MossCellTec™ No.1
Enhances cell nucleus function for resilient skin

mibelle GROUP biochemistry

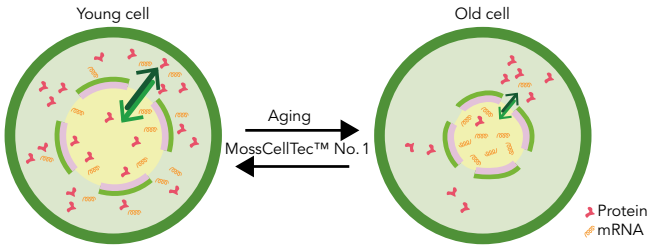
MossCellTec™ is an extract of moss protonema cells produced by the novel MossCellTec™ technology. It enables skin to adapt quicker to environmental changes and improves skin moisture.

The issue
The cell nucleus does not only contain the cell's DNA but is also involved in regulating important cellular processes. To adapt to the ever-changing environment an efficient transport of molecules into and out of the cell nucleus is crucial – a traffic of up to 5 million molecules every second!

In aging cells, the efficiency and selectivity of this nuclear transport is reduced. Different proteins which are responsible for the transport of molecules and the proper shape and stability of the cell nucleus were found to decrease with age. As a result the aging cell can no longer react quickly enough to changing environmental influences and ages faster.

The solution
MossCellTec™ is a novel technology that, for the first time, enables the large scale cultivation of moss cells under sterile conditions and in both a reproducible and sustainable way. Moreover, the biotechnologically produced plant material is completely free of environmental pollutants and pesticides.

The benefit
MossCellTec™ No.1 is an extract of the cells from *Physcomitrella patens* and designed to rejuvenate the cell nuclei of skin cells. As a result the skin is able to adapt much faster to environmental impacts and changes. MossCellTec™ No.1 supports the activity of all other anti-aging actives which work through stimulation of gene expression and is thus a key factor for anti-aging concepts in cosmetics.



The plant
Mosses were one of the first plants to grow on dry land 470 million years ago. They are extremely resistant organisms and established special strategies to counteract environmental stress. Since mosses filter all of the necessary nutrients from the air and rain they also accumulate air pollution particles such as heavy metals. Notably, this high resilience to environmental changes explains why mosses were able to adapt quickly enough to climate changes and survive from the prehistoric times to today. For MossCellTec™ No.1, a protonema culture of the moss *Physcomitrella patens* was established by the specially developed MossCellTec™ No.1 technology.

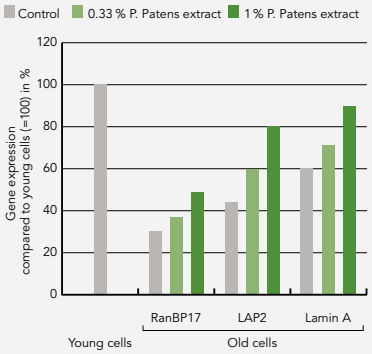
INCI (EU/PCPC) Declaration: Phytol (and) Isomalt (and) Aqua/Water (COSMOS approved*, NATRUE approved).

** Raw material approved by ECOCERT GREENLIFE in accordance with the COSMOS Standard*

Study results

Protection of cell nucleus health markers — S-674

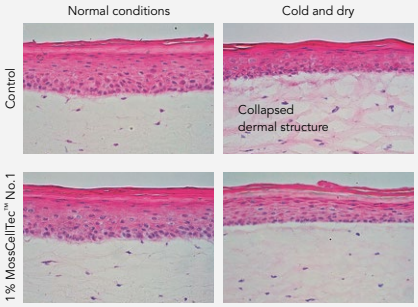
Cell line: Normal human epidermal keratinocytes from a young (f, 20 y) and an older donor (f, 55 y)
Test compound: 0.33 and 1 % *Physcomitrella patens* extract
Treatment: Incubation in test substance for 24 h
Parameters: Expression of genes relevant for the nuclear structure and the transport through the nuclear pore



➔ **Expression of three important nucleus-health relevant genes was increased (concentration-dependent)**
➔ **Rejuvenating effect on the cell nucleus**

Protection against climatic stress — S-713

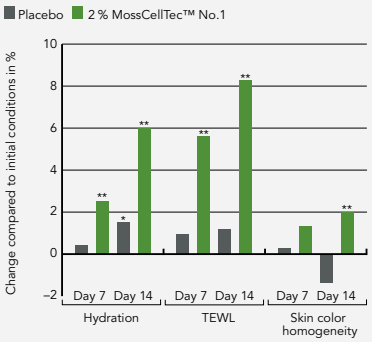
Reconstructed skin was exposed to hot-humid and cold-dry conditions followed by gene expression analysis and staining.
Skin model: 3D human reconstructed skin model
Test substance: +/– 1 % MossCellTec™ No.1
Conditions: Hot/humid 40 °C, 80 % relative humidity (not shown), cold/dry 10 °C, 40 % relative humidity



➔ **Strong visible damage in the dermal collagen network after climatic stress**
➔ **MossCellTec™ No.1 protects the skin from this damage!**
➔ **In addition: stress marker LCE1A was reduced strongly in cells treated with MossCellTec™ No.1**

Improved adaptability to climatic stress — S-709

Volunteers: 23 (f, 39 y – 53 y)
Application: 2x/d, 14 d half face application, 2 % MossCellTec™ No.1
Conditions: Asian volunteers spending 2–5 hours per day oudoors, study performed during summer in Seoul, South Korea.



➔ **Hydration +6 % (up to +17.5 %)**
➔ **TEWL –8 % (up to –20 %)**
➔ **Skin color homogeneity (image analysis + pictures before and after)**

In Addition — S-726/S-648

Improvement of wrinkles and skin barrier. A cream with 2 % MossCellTec™ No. 1 decreased wrinkle depth by 15 % and TEWL by almost 8 % compared to placebo (improvement in 73 % of the volunteers, up to –20 %).

Stimulation of skin barrier markers. Increased expression of two important groups: genes involved in forming the stratum corneum and genes that encode the proteins that form juctions between the cells such as desmosomes and tight juctions.

Recommended use level: 2 %
Applications: Anti-aging treatments, formulations for all types of weather, protection and repair formulas, moisturizing skin care
Moreover: MossCellTec™ No. 1 perfectly fits the Adaptogen trend

Benefits of MossCellTec™ No.1

- Enables skin to adapt to environmental changes
- Improves skin moisture, even in stressful conditions
- Refines skin and creates a flawless complexion
- Maintains cell nucleus health to ensure youthful skin
- Strengthens skin resilience against urban aggressors

SWISS QUALITY PRODUCT