

Skin elasticity - what can cosmetics achieve?

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To keep the skin smooth and free of wrinkles for as long as possible is the main objective of preventive skin care. Besides hydration and smoothing, skin elasticity is the other essential factor where all depends on. Based on selected examples the following article explains potential influences on skin elasticity and how it can be optimally preserved.

A loss of skin elasticity cannot necessarily be put on par with the development of wrinkles. Mimic wrinkles for instance can be successfully reduced with muscle relaxing oligopeptides or spilanthal (para cress extract) without actually improving the basic elasticity of the skin.

Water and lipid balance

This may also apply to the water balance. If the NMF (Natural Moisturizing Factor) is disturbed and the skin consequently cannot absorb enough water the susceptibility for wrinkles also is considerably increased. On the other hand the skin smoothes with the application of amino acids which are natural NMF components and the skin hydration consecutively also increases. Moisture retaining films on the skin surface have smoothing effects too.

Temporary lipid deposits due to a lack of exercise or a weight increase higher than average as e.g. during a pregnancy involve a reduced micro circulation in certain skin parts which also affects the elasticity of the skin.

As a matter of fact, there are temporary effects associated with skin elasticity which can also be recorded (in summary) to a certain extent depending on the specific measuring technique. Individually adapted treatment concepts and the respective nutrition counseling help to cope with these effects.

Ways towards fewer collagen

The basic elasticity of the skin however depends on the collagen filaments of the skin. They recede along with the aging process specifically after the menopause. Frequently also a premature aging of the skin may be observed. A significant role here plays the careless exposure to the UV and IR radiation of the sunlight which both stimulate specific endogenic enzymes to reduce collagen, the so called matrix metalloproteinases (MMPs). Hereditary factors like a weak connective tissue or cornification disorders also accelerate the

loss of elasticity. Continuing negative stress, smoking, excessive alcohol consumption, bad nutritional habits and insufficient sleep are further components here. Skin barrier disorders may also have a lasting effect on the collagen balance. Hence, there are various causes for reduced skin elasticity on the one hand however on the other hand these specific cases also show the potential spheres of activity for a successful protective care.

Special case: atrophic skin

A typical example for reduced skin elasticity is atrophic skin. It is characterized by both a smaller skin diameter and collagen mass compared to normal skin and, consequently drooping skin. The skin tends to form wrinkles, looks dehydrated and has almost completely lost its former attraction. This kind of problem skin may be attributed to a long term application of anti-inflammatory corticoids.

A comprehensive skin care is inevitable and recommended for this kind of skin condition. Massages will increase the micro circulation; the use of coenzyme Q10 nanoparticles based on phosphatidylcholine can stimulate the lipid metabolism. As accompanying measure, caffeine containing extracts like green tea are stimulating and support the blood circulation. Liposomal encapsulated NMF, hyaluronic acid and CM-glucan films as well as aloe extracts improve the skin hydration. With the help of products like vitamin A nanoparticles, vitamin C phosphate liposomes, phytohormones and matrikins it may be attempted to stop the further collagen reduction and perhaps even achieve a modest collagen formation. It is however recommended to start these measures at a relatively early stage as already mentioned above. Preserving a well balanced NMF plays a key role in this context. Besides the intact barrier layers the NMF is the most significant protective factor for the skin and the lower tissue. In corneotherapeutic context we also speak of "outside-in effects"; the NMF is the most effective natural radical scavenger of

the skin.

Emergency: missing sun protection

What can be done if the sun protection product which should stop the premature collagen reduction is ineffective or has simply been forgotten? In this case only an emergency treatment in form of an effective after sun therapy can help to cure the damage. A possible treatment may also be the application of boswellia nanoparticles which stop the collagen degrading matrix metalloproteinases. Even in cases of actinic keratoses, skin damage due to continued UV radiation, the skin lesions may improve considerably. It is also possible to apply echinacea extract in combination with a liposomal concentrate which is rich in linoleic acid and serves as a phosphatidylcholine supplier. Also linseed nanoparticles (omega-3-acids) are rather helpful here. These active agents are supportive insofar as they inhibit inflammatory processes at an early stage and hence stop the formation of erythema which activates collagen degrading enzymes.

Extreme case: stretch marks

While sun protection is a passive measure to preserve the elasticity of the skin, there are also active ways to keep a healthy skin. Temperature stimuli like warm and cold showers and regular and moderate sporting activities provide for an increased resilience not only of the skin but of the whole body. The metabolism is not reduced to a basic stage of activity but stimulated again and again. Therefore it is unnecessary to concentrate on the micro circulation in the skin in particular. Actually it is a vital preventive measure against stretch marks on the belly, hips and breast areas. During pregnancy the collagen structure of the skin is heavily stretched, sometimes even over-stretched in a way that may lead to lasting scars and marks particularly in case of an additionally slack connective tissue. In order to keep the stretch marks as limited as possible massages are recommended to maintain the elasticity of the skin. To support the efficacy of the massages vegetable oils rich in essential fatty acids are used as e.g. linoleic acid, alpha and gamma linolenic acid. The acids support the regenerative activity of the skin. Applied therefore are wheat germ oil as well as the oils of grape seed, evening primrose, rose hip seed and linseed which are also used for general skin care purposes besides massage applications. Specifically oils which are brought into a watery form with the help of nanoparticles are supportive as they penetrate very fast into the skin and will not leave a fatty residue on

the surface. They can easily be combined with vitamin E nanoparticles as well as vitamin C phosphate liposomes (see above). Experience has shown that these vitamins have a strong recovering effect on the skin and may be applied in form of emulsifier free barrier creams.

A frequent case: Cellulite & Co

A specific problem of skin elasticity is cellulite. During the latent phase quite unattractive dents and furrows only become visible when the skin is pressed, while the orange peel skin of an advanced stage can particularly be noticed on thighs and buttocks. Bad nutritional habits, overweight and poor exercise are additional risk factors and induce lipid cells to become larger than already is the case at particular female problem areas. A hereditary weak connective tissue may aggravate this condition. The lipid cells disturb the micro circulation in the lymph and blood vessels with the result of permanent damages to the collagen structure. This problem cannot be solved with external skin care applications alone, it is also necessary to eliminate the risk factors. Appropriate exercise, muscle building activities, massages, shock wave therapy, ultrasonic treatment etc. are important prerequisites for a successful adjuvant therapy with active agent containing products. Only then it is useful to treat the skin with caffeine or green tea containing products which stimulate the micro circulation and with phosphatidylcholine in liposomal products which mobilizes the lipid substances. Also vitamin C phosphate and phytohormones which both influence the collagen metabolism can be applied. In case of a local application of phytohormones as e.g. from soy bean or red clover it should be kept in mind that natural estrogens are also responsible for lipid deposits in cellulite cases. Regarding the nutrition, fat should only be consumed in very moderate amounts. Unless active agents are encapsulated in liposomes and nanoparticles which both support the penetration of agents, it is advisable to undergo an ultrasound treatment for instance. Specific exercises for the problem areas combined with sporting activities have a long term synergistic effect.

Measuring the skin elasticity

A significant issue are problem skins resulting from barrier and cornification disorders. An excellent point of departure for the treatment of these cases with respect to active agents and carrier systems is Professor A. Kligman's corneotherapy (rf. *Ästhetische Dermatologie* 2007 (3), 8-16).

In terms of determining the skin elasticity there are devices which measure the elasticity as such or otherwise read the characteristics of the collagen and elastin filaments. To name a few examples here, the cutometer and reviscometer should be mentioned. The cutometer is provided with a testing probe which is slightly pressed on the skin with the result of a temporary vacuum. The skin is lifted, stretched and then released. These deflections are optically recorded and evaluated. The reviscometer emits an acoustic shock wave, which is registered by the receiver. The time the wave needs from sender to receiver then is recorded. The readings are generally related to the age of the respective person.

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