PROTECTING THE SKIN

New active ingredients in cosmetics protect the skin from increasing environmental pollution. They boost the body’s own detoxification processes and bring the skin flora into balance

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Human skin is really a high-performance organ. It keeps our bodies from drying out and losing essential minerals. Despite the skin’s minuscule thickness of only a few millimeters, if it is healthy it also reliably prevents dirt and microbes from penetrating the body. In the summer, the skin is often exposed to intense sunlight. If the skin is healthy it also reliably prevents dirt and microbes from penetrating. In the summer, the skin is often exposed to intense sunlight. If the skin is healthy it also reliably prevents dirt and microbes from penetrating.

One important starting point is the external layer of the skin. Its structure, which is similar to that of a brick wall, consists of dead horn cells that use lipid bilayers with a complex structure as a binder to form a highly effective barrier. If this structure is destroyed, the skin dries out and becomes rougher and more cracked, thus becoming more vulnerable to penetration by harmful substances.

“Skin-identical, synergistic sphingolipid mixtures can balance out defects in the membranes, strengthen the skin’s defenses, improve its moisture levels, and thus bring the skin barrier back into balance quickly and lastinglly,” says Lersch. His business line already developed such products a few years ago.

Even if the skin is already irritated, cosmetic ingredients can help to provide effective relief. “We know that aryl hydrocarbon receptors inside the skin cells react to diesel soot,” explains Kruttmann. “These AH receptors are basically present in an inactive form. But if they are activated by soot particles, for example, they drift into the nucleus of the cell, where they launch a program that can contribute to skin aging.”

SKIN CARE COSMETICS BOOST THE BODY’S OWN DETOXIFICATION

Skin care cosmetics can counter this aging effect, either by neutralizing the metabolic pathways that have been activated by soot particles or by stimulating the body’s own detoxification processes so that the environmental stress is reduced. Free radicals are highly reactive oxygen molecules. If they are present in large numbers, they cause damage to cells and tissues that the body cannot readily repair on its own. Natural scavengers of free radicals in the skin, such as thioredoxin, dock onto these oxygen molecules, making them less reactive and thus harmless. TEGO Turmerone is a natural substance that is extracted from turmeric. As a cosmetic ingredient, it activates the thioredoxin signal cascade and thus promotes the formation of the skin’s own scavengers of free radicals.

SKIN MODELS FOR ACTIVE INGREDIENT RESEARCH

For quite a while now, dermatological research has focused increasingly on the natural colonies of microorganisms in the skin. “Today we know that a balanced composition of the skin’s microbiome has a decisive influence on health and well-being,” says Kruttmann. Whereas healthy skin has a great variety of microorganisms, in pathological skin conditions the diversity of the microbiome often decreases. In order to reinforce the natural balance of the skin flora, the researchers at Evonik have developed a special microbiotic product called Skinolance. This cell-free extract of Lactobacillus brevis lactic acid bacteria stimulates the growth of other desirable bacteria called Staphylococcus epidermidis. This has a positive effect on the skin’s barrier function, inhibits inflammation, and thus prevents the skin from becoming rough and drying out. These effects on the skin flora and the skin’s appearance have been demonstrated by a clinical study.

Skinolance is thus the most recent example of Evonik researchers’ intention to provide scientific proof of the effectiveness of the company’s own cosmetic ingredients. “This is why we are also participating in the new Tissue Engineering Project House in Singapore,” says Lersch. In the Project House of the strategic innovation unit Creavis, researchers work on innovation projects that are relevant to the company as a whole. The projects in Singapore will include the development of new skin models that will be used, for example, to screen new ingredients for cosmetics in order to assess the possible effects of potential active ingredients.

“The influence of ethnic factors on the biological mechanisms of skin changes is another extremely interesting area that we also want to investigate in Singapore,” says Lersch. So far there have been a number of interesting approaches, but on the whole we still understand far too little about possible differences. So this is exactly the right time for Evonik to tackle this theme together with partners doing scientific research.