



A growing number of anti-aging technologies address the impact of pollution and blue light, while tapping beauty-from-within concepts.

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ANTI-AGING INNOVATION 2020

The pandemic hasn't slowed down breakthroughs in technologies and marketing concepts.

This year has been unlike any other, impacting every beauty and personal category amid pandemic-related shutdowns and dynamic consumer demand. This has forced anti-/well-aging brands in particular to rethink their strategies.

Anti-aging During the Pandemic

For example, Dermafirm's BIOTOC, a non-invasive, professional-grade anti-aging skin care line, scrapped its planned B2B launch in favor of a direct-to-consumer strategy in light of shifting stay-at-home behaviors. The new strategy was carried out in the United States following a South Korean launch in which products sold out within an hour.

"We ... saw an opportunity to give professional level facial care products to personal home care users," says Robert Park, VP sales and operations at Dermafirm USA. "So we have put together the about to be launched BIOTOC 3X starter package and our goal is to provide professional grade facial treatments which can easily be performed at home. The BIOTOC 3X starter package has been tested in clinical studies, and proven successful,



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for its safety and in delivering results: improving wrinkles, brightening and in restoring skin elasticity."

Meanwhile, ReVieve reported a 6% increase in consumer engagement with its digital skin advisor solutions in the month of May. According to the company, searches for "crow's feet" rose 4% from April to May, totaling nearly 100,000 searches. During the same period, searches for "wrinkle" and "fine lines" were up 9%. ReVieve also noted that searches for "rosacea" increased 9% April-May, totaling about 6,000 searches.

Notably, ReVieve pointed out that searches for "anti-aging solutions,"

"eczema" and "redness" declined 20% and 9% each, respectively.

While near-term thinking is evolving rapidly, longer-term breakthroughs unveiled by emerging anti-aging technology offers a clearer sense of the future. Here, we examine an array of recent innovations and their implications for anti-aging beauty, which garnered sales of \$23.45 billion in 2018 and is expected to expand at an annual rate of 5.3% through 2026, per Grandview Research*.

*www.grandviewresearch.com/industry-analysis/anti-aging-market

Pollution & Aging

A number of anti-aging initiatives have begun to focus on the negative impacts of pollutants. Mary Kay Inc., for example, has developed data showing that vitamin C may be an effective antioxidant to address diesel exhaust particles (DEPs), which increase free radicals in skin cells and thereby spur premature signs of aging such as dullness, dark spots and inflammation.

Mary Kay developed and analyzed the effects on skin appearance of a serum containing five botanical extracts known to be rich in the antioxidant vitamin C; pomegranate extract (*Punica granatum*); kakadu plum extract (*Terminalia ferdinandiana*); camu camu extract (*Myrciaria dubia*); acerola cherry extract (*Malpighia punicifolia*); and black currant berry extract (*Ribes nigrum*). The product also comprised a patented, three-dimensional system to target the effects of aging.

To test efficacy, artificial skin tissue was treated with the test serum and genomics analyzed its effects. According

to Mary Kay, the appearance of skin tone, laxity and texture improved after just six days of product use.

The results indicated positive effects on four main classes of genes important to skin firmness. In addition, the serum increased the production of the dermal matrix proteins collagen and laminin, which also support skin firmness. According to Mary Kay, this confirmed the serum worked to help improve the appearance of skin laxity and texture.

of the research, Stefanie Williams, M.D., dermatologist and medical director at Eudelo, London, says, "We might not be able to [clinically]

separate the damage caused to the skin by UV exposure from those caused by air pollution; however, given the major research advances made in skin and air pollution science, my expectation is that the adverse effects of pollution on skin health will continue to have a growing impact in the future in high-density cities."

Well-aging from the Inside Out

Beauty from within concepts have gained steam in recent years and enjoyed renewed interest among health-conscious consumers during the pandemic. A range of technology innovations are available to address aging via these products.

For example, Ajinomoto Health & Nutrition's Indigo Marine Collagen protein powder reportedly helps diminish the effects of aging while revitalizing skin, hair, nails and bones. This is sourced from wild-caught fish in the North Atlantic Ocean and processed in the United States. Kosher Indigo Marine Collagen digests rapidly into the body, according to the company, offering quick-impact effects.

Meanwhile, Lubrizol Life Science's Curcushine microcapsules, comprising bioavailable microencapsulated curcumin, can reportedly delay skin aging by protecting the skin's structures and proteins, including collagen and elastin, from oxidative and inflammatory damage.

The high solubility of the technology allows easy incorporation into varieties of nutraceuticals and beauty drinks.



The Foreo Bear Facial Toning Device targets young consumers to contour and sculpt the face and smooth away the appearance of wrinkles.

In an in vitro study from Lubrizol showing the ROS reduction effect of Curcushine, the microcapsule was shown to have significant protection from oxidative stress on HDFa cell structures.

In another in vitro test, Curcushine's bioavailability was much higher than the control, lasting eight hours after intake. The microcapsules displayed a pharmacokinetic profile of slow release of curcumin compared to the quick absorption, metabolization and removal of free curcumin.

Curcushine is gluten-free, vegan, plant-based, and kosher- and halal-certified.

Wildcrafted Alpine Rose

Mibelle Biochemistry's Alpine Rose Active reportedly rejuvenates the deep layers of the skin, reduces skin redness, increases elasticity and protects from UVA-induced photoaging by cleaning up age-promoting senescent cells. This Ecocert-certified extract of the leaves of Swiss organic alpine rose is harvested by sustainable wildcrafting.

Epigenetics and Aging

Bio-Botanica's EpiFytosomes natural delivery system leverages liposomes to encapsulate water-soluble botanical extracts and other materials to boost bio-absorption of actives to offer oxidation defense. According to the supplier, this delivery system addresses epigenetic factors related to aspects such as aging and lifestyle exposures.

Upcycled Anti-aging

Research out of Spain published in Antioxidants⁸ explores how sweet cherry by-products processed using green extraction techniques could provide a source of anti-aging bioactive compounds. Novel and green techniques were used to obtain extracts from sweet cherry stems.

A supercritical CO₂ extract reportedly presented the best anti-aging character-

⁸<https://pubmed.ncbi.nlm.nih.gov/32414056/>



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istics, including a wide antioxidant capacity that worked against lipid peroxyl and free radicals, as well as relevant photoprotective action and anti-aging properties.

These potential skin care benefits are related to the extract's main polyphenolic compounds—catechin, chrysin and naringenin. However, further studies must be performed to determine: the molecular mechanisms involved in biological activities; the putative pharmacological interactions between the supercritical CO₂ main compounds; and the compatibility and stability of these compounds or the whole extract when incorporated in a final cosmetic formula.

While these compounds have yet to be commercialized, KoffeeUp from Givaudan is an COSMOS-compliant upcycled arabica coffee oil for well-aging applications.

The material's balance between saturated and unsaturated fatty acids reportedly helps it to quickly penetrate the skin layers to improve antioxidant defense, repair and protect the skin, strengthen the skin barrier and support hydration. In applications it

can reduce the appearance of fine lines and wrinkles.

Early Intervention

People age from the moment they're born. New innovation addresses this reality.

For instance, Lipotec Active Ingredients' "all-in-one" peptide for anti-aging, Argireline Amplified (INCI: water (aqua) (and) acetyl hexapeptide-8 (and) sodium benzoate), targets expression wrinkles, which can manifest beginning in one's 30s.

Developed via green chemistry, the multifunctional hexapeptide reportedly features efficacy in diminishing the appearance of expression wrinkles by focusing on muscle relaxation after facial expression, thereby speeding relaxation time.

Efficacy reaches all levels of the skin, per the manufacturer, effectively addressing skin roughness, while boosting radiance and facial volume. In addition, the technology offers a "skip care" solution for minimalistic beauty featuring fewer, more effective materials.

Argireline Amplified allows skin to appear five years younger in five days via the application of 5% of the material, Lipotec claims.

The Foreo Bear Facial Toning Device targets consumers even earlier in their lives. The device is "ideal for those wanting to start early with anti-aging treatments," according to the brand, and leverages microcurrent technology to contour and sculpt the face and smooth away the appearance of wrinkles. Ideal for millennials, the device is pre-programmed with routines via the Foreo For You App.

Natural Retinol Alternative

Sytheon's Sytenol A (bakuchiol) is a patented technology that reportedly offers the benefits of retinol without any downsides.

Per a 2018 British Journal of Dermatology report comparing bakuchiol to retinol¹, "Bakuchiol and retinol both significantly decreased wrinkle surface area and hyperpigmentation, with no statistical difference between the compounds. The retinol users reported more facial skin scaling and stinging."

Sytenol A is a natural compound with >99% purity, according to the manufacturer, and is stable, easy to formulate with and requires no dark room for formulation. The REACH-registered material can be used during the day and has reportedly been shown to stabilize retinol.

Sytheon, also offers Synoxyl AZ (acetyl zingerone), a multi-targeted anti-aging molecule designed to address photodamaged skin, and Synastol TC (*Terminalia chebula* extract), a COSMOS- and Ecocert-certified material that provides defense from pollution and blue light by helping reverse protein glycation, reducing formation of reactive oxygen species associated with pollution and blue light exposure, prevention of lipid peroxidases associated with



Sweet cherry by-products processed using green extraction techniques could provide a source of anti-aging bioactive compounds.

pollution exposure, and reduction of pro-inflammatory biomarkers IL-6 and IL-8.

Embracing Aging

The attitude toward aging is now being viewed as a privilege rather than something negative, shifting perspectives away from "anti-aging" toward regeneration, renewal and radiance, even terming more concepts and products as "well-aging."

For instance, Clariant caters to the specific needs of mature hair, such as volume and shine-boosting, with an Illuminating Silver Hair Nectar comprising the conditioning agent Genadvance Life (INCI: polyquaternium-116) for thin hair.

Eucalyptus Defense

Estée Lauder researchers have found that *Eucalyptus globulus* extract has significant antioxidant activity and

can help to defend against oxidative stress from pollution, UV or blue light. Previous studies had characterized its pharmacological benefits including antibacterial, antifungal, anti-inflammatory, antioxidant, antitumor and antihistaminic.

"The Estée Lauder Companies' R&D team is at the forefront of understanding the impact that environmental stressors have on the barrier of skin and the impact it has on skin aging," said Kurt Schilling, Ph.D., senior vice president, Basic Science Research and Advanced Technology, R&D, The Estée Lauder Companies. "As our scientific research continues to uncover key anti-aging ingredients and better understand the biological mechanisms behind aging, we will continue to apply this knowledge to help define and advance the future of beauty for our global consumers." ■

¹<https://onlinelibrary.wiley.com/doi/full/10.1111/bjd.16918>

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