REVEALING THE FUTURE OF ANTI-AGEING SKINCARE
Key directions for anti-ageing skincare

The annual in-cosmetics exhibitions offer insights into beauty manufacturing trends. By looking at new ingredient launches – along with recent patents and academic research – it is possible to see into the future of cosmetic innovation.

Anti-ageing continues to be a major force in all beauty categories. And within the skincare segment – which leads the industry in volume and trends – there are four key directions.

This exclusive report, supported by Euromonitor International and authored by global skincare analyst Nica Lewis for the in-cosmetics Group, reviews them and highlights potential areas for future growth.

Key directions for anti-ageing skincare

- **Sirtuins, stress & epigenetics**
- **Anti-pollution**
- **Peptide power**
- **Natural**
Sirtuins, stress and epigenetics

Sirtuins burst onto the beauty scene almost 10 years ago following a discovery that suggested resveratrol influenced sirtuin activity. These energetic multi-action proteins regulate cell metabolism and ageing, increase anti-oxidant enzymes and reduce free radicals. Despite much fanfare and launches from major brands like Estée Lauder and Avon, sirtuin technology didn’t quite take off. New skincare products with resveratrol continue to appear, and the next few years may see sirtuin technology revived thanks to new research and new ingredients.

A team at US-based Biocogent has patented a sirtuin stimulating complex with an added protective mechanism. The researchers sought to address a concern that sirtuins had a potential side effect on damaged cells. The anti-ageing complex combines a sirtuin activator and a “sirtuin-offsetting agent” that aims to “prolong cell lifespan while simultaneously avoiding proliferation of cell damage.” It is proposed for cosmetic and pharmaceutical applications. Meanwhile, scientists continue to explore sirtuin biology and the beneficial effects of sirtuin modulation on age-related disorders (diabetes, Alzheimer’s, etc.) and the ageing process.

As a further sign that sirtuins are set to enter mainstream lexicon, there’s a new diet based on foods that claim to have an effect on sirtuin activity. Developed by two London nutritionists and tested in a gym, the Sirtfood Diet emphasises foods that are rich in sirtuin-activating polyphenols such as apigenin, gallic acid, myricetin and quercetin. On the menu are strawberries, buckwheat, rocket, walnuts, kale, green tea, and capers as well as red wine and cocoa. As an inclusion diet (versus an exclusion calorie-restricting diet), it promises to “supercharge weight loss and help stave off disease”.

Among others, Alban Müller, Sederma and Active Concepts offer sirtuin technology for cosmetic applications.

The sirtuin-stress connection
Sirtuins are also believed to be important in maintaining the integrity of the genome, especially in relation to stress. As a result, scientists are also analysing the role of sirtuins in epigenetics (the field that studies external or environmental changes to genes). For example, SIRT1 and SIRT6 appear to complement each other in acting on ageing and inflammation. Further mapping of the functional relationships between and among sirtuins is an exciting new area of research that will have implications for cosmetic science.

Epigenetics and dermatology
A group of researchers in the US, Denmark and France believes the study of epigenetics opens many possibilities for dermatology. Their work examines the epigenetic tools used by cells: methylation, histones and microRNA. It considers applications for treating melanoma, psoriasis and skin ageing. It also highlights two ingredients – resveratrol and Himalayan red rice – said to target these epigenetic mechanisms.

For several years, cosmetic ingredient suppliers have been exploring the world of epigenetics in search of new anti-ageing ingredients. In 2011, Lonza launched ReGeniStem; a year later Infinitec introduced NatureCells, and
Silab’s Epigenomyl followed in 2014 – all are based on actives that affect epigenetic markers.

Mibelle Group believes that epigenetics now shows that gene expression is a much more complex system than imagined. “We are investigating how skin ageing by environmental factors is potentially causing long term epigenetic alterations of the genome in skin cells”, explains Fred Zülli, Managing Director. The Swiss firm’s latest efforts are focused on finding classic models of epigenetic regulators for use as cosmetic actives. Its newest active mimics the function of a Royal Jelly protein responsible for the queen bee’s epigenetic programming. In-vitro studies show an EGF-like activity of RoyalEpigen P5. In clinical studies, the ingredient increased skin regeneration and led to improved evenness in skin tone.

**Stress and the mind-gut-skin nexus**
The link between stress, brain, gut and skin is another exciting area for development. Research has already shown how physical, environmental and/or psychological stress can trigger inflammation in the stomach or on the skin.

Some studies have revealed that stress itself can also leave a legacy, by transferring to future generations. As we begin to understand more about this phenomenon it will be possible to develop appropriate skincare products and treatments. Suppliers are exploring this mind-skin connection with a range of novel actives.

Givaudan broke new ground this spring with Neuroporphline™. Said to be the first generation of cosmetic active ingredients able to block the production of cortisol, the major stress hormone, this active also claims to promote the release of endorphins. It is derived from the wild indigo seeds, rich in protein and used in Ayurvedic medicine to restore health and treat skin conditions.

BASF’s Neurobiox™ anti-ageing active focuses on a new metabolic pathway: the neuro-cutaneous exchange. The effect on human skin biopsies treated with Neurobiox™ formulations showed a ten per cent increase in epidermal thickness and accelerated rates of renewal (in-vivo data). The results after two months demonstrated that the ingredient provided improvement comparable to and slightly better than glycolic acid.

Codif claims to be revolutionising neurocosmetics with NeuroGuard. The active is said to directly target the ageing of neurons. And Arysta Health & Nutrition Sciences, a new Japanese exhibitor at in-cosmetics, offers Sake Peptide, described as a “biostress modulator”.

Anti-pollution

The pollution protection claim is adding a new wrinkle to the anti-ageing skincare market. Air pollution has hit critical levels in Beijing, Delhi and Karachi, among other major cities.

Outdoor air pollution kills 3.3 million people a year\(^{1}\). Besides contributing to premature deaths, particulate matter, traffic fumes and smog are also considered skin aggressors and can cause wrinkles. This is giving beauty brands a reason to strengthen the protection function of many skincare products.

It is also breathing new life into the treatments and nutricosmetics sectors of the beauty business with a variety of oxygenating facials, products and supplements.

Cosmetic ingredient suppliers are helping to drive this trend by offering actives that claim to protect against the effects of pollution. Two of the newest are from IBR: IBR- Pristinizer\(^{®}\) and IBR-Gapture\(^{®}\) claim to address pollution from the inside and out. The actives are designed to “detox” pollutants from the skin and protect from the outside by helping reinforce the skin barrier. Anti-ageing and health benefits for the skin include reducing pigmentation and wrinkles while smoothing and moisturising the skin.

Earlier this year, Lipotec introduced PolluShield\(^{®}\). The active claims to enhance the skin’s resistance to pollution-related damage by creating a barrier between the skin and ambient pollutants as well as boosting the anti-oxidative defense of the skin. It contains a metal-chelating polymer and anti-oxidants. The active’s efficacy was tested in vivo on volunteers exposed to pollution in Beijing.

Other companies that showcased new anti-pollution actives at in-cosmetics 2016 in Paris include Ashland (Blumilight and Elixiance), Codif (CityGuard+), Dow Corning (Citycare), ID Bio (Cell’Intact), Sederma (Citystem) and Symrise (SymUrban).

To help brands and suppliers quantify anti-pollution claims, OxiProteomics – a new French start-up offers in vitro and in vivo analysis of molecular damage protection against pollution, UV and ageing.

The pollution problem

Outdoor air pollution is rising around the world. China used to have some of the highest urban pollution levels. Now, thanks to government measures – the shift to renewable energy and the closure of coal and cement plants – air quality is improving in northern and eastern provinces. Fast-growing cities in India, Iran, Pakistan and Nigeria are some of the new air pollution hotspots, according to recent WHO statistics.

In Europe governments are stepping up efforts to curb air pollution from transport. The Netherlands has voted to ban sales of new petrol and diesel cars starting in 2025. More European capital cities are bringing in car-free zones and days. Deutsche Post wants to convert all its postal vans to electric. Cleaner transport will reduce pollution levels especially in metropolitan areas.

Buildings can also improve air quality by adding more planting to act as carbon “sinks” – architects have proposed a new community housing development in Paris with an actual forest on the rooftop.

These efforts to reduce traffic and emissions will help clear the air but it may take years to reverse the overall trend.
Peptide power

Medical developments are an endless source of anti-ageing innovation. From GABA to growth factors, a number of biotech discoveries have fed directly into cosmeceutical skincare, either as new brands or active ingredients.

Since Botox hit the aesthetic market in the 1990s, there has been a quest to replicate its wrinkle-smoothing effects in a non-invasive skincare product. The advent of topical botulinum toxin is high, although there will of course be a need to comply with local regulations on both application and availability.

Botox-maker Allergan has acquired Anterios, a biotech firm developing technology said to allow neurotoxins to be delivered through the skin without needles. And a pair of South Korean biotech firms has patented a “cell-penetrating peptide fused to a botulinum toxin”™. Procell Therapeutics and ATGC Co claim their recombinant protein complex enables transdermal delivery of the botulinum toxin, making it a convenient alternative to injections. It is being marketed for aesthetic and cosmetic purposes.

Peptides are reliable anti-ageing actives backed by solid in vivo data. They help firm the skin by boosting collagen synthesis. Matrixyl and Argireline are two of the best known and widely used in wrinkle-reducing face and eye care.

New peptide-based actives are appearing in all regions. New York-based BioMimetic Laboratories has patented XEP-30, billed as a next generation neuropeptide. In Switzerland, DSM added to its Syn® range with Syn-Coll, a synthetic tripeptide that boosts collagen production and protects against collagen degradation. Czech firm ContriPRO Biotech developed Clodessine, a peptide from a fragment of the anti-ageing hormone Klotho. It claims to slow cell ageing and activate the cell’s natural defense mechanisms.

Caregen in South Korea has two new anti-ageing skincare peptides (CG-Nugenerin and CG-Illugen) plus a patented peptide complex that acts on growth factors.

Japan’s Arysta offers Aquatide, a resveratrol peptide as well as a new W3 peptide, claimed to target G-protein-coupled receptors (GPCRs), the subject of the 2012 Nobel chemistry prize. GPCRs are tiny receptors on the cell surface that enable the cell to sense the environment around it and adapt to changes and stimuli (from light to neurotransmitters to hormones). This exciting discovery matters most in medicine, where these receptors are targets for life-saving drugs. And it has implications for skincare, potentially opening a path for more detailed neurocosmetic claims.
A more natural approach

Whether from land or sea, plant-based anti-ageing actives have long served as an effective bridge for consumers and brands seeking a more natural look and/or formulations.

South Korea continues to be an innovation hot spot. Researchers at the Korea Institute of Oriental Medicine have patented an active complex based on an evergreen perennial plant. The extract of Anemarrhena asphodeloides Bunge is said to have wrinkle reducing properties. A South Korean university-industry collaboration has produced an anti-ageing whitening fruit and flower complex. The combination of white rose and mangosteen claims to inhibit MMP-1 and tyrosinase activity. And Coseed Biopharm launched two new plant-based anti-ageing actives, forsythia suspense fruit extract and omija.

Traditional Asian herbal medicine is also providing inspiration for European suppliers:

- Laboratoires Expanscience’s new Neurovity® is derived from Vitex negundo (Chinese chastetree) that has been aeroponically grown and claims to increase cell longevity.
- Crodarom introduced Elfe Flower, extract of Epimedium grandiflorum. Native to China, Japan and Korea, this flower is part of the traditional Asian plant pharmacopeia and is said to have multiple actions including anti-ageing properties.
- Gattefosse’s latest addition to its Gatuline line is derived from Japanese cedar buds. Gatuline Renew offers skin smoothing and skin renewing benefits.

Other suppliers are looking to Africa for new botanical extracts and oils. Rahn has sourced an extract from the leaf sap of the South African medicinal plant Bulbine Frutescens for its latest collagen-boosting active, Liftonin-Xpert. Extracts from the same plant are offered through a South African supplier, Timola Natural Products, while Indena’s Sericoside is obtained from the African Silver tree. Similar in structure to centella asiatica it has been shown to act on wrinkles, radiance and under-eye circles.

Marine extracts are ever-popular anti-ageing actives too. From algae and sea fennel to marine collagen and chlorella, there are many cosmetic ingredients sourced from the sea. Spain and France are leaders in this area with notable launches from Greenaltech (Algactiv® GenoFix CPD and Algactiv® Zen) and Lipotec (Cellynkage™). One new microalgae supplier to watch is Algaeing, based on Qeshm Island in the Persian Gulf.
Challenges and opportunities

These “upstream” developments need to be viewed alongside demand-driven innovation and guided by consumer needs and behaviour. Further growth in anti-ageing skincare will also be shaped by broader trends in regulation, sustainability and technology:

Regulation
Regulation will continue to dictate the pace of innovation in anti-ageing skincare. The current distinction between cosmetic, quasi-drug and pharmaceutical makes it hard for ingredient suppliers to progress areas like neurocosmetics in the short term.

“As a raw material developer focused on scientific approach, we sometimes struggle with the fact that “cosmetic ingredient” is not a well-defined term around the world,” says Lenka Rebičková from Contripro. “And we want to avoid crossing the border with pharmaceutical products.”

IBR’s Liki von Oppen-Bezalel cites the globalisation of regulation and China compliance as factors that can inhibit the invention of new components.

Consumer campaigns against animal testing, microbeads and phenoxyethanol – if successful in changing legislation – will impact future formulations for all beauty products, not just anti-ageing skincare. One of the biggest hurdles remains the lack of globally-agreed regulation on the term “natural.”

Sustainability
The movement for greater transparency in business practices and the launch of the Sustainable Development Goals (SDGs) are pushing companies in all industries to revisit product manufacturing. More beauty companies are integrating social and environmental sustainability into their strategy and operations. US, European and Japanese multi-nationals are currently leading this effort. Small and medium enterprises in other markets will be next, as governments and consumers push for action on equality, justice and climate.

Responsible management of water, forests and soil is critical to a sustainable supply chain. The cosmetic industry has already adopted standards for sustainable palm oil (RSPO), soy (RSPS) and paper (FSC), as well as those to conserve biodiversity. L’Oreal, Natura and Unilever are part of an initiative to monitor water footprints and there is an ISO standard (14046) too. Many suppliers have programmes to reduce water consumption and recycle water. The new SDGs on water (SDG6), consumption (SDG12), oceans (SDG14) and forests (SDG15) will give the industry further impetus to better manage resource use.

Technology
Technology – whether digital, diagnostic, assistive or biotech – continues to shape the personal care industry’s relationship with the consumer. Most beauty brands are using apps and social media as a means to engage consumers, monitor results or expand retail reach. And a growing range of technology is used for beauty treatments: lasers, radio frequency, light therapy and high intensity focused ultrasound (HIFU).

For suppliers, biotech has the power to unlock more secrets of human ageing and further improve safe testing. Biotech will also play a major role in developing novel materials in a sustainable way, says Mibelle’s Zülli. The main challenges with technology are cost and pace of change.
Looking ahead

**Neurocosmetics**
It will take time to unlock the secrets of epigenetics for anti-ageing skincare. But now that a link has been made between epigenetics, stress and sirtuins, this is injecting a new dynamism into marketing stories for neurocosmetic actives. Messages about the stress-brain-gut-skin connection will play well with consumers who are attuned to healthy eating and lifestyles.

Another challenge is communicating biotech discoveries to consumers. Mibelle’s Zülli explains “transforming completely new anti-ageing concepts into marketing stories for consumers will also remain a challenge. For example, a new innovative anti-ageing active based on epigenetic science can only be commercially successful if we are able to explain the innovation and the benefits to the consumers.”

This will also drive innovation in the spa/wellbeing sector: electric current and needling are already used to infuse anti-ageing actives into the skin matrix. A new generation of gels with neurocosmetic actives could be developed for use in salon-based treatments or at-home devices with de-stressing and anti-ageing results.

**Pollution protection**
On a global level, the anti-pollution claim will resonate for the next three to five years, even ten years. Once air quality improvement targets have been hit – ideally by 2025 – there will be less need for this claim in cosmetic products. Researchers and suppliers are also exploring skincare implications of indoor pollution from electronic screens, which will usher in a new wave of innovation.

Meanwhile a fresh pollution crisis is brewing in China: heavy metal in soil and fertilisers and pesticides in water. This has already triggered a public safety scare for rice crops. Last year the government spent 2.8 billion yuan to restore the soil but environmental scientists claim three times as much is required. Besides the funds needed, it will also take time for the soil to improve. This could make brands reluctant to source plant extracts from areas where soil and water are contaminated – in China or elsewhere. This could give added momentum to traceability standards and boost credibility of certain ethical labels.

**Peptides**
Robust growth is expected for peptides because of their dependable performance and efficacy. As anti-ageing research stretches deeper into medical territory, we can expect more developments that follow Contripro’s work on the klotho hormone. Zülli also points to gene activation of Foxo and AMPK as methods that deliver beneficial effects on skin cells.
"In terms of growth potential for anti-agers India and Indonesia top the global chart with the highest CAGR projected up to 2020," explains Euromonitor’s Irina Barbalova.

With the lifting of sanctions Iran’s GDP is set to grow five to six per cent in 2015-2016. Euromonitor projects growth of anti-agers there to rise almost a third to US$29.8m by 2020. Iran has just agreed to ease regulations for South Korean cosmetics. And later this year, South Korea’s Kolon Global Corp. plans to open a US$10m retail joint-venture with a view to establishing a manufacturing base in Iran and potentially developing a cosmetic line for the Iranian market.

"In actual revenue gains China will surpass any other market globally, with the US ranking second," adds Barbalova.

"Beyond novel ingredients and formulations, the increasing penetration of skin diagnostic tools, at-home devices and technology to further personalise product solutions is leading the next frontier of anti-ageing developments. Recent anti-ageing devices include Tria Beauty’s FDA approved age-defying at home laser device, OKU Personal Skin Coach, the world’s first iPhone connected personal skin scanning device, and Romy Paris – an at-home device, which works by adding highly concentrated active ingredients contained in capsules to a reserve of serum or cream depending on a user’s needs."

Based on the trends analysed here, the US and Korea are two of the leading markets for biotech research. The patents, research and ingredients developed there are pivotal for anti-ageing skincare. For R&D and marketing professionals in the beauty and personal care industry, the forthcoming in-cosmetics exhibitions and conferences offer a dynamic space to discover trends and shape new ideas.

### Market size by retail value in constant (real) terms and fixed exchange rates (US$)

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<th>Asia Pacific</th>
<th>Iran (modelled)</th>
<th>USA</th>
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<td>Anti-agers</td>
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<td>11,521.3</td>
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<td>Premium anti-agers</td>
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<td>5,573.7</td>
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### Market size by market growth year-on-year (%), 2014-2015 in constant (real) terms and fixed exchange rates

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Citations


ii. https://books.google.co.uk/books?id=1e19BAAQBAJ&pg=PA151&lpg=PA151&dq=sirtuins+stress+epigenetics&ots=0KhNcCG5fi&sig=2z-elOY4TvtC2w1wJB7MNgU0G_o&hl=en&sa=X&ved=0ahUKEwj2kKm96qTNAhWGF8AKHedYCFCQ6AEIQTA#v=onepage&q=sirtuins%20stress%20epigenetics&f=false


Further information

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