

Active agents: any innovative substances or concepts?

published in Beauty Forum 2020 (8), 52-55

"What's new?" It's a typical question cosmeticians ask during trade fairs and hear in beauty institutes from their customers. As a matter of fact, new developments accelerate and a great deal is changing although not everything can actually be identified as innovative. Hypes, trends, unnecessary and sustainable features appear side by side while actual relevance and medial presence often is wide apart.

In the cosmetic field, **hype** can be defined with a temporary up to three years lasting demand for a composition or an active agent while a **trend** can be explained with a continuously increasing demand. If the demand then constantly remains on a high level, the trend has developed into a **continuous burner**. Conversely, a continuous burner can plummet following negative media coverage or when the regulative framework conditions have been changed due to restrictions or bans – this will lead to a so-called **anti-hype**.

Novelties are not only limited to active agents and preparations, also product forms are involved.

Product forms

The **liposomes** developed in the eighties were hype at that time, backed up by a slowly beginning trend and then have progressed into a typical continuous burner. We are talking here of a sustainable galenic form which in its function as a carrier boosts the effects of active agents.

The essential fatty acids contained in herbal oils still set the trend. They stand out due to their anti-inflammatory effects and are increasingly used in novel, non-aqueous **oleogels** with excellent penetrating features.

Just the opposite of oleogels are **aqueous gels** with water-soluble substances as e.g. glycerin, amino acids and filming ingredients such as hyaluronic acid, algae components and extracts as for instance aloe vera. These hydrating gels still are very popular.

Nanoparticles are a typical example for anti-hype products as a consequence of the modification of the Cosmetic Directive and negative media reports several years ago. The demand for this innovative galenic form has plummeted. What remained of it are the biodegradable nanodispersions with particles ranging from liquid to crystalline form. Together with cos-

meuticals they are very effective in the treatment of problem skins.

The product form **micellar water** stands for a short-term hype. They resort to a simple, traditional technology. Just the term "micellar water" has been newly coined.

For quite some time now, **lamellar creams** have become trend products and currently they even are in the focus of interest when it comes to nurturing the skin barrier with physiologically compatible components and making it insensitive to external influences. The anti-pollution promotion ("detox") often relates to already known active agents such as antioxidants and rather has to be referred to as media hype.

Active agents for problem skins

Increasingly dominant in the treatment of problem skins are substances with enzyme-controlling effects, or in other words, substances that influence the endogenous or exogenous metabolic activity. Just to mention a few examples:

- Protease inhibitors impede the degrading enzymes of microorganisms and thus have anti-inflammatory effects. Others inhibit the endogenous proteases (rosacea) that went out of control and thus slow down the degradation of natural proteins of the skin. Boswellic acids are prominent representatives of this group. Collagenase inhibitors and collagen stimulants are components of anti-aging preparations.
- The pharmaceutical and natural substance azelaic acid inhibits the destructive behaviour of anaerobic germs occurring under the protective layer of lipid substances applied for skin care purposes. In cosmetic products it can be safely used up to a concentration of 1%.

- Several antimycotic active agents borrowed from the pharmaceutical industry and used as ingredients in anti-dandruff preparations interfere with the enzymatic metabolism of yeasts and fungi.
- Impeding the melanin formation with tyrosinase inhibitors or substances such as tranexamic acid and niacinamide prevents the hyperpigmentations that can form through radiation and inflammations (post inflammatory hyperpigmentation).

Regenerative active agents

Currently there are no innovative substances or therapies in sight among the regenerative active agents. Retinoids, B vitamins (niacinamide, D-panthenol etc.), zinc complexes as well as isoflavones still hold the line in the category continuous burners. That also applies to the long known probiotics in the form of lactic acid bacteria and for enzyme substrates such as the already mentioned essential fatty acids, in particular also gamma-linolenic acid in the case of atopic skin. Only novelty is that they now are classified as "biogenic" substances.

New representatives among the oligopeptides and capsaicinoids such as the spilanthol occurring in paracress are used for wrinkle reduction. Similar to hyaluronic acid they are efficient and temporarily acting substances. An exception in this context is N-acetyl-glucosamine which can liposomally penetrate into the skin and stimulate the endogenous hyaluronic acid synthesis responsible for the turgor of the skin.

Protective preparations

With regard to their structure, lamellar creams (see above) imitate the skin barrier. They contain long-chained fatty acids, phytosterines (shea butter), ceramides, hydrogenated phosphatidylcholine and squalane and are considered as increasingly relevant for the protection of the skin. They easily penetrate and do not impede the regenerative processes. As a matter of fact, they simultaneously have regenerative effects when combined with ceramide I substrates such as linoleic acid and native phosphatidylcholine. They either are already integrated into the creams or applied in the form of sera before using the base creams. Statistically speaking, the pH-value of the skin slowly increases with the course of the aging process. Appropriate new products with lower pH-value for the elderly skin currently come on the market. It should however be mentioned that correlations between pH-value and buffer capacity of the skin and of the products often are overlooked. There still is research to be

done to clarify the role of the modified pH-value of the skin and the impacts of the pH-value of the products on the physiological processes in the skin. Already today it can be assumed that the skin flora and its living conditions play a relevant part in this context.

Within the marginal group of antiperspirants, low levels of aluminum chlorohydrate still are present since the studies reporting on suspected adverse effects could not be confirmed for one thing and because of the fact that the strong antiperspirant effects have not yet been achieved by other substitutes.

The "no" and "free of" trend

For quite some time now compositions have been booming that, beyond the detox and antipollution features, are intended to eliminate the so-called, usually not exactly defined waste products and toxins out of the skin. Among them are neutralising (alkaline skin care) or absorbent products such as activated carbon, clay or diatomaceous earth. Vice versa, appropriate masks made of fleece; cellulose and kaolin (terra alba) serve the purpose of penetrating active agents into the skin.

It is a significant fact that various substances have been eliminated from cosmetic preparations. Hence the "no..." or "...free" preparations, in other words those without the preservatives listed in the European Cosmetic Directive, without emulsifiers, mineral oils, silicones, perfumes and micro plastics. Frequently a single substance group, such as the parabens is referred to just to use other preservatives listed in the European Cosmetic Directive which then are not mentioned. A similar trend has been observed with sun screens marketed with the information that they are free of older and partly endocrine disrupting UV filters such as Ethylhexyl Methoxycinnamate, Butyl Methoxydibenzoylmethane, Octocrylene, 4-Methoxydibenzylidene Camphor and Benzophenone.

The increasing knowledge on the individual skin flora (microbiome) and how it helps to maintain a healthy skin is another reason for avoiding certain substances since many of them used in cosmetic products are counterproductive for a balanced microbiome. In this context we are not only talking about the preservatives that can cause a negative selection in the microbiome populations and also contribute to the resistance development of unwanted germs. The impacts of other substance groups, highly effective and highly dosed antioxidants included, still are not sufficiently studied. Strong complexing agents such as EDTA for instance that cannot be eliminated with wastewater treatment also belong to this group. Professional circles are more and more

critical about individual and often excessive hygiene measures which facilitate barrier disorders and infections. The trend towards the optimization of skin care routines still is at the outset but it picks up pace.

Trend towards minimalism

In many cases, the trend towards minimalism goes the extra mile and hurries ahead of the scientifically proved knowledge. Just to mention some examples:

- Reduction of active agents to a few and sometimes only one agent as for instance sera, and possibly then in higher concentration. It improves efficacy and statistically reduces the allergy risk.
- Individually adapted products for specific purposes after analysing the skin; providing base preparations such as base creams and –gels that only contain the necessary components.
- Consequently avoiding the counterproductive excessive skin care: This reduces skin blemishes and facilitates the natural regeneration of the skin.
- Reduction of cosmetic additives to the greatest possible extent protects the microbiome of the skin.
- Avoiding regular chemical peelings which increase the risk for perioral dermatitis and rosacea.
- Avoiding unnecessary UV filters in day creams.

Sustainability

Sustainability has become an important aspect albeit its very nature is not clearly recognizable at first sight. A certain composition can be called sustainable considering the extraction of ingredients but also regarding its long-term effects on the skin or its environmental features after its use. It's a debatable point, whether the booming nutraceuticals are sustainable in comparison with the so-called standard nutrition that would supersede this particular product group as well as most of the other food supplements.

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