11 science-led skincare solutions

Adriaane Pielou looks at the global rise of the PhD nerd turned beauty star

DROPLETTE, ELSI SKIN

Elsi Skin's Begin Again cleanser

If the pandemic has taught us anything, it is to trust the science. Scientific proof entails exploratory research and then confirmatory tests and experiments, all clearly explained. Trusting the science – and the scientists who have become fixtures on our screens – has served us well with regard to Covid-19, so it makes sense that this attitude should seep into other areas of our lives, too. Science-backed skincare is booming, turning PhD nerds – the diligent founders who have spent years in a lab, poring over research papers – into unexpected beauty gurus. Here are some of their best inventions.

DROPLETTE

This palm-sized device was launched at the beginning of the year in New York. It costs $290 and delivers hydrating and healing active ingredients, such as retinol, glycolic acid and collagen, into – not simply on to – the skin, via a mist of high-speed spray. According to the European Food Safety Authority, about 90 per cent of topical skincare products don't penetrate the skin, because their molecules are too large. The Droplette's micro-mist, however, delivers its ingredients at such velocity, they can actually penetrate up to 20 layers of the dermis. That's breakthrough delivery technology.

The device's inventors, two twenty-something MIT-trained PhD holders, Madhavi Gavini and Rathi Srinivas, came up with the idea after attending a rare diseases conference. One of the conditions addressed was epidermolysis bullosa, a genetic condition that leaves those who have it with skin so fragile they develop open wounds too agonising to treat with ointments or dressings. Only when the two scientists saw how efficiently the mist of micro-droplets delivered ingredients did they realise the device could also target ordinary skin conditions such as wrinkles, fine lines, hyperpigmentation and dryness. Nasa, which provided the Droplette's first round of funding, obviously agreed.

GOOD SCIENCE BEAUTY

Also focused on the importance of delivery technology is Dr Suzanne Saffie-Siebert, who is Iranian and lives in California. She spent decades researching the needle-free delivery of medication. Along the way, she discovered that the naturally occurring mineral silicon (not to be confused with silicone) is unusually potent in delivering active ingredients deep into the skin. Today, her SiSaf laboratory, staffed with PhD researchers, develops prescription drugs for gene therapy, while silicon forms the foundation of her skincare range, Good Science Beauty, which she launched in 2019.

"But there is little point in spending hundreds on skincare if you leave home without an SPF cream," says Saffie-Sieber. "That's still the most important anti-ageing advice."

CODEX

Several PhD graduates have created skincare lines after searching fruitlessly for a cream that would treat their own skin problems. Canadian-born Silicon Valley resident Barbara Paldus, for instance, launched Codex after being frustrated at the lack of products she ▶

Right, Barbara Paldus's Codex brand is the result of her growing frustration with the lack of transparency in skincare Below, Elsa Jungman, founder of Elsi Skin, believes in using minimal products on the face Opposite page, Royal Fern harnesses the beneficial qualities of the evergreen plant

►could use on her young son, who had suffered from birth from extreme skin sensitivity. While waiting at airports while travelling for work, she'd look for local sunscreens and cleansers that didn't include products she knew her son was allergic to, and became increasingly exasperated at how little transparency there is in skincare.

Transparency became her driving force, and in 2019 she launched Codex, a brand dedicated to sharing what is properly beneficial, healthy and effective for skin. "Discovered in nature, perfected by science" is how she describes her products.

MAISON WOLFBERRY

This brand's under-the-radar founder, who holds a PhD in environmental chemistry and has "the world's most sensitive, blemish-prone skin", launched his gentle range after being unable to find products that didn't work against the skin's natural pH levels.

The term pH describes how acidic or alkaline something is, with the optimal level for skin being between 4 and 5. Acidic (low pH) products support healthy skin bacteria, while alkaline products (that contain a higher pH) encourage the growth of harmful microbes such as Propionibacterium acnes. Changing the pH of your skin can leave it vulnerable to sensitivity, damage and infection. Oil-based products do not have a pH, hence Maison Wolfberry's bestseller is an oil-based cleanser.

ELSI SKIN

Paris-born Elsa Jungman launched Elsi Skin after researching the importance of the skin's microbiome, the bacteria and fungi that live naturally on the skin. At 18, she experienced toxic shock syndrome and the medication she was given was so potent that her skin began to peel off. That led to her developing a painful fungal skin infection itchy enough to stop her sleeping, which in turn led to medication for insomnia that made it hard to concentrate.

Emerging from the experience months later, she decided to train to become a skin scientist, and to explore why it's flawless in some and reactive in others. She completed her PhD on the microbiome in 2012, and launched Elsi in 2018. Each product is third-party-lab tested against the growth of seven different types of skin bacteria and fungi, and each consists of as few ingredients as possible.

The less you use on your skin, the less it can react, she says. She recommends minimal facial cleansing: in the morning, washing just with spring water and rehydrating with a serum, and at the end of the day, using an oil-based cleanser and then applying a serum again.

AUGUSTINUS BADER

Beauty gurus don't come in much more untraditional a form than Professor Augustinus Bader from Austria. This slightly scruffy, borderline eccentric scientist – having worked for years on research with no connection to the beauty industry – is responsible for impressive innovations in skincare.

Professor Bader, head of stem-cell research at Leipzig University, spent 30 years researching how best to help heal burn victims' skin. With funding running low, he realised that by making the oil he had formulated on a commercial basis, he might be able to further fund his work. Launched in 2018, with fans that include Victoria Beckham, his $300 The Face Oil has proved a runaway success.

NOBLE PANACEA

Sir Fraser Stoddart, a British professor, falls into the same offbeat category as Bader. The former was awarded the 2016 Nobel for Chemistry for the invention underpinning his skincare. Made in the course of working for his PhD, his "organic molecular vessels", 10,000 times smaller than a skin cell, can penetrate the dermis to deliver regenerative, healing active ingredients. Two years later he was turning that discovery into the Noble Panacea range. It introduced millions of us to the idea of precisely portioned doses of active ingredients, each contained in a biodegradable casing that starts to break down when it comes in contact with the skin.

BIOEFFECT

Iceland's Dr Björn Örvar, who holds a PhD in plant molecular genetics, was feeling frustrated at how his plant-based epidermal growth factor, produced from barley – a brilliant innovation – was being misused by the large skincare companies he supplied. They'd hype the ingredient on the packaging, but add it to the products in amounts far too minimal to be beneficial. In 2019, he decided he'd stop supplying to other companies and instead formulate his own skin cream, containing a properly potent quantity of growth factors. BioEffect has since won fans around the world.

■ Sir Fraser Stoddart received a Nobel prize for the science that guides his skincare

CODEX; ELSI SKIN; ROYAL FERN

AQ SKIN SOLUTIONS

Similarly, Dr Ahmed Al-Qahtani's AQ Skin Solutions is also based on growth factor. After gaining his first and second degrees in Ireland and then Australia, he was working on a PhD in immunology at the University of California, Irvine, when he started to work with growth factors to heal wounds and create artificial skin grafts. That was the genesis of AQ, now sold in almost 20 countries.

DR ALKAITIS

Perhaps the founding father of scientists as skincare stars, the ultimate PhD nerd turned beauty guru is Dr Alkaitis. A holder of a PhD in Physical Chemistry whose prime interest was ethnopharmacology – the study of how indigenous people use wild plants for medical purposes – he launched his eponymous all-organic skincare range after his wife asked his opinion about some products she'd just bought. Taken aback by the harsh chemical concoction, he told her he'd mix her some creams that would do her skin some good. "Your skin is the mirror to your digestive tract. If you can't eat it, don't put it on your skin," he told her.

Over the years he has been consulted by hundreds of people complaining of acne, dry skin and break-outs, and he gives all the same advice. Eat only organic vegetables for three or four days. No fruit, no wheat, no refined foods. Only raw, and/or steamed vegetables. That has drastically improved the skin of every single one of them, he says – and in a week. Hard to do when sitting around at home surrounded by snacks, but undoubtedly more effective than any skin cream, even his. Which is another lesson in itself.

ROYAL FERN

"No cream can take a wrinkle away," says Timm Golueke, the German dermatologist behind the Royal Fern skincare line, with refreshing honesty. Instead, we should all be looking to have the healthiest, freshest, best-looking skin possible, whatever our age. Golueke completed his PhD at the Skin Clinic of the Ludwig Maximilian University, with a specialisation in autoimmune disorders of the skin, and also underwent training in the field of natural medicine.

He recognised that there were highly effective herbal ingredients that provided the skin with visible benefits, and wanted to combine these with more traditional dermatological treatments.

While reading through medical journals, he came across a study that examined the use of fern extracts in the treatment of melanoma patients. Intrigued, he went on to find several independent scientific studies showing that fern could positively impact all symptoms of skin ageing, whether genetically determined or environmental. A master of survival, fern has existed on our planet for 400 million years, withstanding climate change and natural disasters, while expanding its presence onto every continent. It is evergreen and thus resistant to UV radiation and environmental pollutants. Golueke came to realise that around the world, from Russia, where fern leaves are used to treat eczema, to Korea, where fern leaves are infused into a detoxifying tea, people have been harnessing the healing properties of the plant through the ages. In 2015, after four years of research and development, Golueke launched his Royal Fern line of products. Fern extracts protect the skin's sensitive cell DNA; stop the breakdown of elastin and collagen; stimulate the production of new collagen; possess tremendous antioxidant capacity; and have anti-inflammatory and antibacterial properties.

These formulas were supplemented with proven active skincare ingredients, including hyaluronic acid, vitamin C, vitamin A, vitamin E, macadamia nut oil and cocoa butter. Royal Fern's patented, plant-based products are free of mineral oils and pollutants, and are gender neutral, in line with Golueke's belief that consumers shouldn't pick a product based on their gender or age, but rather on their specific skin type. ■