, and they're interested in what others are striving to achieve. You usually won't find this type of person trying to talk down your goals or tell you how they're not achievable. On the contrary – they're likely to want to learn more about you and share their experiences to help you along the way!

Next time you come across someone who seems to have a clear set of goals, detailed plans and a persistent attitude to achieving them, have a chat. You may have just found a kindred spirit, or even better an inspirational friend!

Before I sign off, a few thoughts on the current COVID-19 situation.

If you were given the opportunity to be a life saver, you'd take it…right?

Wearing a mask whenever you're in a socially crowded environment, mandated or not, potentially makes you a life saver.

You never know, it might be your life!

Till next time…

Cheers,

Julian

breaking bad, the issues of manufacturing up scale, part one – ingredients

by Michelle Kane

You've decided the world of cosmetics is for you and made a great leap in your business plan by either formulating a product yourself, or have employed a consultant formulator to create the 'next big thing' in cosmetics. Congratulations! Off to a contract manufacturer you go with your 100g sample and a set of mixing instructions. How much simpler could this be you ask? All the hard work has been done! Not necessarily as simple as you think is the answer, says Walter…

To begin looking at why often a 100g lab based sample with basic instructions is often not sufficient to produce a first time, instantaneously successful 1000kg batch of product we must delve into some details, and we all know that is where the devil lies...

What is upscale? *(Taking your lab sample to a production size batch)*

It is the process of designing a prototype using the materials, methods, manpower and machinery that are brought together to allow the development of reliable and practical procedures, identifying critical processes and producing guidelines for production and process controls during manufacture.

A responsible manufacturer will also consider stability and integrity of the product under appropriate conditions of storage, transport, use and safety, appropriate testing etc in cases where the formulator has not, as these factors can also impact on the upscale.

As demonstrated at last year's ASCC conference workshop, four people given the same instructions and following the same process produced four different results. There are many reasons for this, but for part one we will explore ingredients.

Formulation says	Walter Says	Why chemical composition matters in upscaling
Lavender Oil	Which one?	Opens up the possibility of using an ingredient of different quality
	Lavandula angustifolia Lavandula latifolia Lavandula hybrida	An ingredient with different properties (leading to unknown stability results)
	French Chinese	A different aroma
	Bulgarian Australian	A different price point (ranging from $90kg to $330 kg for example)

Oh, but I have the INCI !

Formulation says	Walter Says	Why chemical composition matters in upscaling
Cocamidopropyl Betaine 30%	Which supplier?	Different performance based on feedstock, as they are all slightly different
	Which feedstock? • Palm? • Hydrogenated palm? • Coconut? • Hydrogenated coconut?	Opens up the possibility of using an ingredient of a different quality An ingredient with different properties (leading to unknown stability results) Impurities and carbon chain affect viscosity
	True active content?	
	Impurities? What are they?	
So CAB 30 with C12-C18 fatty acids, no glycerin, no methanol, no C8 or C10's will have a significantly different performance to one with a different chemical composition		

Another complication can be that even the same raw material can have different processing methods depending on batch size.

Eg: Coco-Caprylate/Caprate, Isopropyl Palmitate, Polyglyceryl-3 Oleate, Sorbitan Sesquioleate

LAB SAMPLE	PRODUCTION BATCH
Weigh out the oil phase ingredients into a beaker. If solid ingredients are present, melt the mixture until fully liquid.	Weigh all the oil phase ingredients into a beaker. If solid ingredients are present, melt the mixture until fully liquid.
Weigh out the water phase ingredients into a separate beaker (Water, glycerin, $MgSO_4$). Stir until salts have dissolved. The water phase does not need to be heated.	**Weigh out 10% of the water phase and mix with the glycerin and salts.**
Using a pipette, add the water phase dropwise into the oil phase with rapid overhead mixing using a propeller blade.	**Add the 10% water phase, mixed with the glycerin and salts, into the oil phase. Stir by hand until a smooth liquid emulsion is formed.**
Once about a quarter of the water has been added, it can be added quickly, in portions, until a smooth homogenous cream is formed.	Transfer onto an overhead stirrer fitted with a propeller blade. Add the remainder of the water into the emulsion mix and stir rapidly for several minutes, until a smooth homogenous emulsion is formed.
Other sensitive ingredients such as fragrance, actives, preservatives or colour can be added at the end. Your final emulsion will be thick and homogenous.	Other sensitive ingredients such as fragrance, actives, preservatives or colour can be added at the end. Your final emulsion will be thick and homogenous.

Therefore if your formulator only ever makes lab sized samples or lacks production experience, or your contract manufacturer has not had exposure to a specific ingredient where this matters, it can (and does) lead to issues when the formula is upscaled.

Colours and fragrances can present major issues when upscaled from small samples, and usually a great deal of time and effort must be put in by the manufacturer to produce accurate colour standards for referencing. In fact the key to alleviating many colour issues is standardization. Raw materials, proportions, moisture content, mixing, grinding and sifting need to be controlled to get consistent results. Even the light source used by the tester can affect the colour perceived, so it needs to be standardized too. Both the formulator and the manufacturer require a good understanding of colour theory and how to adjust for hue, saturation and brightness.

There are many more issues that ingredients can pose, but hopefully you can see why that 100g sample and a few lines of instructions are not always sufficient to make a production sized batch of product. In part two we will look at methodology and machinery. Ahh, Breaking Bad !

A.S.C.C.

At the recent AGM of the Australian Society of Cosmetic Chemists (ASCC), Michelle Kane from PharmaScope Pty Ltd was elected President.

The immediate Past President is Robert McPherson from Lubrizol International Inc.

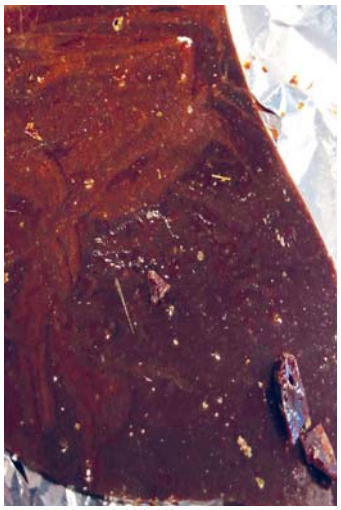
Congratulations to them both.

Examples from ASCC 2019 workshop

Correct – blue colour, Hard crack

Temp too low, change in viscosity

Temp too high, changed colour



Same INCI produced a different result

MICHELLE KANE is the managing director of PharmaScope Pty Ltd, a privately owned contract manufacturer established in 2004. Michelle has over 30 years experience in the pharmaceutical and personal care industry, being involved at many levels from procurement, product development, manufacturing, financial management and staff training and development, to name a few... Being based on the West Coast always brings the added challenge of seeking niche product development solutions and working creatively to achieve manufacturing outcomes in a competitive marketplace for our clients global demands.

Getting down to Business (Insurance) in 2020

by James Gillard

Many of you are living in challenging and difficult times at present. It can be at times like these that Business Owners should take stock of where they are at with their Business.

To subsequently make sure you have adequate, and possibly adjusted, insurance in place which is tailored to your current and forecasted Business activity.

In the Cosmetics & Beauty Industry one such form of Insurance that may require reassessment by you is your Business Insurance. Whether you are an Importer, Exporter, Wholesaler, Distributor, Manufacturer, Retailer, or a combination of these, it may well be time to now check your Insurance covers and respective sums insured.

As a refresher for you, examples of what is covered under a Business Insurance Policy are;

Buildings Insurance

This is an insurance policy that covers the financial cost of replacing or repairing damage to the physical structure of your Business property you own in the event disaster strikes such as a fire. This may include the roof, floors, and walls, as well as any fitted or permanent fixtures. If you own the Building you occupy for your Business make sure that is insured for the correct value sum insured in the event disaster strikes and you have to rebuild.

Contents Insurance

This cover should include the value of the contents of your premises, including

stock and what you would need to replace in the event of a catastrophic event such as a fire, water damage, explosion, impact or accidental damage to name a few example events.

Given the disruptions occurring to Businesses in 2020 you should check that the value of your stock and their volumes are up to date with the insurance cover you have in place. There are Businesses this year who have a lower turn-over due to falling stock volumes which means your insurance policy may require adjustment.

Business Interruption Insurance – sometimes referred to as loss of gross profits cover

This cover provides cover for the loss of income and the additional increased costs of working which results from the interruption of your business which occurs due to a physical loss or damage caused by a fire or a natural disaster. Check to ensure if you have this insurance in place. If you already do, check that the sums insured are in line with any adjustments to your turnover. Also talk with your Insurance Broker to make sure you understand how the loss of gross profits would be calculated for your Business in the event of a loss as some insurers can calculate this in different ways.

Theft Insurance

This covers theft or attempted theft by any person who forcibly and violently enters or attempts to enter the premises, any person unlawfully concealed at the premises, any person who threatens or commits physical violence to you, your employees or other persons, theft or attempted theft by armed hold-up at the premises, theft or attempted theft by any person who breaks into any locked cabinet and/or counter and/or showcase which is located at the premises . As the economy falls on hard times crime rates increase so check if you have this cover to protect you in the event these types of theft happen to you.

Money Insurance

This covers your business's money whilst on your premises, in a safe or strong room, in transit to or from your premises, or in your personal custody, or the custody of a trusted employee. Check to see if you have adequate cover in place for the money kept on the premises or when in transit. Increased crime rates can also increase the risk of money taken so check you have this insurance in place if required.

Glass Insurance

This covers you for breakage of glass at your premises (including internal glass such as glass partitions, or external windows). Cover can include destruction of stock or contents caused by broken glass and cover for signs made of glass or plastic which forms part of an illuminated sign. Cover can also include the cost of temporary shuttering necessary to secure otherwise exposed stock or contents pending the replacement of the broken glass. It can cover the costs incurred in replacing sign-writing, ornamentation, reflective materials and burglar alarm tapes and connections attached to the broken glass. The cost incurred in repairing or replacing damage to window, door or showcase frames and their fittings. The cost incurred in repairing or replacing tiles on shop and office fronts and around the broken glass. Glass damage to external glass which has suffered malicious damage can also be covered. If you lease the Building you are in, you should check your Lease contract with your Landlord to better understand what the requirements are for you to insure glass on the premises.

Public & Products Liability Insurance

This covers you for your legal liability for personal injury to another person (other than employees) or for damage to property owned or controlled by someone else or advertising liability in connection with your business and caused by or arising out of an occurrence, or arising in connection with your products.

General Property Insurance

This covers you for loss or damage to portable or valuable business property such as tools, laptop computers, a personal digital assistant that you carry around with you occurring anywhere in Australia or the rest of the world. In 2020 you may have employees working from home therefore taking such equipment home with them and you may not have these items insured away from the Business premises.

Machinery breakdown & Electronic Breakdown Insurance

This covers you for breakdown of your business's machinery and electronic equipment at the premises which may include items such as air conditioning units, computers, and electronic equipment such as photocopiers and faxes. The aim of the insurance is to cover you for the cost of restoring your business's computer records following a computer breakdown, the increased costs of working (such as the hiring of alternative computers, the hiring of additional staff) following the

breakdown of your business's computers. It also can cover you for the costs of replacing your business's stock which is kept in freezers or refrigerated units if the fridge or freezer breaks down.

Goods in Transit

This provides cover for the loss or damage to goods that your business buys, sells or uses whilst they are in transit. In 2020 you may need to adjust your volumes of stock in transit by sea, air , rail or road so it may be time to check what you have in transit is in line with what you have insured. You may not have this type of cover in place and assume that the stock you import is insured up to arrival at your Business location so it is important to check where the insurance starts and stops with your 3rd parties so you are not exposed or at risk in the event of stock being damaged or destroyed whilst in transit.

Tax Audit Insurance

This covers the professional fees you may incur in connection with an audit or investigation of your business's financial or tax affairs by any authority authorised to do so, e.g. the Australian Taxation Office, Workers Compensation authority.

Want to know more?

If you would like to learn more about Business Insurance, you can always contact our friendly team at IME Insurance Brokers.

We provide professional service and personal assistance when we discuss what your individual circumstances are.

You can contact us by calling our office on 1800 641 260

James Gillard

Managing Director

ABL Tube VS Aluminium Tubes

by Steve Welsh

As projects are now full steam ahead since the halt during the nation-wide peak of "the virus", we have been receiving numerous enquiries from customers regarding our cosmetic tubes. At Weltrade Packaging we can supply a large range of custom tubes which are available in different sizes, in any colour and can be printed on. With this it can be confusing for our customers to pick a tube that is right for their product. One particular question which we receive quite regularly is "What is the difference between an Aluminium Barrier Laminate (ABL) Tube and an Aluminium tube?" Although they might sound and look similar they are quite different.

These tubes are printed on a flat sheet and later welded into a round or oval shape. This means that ABL and aluminium tubes will have a seam line running through the side of the tube, compared to a standard Polyethylene (PE) extrusion tube which will not. An ABL tube is made with aluminium as the barrier and a polyethylene layer on either side of the tube, compared to an aluminium tube which is just pure aluminium.

ABL and Aluminium tubes both have very strong barrier protection properties for products containing essential oils, fluoride, air contaminants, antiseptics and food. So how do you pick between an ABL tube over an aluminium tube? We believe using an ABL tube will have greater benefits over a pure aluminium tube and some of them are listed below:

Pros of an ABL Tube

- Strong barrier protection
- Does not tear
- Does not leak
- Will not easily dent
- Larger range of closures available
- Low consumption of energy & fossil fuels to manufacture
- Been introduced into the market more recently than Aluminum tubes
- Tube manufacturers do not require special machinery to crimp (seal) the tube
- Only 10k unit MOQ

If you do not wish to go down the path of an ABL or aluminium tube we do offer a range of PE extrusion tubes in both single layer and 5 layer options. If sustainability is a major focus for your brand, our PE tubes can be biodegradable, made from sugarcane bioplastic or PCR (Post Consumer Resin). We have noticed a big push from consumers and brands for the direction of sustainability and will only imagine this to grow within the next couple of years. If you have any further questions please do not hesitate to get in touch with someone from our team:

info@weltradepackaging.com.au

or call us on: 07 5597 0102

How the **pandemic** has **changed** everyday personal care **habits**

by Emanuela Elia

Since the COVID-19 pandemic, a lot has changed worldwide in people's everyday life. Due to the highly infectious nature of the virus, we have all noticed some drastic changes in personal care habits. This includes actions such as increased use of hand sanitisers, cleansing products and the introduction of personal protective equipment (PPE) into one's daily routine. For many people, their hand washing frequency has also significantly increased. In February of this year, an article jointly written by the China Dermatologist Association, the Chinese Society of Dermatology, and the National Clinical Research Center for Skin and Immune Diseases addressed the effects of these new habits on the skin and subsequently provided some recommendations.

Main changes in habits

One of the main changes in personal care habits is naturally hand hygiene, as this is thought to be the single most important means by which the spread of the virus can be prevented. Based on the published article, hand sanitising or hand washing with a detergent and water is recommended before many common activities. This includes putting PPE on, before, during and after taking PPE off, before eating and drinking, before and after using the toilet, and after arriving home from having been out. Wearing gloves should not be considered a substitute for hand hygiene.

With regards to PPE such as face masks, which have a more significant impact on personal care habits, each country and region are subjects to differing regulations on whether their use is just advised or mandated. Therefore, people should follow the regulations from the relevant government with regards to when and where face masks should be used.

Consequences and recommendations

Intensified hand hygiene and cleansing may increase the incidence of skin dryness and dermatitis. To reduce

the sustained damage of skin barrier caused by soaps and other alkaline detergents, foamless cleansing products containing moisturizing ingredients are recommended. Where possible, applying a hand cream or emollient after hand sanitiser or extended use of gloves is advisable to replenish skin moisture.

Wearing facial masks may also cause skin dryness. To avoid this, it is important to wear a properly fitted mask made from non-irritating material. It may also help to wear masks in various styles (for example, alternating between ear straps and a strap that goes around the head). This can avoid sustained, repeated friction and pressure on the same sites. Moisturising both before and after using facial protection is the best course of action to maintain healthy skin on the face, in addition to washing the affected areas to prevent any build ups of dirt and oil.

Additional changes in habits

A recent study on the hygiene and personal care habits of Polish women has highlighted other interesting changes. These may be observed in many other countries as well. A questionnaire completed by 140 women revealed increased handwashing and showering upon arriving home and after using local city transportation. However, the number of people washing their hair decreased slightly. Overall, there is an increasing hand cream use and decreasing use in makeup and nails cosmetics as well as fragrances. Almost half of the participants declared that they will likely maintain these new habits also after the pandemic has ended, meaning that the effects of COVID-19 on personal care habits might be seen over a longer time period. The results of this study are not only interesting with regards to hygienic behaviour analysis, but also to examine the use of certain types cosmetics in extraordinary situation when people have reduced social contacts.

More time spent at home and certain government restrictions have also brough changes in other consumer habits including the way we purchase – i.e. increase in on line vs in store sales – and our preferences – i.e. skin and hair treatments that can be used at home as opposed to in salon treatments. Staying indoors can also mean we are getting less natural light, possibly leading to paler skin or deficiencies in certain vitamins.

Many opportunities to benefit individuals' lives

Health and wellbeing are certainly everyone's priority at the present times. While the worldwide surge in production and sale of hand sanitisers and protective masks has been well documented, it is important for the cosmetic industry to also concentrate on new opportunities that have arisen. COVID-19 has increased certain hygiene behaviours in people compared to the past. Additionally, cosmetic products use has changed for the advantage of hand and facial creams and other at home treatments. The focus should be maintaining skin health and beauty throughout the Pandemic with effective products that can also be purchased on the internet and used easily at home. Cosmetic products could play an important role in fulfilling that sense of wellbeing and comfort that consumers are craving now more than ever.

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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.

With Covid-19 impacting the world, the market in Thailand sees a shake-up of the industry in 2020

by Pam Jones

Product innovation in Thailand during 2019 grew the market with products such as, not tested on animals or cruelty-free, natural and vegan. Ira Natural is an example of a new domestic brand growing in popularity with EcoCert, using eco-friendly paper and DIY kits see Fig 1. Khun Kedmanee – Head of the Thai Cosmetic Association recently reported in a Thailand newspaper that the 2019 personal care market valued at THB 300,000 Mio (USD$9 Billion) had almost 50% of sales in exports. Unfortunately, predictions for 2020 will see a negative impact of 10% on those exports with more downturn expected.

Many local manufacturers such as Wutthisak Clinic a brand in the Beauty Clinic range are facing bankruptcy, and large local companies have entirely shut down. Changes in consumer purchasing at department stores, clinics and specialty shops are down while online purchasing is becoming more popular with Lazada and Shopee two of the most popular local online stores. Growth in shopping online has seen an increase of 10% this year.

Fig 1. DIY lip balm kits by Ira Natural.

Market growth in products has shifted from colour cosmetics and fragrances to products such as facial masks and home haircare treatments as people who are working from home are looking for DIY products to pamper themselves.

For those still working, compulsory wearing of face masks sees a new trend in protecting your make up from transferring or rubbing off onto the facial cover. An example is Hourglass Veil Soft Focus Setting Spray. Fig. 2

Wearing masks for long periods has also caused problems and has seen the resurgence of Maskacne. This phenomenon occurred during SARS where sensitive skins subjected to wearing a mask all day begins to develop irritation and acne problems, therefore

Fig. 2 To ensure your base makeup lasts through the day without smudging (especially on a mask), it is important to apply a setting spray. (Cruelty-Free Brand sold online)

prompting increased sales of anti-acne treatments.

Growing concerns for the Personal Care market in Thailand continue to mount with GDP predicted to be -9.2% in 2020 and 2.6% in 2021. As we see here in Australia, these figures tend not to mean much as the severity of the Covid-19 pandemic increases in countries, and the statistics continuously change. What is certain is that many more local companies will close as the majority depend on more than 60% of their business as exports to their close neighbours.

Note: *This will be the last of the Asian Updates for the time being. Unfortunately the COVID 19 has affected the Asian market and most of Pam's contacts have either lost their jobs or are working from home. Once this nightmare eases, Pam will be back with her informative articles.*

formulating solid, mild cosmetics

The world has changed, and we are adapting. We are also dealing with a huge increase in demand for wash products and hand hygiene from the market. Our formulating world is changing too, so this article will focus on solid cleansing formats.

Ordinarily, manufacturers of personal care and beauty products rely on water as a primary ingredient in formulations. However, due to increased global concern for water scarcity and climate change, manufacturers are actively innovating new high-performing rinse-off products such as super concentrates and solid cleansing bars, sticks, and powders that contain little to no water as well as require less water during the manufacturing process.

The pressure is not just on personal care manufacturers, but also on ingredient suppliers to offer enabling solutions for the development of these new products. Excellent choices for these applications are Taurate surfactants such as Pureact WS Series (Sodium Methyl Cocoyl Taurate) and Pureact TR-L90 (Sodium Methyl Lauroyl Taurate), which are versatile ingredients used in the production of bars, body washes, shampoos, and even conditioner bars. Taurate surfactants are remarkably stable across a wide pH range, have excellent detergency and wetting with high-foaming capabilities while maintaining their performance in hard water and salt water; also, they are recognised for their extreme mildness to the skin.

Natural Fruit & Vegetable Extracts

We have a surprise for any foodies out there. Thari Mudalige, our Business Manager for Food Ingredients, supplies a lot of natural fruit and vegetable extracts to colour food products. Coupled with the work Nikki Changavalli, our Formulation Chemist, has done in our new Customer Engagement Laboratory (CEL), we have some solid products that have a beautiful, natural colour to them. We know how these natural food ingredients are also on trend.

Whilst this is focussing primarily on Innospec's solid cleansing, formulating, and manufacturing, there are plenty of other interesting ingredients we can put into solid cleansing products, like colours, scrubs, conditioners, etc.

Bars, Foaming Butters, Sticks or Powders

Let us start with Innospec and go over different product formats, manufacturing them and surfactants to select for them, be they bars, foaming butters, sticks or powders. We don't

need to point out that these formats are all the rage today, nor do we need to say that Innospec is the leading supplier of premium sulphate-free surfactants that we are proud to represent here in Australia and New Zealand.

Shampoo Bars

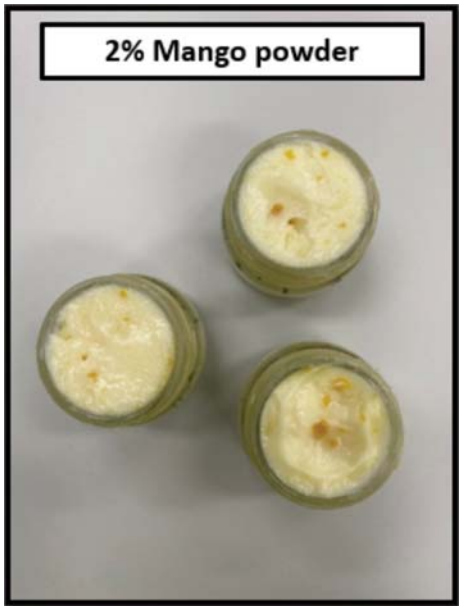
Here are some shampoo bars that Nikki has made. The colour of these are from some of our food extracts. You will discover, the great thing about bars is that you can load seemingly incompatible ingredients at high levels. Here we have loaded 10% AminoSensyl™ from Inolex, which is a 100% natural, COSMOS cationic conditioner. So, you get a load of foam and cleansing from the surfactants and amazing conditioning to go with it.

The fatty alcohols like Brassica Alcohol that are palm-free are also super popular for bar application too.

Scrub Butter

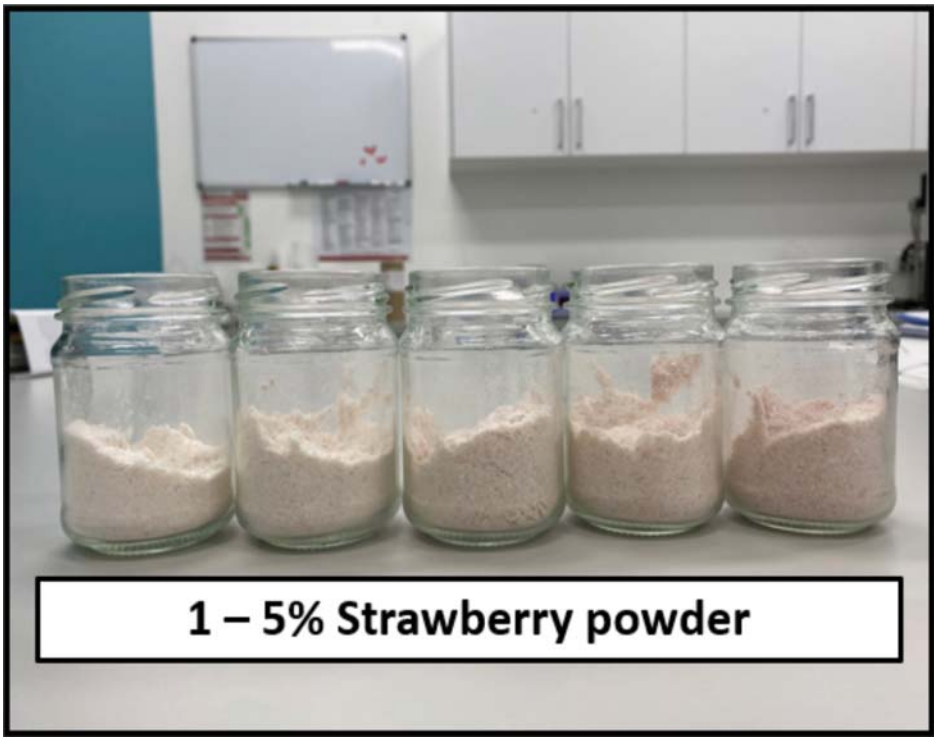
Continuing the food trend, we would like to talk about olives. Boundary Bend, a supplier of the best olive oil and olive-based products you can source. Anyone who has attended one of the pre-coronavirus ASCC Supplier Days would have had a tasting of the Cobram Estate Extra Virgin Olive Oils. Anyone that has not should get out and buy some Cobram Estate EVOO from any local supermarket.

Nikki has created a number of different variants of each formulation, one of which is a foaming olive butter scrub. Given the massive load of surfactants, it's so concentrated that you don't need a lot of it to get the foam – and yet, with a 50% loading of oil, you get a wonderful moisturising effect from the refined BP olive oil without imparting any unnecessary colour to your formulation. We did, however, want some olive green, so we added in some powdered Olive Leaf extract – standardised to 6% active content for some additional anti-redness and antioxidant claims. What better way to also showcase the olive pit scrub also, than in a concentrated butter format? You do not need a lot, but everyone in our office that has tried this has asked for extra to take home! So nourishing, yet so light, even given the surfactant load.



Shampoo Powder

Lastly the Shampoo Powder – while the strawberry colour does not show up that well in this, it was also the first one trialled. Pureact SCG (Sodium Cocoyl Glycinate) is one of the most under-rated surfactants for personal care, as the sensory addition is quite unique, along with the foam boosting properties too. Also, as it is 30% active, it does contain water. This aids in binding the formulation together. The Activsoft C-13 is a self-hydrating quaternised guar, great for powdered products (and bars), so it works without requiring any neutralisation. The Aquasiloil® Argan is a cleansing Argan derivative (also a liquid), and Veegum® CH is a micronised version of Veegum®, so it hydrates a lot faster. Great for DIY for consumers, particularly DIY clay masks and many other powdered products.



Feel free to get in contact with the team at A S Harrison & Co for a hand with samples, formulations and other suggestions: call us on +61 (0)2 8978 1016 or email performanceingredients.ash@harrison.com.au

Argireline® Amplified peptide

Amplifying beauty, simplifying routines

A shift toward a more minimal lifestyle less driven by accumulation and consumption and more by multifunctionality and simplicity is taking place. Minimalism also has a positive impact on the environment: Those who simplify their daily routine also make beauty more sustainable by minimizing the number of products and packages used.
Chemistry becomes greener through the application of the principles of green chemistry, which focus on the environmental impact of products and processes. Those need to be designed to reduce the consumption of nonrenewable resources and technological approaches developed to minimize or eliminate the use and generation of hazardous substances while preventing pollution.

Argireline® Amplified peptide is a new active ingredient developed through the application of the latest scientific discoveries and top-notch technologies and produced following the principles of green chemistry.

Argireline® peptide was the first peptide for expression wrinkles and, after 20 years, is still one of the most commonly used anti-aging peptides worldwide. The new ingredient is an evolution of the Argireline® peptide. It achieves improved efficacy in expression wrinkles, plus global anti-aging effects, by targeting senescence in all the layers of the skin. This complete ingredient is perfect for providing multifunctionality and targeting a broad age range of consumers.

Amplified efficacy in expression wrinkles

Targeting the interaction of neurons with muscle cells has been proven to be the right strategy to improve the appearance of expression wrinkles that start to form on the face around the 30s as a sign of aging. At the molecular level, this pre-synaptic mechanism involves the assembly of the SNARE complex in the motor neuron and the release of neurotransmitters that trigger muscle contraction. Once the muscle contracts, facial expressions emerge in the surface of the skin and become visible as expression wrinkles.

But what happens after contraction? Muscles return to their resting state and expression wrinkles relax. With aging, functional changes occur in muscle cells, resulting in a slowing of muscle relaxation. Over the years, the repeated contraction of facial muscles and their lower relaxation contribute to the permanence of visible wrinkles on the face.

Argireline® Amplified peptide shows a stronger ability than Argireline® peptide to interfere with the formation of the SNARE complex, as assessed by molecular modeling, and to reduce the release of neurotransmitters at the pre-synaptic level.

In addition, at the post-synaptic level, the new peptide performs fundamental actions that can support the relaxation of facial expression muscles. The peptide can reduce the force of contractions while helping the muscles relax faster and more completely afterward. Such observations have been possible thanks to the development of biological tissues by 3D bioprinting technology to perfectly mimic muscle tissue in the lab. Altogether, this complete efficacy can allow users to keep beautiful and relaxed facial expressions, a claim which has been verified through in vivo testing. Clinical studies with volunteers who applied 2%-5% Argireline® Amplified peptide showed visible improvement in the appearance of expression wrinkles (figure 1), while also contributing to having more relaxed and beautiful facial expressions.

Multi-level improvement in skin tissues

Argireline® Amplified peptide is a multi-functional ingredient with augmented efficacy, thanks to global activity in the key mechanisms that drive

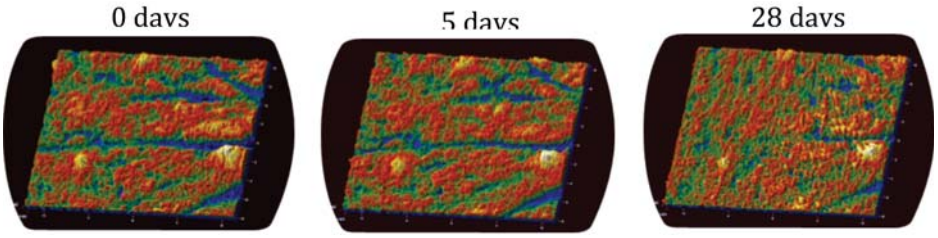


Figure 1. Evolution of crow's feet wrinkles after treatment with a cream with 2% Argireline® Amplified peptide.

aging in all different tissues and cell types of the skin. Cellular senescence is one of the key hallmarks of aging and is defined as a state of stable cell cycle arrest in which cells stop dividing and show morphological and metabolic changes. One such change is the presence of a senescence-associated secretory phenotype (SASP) wherein cells secrete high levels of inflammatory cytokines, immune modulators, growth factors, and proteases. These secreted factors influence neighboring cells, contributing to the propagation of senescence and altering tissue functions.

The efficacy of Argireline® Amplified peptide on layers of the skin has been studied deeply. In the epidermis, the new peptide has been shown to regulate gene signaling to restrict the activation of a transcription factor that is a master regulator of senescence and the SASP. Epidermal cells treated with the active ingredient showed reduced release of cytokines of the SASP that have inflammatory effects and can damage the tissue and reduce the functionality of the barrier function, which is the primary role of the epidermis. In epidermal models showing a decrease in barrier function genes, treatment with Argireline® Amplified peptide was shown to counteract the loss in the expression of genes that are relevant to maintain the proper skin barrier function.

Moving to the dermis, it is very well established that aged fibroblasts become senescent and release SASP molecules that interact with normal fibroblasts, inducing them to become senescent. Senescent fibroblasts produce fewer matrix components, which end up degrading and reducing their quantity. Over time, the dermal layer deteriorates and loses its biomechanical properties, mainly firmness and elasticity. Argireline® Amplified peptide can help counteract such damage. Tests show that the peptide counteracted the increased expression of SASP components of aged fibroblasts, while also raising the collagen type I levels that were dramatically lower in old fibroblasts. Argireline® Amplified peptide also showed the ability to restore the firmness of the skin that is lost with time, as measured using skin biopsies.

In the cells from the subcutaneous adipose tissue, Argireline® Amplified peptide was shown to regulate gene expression for preventing the release of SASP components.

Additionally, in 3D adipose microtissues that are a model of the propagation of senescence and the loss of adipogenesis associated with it, the new cosmetic peptide increased lipid accumulation, suggesting a recovery of adipogenic functions of adipose cells (figure 2). These functions are important for maintaining the properties of this layer and the volume of the facial contours that normally is lost with aging.

Muscle fibers under the hypodermis provide essential support to all skin. The phenomenon of myoaging involves morphological changes that occur with aging to these muscle fibers and results in a reduced diameter associated with the

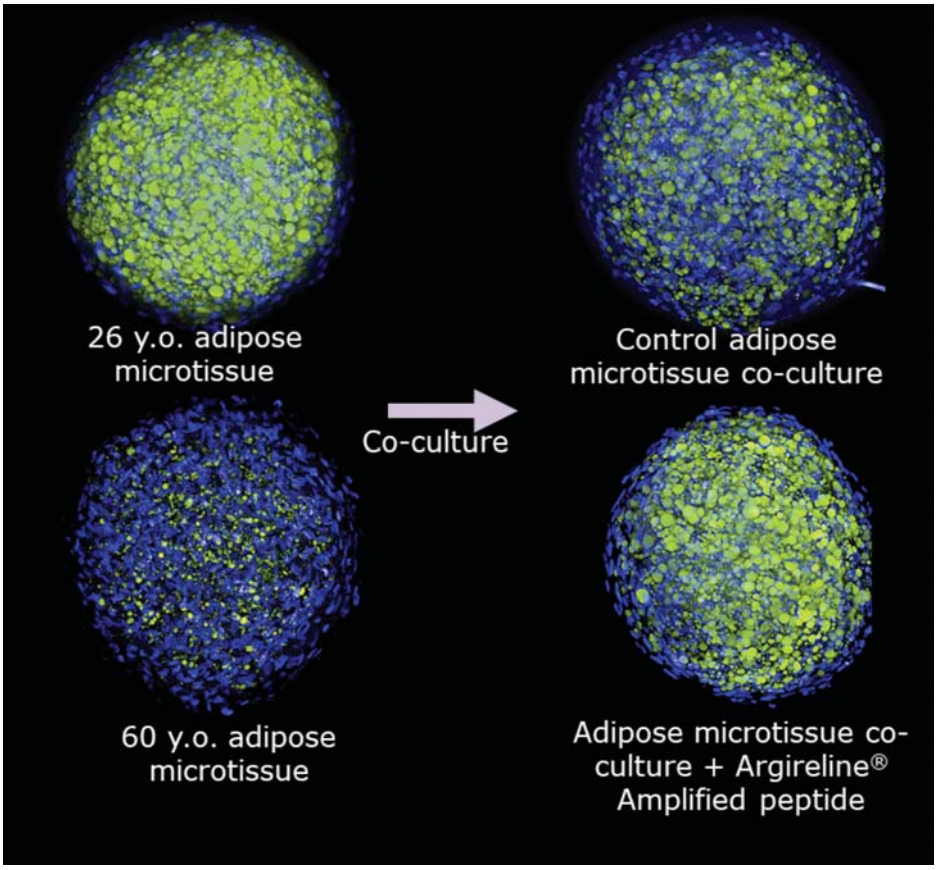
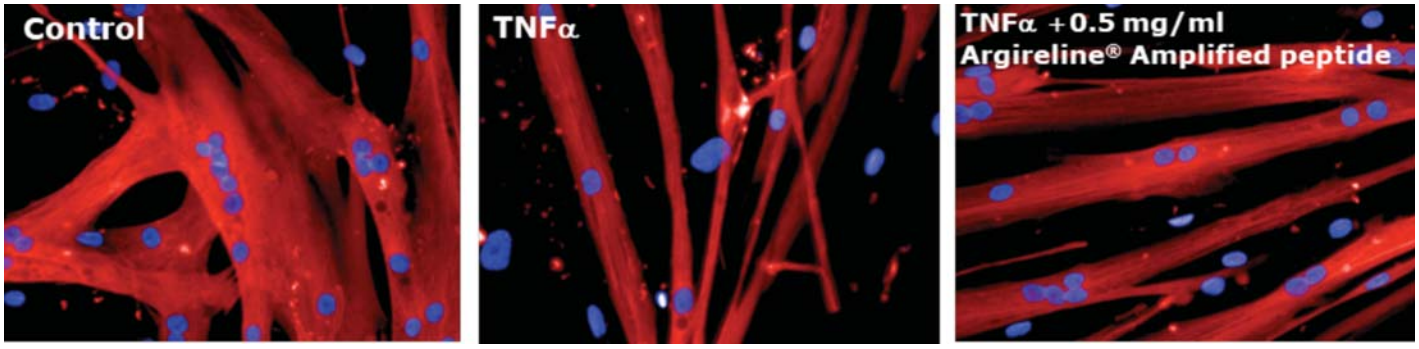


Figure 2. 3D adipose microtissues showing lipids in green and cell nuclei in blue.



loss of muscle mass. This altered muscle morphology reduces support to the skin and contributes to visible sagging. Human skeletal muscle cells can be made to myoage in vitro by incubation with the TNF- factor. Treatment of the cells with Argireline® Amplified peptide has been shown to reverse this kind of damage, thus rejuvenating the cells and their morphology.

All-in-one efficacy

As a result of its broad activity at different levels, Argireline® Amplified peptide can offer multiple cosmetic benefits besides improving expression wrinkles (figure 4). In vivo testing in volunteers who applied a cream with 2% Argireline® Amplified peptide showed a smoothing effect of the skin surface. The increased isotropy of dermal fibers observed by Primos 3D reflects an improved orientation of the extracellular matrix components. Biomechanical properties of the skin, measured by means of cutometry, showed an increase in firmness and elasticity. The presence of fine lines in the skin surface, measured by means image analysis software, revealed a global reduction in these visible lines. The volumizing effect of Argireline® Amplified peptide was also shown on the cheeks by means of image analysis. And an increase in the radiance of the skin was measured by spectrophotometry.

Figure 4. Multi-functional efficacy of Argireline® Amplified peptide. Average values of improvement after 28 days of treatment.

Argireline® Amplified is owned by The Lubrizol Corporation or its affiliates.

sunscreen highlights

by John Staton

the end point for sunscreen testing

What is the MED? I am often asked this question. Technically, it is the point where the exposure on unprotected skin produces a visible response. According to the latest ISO 24444 : 2019 sunscreen test standard, it is "the lowest dose of ultraviolet radiation (UVR) that produces the first perceptible unambiguous erythema with defined boarders appearing over most of the field of UV exposure, 16 h to 24 h after UV exposure." The FDA definition is less clear … "the smallest UV dose that produces perceptible redness of the skin (erythema) with clear, defined borders at 16 to 24 hours after exposure."

As part of the review of the ISO standards, a great deal of effort was focused on trying to give this highly subjective visual evaluation a guidance for greater consistency. The decision was to incorporate photographic examples into the standard itself. These are intended to improve consistency between test labs and between trained evaluators.

Fig 1 shows an example of a series of 6 sequential exposures. In this example, it is possible to observe an possible erythema at exposure spot "1", but the interpretation of ISO (and AS/NZS 2604) of "unambiguous" and "over most of the field of UV exposure" must be taken into account. The first value where a Grade 1 is scored is the MED.

Observation of the protected end point for the tested product is not as difficult. This is because the exposure series gives much greater difference between each of the series than in the case for the unprotected MED. For example, incremental light doses of say 15% would mean, for the unprotected spots, that the value of spot 1 in Fig 1 would be .85% of an MED, spot 2 = 100% and spot 3 = 1.15%. In this case, the MED has a numerical value of one. By comparison for an SPF 30 product, the same series would be spot 1 = .85% of 30/1 = SPF

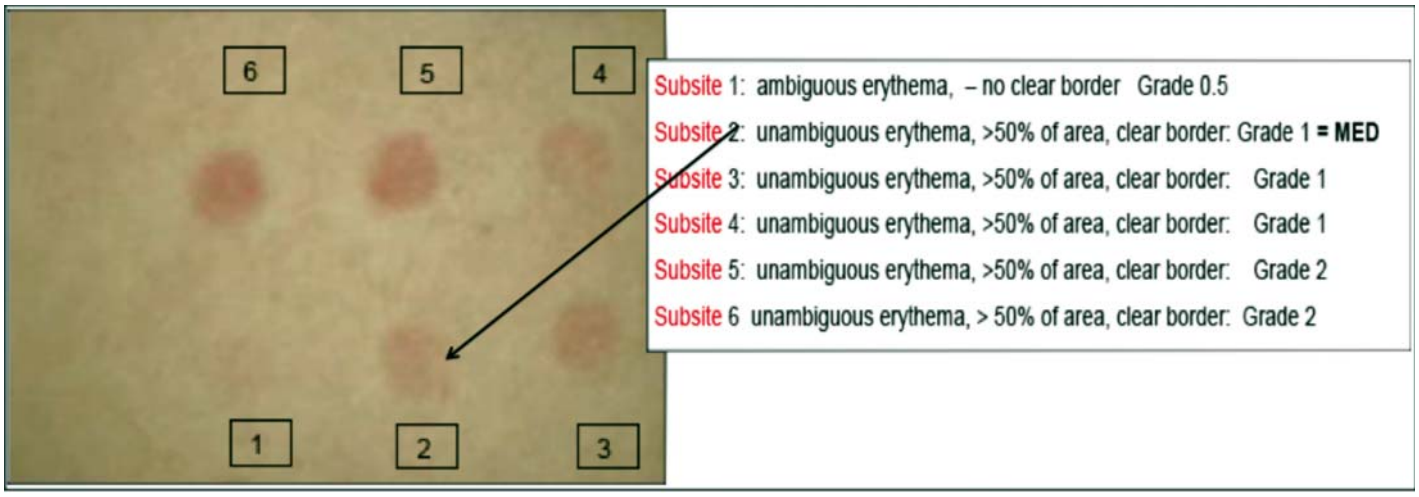


Fig 1.

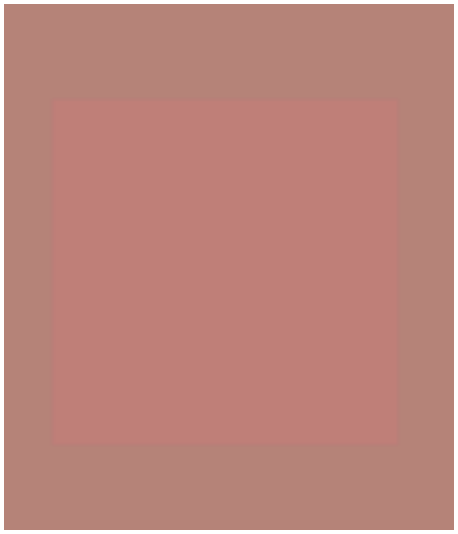


Fig 2– Colour Change Swatch showing a* value (red shift) change in centre rectangle.

25, spot 2 = 100% of 30/1= SPF 30 and spot 3 = 1.15% of 30/1 = 34. From this example, it can be seen that it is MUCH easier to discriminate a change of around 5 SPF units for the protected skin than a change of only a decimal place for the MED.

Why is it Important?

The reporting of the SPF for the test product is totally dependent on a ratio between this MED result and the result from the matching exposure series with the product applied. Underestimating the MED to spot 1 instead of spot 2, would in the above example, overestimate the SPF from 30 to 34. The error increases as SPF increases, so one lab could report SPF 50 and another 57, just on the basis of this difference in reading of end point alone.

Why is it Difficult?

At this point, instrumental end point measurement has not been implemented as part of any SPF standard and observation of this skin colour change relies heavily on the colour acuity of the observer. It is also influenced by background colour of the skin and ambient lighting conditions, evenness of skin and degree of blemishes. You might well observe these effects when observing the example in this article. As a calibration reference, in the colour swatch in Fig 2, the central panel should be discernible against the background, which has an ITAo skin colour typical of a skin type in the darker end range used in the SPF test.

A similar approach is being taken with guidance for the tan end point of Persistent Pigment Darkening (PPD) used for UVA Protection Factor (UVAPF). You will see this in ISO 24442 when it is published later this year.

John Staton
SciPharm Pty Ltd

NICNAS becomes AICIS . . .

Industrial Chemicals In Australia

by Wendy Free

Fair call, most of us HAVE been living under a rock this year, so it's possible in many cases that the long scheduled and several times delayed transition from NICNAS to AICIS (Australian Industrial Chemicals Introduction Scheme) may have slipped your notice.

The bare basics remain the same; 'introducers must be registered', products must be included in the register or be assessed, and as with everything fees must be paid . . . there are however some substantial differences, some possibly 'good', some possibly 'bad' and some 'interesting'.

Let's start with definitions

. . . if it's not

- an APVMA agricultural or veterinary chemical /product or
- Therapeutic Goods via TGA
- Foods for humans (FSANZ) or animals

Then, *natural or not,* **it IS an industrial chemical**[1]

Aspect	NICNAS	AICIS
Registration, Fees, Reporting		
Inventory	(AICS)	(Australian Inventory of Industrial Chemicals)
Exclusion for low volume etc		until 31 August 2022
Legislation	Act + Regulations + Handbook	Industrial Chemicals Act 2019 Industrial Chemicals Charges (Customs) Act 2019 Industrial Chemicals Charges (Excise) Act 2019 Industrial Chemicals Charges (General) Act 2019 Industrial Chemicals (General) Rules 2019 Industrial Chemicals Categorisation Guidelines + Guidance
New Chemical Process	Exempt or application	

"Industrial chemical" deals with the purpose for which a substance is used, not its intrinsic nature, so if you buy honey as a food, and then use it in cosmetics, you've likely changed its purpose. The definition is VERY broad and applies to candles, toys, biocides, car/laundry care, toner cartridges, and much, much, much more including cosmetics and fragrances. It's also important to realize that AICIS is just one of quite a few federal agencies you'll need to consider if you are importing, extracting, manufacturing "industrial chemicals".

So how does this new system work?

It's based on GHS (The "Globally Harmonized System") for classification and labelling of chemicals; which was

Regulator	Context	Examples
AICIS[2]	Business Notification / Classification / Fees	Any "Introduction"
ABF[3]	Incoming Classification & Declarations	"Customs" CITES, Prohibited, Restricted
SUSMP[4]	Legislative controls on supply and labelling	'Poisons' > 10 ppm or in any concertation Colours, extracts, preservatives, and more
State Legislation	Awareness on variations Workplace Safety	"Platinum" Major Hazard Facility / Dangerous Goods
BICON[5]	Permits / Distribution (AQIS)	Biological inc Probiotics, animal extracts Names of Incoming goods CoQ-10
TGA[6]	Declared to be "Therapeutic Goods" / AAN / Proprietary Ingredients	Active Ingredients Premixes
ODC[7]	Permits / distribution / resupply	Cannabis and other substances
DAF[8]	Notification / Approvals	Organic
ACCC[9]	Ethical business practices, truth in advertising, suitability for intended purpose.	Claims about ingredients & intrinsic safety of products

introduced by the United Nations in 1992 and formally adopted in Australia in 2016. There is a multitude of technical documentation and guidance on the various classifications and thresholds to be considered and applied[10].

Confusingly the GHS system of labelling is applied to WORKPLACE chemicals in Australia[11] (ie Professional size shampoo, industrial hand wash etc). However, consumer products are (under the legislation) primarily labelled

Globally Harmonised System (GHS) of classification and labelling of chemicals

according to SUSMP; *it is possible and sometimes appropriate to use both . . . But back to AICIS.*

STEP ONE: Know the **chemical name** and CAS and the intended purpose

- If the purpose of the chemical is one of the 'special cases' such as perfume, preservative, biocide, biological, for use in baby products, products used in personal vaporisers . . . *then you have extra work to do . . . check that first.*

STEP TWO: Then check the register[12]. Your search will give you one of a number of different results

- Can be introduced/used without* restrictions
- Can be introduced/used with restrictions
- Not on the register

* NB: If you change the purpose of the substance, say it was assessed as a perfume and you are using it as a preservative, then the 'approval' may not apply, you may have to apply to vary the inventory.

If your product has restrictions on its use /concentration / data requirements you'll need to know and abide by this BEFORE you commence importation.

STEP THREE: If your product is not yet on the register OR its outside the scope of the approval.

It needs to be assessed using GHS criteria and AICIS rules; firstly by you and then possibly by the regulator.

Assessment =
(Human Health x Exposure) +
(Environmental Risk x Exposure)

(Please refer to page opposite for tables)

There are also systems in place for reporting each of the constituents in perfumes/flavours confidentially to AICIS.

There are of course consequences in place for individuals and companies who do not comply. If this all sounds too much – **sorry**; please note that AICIS will NOT allow agents/consultants or your overseas head office, etc, to report on your behalf, they consider this to be in breach of the Commonwealth's Code of Conduct and Foreign Influence Transparency Scheme Legislation[13].

In summary

If you introduce anything other than APVMA, TGA and/or food you now have significantly more responsibility, this includes circumstances where you modify the purpose of the substances from that originally assessed. You must keep multiple record and supply the data required. All in all, it its GHS classified and low environmental risk, its pretty simply, unless it's a perfume, a preservative, for infant use . . .

Now, back under that rock – Stay well!

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References

1 Industrial Chemicals Act 2019 No. 12, 2019 sections 9 and 10.

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5 https://bicon.agriculture.gov.au/BiconWeb4.0

6 https://www.tga.gov.au

7 https://www.odc.gov.au

8 https://www.agriculture.gov.au

9 https://www.accc.gov.au

10 https://www.safeworkaustralia.gov.au/classifying-chemicals#the-ghs

11 https://www.safeworkaustralia.gov.au/doc/model-code-practice-labelling-workplace-hazardous-chemicals

12 https://www.industrialchemicals.gov.au/search-inventory

13 https://www.industrialchemicals.gov.au/about-us/compliance-and-enforcement/our-powers-and-enforcement-measures-we-can-take

Determining the Introduction Category (example only)

Human Health		Exposure Band		
		1 *eg Cosmetics* <10 kg/pa & <0.1%	2 *eg Cosmetics* <10 kg/pa & >0.1% or <1% or >10kg but <100kg	3 *eg Cosmetics* > 100kg/pa
Hazard Band	Not A, B or C	VERY LOW RISK	VERY LOW RISK	VERY LOW RISK
	A Low Risk ie GHS irritating	VERY LOW RISK	LOW RISK	LOW RISK
	B Medium Risk ie sensitiser or corrosive	VERY LOW RISK	LOW RISK	MEDIUM TO HIGH
	C High Risk ie carcinogenic	MEDIUM TO HIGH	MEDIUM TO HIGH	MEDIUM TO HIGH

Noting that some cosmetics purposes are automatically 'bumped' up a category – eg biocides / preservatives / sunscreens etc.

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Environmental Risk (note these are examples ONLY)		Exposure Band Release is an end use that includes intentional release during use to land, biota, natural waterways or municipal water supplies; intentional release to air during use (other than solely domestic or personal use); fire-fighting, offshore drilling.			
		1 <10kg + no release	2 10 -1000kg + no release	3 >1t & <10t + No release	4 >10t or Release*
Hazard Band	Not A, B, C or D	VERY LOW RISK	VERY LOW RISK	VERY LOW RISK	VERY LOW RISK
	A eg harmful to aquatic life, bioaccumulation, contains Al, Cr, Cu, Ni Se Ag or Zn, cationic polymers	VERY LOW RISK	VERY LOW RISK	LOW RISK	LOW RISK
	B toxic to aquatic life	VERY LOW RISK	LOW RISK	LOW RISK	MEDIUM TO HIGH
	C Very toxic to aquatic life, persistent and bioaccumulative	LOW RISK	LOW RISK	MEDIUM TO HIGH	MEDIUM TO HIGH
	D persistent, bioaccumulative and toxic; ozone depleting, contains as, Cd, Pb or Hg, endocrine	MEDIUM TO HIGH	MEDIUM TO HIGH	MEDIUM TO HIGH	MEDIUM TO HIGH

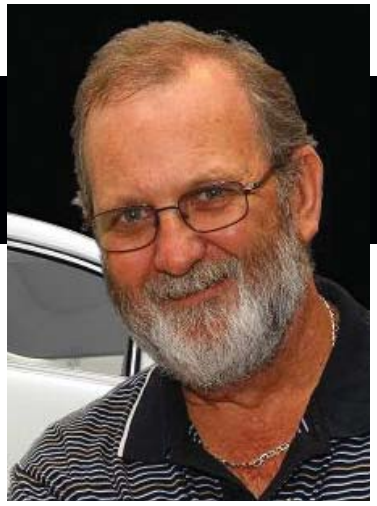
⇩

Introduction Category		Human Health		
		VERY LOW RISK	LOW RISK	MEDIUM TO HIGH
Environmental Risk	VERY LOW RISK	EXEMPT	REPORTED	ASSESSED*
	LOW RISK	REPORTED	REPORTED	ASSESSED*
	MEDIUM TO HIGH	ASSESSED*	ASSESSED*	ASSESSED*

* exceptions apply

Thus there are
essentially *four categories of introduced chemicals*

Category	Context	Your base obligations
Listed	It's already in the register	Check the purpose, check the obligations, report as required, keep records
Exempt	GHS Very Low risk +/- Rules	Report AFTER you've imported it, keep records
Reported	GHS Low Risk +/- Rules	Report BEFORE you import it, keep records
Assessed	GHS Medium to High Risk +/- Rules	Pre-introduction report + supply of requested data before you import it, keep records



Part 53 –

by Ric Williams

InfraRed Light and its Effects on Skin

Sunlight, at an effective temperature of 5,780 kelvins, is composed of nearly thermal-spectrum radiation that is slightly more than half infrared. At zenith, sunlight provides an irradiance of just over 1 kilowatts per square meter at sea level. Of this energy, 527 watts is infrared radiation, 445 watts is visible light, and 32 watts is ultraviolet radiation *("Reference Solar Spectral Irradiance: Air Mass 1.5". Retrieved 2009-11-12).*

UVR

The sun gives off ultraviolet (UV) radiation that we divide into categories based on the wavelength.

UV radiation (UVR) that reaches the Earth's surface can be divided into UV-B (290-320 nm) and UV-A (320-400 nm). UV-A can be further subdivided into UV-A I, or far UV-A (340-400 nm), and UV-A II, or near UV-A (320-340 nm).

UVC radiation is absorbed by the ozone layer in the atmosphere and as virtually none will reach the earth's surface generally does not cause skin damage. Still if exposed UVC rays will cause immediate damage to skin, usually causing skin cancer.

UVB rays are partially absorbed by the ozone layer and have a medium wavelength (290-320 nm). They do not penetrate the skin as far as the UVA rays do and are the primary cause of sunburn and skin cancers. They are also responsible for most of the tissue damage which results in wrinkles and aging of the skin and are implicated in cataract formation. UVB does not penetrate glass, and the intensity of UVB radiation depends on the time of day and the season.

UVA rays constitute 90-95% of the ultraviolet light reaching the earth. They have a relatively long wavelength (320-400 nm) and are not absorbed by the ozone layer. UVA light penetrates the furthest into the skin and is involved in the initial stages of suntanning. The intensity of UVA radiation is more constant than UVB without the variations during the day and throughout the year. UVA (above 320nm) is also not filtered by glass. UVA tends to suppress the immune function and is implicated in premature aging of the skin.

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Cosmepeutics International
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.

Light comparison			
Name	Wavelength	Frequency (Hz)	Photon Energy (eV)
Gamma Rays	less than 0.01 nm	More than 10 EHz	124 keV – 300+ GeV
X-Rays	0.01 nm – 10 nm	30 EHz – 30 PHz	124 eV – 124 keV
Ultraviolet Light	10 nm – 400 nm	30 PHz – 800 THz	3.4 eV – 124 eV
Vacuum UV	10 nm – 200 nm	30 PHz – 400 THz	5.1 eV – 124 eV
UV-C	200 nm – 290 nm	400 THz – 580 THz	4.4 eV – 5.1 eV
UV-B	290 nm – 320 nm	580 THz – 640 THz	4.1 eV – 4.4 eV
UV-A	320 nm – 400 nm	640 THz – 800 THz	3.4 eV – 4.1 eV
Visible Light	400 nm–700 nm	800 THz – 430 THz	1.7 eV – 3.4 eV
Infra-Red Light	700 nm – 1 mm	430 THz – 300 GHz	1.24 meV – 1.7 eV
Microwaves	1 mm – 1 meter	300 GHz – 300 MHz	1.24 μeV – 1.24 meV
Radio/TV Waves	1 mm – 100,000 km	300 GHz – 3 Hz	12.4 feV – 1.24 meV

Visible Light

An extract from the conclusion in the paper published in Journal of Investigative Dermatology (2012) 132, 1901–1907; doi:10.1038/jid.2011.476; published online 9 February 2012, titled ; ***Irradiation of Skin with Visible Light Induces Reactive Oxygen Species and Matrix-Degrading Enzymes***

By Frank Liebel, Simarna Kaur, Eduardo Ruvolo, Nikiforos Kollias and Michael D Southall; states "the approximate depth for penetration of visible light (400–700 nm) in a fair-skinned Caucasian individual was estimated to be between 90 and 750 μm, compared with a depth of 1.5–90 μm for UVR (Anderson and Parrish, 1981). Thus, even though visible light photons are less energetic than UV photons *(and only thought to produce heat)*, due to the deeper dermal penetration visible light may still have a substantial effect on skin. Taken together, these results demonstrate that visible light exposure can induce Reactive Oxygen Species *(Free Radicals)*, which can lead to the release of proinflammatory cytokines and MMPs in the skin, similar to the effects of UV, and therefore visible light may contribute to the signs of premature aging in the skin."

Infra-Red Light[1]

Wavelength and frequency of Infra-Red Light

Infrared waves are longer than those of visible light, just beyond the red end of the visible spectrum. Infrared (IR) falls in the range of the (EM) spectrum between microwaves and visible light. It has frequencies from about 3 GHz up to about 400 THz and wavelengths of about 30 centimeters (12 inches) to 740 nanometers (0.00003 inches), although these values are not definitive.

Infra-Red Radiation Main Effect

Everything with a temperature above about 5 degrees Kelvin (minus 450 degrees Fahrenheit or minus 268 degrees Celsius) emits IR radiation. The sun gives off half of its total energy as IR, and much of its visible light is absorbed and re-emitted as IR, according to the University of Tennessee.

According to the US Environmental Protection Agency, incandescent bulbs convert only about 10 percent of their electrical energy input into visible light energy; about 90 percent is converted to infrared radiation. Household appliances such heat lamps and toasters use IR radiation to transmit heat, as do industrial heaters such as those used for drying and curing materials. These appliances generally emit blackbody radiation with a peak energy output below the wavelength of visible, though some energy is emitted as visible red light.

A TV remote control uses IR waves to change channels. In the remote, an IR light-emitting diode (LED) or laser sends out binary coded signals as rapid on/off pulses. A detector in the TV converts these light pulses to electrical signals that instruct a microprocessor to change the channel, adjust the volume or perform other actions. IR lasers can be used for point-to-point communications over distances of a few hundred meters or yards.

IR radiation is one of the three ways heat is transferred from one place to another, the other two being convection and conduction.

Convection is heat transfer by mass motion of a fluid such as air or water when the heated fluid is caused to move away from the source of heat, carrying energy with it. Convection above a hot surface occurs because hot air expands, becomes less dense, and rises." This is not always possible with human exposure.

Conduction is the process by which heat or electricity is directly transmitted through the material of a substance when there is a difference of temperature or of electrical potential between adjoining regions, without movement of the material. Also not always possible, particularly to ensure the entire body is kept warm.

That leaves **IR radiation** as an essential form of heating the human body. Frankly if we eliminated IR radiation as a source

of heat (plus convection and conduction were not adequate) then we would freeze to death.

The Problem Discovered

Infra-Red light has much less energy than visible light and much much less energy than Ultraviolet light hence had been thought of nothing but warming on skin. Recent studies indicate that due to the deep penetration of Infra-Red light and that it still has some energy content that can break bonds in organic molecules (eg bonds that form proteins such as collagen and elastin) that this effect may cause free radical formation and alterations to collagen and elastin formation. This is the new frontier of skin research and infra-red light may not be the innocent form of light we are exposed to.

From Ref 2, infrared light originates from sunlight and is experienced as heat or warmth, which is often a pleasant human experience. It, too, is present at higher proportions earlier in the day, which could ready the skin to protect against later-day UV exposure through a process known as *photoprevention*. Similar to blue light, however, infrared radiation, especially infrared-A, can negatively affect the skin.

It is particularly harmful to collagen, increasing matrix metalloproteinase-1 (MMP-1) in human fibroblasts, which in turn degrade collagen. Also, mitochondrial damage, occurring from energy creation within cellular organelles, can accelerate the effects of aging. Thus, infrared can increase mitochondrial free radical damage.

Besides exposure from the sun, infrared saunas and cabins are ubiquitous, and these sources can be harmful as well. Hyperpigmentation, scaling and telangiectasias may result from repeated exposures of skin to sauna temperatures.

In a paper by Nadim Shaath[3] he starts out by saying;

"We have been wrong before. …

Whenever the subject of skin damage from non-ionising infra-red rays has come up in the past, it was summarily dismissed. IR rays were thought to be benign because of the relatively low energies and frequencies. Recent evidence, however, has shown that the IR rays, particularly the IR-A rays, induce significant free radicals in the dermis and diminish the skin's anti-oxidant capacity. IR-A radiation has been reported to up-regulate an enzyme that destructs the collagen fibres (the matrix metalloproteinase-1 (MMP-1) expression. Haywood recently reported that the ultraviolet filters used in today's sun care regimes prevent no more than 55% of the damaging free radicals from the sun's UV radiation but none of the IRA induced free radicals.

Since the topic of Infra-Red radiation has raised new concerns, the resulting damage to the skin and the protocols for protection are an important consideration in all future sun care products."

Yohei Tanaka and Lisa Gale (in a paper "The Necessity of Infra-Red Radiation")[4] stated "NIR can stimulate wound healing and treat malignant tumors. NIR can also achieve skin rejuvenation and skin tightening , induce long-lasting vasodilation that is beneficial for ischemic disorders, and relax and weaken dystonic and hypertrophic muscles to reduce wrinkles and myalgia. In addition to usefulness in cancer detection and imaging, NIR induction of DNA damage in cancer cells should be investigated further for an effective cancer treatment. NIR can also activate stem cells, which may be beneficial in regenerative medicine.

However, intensive or long-term exposure to NIR induces deleterious effects similar to UV. Various kinds of tissue damage and diseases, such as undesirable photoaging, long-lasting vasodilation, muscle thinning, skin ptosis, sagging, cataracts, and potentially photocarcinogenesis are induced by long-term NIR exposure.

Despite the wide prevalence of a variety of UV blocking materials, such as sunblock, sunglasses, films, and fibers, effective methods for blocking NIR are not currently established. NIR exhibits both wave and particle properties and is strongly absorbed by water, hemoglobin, and myoglobin. NIR induces photochemical changes and affects a large volume and depth of tissue. As a consequence, NIR can penetrate the skin and the sclera, and affect the deeper tissues, including muscles, lens, and retina, with its high permeability.

Chronic NIR exposure can induce rosacea, which affects all races, although it is more common in Caucasians and fair-skinnedpopulations. NIR should be considered a critical factor in the development and aggravation of rosacea.

Erythema ab igne can be induced by long-term exposure to sources of heat and NIR, such as fires and stoves, and exhibits histopathological changes similar to those seen in solar-damaged skin. The occurrence of telangiectasia appeared to increase with age, increased sunbathing, and poor pigmentation ability. These lesions may develop thermal keratosis, such as hyperkeratosis, keratinocyte dysplasia, and dermal elastosis, which are similar to the changes that occur in actinically damaged skin.

Although various kinds of UV blocking materials are often used to prevent tissue damage from UV exposure, these materials do not block visible light or NIR. Therefore, we should protect ourselves with clothing or *physical block* sunscreen, and glasses that not only block UV, but also NIR, in order to prevent photo-damage and photo-aging. Additional studies are required to investigate the generally quantified dose limit for the body and the necessity of NIR protection."

Aton M. Holzer, MD and Craig A. Elmets (in a paper "The Other End of the Rainbow: Infrared and Skin")[5] stated "Until recently, chronic exposure to infrared radiation (when administered below the threshold for inducing thermal injury) was recognized as the cause of only one skin disorder, erythema ab igne, a reticulate hyperpigmentation classically seen on the legs of those sitting too close to hearth fires. This constellation of epidermal atrophy, pigment incontinence, collagen degeneration and dermal elastosis has had a revival of late with the increased popularity of laptop computers. Laptop computers, allowed to rest on the legs for prolonged

periods of time, can also produce this uncommon dermatosis. Additionally, IR was reported as causative in one case of keratosis lichenoides chronica (Vernassiere et al., 2004). IRA is present in some tanning beds and has been implicated in the potentiation of UV-induced damage in murine dermis (Kligman, 1982).

On the other hand, IR pretreatment has recently been observed to reduce UVB-induced DNA damage in murine epidermis, apparently by stimulating nucleotide excision repair (Jantschitsch et al., 2009). Moreover, IR is also employed in cosmetic dermatology for the treatment of rhytides and skin laxity because of its ability to stimulate the production of dermal type I and III collagen and elastin (Tanaka et al., 2009b), and has found clinical or investigative therapeutic utility in such skin conditions as scleroderma (Meffert et al., 1990), acne vulgaris (Orringer et al., 2007), wounds (Horwitz et al., 1999) and burns (Ezzati et al., 2009), and, in mice, in the treatment of melanoma (Dees et al., 2002)."

In response to a question "Are there any harmful side effects of regular infrared sauna use?" Thomas E. Johnson, Associate Professor, Colorado State University answered (in part)[6];

"The International Commission on Non-Ionizing Radiation Protection (ICNIRP) released a statement on Far Infrared Exposure in 2006. The ICNIRP statement on the biological effects of infrared radiation (IR) indicates that thermal injury (heat) is the dominant risk. Thermal (heat) injuries will depend on the wavelength (or color, if it could be seen) of the IR lights. IR light may cause thermal injury even if you do not feel pain for certain types of IR light exposure.

Hyperpigmentation, scaling, and telangiectasias (erythema ab igne) may occur from repeated IR exposures of elevated temperatures, even if the skin is not burned. Skin cancer is not expected from exposure to IR. However, increased skin temperature can reduce DNA repair efficiency, and promote skin cancer that is initiated by other agents. Skin thickness may also increase due to repeated IR exposures. Ultraviolet light is associated with photo aging of skin, and it is not specifically reported in association with IR light.

If the IR light is >1,500 nm, it is unlikely there will be any effects on the retina but damage to the cornea due to thermal heating could occur. The lens of the eye could possibly accrue damage due to elevated temperatures, leading to cataracts.

Additionally, one must be careful to not overcome the thermoregulatory mechanism of your body. It is possible to cause serious injury to a person by overheating when exposed to IR."

Protection

It seems that little can be done (or should be done) to eliminate Infra-Red Light. As said earlier "IR radiation is one of the three ways **heat** is transferred from one place to another, the other two being convection and conduction".

Also heat is essential for the maintenance of function of the human body.

So what do we do?

Well firstly we can minimise the amount of IR radiation we expose ourselves to, by;

1 minimising our time in the sun, without adequate protection using shade or clothing. Products containing physical sunblocks (Zinc Oxide, Titanium Dioxide, Clays (makeup), etc.) may also have a role, albeit limited.
2 minimising our exposure to other sources of IR radiation such as open fires, household appliances (heaters, lamps and toasters), industrial heaters (such as those used for drying and curing materials) – in general, anything that emits blackbody radiation (heat). Distance from blackbody radiation can minimise the effects.

Secondly we can minimise the effects caused by IR radiation. This would seem to involve antioxidants, inflammatory mediators and other materials that are known to minimise burns.

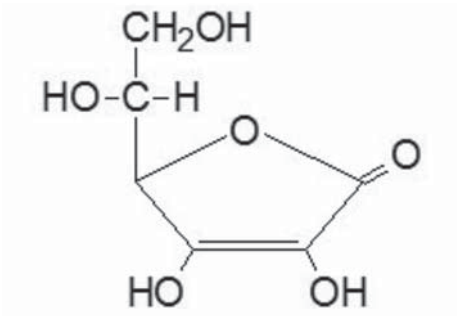
Some specialised cosmetic materials found in literature include;

L-Carnosine –

a nature-identical dipeptide present in milli-molar concentrations in muscle tissues. It protects cells against oxidative stress. In cosmetic products it is used as an anti-aging ingredient which has powerful antioxidant properties and stimulates collagen synthesis. L-Carnosine dose dependently and significantly inhibits IRA induced MMP-1 expression (in vitro) and is able to reduce the number of sunburn cells after UV exposure (ex-vivo results). In latest clinical findings L-Carnosine has been shown to have excellent results when it comes to protection against infrared-induced skin damages or hyperpigmentation induced by high-energy visible light.

Vitamin C (L-Ascorbic Acid)

- from blackcurrant, citrus fruits and tomatoes. Usually found in the form L-Ascorbic Acid (pure form), Sodium Ascorbate, Magnesium Ascorbyl Phosphate, Ascorbyl Glucoside, Ascorbyl Palmitate or Ascorbyl Tetraisopalmitate (an oil soluble more stable form of the vitamin). Also available is a stabilized matrix of micronized L-Ascorbic Acid in Octyl Hydroxystearate and Polysilicone-11.



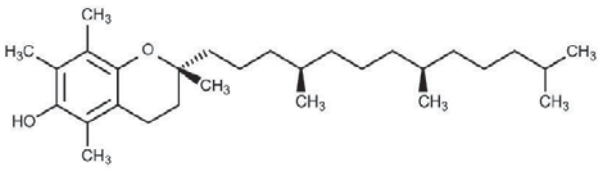
Vitamin C is an essential co-factor in the hydroxylation of proline and lysine to hydroxyproline and hydroxylysine which are necessary for the formation and the function of skin

collagen. Low vitamin C levels could result in diminished collagen synthesis. Recent studies have confirmed the need to deliver vitamin C directly to the dermis, in order to alter local deficiencies.

Important attributes are;

- Preferential stimulation of collagen synthesis, leading to enhanced skin elasticity.
- Potential reversal of thinning epidermis.
- Significant long term protection against UV radiation with continuous application.
- **Significant hydrophilic anti-oxidant action.**

Vitamin E (Tocopherol)



Natural Vitamin E is a mixture of α-Tocopherol; β-Tocopherol; γ-Tocopherol; and δ-Tocopherol, which have the highest anti-oxidant activity of all Vitamin E products commercially available, and has both anti-oxidant and moisturizing benefits. It is used in many applications from antioxidant effects in creams to preventing oils from going rancid. Usually used at 0.5 – 3% depending on the oil load in the formula.

It is reported that γ-Tocopherol; and δ-Tocopherol have 600 times more antioxidant ability than α-Tocopherol hence pure d- α-Tocopherol is generally used as a moisturizer and emollient. The more stable form of Vitamin E (Alpha-Tocopherol Acetate), is manufactured synthetically, has no levels of β-Tocopherol; γ-Tocopherol; and δ-Tocopherol; therefore have virtually no anti-oxidant ability, hence should only be used primarily as a moisturizer and emollient.

Ferulic acid

Is a hydroxycinnamic acid, a type of organic compound. It is an abundant phenolic phytochemical found in plant cell wall components such as arabinoxylans as covalent side chains. It is related to trans-cinnamic acid. As a component of lignin, ferulic acid is a precursor in the manufacture of other aromatic compounds. The etymology is from the genus Ferula, referring to the giant fennel (Ferula communis). Ferulic acid, like many natural phenols, is an antioxidant in vitro in the sense that it is reactive toward free radicals such as reactive oxygen species (ROS). ROS and free radicals are implicated in DNA damage, cancer, and accelerated cell aging. Animal studies and in vitro studies suggest that ferulic acid may have direct antitumor activity against breast cancer[2] and liver cancer.[3] Ferulic acid may have pro-apoptotic effects in cancer cells, thereby leading to their destruction.[3] Ferulic acid may be effective at preventing cancer induced by exposure to the carcinogenic compounds benzopyrene[4] and 4-nitroquinoline 1-oxide.[5] Note that these are not randomized controlled trials done with human participants, and therefore, the results of these studies may not be directly applicable to human use.

If added to a topical preparation of ascorbic acid and vitamin E, ferulic acid may reduce oxidative stress and formation of thymine dimers in skin.

Sensitive skin is vulnerable to external aggressions such as heat and chemical irritants making it more prone to react, causing skin redness, itching and burning sensations which are manifestations of inflamed skin. The activation of skin discomfort sensor TRPV1 channel, expressed on sensory neurons and keratinocytes, plays an essential role in the initiation and the perpetuation of skin inflammation. The presence of inflammatory mediators play a critical role in the development of reactive skin. It has been found that **Tasmannia lanceolata Fruit Extract** inhibits the release of IL-8 induced by IL-1a and dims the inflammatory cascade for optimal calming effect.

Hypericum perforatum

known as perforate St John's-wort, is a flowering plant in the family Hypericaceae. The common name "St John's wort" may be used to refer to any species of the genus Hypericum. Therefore, Hypericum perforatum is sometimes called "common St John's wort" or "perforate St John's wort" in order to differentiate it. It is a medicinal herb with antidepressant activity and **potent anti-inflammatory properties** as an arachidonate 5-lipoxygenase inhibitor and COX-1 inhibitor.

Studies carried out in 2013 on **Thermus Thermophillus Ferment**'s anti-ageing active offering Ultraviolet (UV) protection, has proved to be highly efficient against IR-Ageing.

Both UV and IR induce skin damage but in different ways, therefore, an efficient IR protection requires specialised strategies that Thermus Thermophillus Ferment has successfully demonstrated. Indeed, by an adaptive response to heat increase (specific to IR radiation) and the counteraction of IR-induced ROS production.

Thermus Thermophillus Ferment:

- Improves hydration via the protection of the mitochondrial integrity known to be particularly damaged by IR radiation (ATP synthesis and mitochondrial water content increased by 123%)
- Lessens the inflammatory conditions (PGE2: -54%, IL-6: -53%, IL-8: -61%, vs IR-irradiated control)
- Prevents the denaturation of matrix macromolecules in order to limit wrinkle formation (Collagen I: +70%, Fibrillin-I: +28% vs IR-irradiated control)

Clinical studies have demonstrated the positive effects of Thermus Thermophillus Ferment as being an anti-ageing active that meets expectations for a new generation of photo-protection based on UV and IR protection. It seems to be, by far, the most complete active ingredient to effectively fight against photo-ageing. Derived by biotechnology,

Thermus Thermophillus Ferment, is a ferment that is rich in multifunctional and stable enzymes.

In addition, it also complies with Chinese regulations for cosmetics ingredients.

Buddleja Officinalis Flower Extract

GLOBAL BIOLOGICAL PHOTOPROTECTION, that targets different harmful effects of UV, blue light and IR wavelengths

- Antioxidant and free radical-scavenger
- Stimulation of cellular detoxification systems
- Protection from inflammation
- Photoaging prevention

COSMETIC BENEFITS

- Maintains the normal skin physiology protecting it against effects of light radiations
- Fights effectively against ROS production, inflammation, irritation and dryness
- Prevents appearance of dark spots and premature wrinkling of the skin
- Preserves skin youth, quality and radiance

Finally, Jean T. Krutmann, M.D., professor of dermatology and environmental medicine and director at the IUF – Leibniz Research Institute for Environmental Medicine, Dusseldorf, Germany, theorised that a topical combination of vitamin C, vitamin E and ferulic acid appears to provide protection against skin damage induced by infrared A (IR-A) radiation.

The mechanism by which IR-A damages skin cells differs from the mechanisms of UVA and UVB radiation, where most of the IR-A radiation is absorbed in the mitochondria; in particular, certain components of the mitochondrial respiratory chain (Karu T. J Photochem Photobiol B. 1999;49(1):1-17). Dr. Krutmann and colleagues then theorized that to protect the skin against IR-A damage, "You just have to find **antioxidants which preferentially localize with the mitochondria** and can stop the signal cascade at the very beginning".

Based on that above it seems that IR Radiation is not the benign form of light we originally thought it to be, however, we can mimimise damage but not (yet) prevent damage from occurring. To quote an often-used scientific phrase;

"More research needs to be done".

References

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Jim Lucas, Live Science Contributor | March 26, 2015 02:52am ET

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Amino acid-based surfactants: more than just "natural"!

by Dr. Alexander T. Wagner
Zschimmer & Schwarz GmbH

Amino acids are key components of the human metabolism: Glutamate (fig. 1a), for instance, is the most important substance in the brain to transport information from one nerve cell to another. It is a neurotransmitter. Additionally, amino acids can be linked together in different combinations to create shorter (peptides) and longer (proteins) chains. Both fulfil a variety of different vital functions in the human body: Collagen, for instance, is the most frequently occurring protein in the human body. It is composed of three intertwined chains (triple helix) to lend structure to connective tissue. Simply for spatial arrangement reasons in this protein the smallest amino acid, glycine (fig. 1b), is the main component.

The water solubility of amino acids also makes them an attractive choice for the hydrophilic part of surfactants. When an amino acid is linked with a triglyceride-derived fatty acid (e. g. from coconut oil), surfactants (N-acyl derivatives, "amino acid surfactants", fig. 2a) exclusively based on natural components are created. When the amino acid is produced via a fermentation process starting from glucose or its derivatives, the surfactants even are completely composed of renewable raw materials (e. g. cocoyl glutamate). Those surfactants are an ideal choice for natural cosmetic applications.

Contrary to expectations, the development of amino acid surfactants is not a result of the current trend towards "green" surfactants. The first examples were patented in the 1930's [1]. Already at that time one candidate, a derivative of sarcosine (figs. 1c, 2a), was introduced to the market. The original idea behind this development was to create surfactants alternative to soaps (fig. 2b) to overcome their drawbacks (precipitation in neutral aqueous solutions, sensitivity to water hardness) [2]. The "trick" is to insert a suitable spacer between the hydrophobic part and the carboxylic group (fig. 2). By the way, in the 1930's also the replacement of the carboxylic group of soaps by a sulfo-group was developed (e. g. acyl isethionates [2] and fatty alcohol sulfates [3]).

The attractiveness of amino acid surfactants for cosmetic applications is additionally based on two other aspects: At first, they are proven mild and well foaming surfactants. Secondly, they are excellent biodegradable. The linkage between the hydrophobic and the hydrophilic part of the surfactant is an amide bond (fig. 2a). This type of bondage is frequently "used"by nature (e. g. in peptides and proteins) and can therefore easily be cleaved by nature's enzymes.

Acyl sarcosinates and acyl glycinates: unequal siblings

The difference between sarcosine and glycine is: In sarcosine one hydrogen atom at the nitrogen atom is replaced by a methyl group (figs. 1b, 1c). The seemingly small difference has an immense impact on the physical properties of the corresponding N-acyl derivatives. This can directly be traced back to the capability of acyl glycinates to create hydrogen bonds between the molecules [4]. For acyl sarcosinates, however, this is not possible (fig. 3). In the following some of the consequences are described.

Amino acid surfactants are produced via a two-step synthesis route starting from fatty acid. This process leads to a salt content of 5% and more in customary 30% amino acid surfactant solutions. Additionally, these solutions contain unreacted free amino acid. For some consumer products, however, a high purity grade is required. The reasons, for instance, can be reduced stabilities of "salty" products or

unwanted colour reactions of the free amino acid with other ingredients (e. g. essential oils). Some customers therefore prefer a limited content of salt and free amino acid of maximum 0.5% or even lower. For the purification process the melting point of the protonated amino acid surfactant plays a major role. For protonated lauroyl sarcosinate (lauroyl sarcosine) the melting point is about 50°C whereas for lauroyl glycine and lauroyl glutamic acid it is about 120°C and 100°C [5]. Protonated amino acid surfactants which are liquid at a temperature below 80°C – 90°C enable an easy purification step. So, this is only possible for lauroyl sarcosinate. As a consequence, commercial aqueous lauroyl sarcosinate solutions often have a low salt concentration. In contrast to this, there are only very few suppliers for highly pure cocoyl glycinate and cocoyl glutamate solutions on the world-wide market. To desalt them a more sophisticated procedure is necessary.

Another significant difference between the lauroyl derivatives of sarcosine and glycine is their solubility. Additional intermolecular hydrogen bonds stabilize the solid acyl glycinate form which reduces the water solubility. A suitable measure to prove this is the Krafft-temperature. It informs about the minimum temperature above which surfactants are water-soluble. For sodium lauroyl glycinate it is above room temperature even in weakly alkaline solutions [6]. In contrast, lauroyl sarcosinate is easy to handle in aqueous solutions. Its Krafft-temperature is below room temperature. At pH 7.5 a sodium lauroyl sarcosinate solution is completely deprotonated [2,7]. It is therefore soluble even in cold water and in slightly acidic solutions [2,8]. In a solution of the soap sodium laurate, on the other hand, 50% of the soap is already turned into water-insoluble lauric acid. This confirms the statement that sodium lauroyl sarcosinate is the "better soap" [2].

The different behaviour of acyl sarcosinates and acyl glycinates can also be seen in the viscosity of their 30% aqueous solutions. Whereas the viscosity of sodium cocoyl sarcosinate solutions is water-like, the viscosity of sodium cocoyl glycinate solutions can be in the range of several thousand mPa·s. Therefore, already in the production process problems can arise. Also, for some applications (highly) viscous cocoyl glycinate solutions are difficult to handle. Two very effective measures to reduce the viscosity of cocoyl glycinate solutions will be suggested when ZSCHIMMER & SCHWARZ products are introduced.

The capability of acyl glycinate to create intermolecular hydrogen bonds also has advantages. By these bonds, the stability of foam in comparison to acyl sarcosinate is enhanced [4]. It is discussed that via intermolecular hydrogen bonds the elasticity of the foam is increased [9]. This means that the bursting of foam bubbles is slowed down. In cosmetic applications consumers often perceive stable foam as a very creamy foam. The stabilization of foam by intermolecular hydrogen bonds is a general phenomenon [10]. In cosmetic products normally mixtures of different surfactants are used. Acyl glycinates with their ability to create hydrogen bonds are a smart choice to create a creamy foam also in surfactant mixtures.

A unique property of cocoyl glycinate is the ultra-mildness, which is proven in clinical tests [11]. In addition, the preferred pH-range to use acyl glycinates is the neutral to alkaline pH-range. These facts turn cocoyl glycinate into an ideal candidate for pH-neutral baby care applications as their skin has a pH of about 7. As shown later in a frame formulation, by adding suitable co-surfactants clear formulations can also be created in a pH-range of about 6.

Acyl glutamates: completely sustainable

With a longer carbon chain and an additional carboxylate group the derivatives of glutamates (figs. 1a, 2a) have some different properties than acyl glycinates and acyl sarcosinates. In the production process the additional carboxylate group leads to side-reactions which reduce the yield of the target product. To avoid this, surfactants based on acidic amino acids like acyl glutamates usually are synthesized in aqueous solutions to which a solvent is added. This was already recommended in the patent of the 1930's [1]. When the solvent is volatile like acetone it is removed afterwards to avoid its smell or other adverse effects. In case of using the odourless propylene glycol the solvent usually remains in the product.

Acyl glutamates have a hydrogen atom at the nitrogen atom so they should be able to create intermolecular hydrogen bonds like acyl glycinates (fig. 1). But because of the "bulkiness"of the glutamate group these hydrogen bonds play a minor role, if any. Regarding solubility properties in aqueous solutions, for instance, cocoyl glutamate behaves like cocoyl sarcosinate: It is easily soluble in cold water even in weakly acidic solutions, so it is also a "better soap" [2].

In comparison to the sarcosine and glycine derivatives, cocoyl glutamates have some further useful properties. For instance, they are excellent oil-in-water (OW) emulsifiers for oils of different polarity like vegetable oils and paraffins. Emulsions based on aqueous cocoyl glutamate solutions are cold-processable. Further "add-on" properties of acyl glutamates are discussed in the next section.

Acyl glutamates made from vegetable oils are completely based on renewable raw materials. When propylene glycol made from glycerol is used in the production process, this claim is still valid. Nevertheless, some customers prefer propylene glycol-free cocoyl glutamate solutions.

Surfactants in sulfate-free products for the natural cosmetics market usually are combinations of cocoyl glutamate and sugar surfactants. As cocoyl glutamate is a main surfactant in these formulations the requirements in terms of purity usually are very high.

The principle "thickening without thickeners"

To create viscous aqueous cleansing formulations two different paths are

taken. Alkyl (ether) sulfate solutions are thickened by adding salt. For other surfactant solutions the addition of thickeners is required which in some cases is unwanted. The usage of thickeners can be circumvented when lauroyl sarcosinate or cocoyl glycinate are combined with suitable other surfactants. Via pH-adjustment the viscosity of these surfactant solutions can easily be enhanced to 5.000 mPa·s and more. In two formulations introduced in the next section both amino acid surfactants are combined with lauryl sulfoacetate and cocamidopropyl betaine (CAPB). Usually the surfactant concentration in aqueous cosmetic solutions is so high that they are associated in micelles. A small part is shown in fig. 4. The wedge-shape ("triangle"-shape) for lauroyl sarcosinate (fig. 5) is the result of repulsive forces between the carboxylate group of the amino acid surfactant and other anionic head groups: the sulfonate group and the carboxylic group of CAPB when it is deprotonated. The disordered micelle shape creates low-viscous solutions (fig. 4). Now advantage is taken of the fact that by lowering the pH-value below 7 the carboxylate group of amino acid surfactants is more and more discharged via protonation [2]. Figuratively speaking, the "triangles" are more and more turned to "rectangles": "Ordered" micelle structures can arise at a pH-value of about 5 – 6 (figs. 4,5). This can cause a drastic viscosity increase of the formulation. The negative charge of sulfonate groups does not change by lowering the pH [3] whereas there is probably also a contribution of CAPB's carboxylic group to the viscosity increase. As a consequence of its betaine structure the pH-dependent behaviour of this carboxylic group (protonated or not protonated) is very special. It is discussed elsewhere [13,14]. By the way, the basic thickening mechanism is the same as for alkyl (ether) sulfates. The difference is the trigger (here: pH-value, there: salt). Some examples of thickening amino acid surfactant solutions via pH-adjustement are shown in the next section.

The above-mentioned property applies to lauroyl sarcosinate and cocoyl glycinate. For cocoyl glutamate the situation is completely different as the hydrophilic group here is inherently bulky (figs. 1,6). In alkaline solutions acyl glutamates are double negatively charged. This combination (molecular structure of the hydrophilic group plus two charges) can be used for the opposite effect: To "break" the viscosity of surfactant solutions (hydrotropic surfactant) [15,16]. As an illustration of this effect see fig. 4 from right to left (reverse arrow). In the next section an example for the viscosity decreasing effect of cocoyl glutamates as well as an example for the viscosity increasing effect is introduced.

ZSCHIMMER & SCHWARZ's amino acid surfactants

ZSCHIMMER & SCHWARZ offers amino acid surfactant solutions under the brand name PROTELAN: LS 9011/SL (INCI: Sodium Lauroyl Sarcosinate), AGL 95 (INCI: Disodium Lauroyl Glutamate), AGL 95/C (INCI: Disodium Cocoyl Glutamate) and GC (INCI: Sodium Cocoyl Glycinate).

Additionally, in our portfolio there are some very special products based on amino acid surfactants. LUMOROL K 5601 (INCI: Cocamidopropyl Betaine, Sodium Lauroyl Sarcosinate, Sodium Lauryl Sulfoacetate) is an example for the thickening principle described in the last section. It is a sulfate-free ready-to-use blend which enables the formulator to reversibly create a viscosity of about 5.000 mPa·s via pH-adjustment to about 5.5 [3]. In SEBUMOL S 1000 (INCI: MIPA-Cocoyl Sarcosinate, Polyglyceryl-3 Polyricinoleate, Polyglyceryl-3 Diisostearate, Polyglyceryl-3 Caprate) advantage of the liquid form of cocoyl sarcosine and its alcohol amine salts is taken: It is a clear, liquid product. The surfactants in this product are completely made from natural building blocks. Mixtures of SEBUMOL S 1000 with different natural oils can be used for PEG-free shower oil applications. Additionally, they are excellent PEG-free Make-up removers [17]. Table 1 shows an example formulation. The ingredient SEBUMOL ODPC was introduced earlier [17]. It is a special moisturizing ester on completely natural basis.

Aqueous cocoyl glycinate solutions like PROTELAN GC tend to be viscous. They can have a viscosity of several thousand mPa·s. Some customers prefer low viscous formulations. As mentioned before cocoyl glutamate is an excellent hydrotropic surfactant to reduce the viscosity of surfactant solutions. So, we added small amounts of cocoyl glutamate to GC. The resulting product is PROTELAN GG (INCI: Sodium Cocoyl Glycinate, Sodium Cocoyl Glutamate) which has an easy-to-handle viscosity of about 100 mPa·s. It still has all positive properties of cocoyl glycinate. Table 2 shows a body shampoo formulation which takes advantage of the mentioned principle to enhance viscosity by pH-adjustment. The viscosity of this formulation is about 10.000 mPa·s at pH 6. Another way to decrease the viscosity of cocoyl glycinate solutions is to reduce the salt content drastically. The regular salt content (sodium chloride) of unpurified 30% cocoyl glycinate solutions like PROTELAN GC is about 5%. In PROTELAN GC-D (INCI: Sodium Cocoyl Glycinate), the desalted version of GC, it is below 0.2%. This product has a viscosity of about 100 mPa·s.

Some PROTELAN-Types are ideal candidates for natural cosmetic applications. AG 8-EC (INCI: Disodium Capryloyl Glutamate) and AGE-C (INCI: Disodium Cocoyl Glutamate) are COSMOS and ECOCERT COSMETICS approved. AG 8-EC is a short-chain (C8) derivative with additional bacteriostatic and deodorizing properties.

For some customers propylene glycol-free cocoyl glutamate solutions are of particular interest for natural cosmetic applications. Propylene glycol-free PROTELAN-Types are AG 915 SF (INCI: Disodium Cocoyl Glutamate) and AG 37 (INCI: Disodium Cocoyl Glutamate, Sodium Cocoyl Glutamate). Both products are COSMOS approved

and in the process of NATRUE certification. The properties of AG 915 SF were already discussed in detail earlier [17]. AG 37 was presented at the In-Cosmetics 2019 in Paris. It was developed to match the high requirements of natural cosmetic products concerning purity. With AG 37 we succeeded in developing a product with a salt content (sodium chloride plus sodium glutamate) below 0.2%. Table 3 shows a shower gel formulation which is suitable for natural cosmetics.

Two surfactant blends containing cocoyl glutamate were developed for natural cosmetic applications. LUMOROL K NATURAL (INCI: Sodium Coco-Sulfate, Lauryl Glucoside, Sodium Cocoyl Glutamate, Alcohol, Caprylyl/Capryl Glucoside) is the "natural" counterpart of LUMOROL K 5601. It is also a ready-to-use blend. Aqueous solutions can be thickened via pH-adjustement (fig. 7). Via lowering the pH the glutamate carboxylate groups are more and more discharged by protonation. By this, the strong viscosity decreasing effect of acyl glutamates is steadily reduced towards a (partial) "knock-out": The "wedge"-effect is weakened which is equal to a viscosity increase. The additional trigger "salt" for coco sulfate can be used to support the viscosity increase in lower concentrated solutions of LUMOROL K NATURAL: The viscosity of a 28% solution at pH 4.9 is about 8.000 mPa·s when 0.6% salt (sodium chloride) is added. The other blend, ZETESAP 915 CS, is a suitable raw material to prepare natural syndet wash pieces. The surfactants in this product are coco sulfate and cocoyl glutamate. The advantages of using this product were described earlier [2]. Both blends are ideal candidates natural cosmetic products. In each of them cocoyl glutamate is able to reduce the "harshness" of coco sulfate.

Conclusion

The growing awareness of environmental aspects increases the focus on the raw materials used in cosmetic products. More and more, ingredients are preferred that are made from natural substances. For surfactants this applies to the hydrophobic and the hydrophilic part. The amino acid surfactants shown in figs. 1 and 2a are an ideal choice as their components – fatty acids and amino acids – are part of nature. They are proven to be mild with good foaming properties. For natural cosmetics, cocoyl glutamate is particularly interesting as it is completely based on renewable raw materials. For some customers in particular propylene glycol-free cocoyl glutamate solutions are ideal candidates for natural cosmetic applications.

The N-acyl derivatives of glutamate, sarcosine and glycine are the most popular amino acid surfactants in Europe. ZSCHIMMER & SCHWARZ offers surfactants based on these amino acids for all needs of customers. The latest developments are the propylene glycol-free PROTELAN AG 37 (INCI: Disodium Cocoyl Glutamate, Sodium Cocoyl Glutamate) and PROTELAN GC-D (INCI: Sodium Cocoyl Glycinate). Both have a very low content of salt and free amino acids (in sum: below 0.2%). AG 37 is approvable for natural cosmetic labels. All ZSCHIMMER & SCHWARZ products mentioned in this article are preservative-free and also available in RSPO-MB quality.

The usage of amino acid surfactants in combination with other suitable surfactants is a highly attractive way to create viscous cosmetic products without using thickeners: Lowering the pH-value starting from about 7 causes a steady protonation of the anionic carboxylate group(s) of amino acid surfactants. As a result of the neutral carboxylic function the micelle architecture changes completely. By this, viscous aqueous surfactant solutions can be created. This is the case in the particularly attractive pH-range between about 5 and 6.

Besides this, cocoyl glutamates can additionally serve as viscosity reducer and are an excellent choice for cold-processable oil-in-water emulsions.

"We still do not know one thousandth of one percent of what nature has revealed to us" (Albert Einstein). Extrapolated to amino acid surfactants this means: probably there are even more attractive possibilities for them in cosmetic applications which we do not know today.

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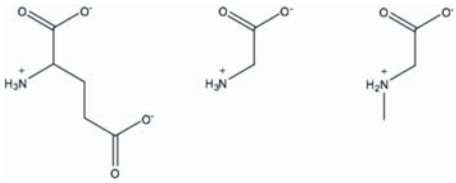


a) b) c)

Fig. 1: Examples for natural amino acids in aqueous solutions (pH 7):
a) Glutamate, b) Glycine, c) Sarcosine

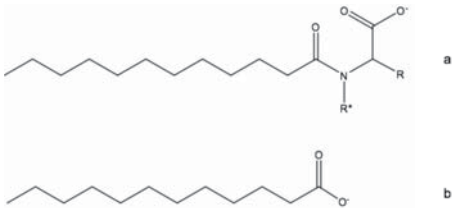
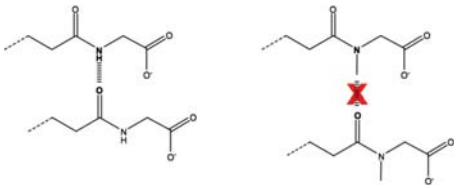


Fig. 2: a) Surfactants based on N-lauroyl amino acids (amino acid surfactants), R: Amino acid specific rest, R*: H for glutamates and glycinates, CH_3 for sarcosinates
b) Soap (laurate)



Acyl glycinate Acyl sarcosinate

Fig. 3: Two amino acid surfactants: Hydrogen bonds (hashed line) can be created only in acyl glycinates

Acyl glycinate

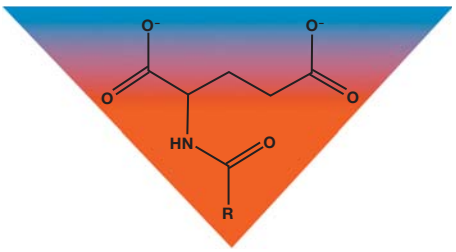
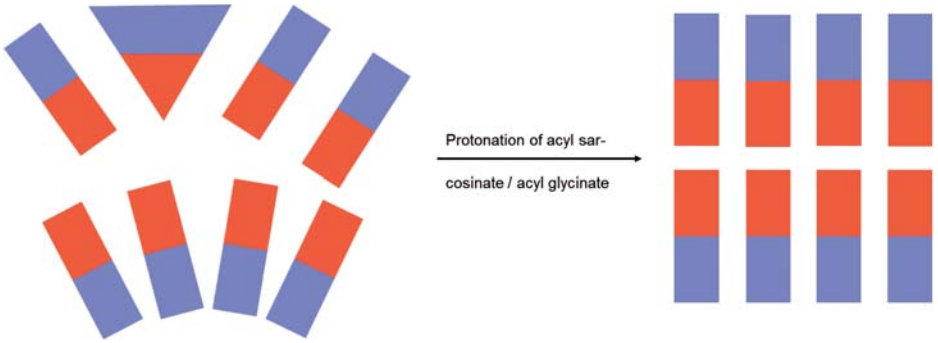


Fig. 6. Schematic spatial arrangement of acyl glutamates within micelles

Table 1: PEG-free Luxurious Facial Cleansing Oil

Ingredients	INCI	w/w %
Almond oil	Prunus Amygdalus Dulcis (Sweet Almond) Oil	53.75
SEBUMOL S 1000	MIPA-Cocoyl Sarcosinate, Polyglyceryl-3 Polyricinoleate, Polyglyceryl-3 Diisostearate, Polygly-ceryl-3 Caprate	30.0
Isopropyl palmitate	Isopropyl Palmitate	10.0
Macadamia nut oil	Macadamia Ternifolia Seed Oil	4.0
SEBUMOL ODPC	Octyldodecyl PCA	2.0
Perfume	Parfum (Fragrance)	0.25



Disordered micellar structures: Low viscous Ordered structures: Viscous

Fig. 4: Thickening process by lowering the pH

Lauroyl Sarcosinate Lauroyl Sarcosine

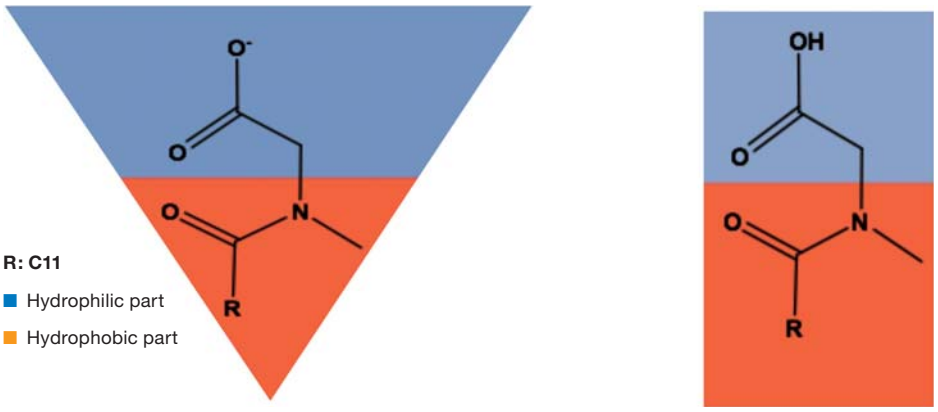


Fig. 5: Anionic and neutral form of an amino acid surfactant: Effective spatial arrangement within micelles. For the position of the "border" between hydrophobic and hydrophilic parts see literature [12].

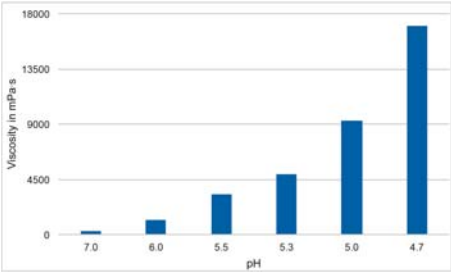


Fig. 7: 40% LUMOROL K NATURAL solution: Viscosity versus pH value

Table 2: Very mild and creamy foaming Body Shampoo

Ingredients	INCI	w/w %
PROTELAN GG	Sodium Cocoyl Glycinate, Sodium Cocoyl Glutamate	20.0
AMPHOTENSID B 5	Cocamidopropyl Betaine	15.0
Sodium Lauryl Sulfoacetate	Sodium Lauryl Sulfo-acetate	3.0
Polyquaternium-47	Polyquaternium-47	1.0
Perfume	Parfum (Fragrance)	0.5
Water	Aqua (Water)	60.5

Procedure:
1. Stir to homogeneity until the solution is clear.
2. Adjust the pH value with citric acid to 6.0.

Table 3: Shower Gel for natural cosmetics

Phase	Ingredients	INCI	w/w %
A	Water	Aqua (Water)	50.5
B	Xanthan Gum	Xanthan Gum	0.5
C	ZUTELAN GL 810	Caprylyl/Capryl Glucoside	15.0
	ZUTELAN GL 124	Lauryl Glucoside	5.0
	Perfume	Parfume (Fra-grance)	0.4
D	PROTELAN AG 37	Disodium Cocoyl Glutamate / Sodium Cocoyl Glutamate	20.0
	Sodium Cocoyl Hydrolyzed Wheat Protein	Sodium Cocoyl Hydrolyzed Wheat Protein	1.25
	Sodium PCA	Sodium PCA	1.2
	Glycerin	Glycerin	4.2
	Lactic acid (80 %)	Lactic Acid	1.5
	Sodium Benzoate	Sodium Benzoate	0.3
	Potassium Sorbate	Potassium Sorbate	0.15

Procedure:
1. Add B to A and stir to a homogeneous gel.
2. Combine C and stir until it is clear and homogenous.
3. Add all components of D to C in the indicated sequence and stir to homogeneity.
4. Combine AB and CD and stir to homogeneity.
5. Control the pH value and adjust if necessary to 5.3 – 5.5 (original).

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