Inflammasomes: key to the engine of skin inflammation
Using natural oils in fragrance: its role in clean beauty
Enhancing nocturnal processes for beautiful skin

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Analysis of ‘The trilogy of lifting’

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Wrinkle minimisation is the Holy Grail of cosmetic active development. Since the creation of the first anti-ageing formulations, the topic has been explored from every angle. The easiest way is of course to cover the skin with foundations to hide those unattractive features of skin ageing. But besides this use of camouflage, there is more which can be done. To understand how to improve or preserve the youthful appearance of the skin we need to know about its underlying biology.

The skin is composed basically of three layers: the subcutaneous adipose tissue, the dermis and the epidermis, which protects the body from the environment. Wrinkles only develop in the dermis and epidermis. Because of this, it is important to keep these tissues in a juvenile state.

The dermis is a very strong and resilient tissue, which is responsible for the skin’s firmness and elasticity as well as its hydration. You can think of it in terms of a piece of leather as that is what it actually is: a tightly packed protein mesh consisting mainly of collagen, which is responsible for the firmness together with elastin, which is responsible for the elasticity. This tissue is supplemented by moisture-retaining molecules such as hyaluronic acid and proteoglycans.

The epidermis is even stronger than the dermis and is held together by a huge network of keratin that forms interconnections between the cells of the upper epidermis. It is easy to understand that the firm and elastic skin we had in our childhood requires sufficient quantities of the important components and that any decrease in these, e.g. in collagen and elastin, will affect the restoring potential of the skin. You can readily observe this in real life: if you pinch the skin of a child on the back of their hand, you will see that the skin retracts immediately when you let it go. In contrast, when you do the same to a person aged 80 years and older, this can take up to a minute or even longer.

Wrinkles appear at regions where the dermal proteins collagen and elastin are less dense and where the connectivity of the dermis with the epidermis is weakened. This does not happen by chance but is the result of continuous repeated mechanical forces acting on the skin. The first mechanical forces that do this are involved in movement and as a result, the very first wrinkles we have are on the joints of our fingers and palms that are already there when we are born. So, whatever moves will cause wrinkles to develop and therefore our facial expressions will make wrinkles appear on our face sooner or later.

Rahn has developed three solutions in its Liftingon® range to fight wrinkles using completely different approaches:

1. Liftingon-Xpress, the instant wrinkle minimiser that employs a surface-acting bio-polymer blend.
2. Liftingon for alabaster-like skin is an epidermal astringent thanks to the tannins it contains while it also stabilises the dermal structure by providing bioavailable silicon.
3. Liftingon-Xpress ECO, the smart and ecological collagen manager improves dermal density by delivering the perfect amount of additional youth collagen.

Instant wrinkle minimiser

Instant cosmetic lifting is an attractive way of achieving fast and visible results. Liftingon-Xpress (now referred to as ‘the wrinkle minimiser’) acts on the epidermis, the outer cell layers of the skin, where wrinkles become apparent. The active ingredients are hydroxypropyl methylcellulose, pullulan and Porphyridium Cruentum Extract. The carefully adjusted blend of these polymers in the wrinkle minimiser generates a physical tightening and smoothing effect. The polymers form a three-dimensional network on the skin with powerful adhesion and cohesion effects. The result is an immediately noticeable tightening effect that lasts for hours as well as a quick and significant smoothing of wrinkles (Fig 1).

Application of the wrinkle minimiser resulted in a significant reduction of nearly all types of wrinkles in tests. The microrelief of the skin of the hands and arms is markedly improved, the prominence of fine lines on the face is reduced and the wrinkles in the eye area and forehead are significantly minimised.

Functional ingredients and efficacy

Hydroxypropyl methylcellulose (HPMC)

HPMC is used in the cosmetics industry in emulsions, toothpastes, shampoos, soaps, creams and lotions. During the development of the wrinkle minimiser, it was a particular challenge to select the type with the best tightening properties from the various kinds of HPMCs. The variant employed in the polymer matrix provides the wrinkle minimiser with outstanding performance as a wrinkle-smoothing rapid dermo-tensor.

Pullulan

Pullulan is a natural polysaccharide made of maltotriose units. Its chemical structure with the α-(1→6) bonds provides pullulan

Figure 1: Liftingon-Xpress gives uplift to wrinkled skin using tensile forces created by a sophisticated polysaccharide film composed of hydroxypropyl methylcellulose, pullulan and phycoloids obtained from red algae. Wrinkles disappear within seconds. As this is a mechanical effect, signs of visible rejuvenation are not permanent but do last for a couple of hours.
with outstanding flexibility and gives it special physical properties, such as powerful adhesion/cohension to skin while it can also form thin, transparent films or networks with perfect mechanical characteristics leading to shrinkage when water is released.

Porphyridium Cruentum Extract
Porphyridium cruentum is a unicellular red alga. The alga continuously secretes a mucous made of polysaccharides called phycocyanin, which protectively surrounds the cells like a gel capsule. The key monomers are sulfated, inner acid-containing sugars capable of retaining a high amount of water. The secondary algal metabolites may also contribute to a long-term cosmetic function in the skin.

All these three ingredients deliver film-forming polyelectrolyte polymers that have a synergistic tightening effect and at the same time have moisturising properties. The polymer matrix is in the wrinkles minimisation has been optimised to give a tightening effect that is intense and immediately perceptible but at the same time keeps the film flexible, ensuring a long-lasting effect for several hours. Incorporated in a marketable formulation (7003380006, Ageless Eye Serum), the immediate effect is readily visible to the naked eye, as Figure 2 shows.

For alabaster-like skin
Liftoxin (now referred to as the epidermal antigen) was designed to re-establish and protect the organization of the fibrous network with regards to the dermal extracellular matrix. It can be seen as a dual-component glue for the dermal network (see Figure 3). In vitro, Liftoxin can lead to a loosening of the skin with the help of fibroblasts. Both orthocollagen and tannic acid are capable of binding and gripping extracellular matrix fibres due to their high content of hydroxyproline. Orthocollagen strengthens the existing collagen network and induces the synthesis of new collagen fibrils. Tannic acid contributes to the stabilization of the fibrous network. By these means, it reorganizes the bundles of collagen in a way that promotes the formation of new collagen bundles. Further, the fixation of the collagen matrix to the basal lamina strengthens the dermo-epidermal junction, counteracting the formation of fine lines and excretion of fine lines to form deeper wrinkles.

The epidermal antigen not only provides mechanical support to the dermal structure but also promotes healthy cell function. Valuable nutrients and vitamins present in the serum extract provide the viability of keratinocytes and fibroblasts. Orthocollagen stimulates the collagen production of fibroblasts, while Liftoxin is able to stabilize the collagen network (Figure 4). Application of 0.2% Lifting to the delayed gel contraction when fibroblasts are applied to the collagen matrix. This demonstrates the physical power of tannic acid to bind and reorganize a collagen network.

before application 30 sec after application 3 min after application

Figure 2: Liftoxin-Xpert Eco (now referred to as the collagen manager) offers an innovative mechanism that can compensate for an imbalance in the collagen metabolism of the dermis in a controlled manner (Figure 7). The unique combination of acetylated polypeptides, which has a stimulating effect on the fibroblasts, and compounds such as hyaluronic acid, which suppress the development of inflammatory mediators, can be seen as a new approach to the treatment of wrinkles. The effects mean that the formation of wrinkles can be delayed for a long time, and old skin can be restored to a more youthful structure.

Figure 3: Liftoxin-Xpert Eco (now referred to as the collagen manager) offers an innovative mechanism that can compensate for an imbalance in the collagen metabolism of the dermis in a controlled manner (Figure 7). The unique combination of acetylated polypeptides, which has a stimulating effect on the fibroblasts, and compounds such as hyaluronic acid, which suppress the development of inflammatory mediators, can be seen as a new approach to the treatment of wrinkles. The effects mean that the formation of wrinkles can be delayed for a long time, and old skin can be restored to a more youthful structure.

Figure 4: Tannic acid in Liftoxin is able to stabilize the collagen network. Application of 0.2% Liftoxin leads to a delayed gel contraction when fibroblasts are applied to the collagen matrix. This demonstrates the physical power of tannic acid to bind and reorganize a collagen network.
Evenness of skin microstructure and fine lines with use of Lutiron. After 28 days of treatment with 2% Lutiron, the skin was markedly enhanced.

Figure 6: Improvement of visible wrinkles with use of Lutiron. After 28 days of treatment with 3% Lutiron, wrinkles were markedly reduced.

NG is now able to supply the instant wrinkle minimizer Lutiron-Xpress for those needing their best looking moment of the day, to stabilise the existing dermal network with Lutiron to preserve a youthful-looking appearance and provide the optimal amount of collagen in situations where mature skin cannot accumulate the additional quantity required for dermal stability by itself.

From study data on wrinkle reduction, we can conclude that Lutiron-Xpress acts instantly for several hours but has no long term effect on the skin structure (light red line at 0, Fig 5). Lutiron develops its full efficacy.

Figure 8: Lutiron-Xpress visibly reduces wrinkles. Deep expression wrinkles in the eye area are significantly reduced after just 6 weeks and almost vanish after 3 months of treatment with 3% Lutiron-Xpress. The result was a highly significant subjective rejuvenation by 7.5 years as assessed by a collective of 67 persons asked to estimate the age of the subject from the study photographs.

MAJIME BIO
PREBIOTIC BIO-FERMENTED FRUIT EXTRACTS

Majime Bio is a natural ingredient produced by fermentation by lactic acid bacteria. Traditionally fermented substances are prebiotic and therefore extremely beneficial to the skin microbiome.

BENEFITS
- Unique & beneficial to the skin microbiome
- Helps the skin absorbing the product better
- Sustainability & Traceability
- Self-preservation
- Enhance skin immunity
- Improves hair quality

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after only 4 weeks although it has to be admitted that no later time points were investigated. Liftonin®-Xpert Eco needs more time to manifest its efficacy as it influences skin biology at a deeper level to promote collagen expression, which obviously takes a while but gives the best results. In view of these results, it is apparent that a combination of these three active ingredients would serve as a powerful supplement in cosmetic formulations designed for the initiation of anti-wrinkle treatment that would provide impressive instant results combined with collagen stabilization and a long-term collagen buildup.

References

7. Natarajan V, Kirthika N, Madhan B, Sehgal PK.

Figure 9: Progression of efficacy based on study results. By means of continuous use of the active ingredients, the anti-wrinkle effect of Liftonin®-Xpress is manifested immediately, while the effects of Liftonin become apparent within 4 weeks and those of Liftonin®-Xpert Eco within 3 months in accordance with their individual modes of action. Continuous use of the latter agents will maintain achieved benefits at a high level.


Formulation 1: Ageless Eye Serum

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<th>Phase</th>
<th>Substance</th>
<th>INCI Name USA</th>
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<tr>
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<td>Water</td>
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<tr>
<td></td>
<td>LIFTONIN®-Xpress®</td>
<td>Hydroxypropyl Methylcellulose, Pullulan, Porphyridium Cruentum Extract</td>
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<td>2</td>
<td>Optigel WX®</td>
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<td>Optigel CL®</td>
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<tr>
<td>4</td>
<td>Solagum AX®</td>
<td>Azacit Senegal Gum, Xanthan Gum</td>
<td>0.30</td>
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<tr>
<td>5</td>
<td>TEGO Pep 4-17®</td>
<td>Tetrapeptide-21, Glycerin, Butylene Glycol, Water</td>
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<td>6</td>
<td>Verasil PC®</td>
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<td>7</td>
<td>Eldew PS-203®</td>
<td>Phytosteryl/Decylsodium Lauryl Glutamate</td>
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<tr>
<td>8</td>
<td>Citric Acid solution 10%</td>
<td>Citric Acid, Water</td>
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Production: Prepare half of the water / Add LIFTONIN®-XPRESS® while stirring; let it swell for about 10 minutes, the phase must be free of lumps / Take the other part of the water and add Optigel WX and CL while stirring / Homogenise for 10 minutes and add the whole gel to the water and LIFTONIN®-XPRESS mixture while stirring / Continue stirring till a homogenous gel appears / Add the remaining ingredients while stirring; homogenise

Properties:
Appearance Light brownish gel
pH value 6.5-7.0

Suppliers: 1 Several 2 Rahn AG 3 BYK Chemicalie 4 Seppic 5 Evonik Industries 6 Ajinomoto

April 2020

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