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SPECIAL REPORT

INNOVATION A recurring obsession

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Miss Dior

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DIOR

Editorial

Innovation is in our heart

A recurring subject from our very first issue, innovation never ceases to amaze us. Anything goes! Raw materials, processes, support functions... Innovation takes us back to reveal bygone products' secrets. It invites us to think forward. It incites us to think of the here and now. The perfumery and cosmetics sector is a favorite for this tsunami. Every day,

"Innovation is no use if it is not fed with the ingredients of progress."

the public wants novelty. In this special issue dedicated to innovation, we will, of course, present novelties from the industry, from service providers, from researchers in the perfumery and cosmetics sector. We will, of course, show you testimonies from those who are innovation today. We will, of course, share with you the expertise that frames the field today. But we will also take a step back – or a step up, if you will – to give you another look onto innovation. Marc Giget's interview thus strongly stresses that innovation is no use if it is not fed with the ingredients of progress.

Enjoy the read!



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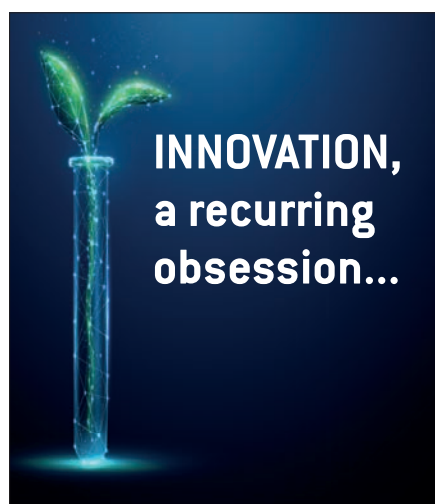


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CSR

Expanscience unites with the B Corp Beauty Coalition

With impACT, its new CSR strategy, Expanscience has set ambitious goals to accelerate its transition to becoming a company with a positive and regenerative impact.

B Corp certification

International B Corp certification ranks among the world's most demanding labels. It singles out companies that include social and environmental goals in their activities and business model and helps them move forward. There are currently 4,460 companies worldwide with B Corp certification. This certification covers five areas with key

impact: governance, employees, community, environment, and customers. The principle of interdependence aims at improving both the company and its entire ecosystem (partners, suppliers, customers).

After being the world's first pharmaceutical and dermocosmetic laboratory to receive certification in 2018, Expanscience has now renewed this certification and moved ahead by 10 points. Evaluation results highlight the progress made in a number of areas:

- measurement, reduction and definition of a trajectory to contribute to planetary carbon neutrality by 2030,



- eco-design of Mustela products and analysis of their lifecycle,
 - formulation of organic ingredients and use of a greater proportion of them in Mustela products,
 - certification of plant supply chains (Fair for Life), raw materials and cosmetics (Bio/EWG Verified),
 - social action for employees,
 - ethics and transparency,
 - joint actions with Expanscience communities and stakeholders to develop more sustainable offers and models.
- Regarding this last point, Expanscience is now part of the B Corp Beauty Coalition alliance.

The B Corp Beauty Coalition

Being a B Corp company with a pledge to be better for the world means doing more. To support this goal, Expanscience has joined forces with nearly 40 B Corp companies in the beauty sector to found the B Corp Beauty Coalition.

This international alliance of B Corp companies aims to implement in-depth changes that will improve the social and en-

vironmental footprint of the cosmetics industry. Its members commit to acting to improve the industry's key issues. They focus in particular on ingredient supply and sustainability, greener logistics and eco-responsible packaging.

The 12 elected members come from businesses large and small, from 8 different countries, and with a combined experience in all beauty categories. As a board member, Jean-Paul Berthomé, President of Laboratoires Expanscience, will play a special role in providing regular updates on the progress of the current working groups and for defining the next steps of the coalition.

"With our Mustela and Babo Botanicals brands and our cosmetic active ingredients business, we want to contribute to the transformation of the cosmetics industry. The B Corp Beauty Coalition enables us to act concretely in cooperation with companies that share our convictions. Together, we want to embody a new approach to beauty and speed up transition in the sector. This collective action is key to addressing major planetary challenges, such as contributing to worldwide carbon neutrality, combating the destruction of biodiversity and achieving zero waste" he says •

🌐 www.expanscience.com

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Ingredients

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Golgemma is a manufacturer and supplier of certified natural extracts since 1982 for the personal care and beauty, nutrition and well-being, and aromatherapy industries.

Relying on a solid network of partners producers, the company makes the traceability and sustainability of its products a priority.

Its extensive product range, including more than 300 natural extracts is based on the sourcing of top-quality raw materials ensured thanks to its twin location in the South of France, a region famous for the cultivation of aromatic plants.

In addition to the products in its catalogue, the company work with its clients in the development of their projects, offering a range of customized services, from feasibility studies to production.

Golgemma is a first-choice partner for the supply of cosmetic ingredients. At In-Cosmetics 2022, the company has decided to spotlight 6 of its most inspiring compositions :

- orange blossom hydrolate + Leucidal

- rose hydrolate + Leucidal
- arnica on hemp oil
- calendula on apricot oil
- cornflower on avocado oil
- apic oil – anti-oxidant active ingredient

Leucidal is a multifunctional antimicrobial ingredient of natural origin. Golgemma has chosen to integrate it in the preparation of its hydrolates due to its suitable preservative action. Using Leucidal now allows the company to offer a range of hydrolates with the same minimum date of durability as hydrolates with preservatives, i.e. two years. It is therefore an especially advantageous alternative to the synthetic preservatives used in cosmetics for the clients who prefer 100% natural floral waters.

Oily macerate: the fresh or dry plants macerate in carefully selected vegetable oils. The process is made in its own factory located in Die (France). The E vitamin, known as an antioxidant, is then added. The oil acts as a solvent and becomes a useful carrier for the actives of the plant ●

📧 www.golgemma.com



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engineering natural active ingredients

Haircare

New **root** cover up powders

The cosmos organic certifiable powders are available for blond, chestnut and black hair.

The hair care range of Nuwen composed with dry shampoo and styling powder was extended and now comprised a root cover up powder. In the same vein to develop effective, natural and waterless products, the R&D team has been working for more than a year to offer this new product to be integrated into the hair routine.

"We started from the observation that hair color needs to be renewed every six to eight weeks in average. But when gray hair shows up much sooner people faced to unaesthetic

and expensive constraints. In order to stretch out the time between hair coloring and to visibly reduce grey roots, we developed this root cover up powder", explains Sandrine Le Guichard, R&D Manager at Nuwen.

The formulas contain 100% ingredient from natural origin: organic corn starch, white clay and activated vegetable charcoal for the black hair formula. They are fragrance-free and Cosmos Organic certifiable. The shades are available for blond, brown and black hair and can also be custom developed.

Root cover up powders can be applied to all types of coloring, using a brush on the



roots of the hair, insisting on the visible areas: hair lines, temples, fringes. The application is to be renewed every day and rinsed with shampoo ●

📧 www.nuwen.com

Nuwen will present their new root cover up powders at in cosmetics in Paris from April 5 to 7, stand Q37.

Beauty tech solutions

Shiseido commits to **invest** in Perfect Corp.

Shiseido has announced a minority investment in Perfect Corp. (Taipei, Taiwan, "Perfect"), a leading AR and AI SaaS solution provider.

In the medium-to-long-term business strategy "Win 2023 and Beyond," Shiseido has positioned "Build a digitally driven business model and organization" and "Accelerate innovation through external collaborations" as a part of its strategies. Shiseido has provided virtual makeup experiences from numerous brands which were powered by Perfect's leading-edge innovative technology. *"Throughout the years, we have built trust and partnership with the company's market-leading expertise in this category.*



With the minority investment in Perfect, we will be able to strengthen our partnership and leverage state-of-the-art technology as well as consider making future collaborations with the company in new categories. This will help us accelerate our digital capabilities to enhance services to our consumers

and drive further innovation enabling us to be a global leader in the beauty industry" says the company.

Founded in 2015 by Alice Chang, Founder and Chief Executive Officer, Perfect is the world's leading provider of AI and AR SaaS solutions to the beauty and fashion industries. It serves a wide array of segments including cosmetics, skincare, hair coloring, fashion accessories, and more. Perfect's enterprise solutions are utilized by 95% of the world's top 20 global beauty groups and over 400 beauty brands in more than 80 countries and regions ●

📧 www.perfectcorp.com

Perfect Corp. launches pioneering NFT solutions with AR virtual try-on capabilities

Perfect Corp. has launched the first-ever virtual try-on NFT collection, bringing new experiences to consumers, and allowing them to virtually interact with the digital assets. The innovation uses augmented reality technology to create next generation NFTs, setting it apart from the currently available image, video, and audio formats. The solution also enables beauty and fashion brands to deliver this new NFT experience to their customers through their own digital channels, for example on brand's website or apps.

With this solution, consumers will be able to try assets across multiple beauty

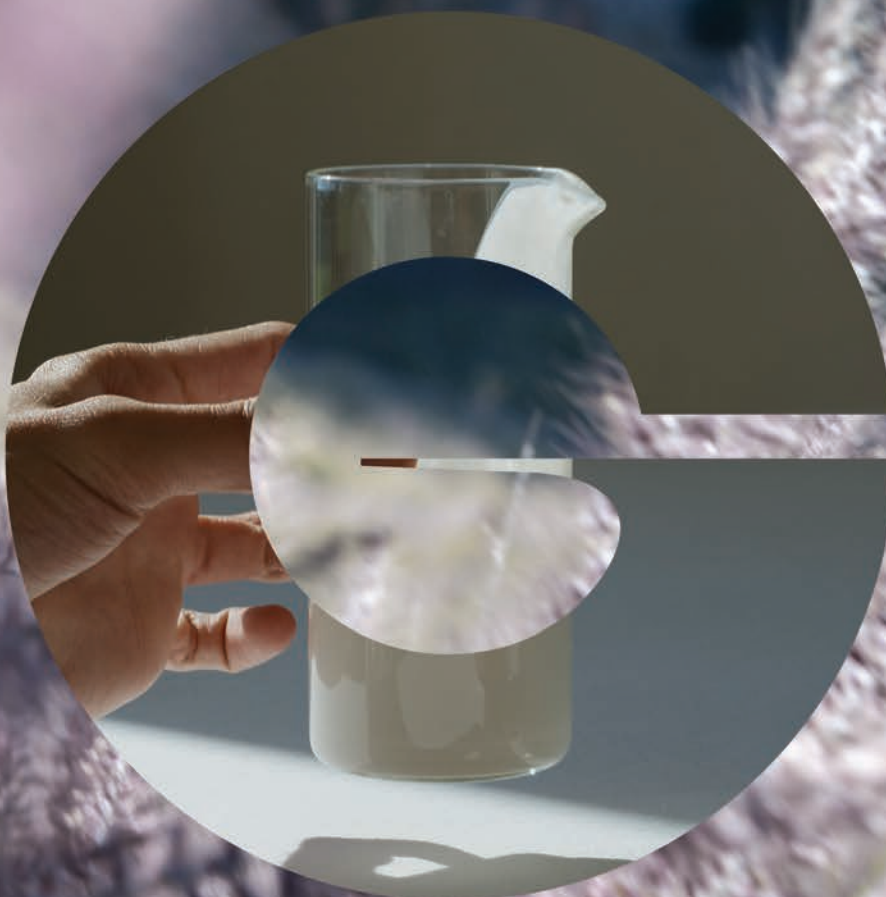
and fashion categories, including makeup looks, watches, jewelry, glasses, nail art, and more.

The new complete NFT business solutions from Perfect Corp. streamline the entire NFT creation process, and provides a simple and highly accessible release path for brands who wish to cater to the rising demand for wearable NFTs. As brands prepare to enter the Metaverse, these digital assets hold significant value, and can be easily adapted to engage consumers in new, fully immersive worlds, such as virtual stores

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Exhibition

Testing and regulations take centre stage at in-cosmetics Global

From sourcing the latest lab equipment to achieve high productivity, repeatable results and quick batch turnovers, to gaining insights into the regulatory and evaluation process, dedicated product zones at in-cosmetics Global will provide attendees with a unique opportunity to discuss their testing and regulatory needs with the industry's most prestigious suppliers.

Ingredient safety continues to make headlines across the EU as the latest consumer favourite hair care brand causes controversy for its alleged use of the now-banned ingredient, butylphenyl methylpropional (most commonly known as lilyal). The classification of the synthetic ingredient, that mimics the aroma of lily of the valley, was updated in May 2020 by the European Commission. And, from 1st March 2022, it was announced that the ingredient had been banned. Demonstrating the evolving nature of cosmetics regulations, brands and R&D professionals are required to not only keep pace with the latest legal changes but ensure their formulations are safe and compliant for consumers to use.

Helping brand owners and R&D professionals ensure their new products are safe, effective and compliant, the Testing and Regulation Zone returns to in-cosmetics Global from 5–7 April 2022 at the Paris Expo, Porte de Versailles. With lab owners and regulatory agencies confirmed to exhibit, attendees can find out how to put their products and ingredients through their paces to ensure industry and market compliance.

Helping attendees discover the most up to date regulatory data, Coptis Software Solutions will highlight how brands can gain access to validated, detailed, and continuously updated cosmetic regulatory data, and toxicology information of more than 3,000 substances. Meanwhile, helping attendees test the safety and efficacy of cosmetic products, Bio Basic Europe will showcase a range of valuable testing and product evaluation services, from *in vivo* and *in vitro* tests on medical devices, cli-



nical trials with ethical committees, to advice on regulatory compliance and chemical-physical and microbiological tests. Also exhibiting in the Testing and Regulation Zone, Delfin Technologies Ltd will showcase a range of portable instruments for product testing, including its MoistureMeterSC, designed to measure skin surface hydration; and SkinColorCatch, a precise all-in-one colourimeter for measuring skin colour, melanin, and erythema.

Elsewhere, the popular Lab Zone will also return to in-cosmetics Global this April

offering attendees a chance to discover the latest lab equipment. For example, Courage + Khazaka electronic GmbH will demonstrate its leading scientific testing instruments to assess a wide range of skin parameters from sebum, moisture, pH, melanin, elasticity, TEWL, roughness, colour, gloss, temperature and more. Additionally, Stable Micro Systems Ltd's Universal texture analysers will highlight how R&D professionals can measure the strength of gels, break strength of lipstick, hardness of tablets and soaps as well as the flow properties of powders and creams.

Skinobs partners with in-cosmetics Global to Boost Your Test

in-cosmetics Global will also provide attendees with a unique opportunity to identify the most suitable methods and test laboratories that best correspond to their evaluation specifications. Hosted by Skinobs – the search platform that allows cosmeticians worldwide to easily identify preclinical and clinical methods while facilitating testing laboratories to evaluate cosmetic actives and products on skin, hair or nails – the Boost Your Test feature at the show will guide participating attendees through the evaluation process.

Supported by PHD Trials, Complife Group, Validated Claims Support, Centre International de Developpement Pharmaceutique Ltee (CIDP), QACS and Monasterium Laboratory, the feature will enable visitors to find the answers to pertinent questions such as how to substantiate innovative claims; what is the best anti-maskne protocol; what CRO for SPF testing; and what methods to analyse the skin structure.



Roziani Zulkifli, Exhibition Director of in-cosmetics Global, commented: “in-cosmetics Global will once again provide attendees with a full view of the supply chain, from the innovative new ingredients coming to market, the lab equipment needed for formulating through to the testing and regulatory

requirements that brands must meet before a product is launched to market. As we return to Paris after a long-anticipated wait, we’re excited to bring all corners of the global personal care ingredient community together to once again network, source and learn.” ●
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Ingredients

Innovations from skin to scalp care

At in-cosmetics Global 2022 the Givaudan team is pleased to present two new innovations that will push the boundaries of sustainability and technology.

Patchoul'Up, the scalp dry flakes

eraser and self-confidence enhancer

Patchoul'Up is an eco-designed upcycled active able to rebalance sebum production, with a visible consequence of eliminating dry flakes from the scalp and normalising the microbiome for a global well-being. Sourced responsibly in Indonesia, Patchoul'Up is crafted by green fractionation following a 100% integrated, traceable, and durable sourcing and designed from patchouli leaves from leftover fragrance raw material.

Two double-blind studies versus placebo have shown that volunteers using a shampoo containing Patchoul'Up had +34% rebalanced sebum production and a -13% decrease of dry flakes. For those using only a leave-on lotion, they had a -31% reduction of dry flakes from the scalp in one month. 100% of the active group enjoyed an improvement of scalp quality. 87% felt a reduction of itching intensity and 93% saw no dry flakes on clothes. As dry scalp and flakes are commonly associated with a lack of well-being, two recognised neurosciences methods were used to evaluate evolution of the volunteers' well-being. They revealed that Patchoul'Up significantly improves by over nine fold their positive emotions while there was a more than threefold decrease in their negative feelings.

Patchoul'Up provides unique results, making it a true ally in the age of feel-good cosmetics!

Cristalhyal e-Perfection, the clay-vectorised HA for skin perfectness

Cristalhyal e-Perfection is pushing the boundaries of hyaluronic acid performance by its innovative and sustainably vectorised complex of bentonite clay and high mole-



cular weight (HMW) hyaluronic acid (HA). Crafted by biotechnology and empowered by the electrical attraction from the skin's deep layers, the active ingredient is providing a triple action to the skin, from well-ageing to long-lasting hydration and mattifying.

Inspired by the mechanism of electric devices enhancing the penetration of cosmetic actives by adjusting the electrostatic charges of ingredients, the innovative combination of this ingredient can deliver high molecular weight HA deep into the skin (as deep as a low molecular weight HA), to provide long-lasting hydration benefits, a smoothing efficacy on the skin on fine lines and first wrinkles, while benefiting from the detoxifying effect of the clay on the skin surface.

Clinical tests performed on 40 women aged between 35 and 55 years old demonstrated fast-acting benefits in just 1 to 6 hours (one application of the product), with a significant reduction of crow's feet wrinkles,

down to -17.4% versus placebo, and a mattifying effect down to -21.1% versus placebo. A prolonged use of the product, for one month, demonstrated an increased and durable efficacy, with a mattifying effect by -10.2% versus placebo (measurement performed at the end of the day, without the product on the face) and a decrease of fine lines by -22.7% versus placebo.

With this complex, consumers can enjoy synergistic benefits from popular ingredients about which they're already well-informed, in a clean and natural formula they can trust ●

🔗 www.in-cosmetics.com/global

During in cosmetics, meet Givaudan Active Beauty, stand G80



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Packaging

L'Occitane and VPI release their **refill** with 100% recycled polypropylene

Since its inception L'Occitane en Provence has been a brand that is committed to reducing the environmental footprint of its packaging and eager to embrace a circular economy. Increasing its reusable or refillable solutions has been at the core of this strategy ever since it launched its first eco-refill in 2008. Now VPI, a French specialist in injecting plastic parts for use in the luxury industry, is carrying out an ambitious and innovative project for the brand: to make a new kind of refill for its iconic Shea Ultra Rich Body Cream products.

A new refill and a new material: a real challenge to overcome!

Eco-responsibility is at the heart of L'Occitane's concerns. The strength of its CSR convictions is reflected in the products it offers, the ingredients it chooses and the packaging and accessories it uses. Products are made in accordance with the principles of eco-design and the Shea Ultra Rich Body Cream ticks several boxes for minimising its environmental impact. In addition to introducing a refill – which is a significant initiative in itself – L'Occitane's teams decided to use a 100% PCR (Post-Consumer Recycled) PP material. This entails reusing fossil resources and rooting L'Occitane more deeply in a circular economy process. The 100% PCR PP tub has the benefit of preserving natural resources, supporting recycling sectors and reducing the environmental footprint of the whole supply chain thanks to the inherent lightness of its material.



The use of 100% recycled PP and the creation of the tub represent genuine technological strides through which VPI has demonstrated its ability and commitment. It has been a truly impressive feat by VPI, on behalf of L'Occitane, to manage and ensure the traceability of batches of recycled material and expertly produce a 200ml container all within a tight turnaround time.

Reinventing modes of use of iconic product packaging

The 200ml Shea Ultra Rich Body Cream represented a major technical challenge. L'Occitane asked VPI to use its skill to meet the twin demands of flawlessly harnessing a new material and instilling new refilling gestures.

Close team work that involved studying the design of the grip and perfecting an

unsapping and re-snapping closure led to the invention of a user-friendly and pleasant mode of use.

The tub contains 200ml and is heat sealed after filling. At the first purchase, the tub fits in an aluminium packaging and then stands alone for reloading.

« We at VPI are honoured to work with committed companies such as L'Occitane en Provence. We are grateful to the teams on site who think ahead about eco-design and, when it comes to developing and mass producing products, invest so that they can oversee wonderful, genuinely eco-designed projects. We are proud to have been able to complete such deep research on recycled materials and to have helped bring such ambitious action plans to fruition, » declared Marc Beltrami, VPI's Head of Sales.

“The Shea Ultra Rich Body Cream refill enables us to substantially reduce our dependency on plastic. Compared to the old product, it accounts for an annual saving of more than 40 tons. It also helps us to fulfil our ambition of using Post-Consumer recycled plastic. VPI's teams rose perfectly to this challenge”, said David Bayard, the Packaging R&D Manager of L'Occitane en Provence ●

🌐 www.les-ingredients.com



Materials

Custom converter of high performance adhesives

Tecmatel is a converter of technical adhesives and other custom-made flexible materials. Its core business, which is still relatively unknown, is to assist and advise its customers in the manufacture of high-tech custom-made adhesive parts.

Among the wide range of applications offered, Tecmatel provides solutions for marking, surface protection, as well as sealing, electrical, dielectric, thermal, sound, gas, water (hydrophobic and/or oleophobic parts) and many other solutions.

The specialist in the transformation of custom-made adhesive parts, offers in particular for the field of cosmetics and aesthetics solutions of exfoliation for the skin, ephemeral tattoos and maintenance of nail / hair prostheses, skin jewelry and POS solutions.

A recognized expertise

The company has one of the most sophisticated and versatile machine parks in Europe with more than 42 machines for laser cutting, waterjet cutting, plotter cutting, flatbed cutting, lamination, slicing, cutting and slitting.

The production team is also continuously trained on new practices, machines and market innovations to offer the most technical solutions.

Official partner of 3M and certified "3M Preferred converter", the converting specialist knows how to rely on renowned partners. Tecmatel offers solutions



in collaboration with other partners such as Nitto, Tesa, Rogers, Scapa, Henkel...

A privileged relationship

Tecmatel has always supported its customers in the realization of the most complex projects by relying on values that are essential to it: listening, responsiveness, quality, technicality, innovation and performance.

Tecmatel is committed to always being a source of proposals in order to provide its customers with the most suitable adhesive solutions, taking into account the latest innovations in the sector, and considers its customers as long-term partners ●

● www.tecmatel.fr

Specialist in the transformation of custom-made adhesives since 1990, Tecmatel will be present at the Global Industrie trade fair (Hall 5 - Stand V75) from May 17 to 20, 2022. This SME with 54 employees based near Paris has chosen to present its expertise to all the major industrial players. For the 4th year of the Midest show, Tecmatel will present its know-how to all the major industrial players for the medical, electronics, aeronautics, cosmetics, luxury goods, POS, industrial and defense sectors.

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CSR

IES Ingredients: EcoVadis **Platinum** medal

The distribution company IES Ingredients has been awarded the Platinum Medal for 2022 by EcoVadis, world's most trusted business sustainability ratings. This medal distinguishes the top 1% of companies with the best ratings for their ethical practices and social and environmental performance.

With a score of 85/100, IES Ingredients meets the requirements of continuous improvement in CSR (Corporate Social Responsibility). At IES Ingredients company, this approach is driven by employees invested in issues such as the biodiversity protection, fight against global warming, action for the territory, well-being at work, ethics and internal communication.



"All our employees are aware of our CSR challenges and are motivated to take part in working groups. I would like to thank everyone for their commitment to improving our approach on a daily basis. This rating is therefore a recognition of our commitments to our employees, our customers and our suppliers", says Noël

Poinsignon, Deputy Managing Director. The EcoVadis rating has become increasingly important in this business, particularly in terms of sustainable procurement. IES Ingredients is fortunate to be supported by partners who are also committed to this continuous improvement ●

✉ www.ies-ingredients.com

Excipients

The Lipoid Group **expands capacity** at its Cologne facility

The Ludwigshafen-based Lipoid enterprise, which supplies excipients to the global pharmaceutical industry and operates four independent production facilities in Germany, remains on a continuous growth track. A medium-term investment in the triple digit million-Euro range is currently under-

way at the company's Cologne site, Phospholipid GmbH, to construct a modern production and laboratory complex, a pharmaceutical warehouse, and a new steam generation and cooling water unit, all on a total area in excess of 15,000 m². The implementation of this project is in

the hands of a 20-person interdisciplinary team covering the areas of engineering, quality assurance, quality control, production, and procurement, which is working together with local architects, specialist planners, and other experts.

This allowed the symbolic groundbreaking ceremony to take place as early as January 2022.

Commissioning of the plants for steam and cooling water generation will follow in the course of this year. Completion of the warehouse building is already planned for the first quarter of 2024. The areas for quality control, quality assurance, as well as administration should be ready to move in by the end of 2024 at the latest. Commissioning of the production building is likewise scheduled for the fourth quarter of 2024.

Through the implementation of the planned process and plant engineering, the corporate group intends to substantially enhance the capacity of this site while simultaneously complying with its self-imposed sustainability goals.

According to the overall project manager Dr. Lorenz Gabel, these investment projects are based on a clear decision of the Lipoid Group to pursue long-term development of the existing site ●

✉ www.lipoid.com



ies

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Latest NEWS

products & market

Packaging

Stoelzle Masnières Parfumerie SAS signatures



From left to right: Jardin de l'Orangerie, Neon Garden, Rosa Carnivora, Raving Rose, Cannabis Patchouli, Santal Greenery, Voodoo Chile, Rock the Myrrh, Fleur du Mal, Soie Malaquais.

On March 2nd, during the presentation of his Womenswear fall-winter 2022-2023 collection at the Paris Fashion Week, the Belgian designer Dries Van Noten unveiled his beauty collection of perfumes and make-up.

Creative director of the brand that carries his name, Dries Van Noten joined the Puig Group in 2018. Passionate about flowers – that he cultivates in his magnificent garden in his Antwerp home – he describes his debuts into the worlds of fragrance and make-up as if “*playing a creative ping-pong*”, teaming up with eleven leading international perfumers that interpreted different aspects of the brand’s unexpected olfactive universe. He has therefore expressed his creative and artisanal vision in a contradictory, rule-breaking genderless collection of 10 eaux de parfum.

The brand has entrusted Stoelzle Masnières with the exclusive production of both the glass and the decoration of these refillable bottles which like the world of Dries Van Noten, are full of striking visual statements.

This great collaboration between the development teams has made it possible to meet several challenges that make each of these bottles an object of beauty on itself:

- develop 10 versions of different decorations for each of the fragrances. 8 bottles were lacquered and 2 bottles were powdered; (exclusive STO process/Quali Glass Coat 2.0)
- adapt a new “clockwork” type neck with notches;
- provide several solutions for gluing the shells to ensure the perfect adhesion of each of the beautiful materials chosen for these 10 projects: porcelain, wood, metal, resin. Making these bottles true collectable objects.

Refillable bottles 100ml – in order to refill the bottle, a key and a funnel are sold to unscrew the pump kit ●

📧 www.driesvannoten.com

📧 www.stoelzle.com

Packaging

New range of beauty innovation with sustainable material

Chanel has just launched an innovative and eco-responsible approach to beauty combining skincare, makeup and a fragrance mist: N°1 de Chanel.

Its formulas honor ingredients of natural origin that are renewable and have reduced environmental impact. They contain up to 97% ingredients of natural origin⁽¹⁾ without compromising effectiveness, safety or sensory quality. The eco-design packaging includes sustainable Sulapac material, and faithful to the House of Chanel's exacting standards, every detail was considered.

The full range of packaging for the N°1 de Chanel is eco-designed and includes lids that contain bio-based materials. They are the result of a collaboration that began in 2018 between the Chanel Fragrance and Beauty Packaging Innovation Department and Finnish material innovation start-up Sulapac.

"The new-generation lid of the N°1 de Chanel Cream is made of 90% bio based materials from renewable resources: FSC⁽²⁾ certified wood chips that are by-products of industrial side streams combined with camellia seed shells. It was a genuine technological challenge that has now resulted in several patent-pending⁽³⁾ applications. Faithful to the House of Chanel's exacting standards, every detail



was considered at length including the sensory quality of the material; its resistance to heat variations; the unique sound of the jar closing; how it feels in the hand; and the depth of the matte satin finish engraved with the iconic double C," Chanel explains.

It took more than 40 trials before Sulapac's R&D Manager, Piia Peltola was able to find the right material recipe. *"It has been fascinating to see up-close this level of devotion to the brand feel and its environmental impact,"* Piia Peltola says. *"Our first big task was to innovate a bio-based material that contains by-product camellia seed shells whilst making it resistant to heat and moisture. It was just a concept idea when we started. Camellia is inherently hydrophilic material, meaning it absorbs water strongly. Solving this was a great accomplishment from us, and the first time we have incorporated such ingredient in our packaging material in a bespoke way,"* Peltola explains the scope of this collaboration.

"By this example we encourage more companies to choose sustainable packaging materials," says Suvi Haimi, CEO and Co-founder of Sulapac. *"It was fascinating to combine by products like camellia seed shells and FSC certified wood chips in this unique packaging material. Now, we have proficiency in also utilizing other side streams without compromising the functionality of the final product. It helps us to reduce the environmental footprint even further,"* Haimi concludes ●

✉ www.sulapac.com

(1) According to ISO 16128 standard.

(2) Forest Stewardship Council: Wood from responsibly managed, FSC certified forests and other supervised sources.

(3) Three international patent applications pending.

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cosmetics
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group

Packaging

Nuxe selects Aptar Oil'Mist spray pump

Aptar Beauty + Home is pleased to announce that its Oil'Mist dry oil spray pump has been chosen as the dispensing system for the entire Nuxe Huile Prodigieuse range including the newest launch in the line, Neroli.

The choice of Aptar Oil'Mist for Neroli follows several years of close collaboration with Nuxe, which began when the Aptar pump was chosen by Nuxe as the dispensing system for Huile Prodigieuse Or⁽¹⁾.

Launched in June 2021, Neroli is the latest expression of Huile Prodigieuse, adding a certified organic offer that answers the needs of modern beauty consumers seeking products that are good for themselves and do not harm the environment.

"Nuxe has worked with Aptar for many years, and we are delighted that this colla-



boration continues with this new partnership on our Bestsellers" says Silvia De La Flor, Head of Procurement Nuxe Groupe. Specially designed to dispense dry oils, Oil'Mist guarantees watertight, drip-free oil diffusion. Featuring a crimp-on pump system, Oil'Mist comprises of a watertight pump, a metal over-encapsulated actuator

and a metal cap. Reliable and robust, Oil'Mist incorporates a precompression spring that enables delivery of dry oil to the body in a light, but generous and uniform cloud.

Available in two formats – 100 microliters (50ml) and 140 microliters (100ml) – Oil'Mist spray pumps for the Nuxe Huile Prodigieuse range have been paired with caps that incorporate metal anodizing in high-end gold and rose-gold finishes to match the hues of the oils contained in the bottles ●

📧 www.aptar.com

Nuxe's Huile Prodigieuse is available in 65 countries around the world, and is the leading dry oil product in France's pharmacy and parapharmacy channels.

Ingredients

New natural and upcycled grapeseed oil

Grapeseed (*Vitis Vinifera*) oil is a natural and upcycled ingredient derived from wine production which generates an abundant by-product called grape pomace. This solid waste, often unwisely discarded, contains the precious seeds from which the oil is then extracted.

Olvea's grapeseed oil comes from a responsible and short-supply chain. Grown and produced in Europe using green manufacturing processes (solvent free extraction and physical refining), this product has a



low environmental impact and contributes to waste reduction.

Natural Cosmos Approved as well as 100% natural according to ISO 16128 standard, this high quality vegetable oil benefits from the purest assets and strengths.

Innovative cosmetic ingredient, our grapeseed oil enables personal care manufacturers to answer the growing demand for natural products. Its highly functional properties make it the perfect upcycled oil for skin and hair care formulations ●

📧 www.olvea-vegetable-oils.com

Perfumes

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Antinomie's mission is to offer everyone designer perfumes to give everyone the freedom to affirm what they want to be, when they want to be.

Through a varied, unisex and singular collection, the brand breaks the codes of the perfume industry and offers a unique olfactory universe of waters and extracts of designer perfumes, non-genetic, with concentrated formulas and long-lasting fragrances. All the fragrances are designed and developed in France and offered in generous and varied formats ●

📧 www.antinomieparfum.com



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Environment

Palm derivatives users pool funding to create positive impact in sourcing regions

Leading cosmetics, personal care, healthcare and oleochemicals companies are providing funding to a project that will generate positive environmental and social impact in the region where they source palm oil derivatives.

At least six members of Action for Sustainable Derivatives (ASD) – including Croda International, The Estée Lauder Companies through its Charitable Foundation, GSK Consumer Healthcare, Natura & Co, Seppic and Stéarinerie Dubois – will collectively provide financial support to an on-the-ground project in a priority region that has strong supply chain links and systemic environmental and human rights challenges.

The ASD Impact Fund has been developed in partnership with Tides Foundation, using the Tides collective action fund model which provides an established, efficient and effective way to enable multi-

donor collaboration to help create positive change in the world.

ASD is a collaborative initiative of palm oil derivatives users aiming to transform their supply chains. Each year, ASD conducts an investigation to map its members' supply chains and monitor risks. This helps to identify priority supply chain players to engage, as well as the priority landscapes in which to focus investment.

To drive positive impact on the ground in those priority landscapes, the collaboration undertook an extensive process to identify existing projects that address underlying issues influencing responsible practices in palm production landscapes.

The funding model will enable the six ASD members to collectively direct resources to those projects.

"We're proud to launch the ASD Impact Fund. Together, a number of our members are able to pool their resources to fund projects that support our vision for palm derivatives sourcing that is free from deforestation, respects human rights, and supports local livelihoods," said Edwina McKechnie, Associate Director, Consumer Sectors at BSR. *This first project will ensure resources go into directly supporting smallholders, landscapes and communities linked to ASD's supply footprint."*

"The primary purpose of ASD is to positively transform industry practices for key derivatives supply chains, and we are pleased



to see this work take concrete next steps. The collective impact efforts conducted through ASD will now allow different types of downstream companies, including intermediary players and SMEs, to support on-the-ground actions in strategic palm oil production areas connected to their supply", added Ariane Denis, Deputy Director, Sustainable sourcing at Transitions.

"Through the Fund, we are able to facilitate impact on-the-ground by providing a mechanism to collect finance from multiple sources, and secure a pipeline of funding to projects in priority production landscapes shared by palm derivatives users," said Ricki Berkenfeld, Manager, Consumer Sectors at BSR.

Michelle Fargen, Global Head of Procurement and Sustainable Sourcing, Croda, said: "It has been our desire to participate in direct impact projects to enable further positive results at local levels. The ASD Impact Fund will enable us to do this in partnership with like-minded ASD members. We are excited to see the positive impacts to our local market areas."

Nancy Mahon, Senior Vice President, Global Corporate Citizenship & Sustainability, The Estée Lauder Companies, said: "At The Estée Lauder Companies, we know that global challenges require collaborative solutions. That's why we're proud to support, through The Estée Lauder Companies Charitable Foundation, the launch of the ASD Impact Fund".

Marie Ollagnier, Global CSR Director, Seppic, said: "At Seppic we are proud and excited to contribute to the ASD Impact Fund. Seppic has actively promoted the sustainable transformation of the palm supply chain for years, and our participation in this on-the-ground collective program is a new step for us to further engage at the local level to reach higher positive impacts on the environment and communities."

Hervé Gondrand, General Manager, Stéarinerie Dubois, said: "Building this bridge between the downstream and upstream actors is fully in line with our commitment to make palm oil derivatives sourcing more sustainable, free from deforestation, respectful to human rights and supporting local

livelihoods. It provides us a path to the accomplishment of the agenda of the Sustainable Development Goals of the United Nations Global Compact."

Sarah McDonald, Vice President of Sustainability, GSK Consumer Healthcare, said: "GSK Consumer Healthcare is proud to support the ASD Impact Fund. Addressing the social and environmental barriers that stand in the way of people's everyday health is fundamental to our company purpose and sourcing commodities, such as palm oil, in a sustainable and inclusive way is a core part of our sustainability strategy".

The project will have an identified need and scope where ASD can add value through pooled funding contributions. In choosing the project ASD assessed:

- environmental conservation/ restoration potential;
- proximity to priority mills and landscapes;
- potential to enhance smallholder livelihoods;
- how established and robust the project is

● sustainablederivatives.org



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Packaging

New sustainable components in escalating PCR percentages

Available in 30, 60, or 100-percent post-consumer recycled content, Baralan's new closures offer an eco-friendly alternative to traditional polypropylene components. Baralan has announced it will now offer sustainable components in varying post-consumer recycled (PCR) percentages. The company's range of closures produced in their own production facility in Italy, which have been traditionally produced in polypropylene, will now be available in three PCR levels: a base level of 30%, an intermediate a level of 60% or a full level of 100%.

Baralan's new sustainable items will be developed in an effort to promote a circular economy throughout the cosmetics packaging industry that advances the evolution towards more conscious beauty and allows for a tangible sustainability approach. This benefits the environment by reusing waste, reducing energy consumption, and maximizing finite resources.

The varying PCR levels offered will allow brands to maintain their desired level of packaging aesthetics, while also achieving their sustainability goals and meeting the increased consumer demand for sustainable products. Even customers requiring components with premium aesthetics can



still incorporate a certain amount of PCR into their packaging solutions.

Importantly, the PCR material can be used with existing molds and equipment, allowing brands to transition to more sustainable products without having to invest in specialized equipment. When combined with the company's premier line of glass containers, the result is a significant step toward fully recyclable packaging sets important for companies striving for closed-loop materials circularity.

"This launch is extremely exciting for us in the sustainability perspective one that signifies our commitment to developing innovative, yet eco-friendly cosmetics and beauty packaging solutions that meet the high levels of quality our brand customers and end-users expect, while at the same time reducing our environmental impact, said Maurizio Ficcadenti, Global R&D Manager. While our PCR closures mark our latest shift towards sustainability, in 2022 and beyond our team will be keenly focused on making even more sustainable improvements across our product lines that support a closed-loop system for recycling materials and reducing waste" ●

✉ www.baralan.com

Make-up

Rechargeable pack of Phyto-Lip Shine Lipstick

Sisley entrusted TNT Global Manufacturing with the production of the rechargeable pack of its Phyto-Lip Shine Lipstick. TNT Global Manufacturing has developed the Phyto-Lip Shine Lipstick packaging for Sisley, designed in gold anodized aluminum with a PP insert and decorated with a white

silkscreened pattern, protected by a varnish. A silkscreened S on the top and the debossed logo mark this rechargeable pack. TNT Global Manufacturing also supplies the mechanism of this outstanding achievement ●

✉ www.tntgm.com



Packaging

Latest innovations in photobiology studies

CIDP has expanded its catalogue of services by adding various variants to SPF testing - sand resistance, sweat resistance, rubbing resistance, friction resistance.

With a foothold on four continents, CIDP provides unique access to a multi-ethnic panel of volunteers and offers protocols for safety testing (phototoxicity, patch test, observational, epidemiological and consumer tests). CIDP has invested in a wide range of equipment like Visia CR, Colorface, Antera, Primos, Dermascan C, DermLite that can help in objectively concluding on efficacy claims such as anti-acne, anti-wrinkles, pigmenting/depigmenting, whitening, etc. All the protocols at CIDP include a combination of biophysical and biochemical evaluations to objectively demonstrate the potential effectiveness of cosmetic products. Biomarkers that are evaluated include surface biomarkers as well as epidermal/dermal biomarkers (from biopsy punches). CIDP has recently developed methodologies for substantiating claims against exposome. With the help of its unique Controlled Pollution Exposure System, CIDP proposes quantified vaporization of pollutants (ambient dust, indoor dust, diesel, ozone) on the skin at controlled flux. Additionally, the mechanism underlying exposure to blue light can also be studied using monochromatic LEDs that emits light at 415 nm (mimicking solar radiation) or at 450 nm (mimicking electronic devices). Methodologies combining *in vivo* (application of product on human volun-



In vivo studies – volunteer's back exposed to a combination of pollutants using CIDP's unique Controlled Pollution Exposure System.



Ex vivo assays – hair strands exposed to UV and cigarette smoke.

teers), and *ex vivo* (exposure of tape strips or hair strands to exposure) are also proposed. CIDP's preclinical laboratory offers numerous cellular models including monolayer cells or human skin explants. The latter is a unique model that emulates real physiology of the human skin and allows an adaptable application of test product either topically or systemically. Numerous assays can be proposed including cytotoxicity, oxidative stress, inflammation, immunostaining of key biomarkers and skin penetration assays ●

● www.cidp-cro.com

Meet CIDP at stand S81 for the In Cosmetics Global Trade Show to be held in Paris from 5-7 April 2022.

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Show

MakeUp in Paris returns in live

MakeUp in Paris returns on June 16 and 17, 2022 at the Carrousel du Louvre for its 12th edition, gathering and inspiring the international beauty community to co-create and find, together, future solutions to the major challenges of the sector and determine the cosmetics market for tomorrow.

As a Glo.cal business facilitator, MakeUp in Paris is orchestrating a friendly and intimate event gathering with the best of suppliers and beauty brands of skincare and makeup.

MakeUp in will unveil its new identity!

Following the rise of the hybridization of makeup and skincare, MakeUp in has adapted its offer for several years now to meet the expectations of the market. Today MakeUp in has designed a new visual identity to reaffirm its skincare and makeup positioning.



Back to normal edition!

After a successful 2021 edition in October, MakeUp in Paris looks forward to welcoming +150 exhibitors and +4,000 visitors in Paris to resume business and promote innovation. Suppliers of ingredients, formulation, packaging, accessories, full service and digital makeup devices are eager for opportunities to display their products and network with potential buyers and brands.

"The pandemic has put an end to the trade show business, but the beauty industry, more than any other sector, needs a real trade show with face-to-face contact. The use of the 5 senses is mandatory to evaluate a beauty product" says Sandra Maguarian, show Founder and Director

MakeUp in Paris, a real beauty trends "Think Tank"

MakeUp in Paris will also feature a fulfilling conference pro-

gram with experts from the industry giving valuable insights into global beauty market trends. Among the conferences' main themes: color prescription, cosmetics marketing, beauty aging, launching a cosmetic brand, indie brands and distribution channels, re/generative cosmetics ... and more to come.

IT Awards competition

MakeUp's highly regarded innovation competition (ex IT Products) returns in 2022 with a new name and new features! More than a selection of innovative products, the new IT Awards competition will reward 4 winners among the innovations presented by the exhibitors.

All the selected products will be exhibited at the heart of the show and the winners will be rewarded with a trophy during an award ceremony on the first day of the show ●

📧 www.makeup-in-paris.com

Show

Technature and its WoW powders!

Ethical and responsible, powders are on the rise: they are light and can therefore be taken anywhere easily, they are waterless and therefore do not require preservatives and they meet the expectations of consumers who are increasingly concerned about the environment. Perfect for people looking for new gestures while being easy to use, they make you invest differently in the product experience.

But make no mistake, these formulas are practical but also elaborated and high-performanced with an expert know-how, whether in formulation or process control. Once rehydrated, they reveal multiple textures (gel, cream, mousse, etc.) and pro-



ducts with varied functions adapted to the different needs of the skin (moisturizing, purifying, soothing, brightening, cleansing, anti-aging, radiance, etc.). Powders have always been part of Technature's DNA: whether they are developed

for masks (peel-off, thermal masks, rinse-off masks, etc.), scrubs, face cleansers, or hygiene care, our powder formula offer is very wide.

However, powders have not finished inspiring us and revealing their full potential. What if a powder didn't need to be rehydrated to transform... This dream has come true with one of our latest innovations: a brand new powder that transforms into a cream, with guaranteed Wow effect and sensoriality! In addition to offering an original beauty routine, its formula is customizable (active ingredients, applications, color, etc.).

There is no doubt, powders can always surprise us and have a bright future ahead of them ●

📧 www.wow-products.fr

Environment

Geka continues sustainability push across entire value chain

In line with its vision of creating a cleaner beauty industry, Geka has been awarded a B Supplier Engagement Rating (SER) by the CDP for reducing the climate impact of its supply chain. The rating builds on an overall climate change score of B for Geka in 2021, illustrating how the high precision beauty application expert is taking a leading role in sustainable cosmetics.



SER scores are calculated by the CDP across multiple criteria: governance, targets, scope 3 emissions and value chain engagement. Companies undertake a CDP climate change assessment, with results used to arrive at an overall result. Ultimately, the awarded rating denotes the efforts made by a company to engage with its supply chain to minimize carbon emissions. Information provided by the CDP can be used by businesses to set further targets to tackle climate change and provide transparency to customers.

“One of our key targets for 2025 is to reduce the carbon footprint of our global value chain by 30% compared to 2019 and we are committed to working closely with our supply chain to achieve this, explains Girts Cimermans, CEO, medmix. We want our suppliers to be part of our journey towards a low carbon future, which means engaging with them regarding materials, logistics and types of energy used. By sharing these initiatives, we demonstrate to our cus-

tomers that by choosing Geka, they are partnering with a business which is actively working to improve sustainability in the beauty industry.”

As a part of medmix, a global leader in high-precision delivery devices, Geka is disclosing its activities with the CDP. This is aligned with the transparent, integrated approach that all medmix segments are taking towards improving their environmental footprint. Under this ongoing effort, Geka has had its carbon inventory independently assessed by the TÜV Nord last year and is also signed up to Science Based Targets Initiative (SBTi), which conforms to the Paris Agreement to reduce greenhouse gas emissions ●

● www.geka-world.com

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- **Reduce product waste**

INNOVATION, a recurring obsession...

In cosmetic perfumery, innovation is essential. Innovation that is communicated to markets and customers in any case... Whether it is in sourcing, formulation, process, packaging or management, innovation is an obsession for all the actors of the sector. How to do better? More respectful? Cheaper? From whom to draw inspiration? An answer in advance? Nature is everywhere...

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Testimonies

Innovation: what does it mean to you?

In this part, we let you speak... Two simple questions, but which allow us to know a little more about what makes you innovative on a daily basis. Thank you all for answering!



Adrien FAURE,
Cosmetic Project
Manager,
PolymerExpert



Audrey LOTTIN,
Project Manager,
Nippon Shikizai France



Pauline MARTIN,
Operational Marketing
& Communication
Manager, Givaudan
Active Beauty



Sébastien NICOULES,
R&D Manager, CDA.



Philippe SIBOUR,
CEO & Founder,
Alliance Consulting



Guillaume VIELLE,
Sales Manager,
Flavex



Florent YVERGNAUX,
R&D Manager,
Solabia Group

What is innovation according to you?

Adrien FAURE: Innovation is a way to make a good or an operation better according to contemporary expectations, by providing new solutions. A change of perspective, R&D work or even the transposition of applications from one sector to another can achieve this goal. Innovation used wisely is for me the key to a more responsible world.

Audrey LOTTIN: For Nippon Shikizai France, there are different types of innovations: product innovations, process innovations, marketing & commercial innovations and organizational innovations. We must work on each of its innovative axes in order to offer ever more interesting full-service cosmetic offers.

Innovation is for us the fact of deepening a new direction of work allowing our teams to be more effective, more relevant and more disruptive in order to bring novelties in our sector of activity. But innovation is also a state of mind, a desire for continuous improvement. To be innovative, we have to be creative, always have new ideas, do research, exchange with our partners in the sector and know how to question ourselves and be daring.

Pauline MARTIN: At Givaudan Active Beauty, innovation is at the heart of all our research in our Centers of Excellence dedicated to biotechnologies and plant fractionation. Indeed, each of the ingredients brought to market must be avant-garde. This ambition allows us to push the limits of what is possible, while remaining in line with our raison d'être: "Creations for happier and healthier lives, with a love of nature. Thus, we innovate as well in the performance of the ingredients,

BisaboLife is the proof, launched in 2017, we continued to work on the product to make it even more efficient and meet the expectations of customers and consumers all the more by unveiling its new performance in 2021. Cristalhyal™ e-Perfection launched during in-cosmetics 2022 is also proof of incredible work to make the impossible possible, namely, allowing high molecular weight hyaluronic acid to penetrate deeper into the skin and thus increase its skin benefits. Innovation at Active Beauty is therefore present at all times during the development and life of a cosmetic ingredient. Innovation is also present during our research before a product launch, in clinical tests, with the support of artificial intelligence as for the launch of Chronoglow, but also during specific tests related to neuroscience, thus allowing the measurement of the well-being benefits of a cosmetic ingredient, such as for Patchoul'Up, whose launch is also made during in-cosmetics global.

Sébastien NICOULES: Create relevant and sustainable solutions for new problems or improve existing solutions by thinking differently.

Philippe SIBOUR: Generally speaking, innovation symbolizes one of the major elements of intangible capital, the contours of which we wish to know in order to estimate the intrinsic value of a company.

Guillaume VIELLE: Innovation is the science put into application.

Florent YVERGNAUX: For the Solabia Group, as a supplier of active ingredients for skin and hair applications, innovation means developing new and ever more effec-

tive products that meet the needs of our customers. In this context, biomimicry is an inexhaustible source of ideas. This is achieved by constantly adapting to market constraints whether environmental or regulatory.

For example, the biology of skin and hair has made enormous progress over the last 10 years in understanding the functioning of numerous biological mechanisms. For example, we can cite knowledge of aging with the impact of genomics or knowledge of the microbiota, which is constantly expanding, with, in addition to these developments, interactions with the sensory and emotional aspects that have become essential. Very often, innovation, to be powerful and efficient, cannot be done alone and requires partnerships during projects. This is why the Solabia group has established collaborations with universities, technical centers and internationally renowned manufacturers, and also participates in various projects within the framework of the Cosmetic Valley cluster.

And what's the point?

Adrien FAURE: Innovation must be at the service of both humans and their environment. It allows us to improve the living conditions of everyone while preserving and respecting a balance with the planet that has been put aside for too long.

Audrey LOTTIN: Innovation can allow Nippon Shikizai France to stand out in its market. It can also allow us to improve productivity, reduce our costs or establish new partnerships with brands or suppliers. The important thing to remember is that innovation must increase the value of our company.

Innovation is at the heart of the policy of the cosmetics sector. All brands and stakeholders invest, try to innovate to be different, to offer products that create new needs and respond appropriately to consumer needs based on scientific and technological advances.

Pauline MARTIN: Innovation serves to meet the expectations of customers and their consumers, but also their future demands. We are talking here about concrete demands, such as even better performing products, in an even shorter time, while respecting their commitments, namely cosmetics that respect nature. This is also why we have a catalog dedicated to upcycling. But it's also why we respond to trends such as multifunctional ingredients to reduce the number of ingredients in a formulation. But also to the trend of skinification, taking part in this demand for care dedicated to the scalp. Innovation serves to energize the cosmetics industry, and to always surprise our customers and their consumers while guaranteeing an eco-responsible commitment.



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Sébastien NICOULES: To improve the daily life of users in the broadest sense while respecting the various constraints whether technical, normative or environmental.

Philippe SIBOUR: Isn't innovation one of the best drivers to stay ahead of direct competitors or to conquer new markets? Adapting one's strategy and the resulting organization to preserve one's revenues and one's capacity to innovate, an essential pillar of the business model, becomes obvious, especially for the cosmetics industry.

In fact, any innovation implies a share of risk that must be mastered and facilitated internally at all costs. Costs are high and resources are limited, which must be optimized through innovative processes or the integration of expert skills. The ultimate innovation sometimes lies in the simplicity or creation of new solutions on an existing basis. Thus, the innovative company is defined more and more by its ability to share as much information as emotions to the greatest number of people. The more it knows how to communicate its own insights, the more it will attract the support of its teams in an unavoidable change process, and thus encourage the emergence of future talent...

Guillaume VIELLE: Innovation contributes to extract the essence of nature.

Florent YVERGNAUX: Innovation is constantly used to adapt and progress in efficiency, stimulated by new scientific and regulatory information, while strongly limiting its impact on the environment. On these points, the evolution of biotechnologies (fermentation of bacteria or fungi, enzymology, microalgae) guided by biomimicry and new techniques of extraction from terrestrial or marine plants are key points in the development of new active ingredients that are increasingly effective in meeting the requirements and expectations of customers ●

Standpoint

Getting in tune with consumers and their emotions

Brands and industrialists in the cosmetics field are currently finding new ways to respond to regulations and market expectations that are more and more demanding. Innovation is key. Marc Giget, who is a professor, an innovation expert, a member of the *Académie des technologies* (Academy of Technology) and the president of the European Institute for Creative Strategies and Innovation as well as of the *Club de Paris des directeurs de l'innovation* (Paris Club of Chief Innovation Officers), explains it all.

How would you generally describe innovation?

The classic definition of the term means simply to add something new to reality. To give what's new a positive vibe, one should speak about "progress", which entails there's an enhancement: social progress, technical progress, medical progress... Individuals usually don't ask for innovation, but they demand progress in everything that regards them, meaning things get better: getting better health services, being better protected, in better health, more beautiful. In one word, happier.

It is to be noted that the great goals of modern innovation were set by the humanists of the Renaissance. They concern:

- the improvement of the human condition (education, health, means of existence... and beauty!),
- the improvement of human relationships through exchange, gratitude, sharing and cooperation,
- the improvement of life in the city (with the utopian view of building the ideal city),
- the improvement of our relationship to nature (man should strive to be more discreet and respect other species).

Although they were stated more than five centuries ago, these aims towards progress remain unchanged. Innovation allows us to advance further towards them.

Does innovation have specific characteristics in the field of beauty and the cosmetics industry, in your view?

Yes, because this is a field in which deliverables are very subtle, as they are linked to expectations, wishes, whims, yearnings, dreams and ideals – in other words, to the most profound human feelings.

One should however distinguish between innovation in the fields of makeup and care products, even though the aim is beauty in both cases.

Makeup, which is linked to the term cosmetics, is

"Major innovations were born from major constraints."

governed by aesthetic and cultural principles. As far as you can reach back into human societies, men and women have used makeup - more than they do today, actually - for their social life (dance, rituals, holidays...)

as well as for their personal wellness (beauty, seduction, recognition...). It is a fundamental element in the command of one's image and in social recognition. However, it is an ever-changing field, subjected to the transformations of society: trends, waves, fashion... The technical aspect is important, of course but, to sum things up, let's say the artistic director's role usually trumps that of the R&D directors where innovation choices are concerned.

The care sector is quite different, because it is close to the healthcare sector. R&D investments are very important, especially in the field of life sciences where progress is tremendous. Innovation processes are longer, more structured and supervised, getting closer to those observed in the drug industry.

Its impact is more structuring than that of makeup. It might be considered that it brings makeup a sound basis and the conditions of a more sustainable beauty.

Does innovation in cosmetics usually stem from demand from labels, or is it sparked by providers' initiative?

This illustrates the debate about the respective roles of "technical push" and "market pull" in innovation. The technological push from providers is very important in the fields of care, in the context of a major scientific and technological evolution which is far from over, especially in the biochemistry, molecular biology and regenerative biology areas. These scientific and technical pushes bring sizeable improvements, which a label cannot possibly ignore, because it would mean lagging significantly in terms of competitiveness.

However, innovation is also pulled by new requirements from society, which labels' marketing teams pick up

on. It is a difficult exercise in a rapidly evolving society whose aspirations can sometimes be contradictory.

The cosmetics industry faces numerous constraints (regulatory, linked to allergies and sustainable development, to take into account consumer's expectation of more transparency etc.). Can innovation be born from these constraints?

These constraints are linked, among other matters, to the 17 sustainable development goals 2030 which apply globally. Each country and field then add specific constraints, which can create the impression of a regulatory tsunami, especially in Europe where regulations are the most stringent. However, these evolutions are not industry-specific, every sector has to deal with them.

Also, all historical analyses show that major innovations were born from major constraints. Radical innovation can actually be defined as a way to get rid of constraints.

This is currently illustrated by a wave of revolutionary cosmetic products which are particularly efficient and contain up to 5 times less components than the previous generation. They stress the absence of those components which were problematic (no parabens, no silicones, no phenoxethanol, no phthalates, no conservatives, no titanium dioxide, no aluminum, etc.) and simplified formulations which first and foremost use natural extracts, as it is what the market currently asks for.

In his speech during one of your "Les Mardis de l'innovation" ("Innovation on Tuesday") conference cycles as far back as ten years ago, Mr. Éric Perrier from LVMH Recherche insisted on the role played by emotion. What role does emotion play in innovation in the cosmetics field?

Innovation in beauty answers a very profound need for individuals to feel beautiful in their own eyes as well as in other people's. This is definitely in the realm of sensitivity and emotion. Depending on how you think about beauty, you may feel included or excluded. The beauty industry has, for a long time, played a part in the exclusion of some of the population, by showing very specific types of beauty, which were standardized and unreachable, even by using the products being sold, leaving people with a feeling of frustration rather than making them feel better.

Faced with growing criticism, the industry adapted by recognizing the existence of many types of beauty. This radical mutation is not over yet. It will be necessary to go beyond just the perfunctory personalization of beauty products enabled by Industry 4.0. Fulfilling everyone's aspirations, developing one's own beauty, is tomorrow's great innovation challenge if we want it to generate as many positive emotions as possible. The field is wide - as Baudelaire said it so well, There are as many types of beauty as there are ways of considering happiness ●

Interview by Yaël Zajac

Marc Giget, innovation expert

Marc Giget is the president of the *European Institute for Creative Strategies and Innovation* (EICSI) and the *Club de Paris des directeurs de l'innovation* (Paris Club of Chief Innovation Officers). He's a member of the *Académie des Technologies* (Academy of Technology).

A renowned specialist of Innovation and its impact on human progress, Marc Giget first directed his research towards the socio-economic and strategic stakes of technical progress. This was the object of *La dynamique stratégique de l'entreprise* ("The firm's strategic dynamics"), a book which got an award at McKinsey's Grand Prix du livre de management in 1998.

He then created a firm whose business was to evaluate investments in the field of high technology and managed it for 15 years. This firm was the global



leader in its specialties (feasibility and evaluation of projects in fields such as space, telecoms, broadcasting, digital platforms, navigation, localization, resource management).

From 1998 to 2008, he held the chair for Economy and Management of Technology and Innovation at the Conservatoire National des Arts & Métiers.

In 2000, he created "Innovation on Tuesday", which consisted in conferences and free training in innovation and human progress. In 18 years, more than 500 players in the field of innovation.

In 2018, he published *Les nouvelles stratégies d'innovation, vision prospective 2030* ("New innovation strategies, a prospective view to 2030"), Éditions du Net and, in 2021, *Pérennité, innovation et résilience des entreprises* ("The firm's longevity, innovation and resilience"), Éditions EICSI.

Research

Lighting cosmetics through synchrotron techniques

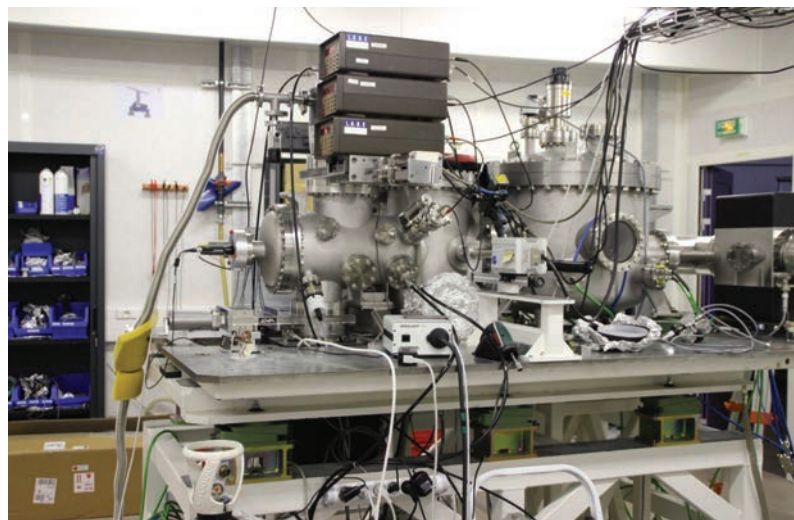
Ten thousand times as intense as sunlight, extremely bright, synchrotron light allows for a fine exploration of matter to understand its structure and properties better. Cosmetics industrialists wishing to innovate and analyze their products' properties and interactions with skin or hair can use it to "see" what happens at the heart of matter.

First, an electron cannon shoots electrons into a linear accelerator. These electrons then travel through a storage ring – the ring is as big as two soccer fields – and around it thanks to big bending magnets and inverters that will deviate them from their trajectory. Every time the beam is deviated, the electrons lose part of their energy, which is dissipated as synchrotron radiation. The energy loss is compensated thanks to superconducting cavities in the ring. Each synchrotron beamline is specialized in a given range of energies (or wavelengths) and one or more synchrotron technique(s): diffraction, diffusion, absorption, fluorescence, photoemission, radiography, tomography... Three types of information which can be useful to the cosmetics industry can be gathered through synchrotron light: structural information (molecular organization), chemical information (characterization of skin and hair biological matrices, of active substances and their interaction) and morphological information (to go into more detail inside a complex matrix). For example, using synchrotron light in the infrared domain helps determine the chemical composition of the various parts of a hair, or of skin, with spatial resolution that is only a few micrometers. Thanks to the synchrotron's X-rays, the structure of



▲ Synchrotron in Grenoble (France).

How a synchrotron works...
▼



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little or poorly crystallized materials can be analyzed for various applications: determining molecular envelopes, studying conformation changes, studying colloids, micelles, emulsions, etc. In addition, the performance of classic techniques can sometimes be insufficient to trace the penetration of active substances into the skin or hair, or to reveal their effects on these tissues' microstructure. Using microanalysis and synchrotron imaging techniques brings objectification tools for ex vivo analyses, because contrasts come from density, chemical composition or molecular organization, and therefore need no highlighting.

In further detail

"Synchrotron light offers industrialists techniques that complement those used by laboratories, often when the latter show their limitations. More photons are emitted, and the reduced-sized light beam allows for an easier observation of very small objects, down to a nanometer. Synchrotron light also makes kinetic monitoring faster, or observations more precise", adds Philippe Deblay, Head of industrial relations and development at Soleil, a synchrotron in the Île-de-France region. Using the

services of a synchrotron can also mean saving time. Just a few hours, when some analyses can take months! Among the domains to which this applies, cosmetics have a prominent position alongside pharmaceuticals, biotechnology or the complex materials sector. Cosmetics account for 10% of industrial projects in the Soleil synchrotron pipeline, for example.

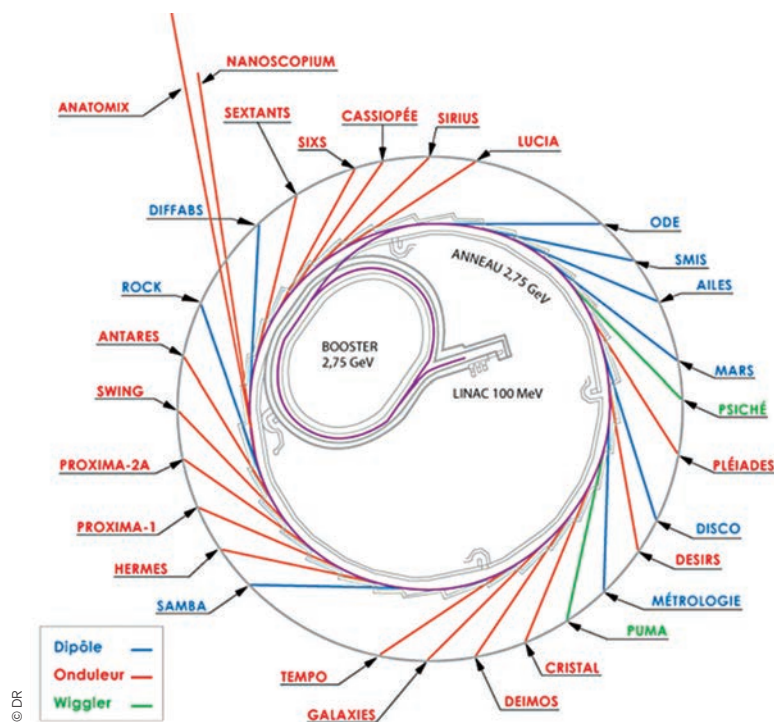
Soleil, one of two active synchrotrons in France, is among the founding partners of Cosmetomics, an innovation-oriented mutualization concern, alongside Cosmetic Valley, the project's sponsor. Cosmetomics is established in the Île-de-France and Normandy regions and advertises a wide range of innovating tools for characterization and its expertise in scientific instrumentation to study cosmetic products (composition, structure, chemical and microbiological stability etc.), their interactions with various media (skin, hair, container, etc.) and with the environment. The concern serves industrialists. Its aim is to fire up collaboration between firms and state-financed research, and to give SMEs access to a network of multidisciplinary skills coming from public laboratories and innovating firms. "Cosmetomics is a network made of 15 partners specializing in tests and measurements for the cosmetics sector. Alongside competitiveness hub Cosmetic Valley, 14 public and private entities make up Cosmetomics. Nine come from Normandy and five from Île-de-France.

Two synchrotrons in France

There are 80 synchrotrons in the world, including two in France. Located in the Île-de-France region, in Saint-Aubin on the Saclay plateau, Soleil (an acronym for Source Optimisée de Lumière d'Énergie Intermédiaire du Lure, Lure being an acronym itself, standing for Laboratoire d'Utilisation du Rayonnement Électromagnétique, a pioneering laboratory in the use of synchrotron radiation in France) was inaugurated in 2006.

A branch of CNRS and CEA, it is a center for research as well as a resource center for public and industrial research. Equipped with a 364-meter-long concrete ring, this synchrotron has 29 beamlines working in parallel. Soleil welcomes more than 3,500 external users, from France and abroad.

ESRF (European Synchrotron Radiation Facility) is older. It was inaugurated on Grenoble's scientific peninsula in 1994. This electron accelerator is financed by twenty-two member states and welcomes close to 7,000 researchers every year. In late 2018, as part of its Extremely Brilliant Source (EBS) project, aiming at enhancing its performances, it was stopped, then restarted in 2020 as the first high energy fourth generation synchrotron in the world; it produces X-rays that are 100 times as brilliant as its previous version and 10,000 billion as intense as those used in the hospital sector. Some 44 light lines turn around its 844-meter-long ring.



▲ The beamlines of the Soleil synchrotron.

Four universities, three engineering schools, three research firms (public contractors) and four scientific and technical centers belong in the network. A regional specialisation is on offer: the Normand part is specialized in the safety and innocuousness of products while the Île-de-France part is specialized in the efficiency of cosmetic products. In this operation, Soleil deals with the chemicophysical analysis, along with Cergy-Pontoise University", Philippe Deblay explains.

Composing, formulating, testing applications, comparing a cream's effects before and after an active substance has been added to a cosmetic product, for example industrial innovation must go through precise monitoring of interactions between a product and skin or hair. Synchrotron techniques allow to go into these analyses in more depth ●

Yaël Zajac

Ancient Egypt's cosmetics revealed by X-ray diffraction

The use of blush powders (very often lead-based) in Ancient Egypt has been known since the nineteenth century. By the end of the 1980s and at the very start of the 2000s, French researchers were able to analyze pigments further. The development of large instruments such as synchrotrons and progress in the field of IT led to new possibilities, bringing the necessary precision to study these compounds. Complex blends of these lead compounds

were first observed thanks to scanning electron microscopes, but this simple analysis was still insufficient to identify each of the mineral phases. To recognize the nature of minerals in the peculiar organization of chemical elements, researchers used X-ray diffraction, which provides an image of the distribution of atoms in matter. They also used synchrotron radiation to very precisely quantify the proportion of each mineral matter.

Innovation in biobased polymers for cosmetics

Nature in service of beauty

PolymerExpert has developed a 100% biobased rheology modifier for oils: the recently launched and already awarded gelling agent is a promising natural ingredient for innovative and ecologically responsible cosmetics.

Driven by its passion for innovation and commitment to developing natural cosmetic ingredients with sensorial appeal, PolymerExpert recently launched a 100% biobased oil rheology modifier derived from castor and rapeseed oils: EstoGel Green. This innovative and versatile natural ingredient can be used to modify the rheology of a large range of oil systems (polar to apolar), suspend particles (pigments, glitters, mineral filters), stabilize emulsions, and improve the homogeneity of applied cosmetic products at concentrations as low as 1%.

Since its foundation in 2000, the French company PolymerExpert has become a major player in the design and manufacture of specialty polymers. A variety of smart polymer technologies have been developed by the company, from self-healing materials to shape memory and photochromic polymers for medical devices. EstoGel Green, launched at the end of 2021, follows the successful launch of its precursors ExpertGel and EstoGel M. While ExpertGel is a water-soluble thermo-gelling polymer that brings exceptional rheological properties to cosmetic formulations, EstoGel M is an oil rheology modifier of more than 90% natural origin, born from an industrial/academic collaboration.

EstoGel Green combines natural origins with high-level performance and is an attractive solution for cosmetic industries who seek to substitute historically synthetic raw materials in the development of natural technical products for color cosmetics, perfumery and skin, sun and hair care, for example. The EstoGel Green technology is based on supramolecular chemistry and relies on the formation of intermolecular interactions for a broad range of oils to produce transparent, reversible and shear-sensitive gels with high suspensive ability. EstoGel Green is easy to spread, pump and spray (shear-thinning property), has a neutral sensorial touch on skin, is easy to disperse and allows the development of various galenics (anhydrous formulas, emulsions, sticks, etc.). It is in line with the



Thaïssa C. Chaparro,
PhD, PolymerExpert.

current industry demand as a Cosmos-approved ingredient of 100% natural origin, according to ISO 16128 (ION =1), free of palm derivatives and INCI China compliant with a friendly INCI name (*Hydrogenated Castor Oil/Sebacic Acid Copolymer*). Furthermore, EstoGel Green does not introduce microplastic fragments into the environment. It is an environmentally benign product not only due to its renewable origin but also due to its reduced environmental footprint at end-of-life. For its innovation and importance, the product has already won several awards in France by prestigious contests, such as Cosmétiquemag, Cosmet'Agora and Lipids & Cosmetics.

With consumers becoming more interested in natural products and with fossil fuels dwindling, the transition towards alternative renewable resources is now inevitable, and cosmetics are on the verge of a green revolution. Turning to nature as an alternative source of ingredients – as well as inspiration – can also be a strategic advantage: through millions of years of incessant work, nature has perfected its ingredients and processes, and new materials sourced from nature can offer improved biocompatibility, alternative physicochemical properties, and a unique sensorial effect that serve the well-being of body and mind. However, the promise of 100% human-friendly cosmetics is not

enough, it now is crucial to go beyond. PolymerExpert's holistic commitment extends to offering a positive and restorative impact on the planet, via nature-friendly products, from the source of its ingredients to the degradability of the final product. While nature has always been at the service of cosmetics, it is time for cosmetics to also be at the service of nature. And EstoGel Green is a key ally on the development of this new generation of responsible cosmetic products ●

Thaïssa C. Chaparro





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Claims

Hair beauty and human testing

Hair and beauty is a wide field of investigation for both devices manufacturers and testing laboratories. The hair care global market is recording an annual growth of 3% and will exceed the \$91 billion told *Premium Beauty News* last year. While Beauty may be a largely female-focused industry, the men may be particularly attached to their hair look. Hair is a big part of men or women identity worldwide and, as a culture, they are giving some importance on the look and style of their hair. Moreover, consumers are seeking new ideas for bettering their hair grooming rituals, in the form of products that are at once natural, ethical

OUR EXPERT



Anne CHARPENTIER
Skinobs

and sustainable but maintain their cleansing and caring benefits. Shampoos, conditioners, colouration, permanents, styling gels, offer various ways to follow the hairstyle trends. The ingenuity of the cosmeticians makes possible so many organoleptic design: shampoo, soap, serum, oil, mask, powder... A multitude of benefits whatever the type

and ethnicity of hair: care, volume, anti-frizz, smoothing, flat hair, repair, gloss, shine, colour, fine hair, curly hair, straightening effect, restore, anti-sebum, anti-dandruff, UV protection, anti-breakage, moisturising... Hair strength is considered as one of the primary indicators of its health. Finally, the wide range of hair beauty performance can be summarising as 4 main fields:

- wash
- cure & protect
- give a style
- colour

Clinical, use tests and biometrological studies play a key role in research and

HAIR CARE CLAIM SUBSTANTIATION – STRANDS AND CLINICAL ASSESSMENTS

Studied effect	Methods and devices
Fibre physical aspects and swelling analysis	hair cross-section by dimensional Analysis, DMS770 (Dia-stron)
Mechanical analysis for suppleness, flexibility, break resistance...	with tensile, stress relaxation, fibre bending, torsional analysis, combing analysis (wet or dry), friction, curl compression, three point bend. Rumba (Bossa Nova Vision), MTT690, FBS900, CYC802, FTT950, FDAS770 (Dia-stron), Fibrotext, Flexabrasion.
Hair surface, structure thickness, density diameter and permeability	Infrared microscopy, confocal microscopy, scanning electron microscopy, optical multiphoton tomography, atomic force microscopy, interferometric microscopy, polarimetric microscopy with K-Probe Xpolar (Kamax)...
Global hairstyling, anti-frizz, volume, curl, bending force, flexible hold	Bolero and Sirtaki (Bossa Nova Vision), image analysis, hair tune, fibra, one (Diastron)...
Combing	Sirtaki (Bossa Nova Vision) fibra, one (Dia-stron), XLW auto tensile tester
Colour and shine	Permeation, colour fade, bleaching test using: Goniolux, Glossyeter, SkinGlossMeter, Samba Hair and Salsa (Bossa Nova).
Anti-dandruff	Dandruff Meter DA20, gravimetry, imaging...
Optimize the protein	SquameScan (Heiland), FibroTX (Eotech)
Hair loss and hair growth	Trichogram, trichoscale
Anti-pollution	Epifluorescence microscope (oxiproteomics), fine particles quantification, heavy metal analysis, particles adhesion, lipidic peroxidation & proteins oxidation omics analysis (Phylogene).
Moisturizing of the scalp	Corneometer (C+K), Dermalab hydration (Cortex), Epsilon (BIOX), MoistureMeter SC...
Scalp surface	SpectraCam (Newtone), Epsilon (Biox), Dermatop-HE (Eotech), Visia-CR, Visioface and Visioscan (C+K), SiaScope, ViewSkin, C-Cube (Pixience), Antera 3D (Miravx) TiVi80 (Wheelsbridge), SIAScope, and all videomicroscops...
Sebum of the scalp	QuantiSeb, Dermalab sebum, sebumeter, sebum analysis: shotgun mass spectrometry, metabolomic MS:MS-16srDNA-PCR (Phylogene), Raman microscopy...
Global aspect	Hairdress score, sensory and neurosensory analysis, consumer tests...



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development for hair and scalp grooming to evaluate their efficacy and safety and improve hair care beauty products or scalp treatments to market. Finding the relevant testing, the reliable method and the experienced testing partner can sometimes be a real challenge.

The list of the biometrological protocols dedicated to fibres and head testing is vastly focusing different targets: the scalp, the cuticle, the cortex, the hair structure and mechanisms or the growth...

- Fibre physical aspects and swelling analysis: hair cross-section by dimensional analysis.
- Mechanical analysis for suppleness, flexibility, break resistance, smoothness: with tensile, stress relaxation, fibre bending, torsional analysis, combing analysis (wet or dry), friction, curl compression, three point bend.

- Global hairstyling, anti-frizz, volume, curls, bending force, remain hold, flexible hold, combability, shine...
- Hair structure and permeability: various microscopic analysis...
- Colour and shine: permeation, colour fade, bleaching test using.
- Specific claims: moisturizing, anti-sebum, anti-dandruff, hair loss and hair growth.

As a complementary point of view to the biometrological evaluation, other protocols including the scorage by dermatologists or hair dressers, the insight of consumers via questionnaire of lifestyles are highly recommended.

Moreover, the today inescapable antipollution claims which is also a big request for hair protection can easily be added to this list. Hair must resist to the environment for four to six, seven and even eight

years, compared to skin, which is usually renewed in 28 days. There is some evidence to consider the impact of the environment like cigarette smoke, gases, water and sun on the hair.

The antipollution on human objectivation can be summarised as in situ in polluted metropolis or under standardised pollution conditions (smoke, particles...) with the quantification of the protection effect by:

- heavy metal Analysis: HPLC;
- particles adhesion visualization: dermoscopes;
- lipidic peroxidation & Proteins oxidation: biochemical analysis, Carbonyl test Squalene, Monohydroperoxide (SQOOH), Malondildehyde (MDA);
- omics analysis.

The new digital era influences undoubtedly the beauty lifestyle and the customisation and personalisation of the hair care experience. It is propelling hair salons into the digital age using hair diagnostics and augmented reality such as L'Oreal's StyleMyHair, Wella's Colour DJ (Coty) or Schwarzkopf's SalonLab Apps. These new uses are in the heart of the relationship between the brands, the products and the consumers. It gives the opportunity, in a 3 in 1 way, to analyse the fibre and scalp, make a diagnosis and personalise hair care treatment on-site based on a client's hair data. The development of the app uses also helps the brands to collect data and insights of both hairdressers and consumers. It strengthens the trade marketing management with the hairdresser and enables to improve the safety of clients and professionals and the efficacy of these products.

The major issue of this beauty category is to answer the needs to combat both intrinsic and external damages, as they are mechanical, thermal or chemical treatments and protect from the environmental conditions. To substantiate all claims there are numerous and various protocols analysing at both microscopic and global scales the hair and the scalp. No need to split hairs any more! ●

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The red fox uses the earth's magnetic field to hunt[1]. The whitefly hijacks plant genes to neutralize toxins[2]. The raven anticipates its schedule[3].

No need to deny it. Many species besides *Homo sapiens* can develop ingenious strategies, sometimes more efficient than our own. Could cosmetic innovation benefit from what nature already knows?

Taking a closer look, the diversity of living organisms already provides every strategy and function desirable to the cosmetics industry. Based on this finding, Seqens cosmetics has built an innovation process that specifically addresses biomimicry to develop active ingredients through the observation of animal self-medication behaviour, strategies for resistance to extreme conditions or human exceptional longevity cases. Follow us behind the scenes of our discoveries in pursuing the creativity of the living that allows us to identify the sustainable active molecules of tomorrow.

OUR EXPERT**Aina QUEIROZ**Head of Innovation & Scientific Com.
Seqens**Biomimicry, a real newcomer?**

We often hear a voice protesting that humanity has always been inspired by living things and that biomimicry is nothing new. Indeed, humans have never stopped observing nature, studying birds to learn how to fly on our own, for example. But the very foundations of biomimicry really offer a new way of thinking, with new tools at our disposal. This term, popularized by Janine Benyus, is an approach to innovation that seeks sustainable solutions to human challenges by emulating the time-tested patterns and strategies found in nature for millions of years.

Indeed, the sobriety and efficiency of nature represent a lever to meet the growing needs of the population while res-

pecting the principles of sustainable development, defined by its 3 pillars: social, economic and environmental, perfectly in line with biomimicry. In essence, the living ecosystems are sustainably built for their survival and each species co-constructs relations of symbiosis, predation and defense with other species to ensure their prosperity. As an example, nature is full of solutions for saving or producing energy in an alternative way, with systems for converting energy into electricity, based on movement of algae, the fins of hump-back whales or the geometry of the wings of the long-eared owl. In this context, biomimetic scientists and innovators are looking to nature's blueprints to offer us a new generation of sustainable solutions. The fields of application are extremely wide, from bioinspired locomotion to architecture or therapeutic applications through active compounds of botanical origin.

Thus, the molecular content of the actual plants is the result of co-evolution with the rest of the living world, in contact with its "roommates" to either repel them (herbivores) or attract them (pollinators). All these extreme conditions in which they have been placed during their evolutionary life. They thus represent an infinite source of ingenious molecules that have ensured this exceptional survival and allow them to solve a wide range of issues. A first interesting lead is the observation of animal species able to take advantage of this library of plant molecules to heal themselves, a phenomenon known as zoopharmacognosy.

Zoopharmacognosy: animals practicing phytotherapy

Daniel Janzen was the first scientist, back in the 1970s, to publish and explain that certain vertebrates might just have acquired knowledge that enabled them to avoid certain toxic plants and even improve their



Figure 1: a western lowland gorilla (*Gorilla gorilla gorilla*) eating. Monitoring the health and behaviours of gorillas living in the Mamfé region highlighted the importance of *Aframomum melegueta* seeds in fighting certain inflammatory conditions[12].

own health through the plants they used[4]. The repeated observation of curative behaviours in animals has consequently given rise to a new field of research in the form of 'zoopharmacognosy' – a term coined by R.W Wrangham[5].

No real initiatives have been instigated in this perspective with regards to screening key biological pathways where skin tissue is concerned. That's why Seqens Cosmetics has chosen to put this at the center of its new plant molecular innovation and discovery platform known as "Etho-Phytology". Two avenues will be examined with a view to identifying plants with great potential in terms of developing new cosmetic active ingredients.

Many species practice what is known as "fur rubbing", which involves rubbing their coats or skin with plant-based compounds, to fight certain serious skin conditions or repel certain pathogens. Indeed, there have been many reported cases of the white-faced capuchin (*Cebus capucinus*) coating its fur in a plant-based material made up of four different species, namely fruits of the *Citrus* genus, stems and leaves of *Piper marginatum* and *Clematis dioica* and even *Sloanea terniflora* seed pods [6, 7]. During the rainy season, they chew these plants up, coat them in saliva and roll them in their hands before applying them directly to their fur to prevent certain skin diseases[6].

Other examples of more local applications include the white-nosed coati (*Nasua narica*) coating the fur on its stomach and face with *Trattinickia aspera* resin[8], which has a camphor/menthol-like odour. Some Bornean orangutans apply a greenish foam, obtained by chewing up *Commelina* leaves, to their joints and this plant is also used by local populations as an anti-inflammatory for muscle and joint pain[9]. In addition to the therapeutic benefits they have been found to have, some studies have suggested that such behaviours help to improve olfactory communication among groups [10] and



create social bonds [11] in the same way as grooming and hand-sniffing.

Members of the primate kingdom are known to consume a very wide range of plant-based substances for their therapeutic properties, including chewing on bitter stems or bark. Some cases of zoopharmacognosy in primates also involve them eating seeds. For instance, the western lowland gorilla (Figure 1) is believed to eat seeds of grains of paradise (*Aframomum melegueta*) to protect its myocardium[12]. Monitoring the health and behaviours of gorillas living in the Mamfé region of Cameroon has helped to highlight the importance of *Aframomum melegueta* seeds in fighting certain inflammatory conditions responsible for cardiomyopathy. Furthermore, the lack of availability of *A. melegueta* to gorillas held in captivity has been found to have a detrimental effect on the animals' health[12]. The fact that the seeds contain molecules belonging to the gingerol family, such as [6]-paradol, [6] shogaol and [6]-gingerol, could explain the preventive effects it has been found to have on the gorilla's myocardium through the cyclooxygenase-2 (COX 2) pathway[13].

We consequently decided to focus our attention on this *Aframomum melegueta* species[14] with a view to using this new discovery process to discover new active molecules. The implementation of an experimental plan allowed the laboratory to select the best extraction parameters for the seed and identify different anti-inflammatory fractions along with the associated active molecules. The various extracts obtained through this research were then tested on representative models of skin inflammation to identify the best possible combination for obtaining the extract.

The creation of this new scientific platform influenced by the observation of plant-animal interactions offers new opportunities for the company to develop bioinspired dermo-cosmetic active ingredients. Our

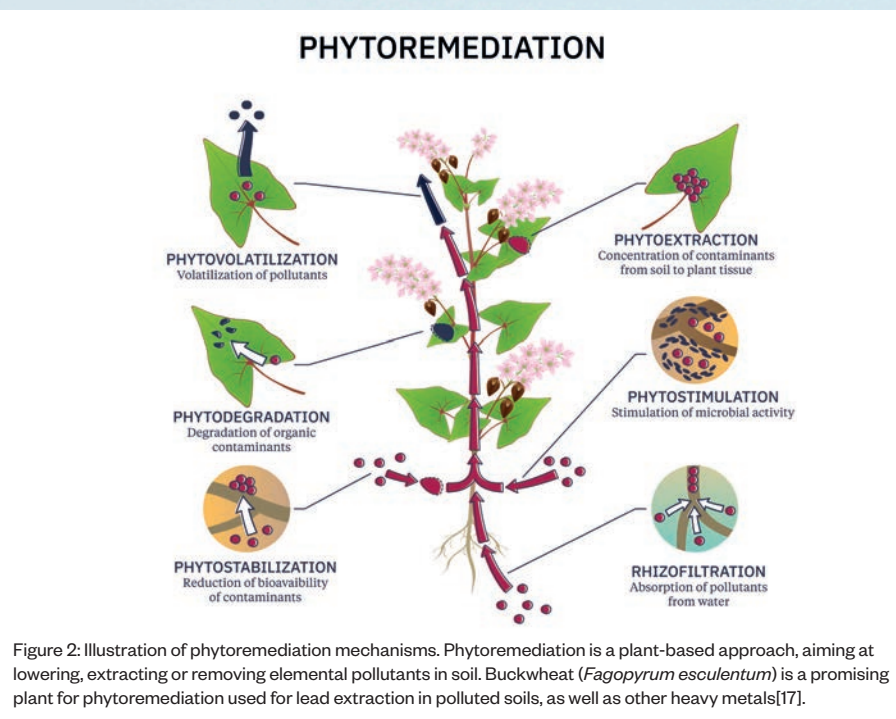


Figure 2: Illustration of phytoremediation mechanisms. Phytoremediation is a plant-based approach, aiming at lowering, extracting or removing elemental pollutants in soil. Buckwheat (*Fagopyrum esculentum*) is a promising plant for phytoremediation used for lead extraction in polluted soils, as well as other heavy metals[17].

investigations do not stop here: a second approach of new active molecule discovery in living organisms involves taking a closer look at species able to survive extreme conditions.

Extremophiles: these species surviving in harsh conditions

There are several ecosystems on Earth that are generally not habitable and are referred to as "extreme environments" where few life systems thrive. These areas represent a second, bio-inspired strategy to produce active ingredients dedicated to certain stresses at the skin level. The organisms that thrive best in these difficult environmental conditions, commonly called extremophiles, represent the unique adaptability of primitive life forms[15]. As an example, extremophile plants develop and grow in harsh environments with high levels of cold, heat, drought, pollution, or salinity, which has resulted in original adaptations. The structural, physiological and genomic features of extremophiles that make them capable of withstanding highly selective environmental conditions are particularly fascinating. Extremophile plants likely possess core mechanisms of plant abiotic stress

signaling [16] and these abilities are usually a source of inspiration for humans.

When looking at pollution, bioremediation is a natural process used to treat contaminated media through the use of living organisms. It represents an interesting source of inspiration to develop bioactive solutions adapted to urban skin. In this context, we screened different plants capable in their natural environment of both decreasing high levels of pollution, known as phytoremediation (Figure 2), and adapting the bacterial composition of its environment. From this perspective, we identified buckwheat (*Fagopyrum esculentum*, *Polygonum Fagopyrum*), a promising plant for phytoremediation used for lead extraction in polluted soils, with an ability to tolerate and accumulate Pb^{2+} as well as other heavy metals[17]. The rhizosphere of buckwheat can also impact the soil microbiome, with beneficial effects on its health[18]. Starting from a buckwheat extract, we thus carried out a clinical study to confirm its interest in promoting the adaptation of urban cutaneous microbiota. Moreover, certain bacteria are also of particular interest to bioremediation.

As an example, *Paracoccus aminovorans* is known to have interesting potential for soil bioremediation[19]. This species thus represents a promising candidate for bioremediation of PAH (Polycyclic Aromatic Hydrocarbons)-contamination, such as benzopyrene, also found in atmospheric pollution and harmful to the entire human organism, including the skin[20]. We thus sought to investigate *Paracoccus aminovorans* in this study, both in the polluted air and at skin level.

Thanks to this clinical study, the beneficial properties of this bioinspired buckwheat extract *versus* placebo have been demonstrated when applied to skin naturally exposed to a polluted environment. Significant evolutions were demonstrated both in terms of biometric and biological characteristics (skin tone, oxidation of *stratum corneum* proteins) associated with an impact on the cutaneous microbiota. This natural active ingredient thus represents a first candidate of interest to help the microbiota of skin exposed to pollution: it supports skin to adapt and limit the consequences of pollution paving the way for new developments within the "Expo'biota" concept.

Beyond survival in harsh external environments, some species are also of interest because of their extreme longevity. Our latest approach to biomimicry takes the healthy ageing of some human centenarian populations as a source of inspiration.

Healthy centenarians: champions of longevity

The understanding of the human longevity phenomenon represents a biomimetic axis of interest for dermo-cosmetic science. Experts in exceptional longevity suggested that ageing is not limited to genetic aspects, but also involves nutritional[21] and psychosocial factors[22]. The latest global report issued by the World Health Organization[23] highlights the importance of promoting "Healthy Ageing" and proposes a public health framework with the initial key measures



Figure 3: Okinawan farmer Alpinia zerumbet zerumbet (syn. Alpinia speciosa) leaves. This plant is commonly called getto or shell ginger, considered to contribute to longevity phenomena in Okinawa [25, 26].

along these lines[24]. From this perspective, the study of centenarians living in regions with a higher-than-average life expectancy, such as Okinawa Island, constitute a valuable research material to understand healthy ageing. As an illustration, the Okinawa Centenarian Study (OCS) conducted on more than 900 centenarians since 1975, suggested that genes, lifestyle and psychosocial factors are key to explaining this phenomenon[25].

Inspired by these unique characteristics, we went to Okinawa to meet local pharmacopoeia experts as well as the principal OCS investigators to take a closer look at the nutritional and psychosocial factors contributing to this exceptional longevity.

In the scope of this work, we have identified the getto plant (*Alpinia zerumbet*, *Alpinia speciosa*), known to contribute to longevity in Okinawa (Figure 3) [26]. A getto leaf extract was tested at the transcriptomic, proteomic and clinical scale. These studies were able to demonstrate a benefit on an "aged" fibroblast model (Hayflick replicative senescence model), stimulating the expression of most genes involved in extracellular matrix synthesis and organization. Effects on the inhibi-

tion of the expression of genes involved in the deterioration of the extracellular matrix, inflammation, or in response to oxidative stress were also observed.

At the *ex vivo* scale, after treating skin explants with getto extract, an improvement (*versus* untreated controls) in dermal-epidermal junction (DEJ) morphology and undulation was observed[27]. Immunostaining also evidenced a significant increase, for the treated explants (*versus* untreated controls), in the level of markers such as collagen type I and laminin-5, known to be key for skin cell-anchorage. In terms of clinical evaluation, VISIA-CR evidenced an improvement in skin texture after treatment with a getto extract formula *versus* placebo at 28 days and 56 days[27]. This treatment also contributes to a "healthy" appearance, by promoting a rosy glow instead of a yellowish complexion, one of the visible signs of skin ageing[27]. These studies therefore showed that this plant, in addition to its nutritional effect, also had a beneficial cutaneous effect by promoting tissue and cellular connections, while giving the skin a healthy appearance. This extract thus represents a botanical active cosmetic ingredient which falls within the scope of the

COSMETOLOGY

"healthy ageing" skincare product segment. Hence, these products no longer try, in vain, to make time stand still, but rather embrace the passing of time by promoting healthy ageing.

Other geographical areas with exceptional longevity are also being studied by our teams through field ethnobotanical surveys, representing the study of a region's plants and their practical uses through the traditional knowledge of local cultures and people.

What if biomimicry made us humbler?

In a world increasingly aware that other species are affected by our behaviour, there is also an urgent need to realize that our progress also depends on them. Biomimicry, meaning to learn from the strategies used by the living world, represents an interesting approach to prevent humans from being systematically put in a position of superiority. This discovery tool allows us to create products, processes, and systems that solve our greatest

challenges sustainably. It also encourages conservation for ecosystems and its inhabitants, because they hold the knowledge we need to thrive.

Does biomimicry show a future avenue for the cosmetics industry? At our level, as an explorer of new natural active molecules, this represents an incredible lever, whether by observing animal behavior, studying extremophilic plants or deciphering the mechanisms behind the exceptional longevity phenomenon.

The combination of these different approaches allowed us to identify three plants to help the skin in three distinct contexts: inflammation, ageing and pollution exposition.

- Inflammation: grains of paradise seeds (*Aframomum melegueta*), whose use by gorillas to heal themselves inspired the development of an anti-inflammatory active ingredient.

- Ageing: Getto (*Alpinia zerumbet*, *Alpinia speciosa*), one of the central plants in the Okinawan diet, a region with excep-

tional longevity. The extract of getto leaves prevents premature ageing and promotes healthy skin.

- Anti-pollution: buckwheat seeds (*Fagopyrum esculentum*, *Polygonum Fagopyrum*), a plant resisting very high levels of pollutants. It has been studied for the development of an active ingredient limiting biological impacts of pollution and recruiting certain microbes adapted to this urban environment at the skin level.

This research work is part of a global approach to sustainable innovation that consists of considering our impacts throughout the supply chain in full transparency and giving back to living organisms what they bring us by protecting them. The growing interest in this research of new bio-inspired components within the cosmetic industry is in line with consumer expectations. They are looking not only for nice stories but more and more for transparency and new opportunities to feel connected to the wild ●

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Cosmed update

Allergens in perfume – a long story!

When talking about fragrances in cosmetics, the subject of allergens often comes up. These substances are indeed distrusted by consumers despite the relatively stable and low percentage of allergic people (between 1 and 3% of the general population according to the opinion of the SCCS/1459/11). This is mainly due to a confusion between allergic reactions and irritations. Cosmed looks back at the origins of this list of allergens, and clarifies the expected developments.

What is an allergen in cosmetics?

First of all, a distinction should be made between allergies and irritations. An irritation reaction is a local and reversible inflammatory reaction of the skin surface, created by a substance that is not well tolerated by sensitive or weakened skin. This kind of reaction is much more frequent than an allergy reaction, which is an immune reaction of the body to a substance, known as an allergen or sensitiser, to which the immune system should not normally react.

If skin sensitisers are substances that have been “officially” classified by the CLP regulation (EC) n°1272/2008 for their sensitizing potential (risk phrase H317), cosmetic allergens are a much more restricted list of defined substances, mainly derived from perfume. This list of allergens originates from the opinion of the SCCNFP (Scientific Committee on Cosmetic Products and Non Food Products intended for Consumers) adopted in December 1999, defining 24 allergens. This list consisted of the 13 substances most frequently reported as allergens (according to the data of the time), plus 11 substances, less frequently mentioned, whose allergenic potential was less documented. The following year, this list was completed by 2 mosses commonly used in cosmetic formulations (tree and oak mosses)

OUR EXPERT



Sybille MILLET
Regulatory affairs, Cosmed

These 26 allergens were included in the 7th amendment of the former cosmetics directive 76/768/EEC, which introduced a labelling requirement if their concentration in the finished product is higher than 100 ppm for rinsed products and 10 ppm for leave-on products. This requirement, which came into force in 2004, has been maintained by the cosmetic regulation (EC) n°1223/2009 in force since 11 July 2013.

This list of 26 allergens has not been modified since its introduction, except for the banning of Lyrall (HICC) in August 2021, reducing the list to 25 substances. Then, the Regulation n°2021/1902 (so-called omnibus IV) of 29 October banned lilyal (*Butylphenyl methylpropional*) in cosmetics from 1st March 2022.

Tests used to assess sensitising potential of substances

The test used until 2017 to assess the sensitising potency of a substance was the in vivo LLNA test (Local Lymph Node Assay - OECD Methods No. 429, No. 442a, No. 442b). This test was used to assess the classification of a substance as a skin sensitiser under the CLP Regulation. However, in July 2021, the OECD warned that this test produces false positives when applied to lipophilic substances. This concerns in particular Linalool, Limonene, and Citronellol. (publication: OECD ENV/CBC/MONO(2021) 11/ANN6 of 16 July 2021)

Since 2017, *in vitro* tests are used to assess sensitising properties of substances under Reach Regulation. In June 2021, OECD published the “Guidelines on Defined Approaches for Skin Sensitisation”

(Guideline n°497). However, with regards to the OECD tests validated so far, technical constraints remain for lipophilic and multi-constituent substances (such as essential oils).

Developments in the safety assessment of sensitising substances

A model for dermal sensitisation quantitative risk assessment (QRA) was developed and implemented by the International Fragrance Association (IFRA). This model was evaluated by the SCCS in 2008 and 2012. The IDEA project (International Dialogue for the Evaluation of Allergens) was then established in 2012 to further improve the risk assessment of fragrance allergens. The IDEA project has introduced dermal aggregate exposure for fragrance ingredients resulting in the QRA2 methodology which was reviewed by the SCCS in 2018 (SCCS/1589/17). In that opinion, the SCCS concluded that explanation of certain methodological approaches and assumptions, as well as a description of uncertainties should be provided to enhance understanding of the methodology.

The IDEA project continued its work in order to further improve and refine the QRA2 methodology and in February 2022, a mandate has been sent to the SCCS to assess the derived safe use levels for the fragrance ingredient Citral by applying the refined QRA2 methodology based on the induction of skin sensitisation. SCCS will have to deliver its opinion by November 2022.

Changes in the list of allergens

This list has always been the subject of much discussion. The most notable development was the publication of the SCCS opinion in June 2012, which recommended increasing the list of labelled allergens to 87 substances! (Opinion SCCS/1459/11) While this opinion caused panic at the time of its publication, the subject remained in the shadows before emerging again in 2018.

Indeed, the European Commission has taken up the subject and has launched reflections on its implementation at Cosmetics Working Group of the European Commission.

An acceleration was made on 5th December 2018. A public consultation on the impact assessment of allergen labelling is launched on 3 scenarios:

- 1- No further action or labelling (Status Quo)
- 2- Labelling of all allergens on the packaging
- 3- Digital labelling of allergens, with several possible technologies (website address, QR code, barcode)

A new consultation is launched in November 2019. The summary of the surveys was published in December 2020. Positions are split in half between digital labelling, a position mostly defended by Industry, including Cosmed, and on pack labelling, preferred by consumer associations.

The European Commission has proposed a draft regulation in 2021 that adds all the new allergens to Annex III of the regulation, with a labelling requirement directly on the packaging.

The deadlines considered are 3 years for the placing on the market of products and 5 years for the withdrawal of non-compliant products from the date of publication of the regulation. Digital labelling is considered only as an additional information that cannot replace the information on the packaging, to not compromise the safety of consumers who do not have access to technology.

In general, digital labelling will need to be examined in depth in the coming years in coordination with developments in all sectors in this area.

Analytical methods

The implementation of allergen labelling cannot be done without the development of appropriate analytical methods, both at the level of raw materials and at the level of the finished product. IFRA has been working on this issue and has proposed a new method of determination, from 24 to

57 allergens. Why only 57? These are the allergens that can be "technically" analysed by GC-MS. Specifically, plant extracts and essential oils, which represent a part of the new list, can't be analysed by this method due to their complex composition.

In terms of certification, this IFRA method has been included in the new version of the EN 16274 standard published in August 2021 "Allergen analysis method - Quantification of the extended list of 57 suspected allergens in perfume raw materials and ready-to-inject perfume compositions by gas chromatography/mass spectrometry".

Next steps and challenges

The draft regulation is still under consideration by the Commission.

In order to facilitate the implementation as much as possible, the industry representatives, of which Cosmed is a part, have proposed to the Commission:

- The creation of INCI names for some substances that did not have them
- The use of "grouping names" to facilitate labelling and recognition of substances by the consumer (e.g., one name for different rose ketones "rose ketone" or for different kinds of lavender "lavandula oil/extract").

There are still some outstanding criteria on the implementation of the labelling,

especially with regard to the possible phenomenon of "double labelling". For example, in the case of the use of certain allergens listed as ingredients in the formula and also provided via the fragrance concentrate.

This should be clarified following further discussions in the working groups and in the final regulation which would be adopted.

However, once the regulation is adopted, another major challenge for the industry will be the implementation of the new labelling, which will impact all cosmetic products. First simulations estimated that the list of ingredients could be extended by 10 new allergens.

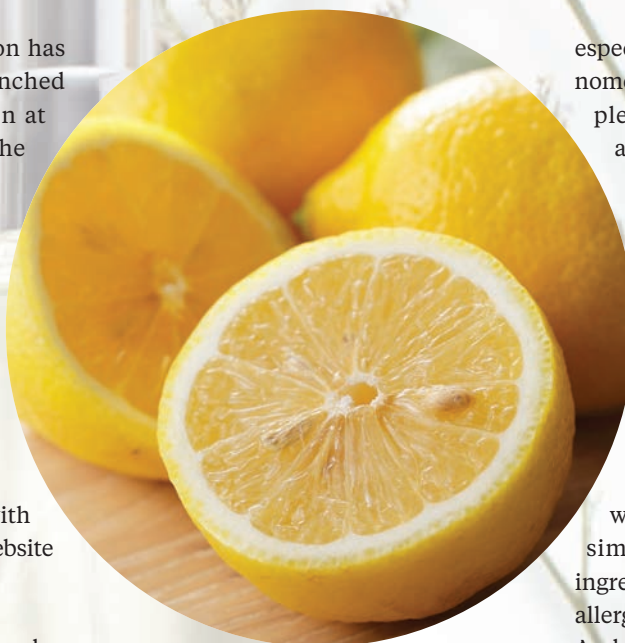
And on this point, due to the presence of plant extracts and essential oils in the new list, natural cosmetic products will be the most impacted. The analytical work and data collection on natural substances, which are themselves allergens from the list, will be a real challenge.

Also, the 36-month deadline given to the industry for placing products on the market seems very short in view of the foreseeable bottleneck in data collection between manufacturers and their fragrance suppliers. This collection time will have to be spread over several months and will further shorten the timeframe for labelling changes or reformulations, which will also have to be staggered in view of the volume of products concerned.

Conclusion

The year 2022 will be a pivotal year for allergens and the industry will be heavily involved in the implementation of this new labelling.

If the display is currently defined on the packaging, Cosmed continues to militate for dematerialization, in order to be in phase with the changes planned for the cosmetics regulation, which will be discussed more concretely during this year 2022. The objective is to reconcile the timetables. Cosmed participates in the Cosmetics working groups of the Commission and continues to actively follow this issue ●



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