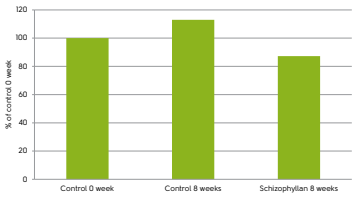
CONTIPRO

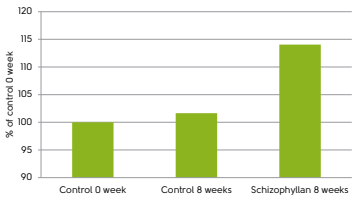
SCHIZOPHYLLAN

Schizophyllan (SCH) is an extracellular polysaccharide of fungus *Schizophyllum commune* which is able to regulate the response of different types of cells to external stimuli and thus affect their viability and protein synthesis. As a result, it has the very interesting capability of positively influencing the visible effects of skin aging.

Hydration support by underpinning the viability of epidermal cells



Effect of 0.005% Schizophyllan on skin barrier, 8 volunteers treated (25-57 years) + 29 volunteers control group, Daily application for 8 weeks, $p \leq 0.05$, Measured by MPA 580, Tewametry

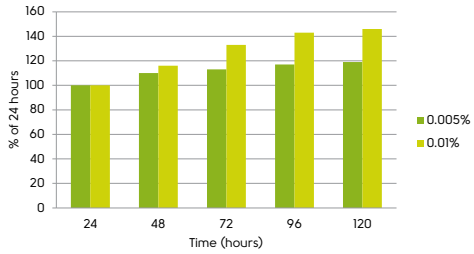


Effect of 0.005% Schizophyllan on skin water content, 8 volunteers treated (25-57 years) + 29 volunteers control group, Daily application for 8 weeks, $p \leq 0.05$, Measured by MPA 580, Corneometry.

During the eight-week *in vivo* study of the effects of SCH, data were obtained showing a positive impact on skin hydration.

In the subjects treated, there was a reduction in the transepidermal water loss (TEWL) characterizing the increased barrier function of the skin, which was confirmed by elevated hydration of the epidermis.

Mechanisms of action

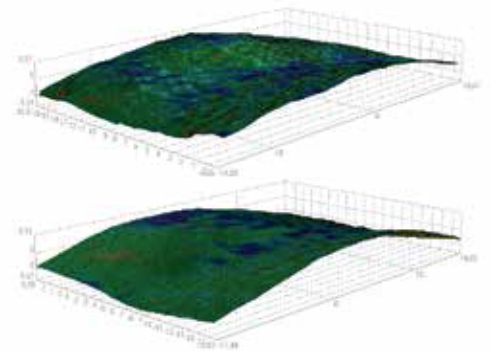


Increase of HaCaT keratinocytes rate proliferation by 0.01-0.005% Schizophyllan treatment, n = 1, Measured by XTT assay

Loss of water due to penetration through the stratum corneum is prevented by the natural moisturizing factor (NMF), which is a mixture of substances, especially of a lipid nature, that acts as a semipermeable barrier in the stratum corneum.[1]

Schizophyllan demonstrated an ability to increase the viability of keratinocytes, resulting in the increased production of NMF precursors and accelerated restoration of the stratum corneum. Therefore, the restoration of NMF is accelerated and its quality is enhanced, which helps reducing TEWL, as demonstrated *in vivo*.

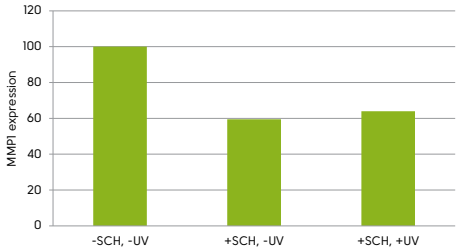
Wrinkle reduction due to the stabilization and protection of the extracellular matrix



In vivo effect of 0.005% Shizophyllan application on wrinkles; Measured by 3D LifeViz. Upper control, lower Schizophyllan.

In the monitoring of the *in vivo* effects, Schizophyllan's significant ability to reduce wrinkles was demonstrated. As shown in the visualization of a typical situation at the beginning and the end of the study, there was a marked reduction in the scope and depth of wrinkles. This, combined with increased hydration of the skin, leads to an overall improvement in the appearance and condition of the skin, the subjective perception of which was also repeatedly affirmed by our volunteers.

Mechanisms of action



Effect of 0.05% Schizophyllan on TGF-beta expression 24 hours after HaCaT keratinocytes treatment, n = 1, Measured by RT-PCR

The basic principle demonstrated in vitro is the modulation of the activity of skin cells, in which Schizophyllan promotes the increased expression of transforming growth factor beta (TGF-beta).[2]

This modulator of cell activity has a major influence on the synthetic activity of cells. TGF-beta in cells increases the production of collagen, an essential component of the ECM which is responsible for its structure and strength and which in particular, in our case, smoothes wrinkles in the deeper layers of skin.[3]

Another impact of TGF-beta is that it reduces the production of matrix metalloproteases, which are responsible for the degradation of extracellular matrix components and thus collagen.[4]

All data were obtained in the relevant *in-vivo* and *in-vitro* measurements and, subject to registration, can be accessed at www.contipro.com/anti-aging

SPECIFICATION: **Schizophyllan**, powder

Origin	biotechnological processing
Appearance	white to slightly yellow or greyish powder, fibres or granules
Smell	typical characteristic
Appearance of 0.5 % aqueous solution	slightly opalescent solution
Loss on drying (%)	≤ 10.0
Kinematic viscosity (cSt)*	1.10 – 1.70
pH of 0.5% aqueous solution	5.0 – 8.0
Ash (%)*	< 3.0
Total nitrogen (%)*	< 1.0
Microbial contamination (CFU/g)	< 100

* calc. on dry basis

SOURCE

- cultivation of mycelium of selected Schizophyllum commune strain. Its molecular weight is reduced by special cleavage.
- non-GMO
- non-animal materials used during the manufacturing process

SOLUBILITY

- fully soluble in water, forms viscous solutions. Dissolution in cold water is time consuming process and therefore is recommended dissolving in hot water. Schizophyllan has the ability to form microgel.
- limited solubility in water/alcohol mixture. The concentration of alcohol has to be below 40% for full solubility of Schizophyllan.
- insoluble in non-polar solvents

Literature

[1] Verdier-Sevrain, S. and F. Bonte (2007). "Skin hydration: a review on its molecular mechanisms." J Cosmet Dermatol 6(2): 75-82

[2] T.Muthny, M. Moravcova (2013). "Skin aging in the context of sun damage and immune response alterations." SOFT Journal 4: 2-8

[3] Chen, S. J., W. Yuan, et al. (1999). "Stimulation of type I collagen transcription in human skin fibroblasts by TGF-beta: involvement of Smad 3." J Invest Dermatol 112(1): 49-57

[4] Slavin, J., E. Unemori, et al. (1994). "Transforming growth factor beta (TGF-beta) and dexamethasone have direct opposing effects on collagen metabolism in low passage human dermal fibroblasts in vitro." Growth Factors 11(3): 205-13

Version: P-01/2014

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