## Recipe for success

**Many skincare products make big promises, but we need to get past the marketing spiel to find out exactly what we're putting on our patients' skin. Dr Julia Hunter delves into the science behind product ingredients, particularly their role in inflammation and skin toxicity**

When it comes to skincare, it's all about the ingredients. Patients want products with ideally organic and certainly healthy ingredients and an overall lack of toxicity, as well as good penetration into the skin and provide best visible results.

Before training as a dermatologist, I started my career as an anaesthetist, working with some of the most prominent plastic surgeons in the US. As I watched patients being operated on, I realised that we needed to do something more substantial about their rosacea, acne, brown spots, enlarged pores and hyperpigmentation. Following this fantastic surgery, their skin still looked terrible.

We should be trying to cure people rather than just treating their symptoms in perpetuity—we have to address the "why". So I focused on the number one goal in medicine: to use the best tool for the job but do it in a non-toxic, non-inflammatory way, and to do no harm. Some of the older peeling agents have issues with toxicity so, fortunately, we have some alternatives available in today's industry.

**Science vs marketing**

As medical practitioners, we're looking for accurate science behind these products. We have to negotiate marketing which can sometimes have less objective facts and skewed viewpoints.

We have to get beyond this and find out why we should use one product versus another. What is the best tool for the job, and which is physiologically correct for the skin? Ingredients are an essential part of that.

Inflammation is the cause of all disease in ageing. So with every treatment we want to provide, we want it to be non-inflammatory. One of the biggest problems we have in today's world is toxicity. Studies have shown that foetuses are perfused with toxins. Breast milk is perfused with toxins. So we don't want to introduce any therapies that increase inflammation, disease or the toxic load that the body has to handle.

There are a number of additives and chemicals added to these products which result in inflammation, thinning the skin and ageing it. Youthful skin is volumized skin.

But is inflammation the cause or the effect? It's generally the cause; the effect results in biological processes that occur, enhancing internal inflammation.

The skin is a window to what's going on inside the body, so many skin conditions are a result of internal inflammatory processes—we don't want to do anything that enhances those. Acne is an inflammatory condition. Rosacea is an inflammatory condition—we've been treating rosacea with all sorts of medications over the years but we've never been successful. However, if you treat the internal inflammation, the rosacea will decrease, whether or not you put the right ingredients on the surface of the skin.

Melasma and hyperpigmentation involve internal inflammation. The sun causes inflammation. Even hair loss has been shown to be caused by a variety of internal inflammation conditions.

Anti-inflammatory research is vital because we have to address inflammation in order to minimise disease and slow down the ticking of the biological clock. Inflammation decreases the collagen content in the skin thickness, therefore decreasing the skin's immunity and increasing the risk of cutaneous infections and carcinogenic potential.

**Harmful ingredients**

In choosing a therapy for a specific skin problem, we have to consider ingredients. There are a number of ingredients to avoid which enhance inflammation and disrupt hormones.

Triethanolamine and parabens are hormone disrupters. Sodium lauryl sulphate and propylene glycol enhance inflammation and increase carcinogenic potential. These are all included in products because they're cheap—they're not necessary if you use the right ingredients. Acrylates need to be avoided, while triclosans are a form of pesticide. Thiazolidinones, ammonias and sodium bisulfite increase allergic potential. We're seeing patients are increasingly allergic to a variety of things, in particular the salicylates.

So is there anything wrong with the products we're using? I always want to make sure I'm optimising results for patients. I consider glycolic to be a very strong irritant and, most importantly, there is no receptor for it in the skin. It has to be neutralised because when it goes into the skin, it has nowhere to go; it doesn't have a receptor to meet. I choose not to use glycolic acid because I think it has a greater downside than an upside.

Glycolic acid activates the free radical cascade and dissolves the protective barrier. It's also known to be corrosive and metabolises TO oxalic acid which is toxic and increases kidney stone formation. You have to be very careful using it on people who have any compromised kidney function. The vast majority of glycolic acid is now synthetic, so you have to be careful because this is made from formaldehyde, not from grapes and fruits.

Hydroquinone is banned in the EU but is still available in the US. But the product is a phenol in its chemical structure, and is known to cleave DNA and RNA. Its metabolites are known to be nephrotoxic and liver toxic. They are also known to be a carcinogen and increase sun and pigment risk —we don't want to use anything on our skin that increases our UV exposure. Again, there is no receptor in the body for hydroquinone.

Trichloroacetic acid (TCA) is unstable and very difficult to control; it dissolves the skin. It doesn't cause building and thickening, instead it thins the skin. TCA coagulates, is corrosive, has pigment issues and increases UV exposure. Bearing in mind that youthful skin is volumised skin, we don't want to do anything that thins the skin in perpetuity because this defeats our purpose.
Salicylic acid is incredibly drying and, in my practice, patients simply won't tolerate it. I'm increasingly seeing a huge amount of allergies to salicylic acid. Absorption also causes metabolic acidosis, which translates to increased inflammation.

**Alternatives**

We want ingredients that work at least as well, if not better, and we want to avoid inflammation as much as possible. We want to build and volumise, to enhance the skin components, enhance collagen production and increase depth of penetration. All products should be synergistic with technology, which enables us to penetrate down into the deep dermis.

There are alternatives to the glycolics, TCAs, Jessners and phenols that work just as well and are non-toxic. L-mandelic acid comes from bitter almonds and is a non-toxic alpha hydroxy acid (AHA). It's stronger than glycolic acid and is anti-microbial and anti-pigment—it has shown to have a 50% reduction in studies with a low dose L-mandelic.

It also provides collagen and skin component stimulation and is an anti-inflammatory, providing increased volumisation and penetration. The ingredient can also be used on skin of any colour.

Lactic acid is a non-toxic AHA. It hydrates, exfoliates and is non-inflammatory. It enhances ceramide production and stimulates collagen and skin components, resulting in volumisation.

L-Malic acid is produced by the body in the Krebs cycle. It also comes from apples, is a non-toxic AHA and an anti-inflammatory. It facilitates the penetration of other ingredients and is a strong exfoliator.

**Chirally correct**

We need to use physiologically correct peels because they're non-toxic and are equally, if not more, restorative in anti-ageing. Chirally correct ingredients that are put on the skin mimic natural ingredients, allowing us to put them on skin of any colour. Chirally correct means chemically correct. It means the body has a receptor for the specific ingredient that you're putting on the skin.