ALGAKTIV® essential bioactive ingredients derived from microalgae

RestoreSKN™

Description

Skin and aging

Skin aging is the result of environmental aggressions (sun, pollution, pathogens, chemicals...) that produce free radicals which in turn produce DNA lesions in skin cells. DNA damage accumulates over time leading to faulty working of the cell machinery, which results in limited renewal of skin cells and the thinning of the skin extracellular matrix.

Over millions of years, evolution has shaped microalgae into highly complex cell systems with distinctive molecular tools that allow them to survive in the most extreme environments (outer space, high and low temperatures, highly oxidative environments, high UV-exposure).

ALGAKTIV® uses its molecular knowledge about microalgae and its proprietary biotechnological tools to create a singular and natural blend of microalgae derived actives with unmatched characteristics: **RestoreSKN™**

RestoreSKN™ is a blend of lipophilic fractions from green and brown microalgae isolated from extreme oxidative environments, reproduced in closed biotechnology conditions to preserve its natural integrity and encapsulated in liposomes for optimal delivery.

RestoreSKN™ actively promotes the production of collagen, elastin and the skin intrinsic growth factors to **rejuvenate and restructure** aging skin.

Insight - Mechanism of action

RestoreSKN™ stimulates the production of keratinocyte growth factor (KGF) and fibroblast growth factor (FGF), which are responsible for rejuvenating the skin and strengthening the barrier function.

RestoreSKN™ induces the secretion of granulocyte-macrophage colony-stimulating factor (**GM-CSF**) by keratinocytes. GM-CSF is a potent booster of the skin natural immune defenses and promotes skin repair and regeneration. GM-CSF has also been described to accelerate the process of re-epithelialization by increasing keratinocyte and endothelial cell renewal, migration, and survival, thus promoting healing of skin injuries resistant to repair due to the aging process.

Finally, **RestoreSKN™** rapidly induces fibroblasts to produce collagen and elastin resulting in improved skin elasticity, thickening and the replenishment of fine lines and wrinkles.

Key information

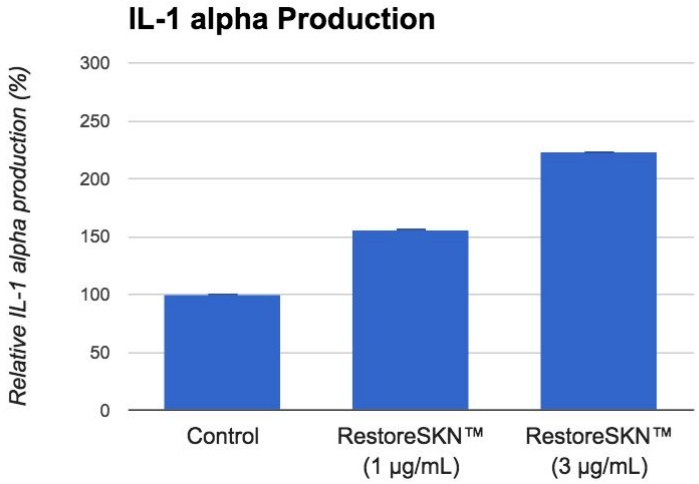
INCI	Plankton extract (and) lecithin
Recommended use	0.5 to 2%
Applications	➢ Rejuvenate ➢ Firm and restore the skin ➢ Boost natural defense system ➢ Repair the skin barrier function ➢ Wound healing and tissue repair

In vitro efficacy

Regenerate: IL-1 alpha and GM-CSF synthesis

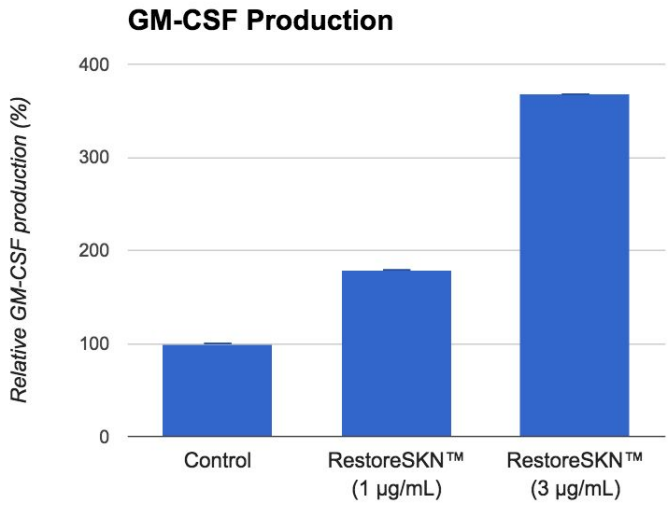
IL-1α is a basic cell-to-cell communication factor required to maintain the normal functioning of the skin and is constitutively produced by epithelial cells, mainly by healthy keratinocytes. Its role in the maintenance of the skin barrier is specially relevant with increasing age. When under aggression or when disruption of the skin barrier occurs, it acts as a potent stimulator of both fibroblasts and keratinocytes to restore the barrier.

Human keratinocytes were treated with different concentrations of **RestoreSKN™**. After 30 hours, **RestoreSKN™** dramatically increased the production IL-1α and GM-CSF.



RestoreSKN™ stimulates the secretion of keratinocyte growth factor (KGF) and fibroblast growth factor (FGF), crucial growth factors responsible for rejuvenating the skin and strengthening the barrier function, by boosting the levels of IL-1α.

According to the latest research, GM-CSF promotes skin repair and regeneration and is a potent booster of the skin natural defenses. GM-CSF promotes the healing of skin injuries resistant to repair due to the aging process.

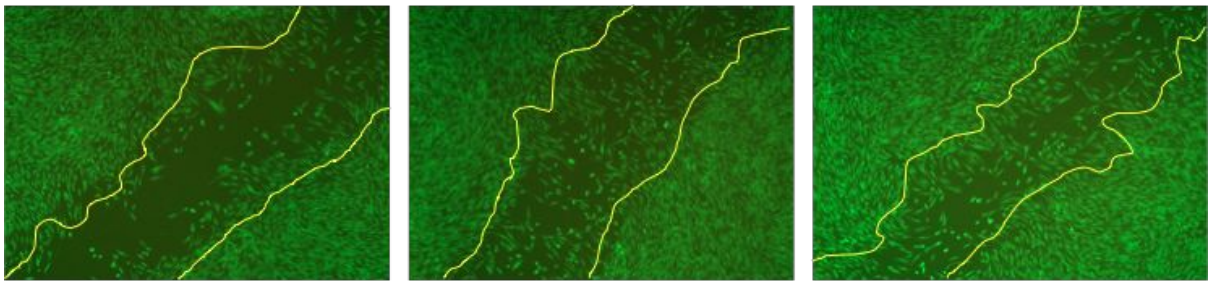


RestoreSKN™ regenerates the skin by inducing the secretion of the growth factor GM-CSF responsible for accelerating the renewal, migration and survival of keratinocytes and endothelial cells.

Repair: Fibroblast renewal

To study the effects on fibroblasts, a wound healing assay (scratch test) was performed using **RestoreSKN**™. Fibroblast renewal and migration was measured after 24 hours compared to a negative control and to cells treated with 50 ng/mL of Vascular Endothelial Growth Factor (VEGF) as a positive control.

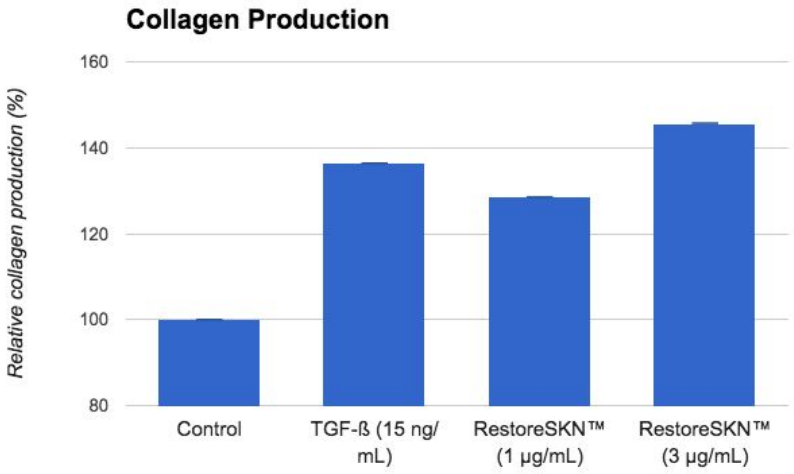
The wound healing assay demonstrated the potential to significantly stimulate and promote skin cell regeneration in just 24 hours. Rapid migration and renewal of fibroblasts cells highlights the repair and regenerative properties of **RestoreSKN**™.



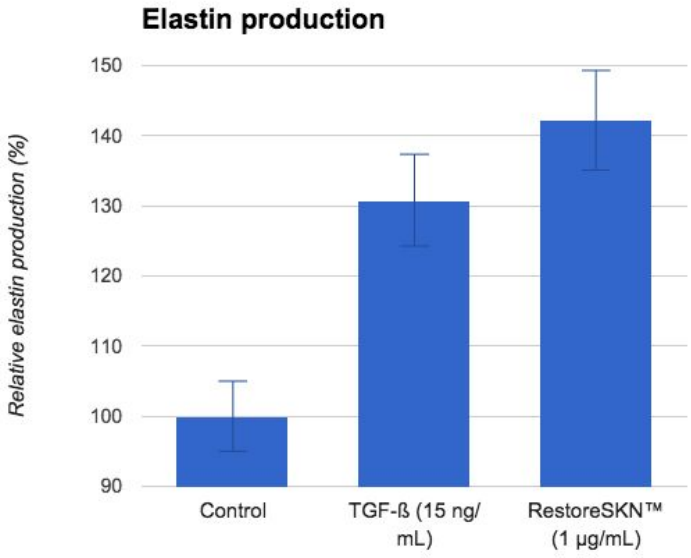
Basal | RestoreSKN™ (1 µg/mL) | VEGF (50 ng/mL)

Rejuvenate: Collagen and Elastin boosting

Fibroblasts were treated with different concentrations of **RestoreSKN™**. Transforming growth factor beta (TGF-ß) was used as a positive control.



RestoreSKN™ replenishes fine lines and wrinkles by strongly inducing skin fibroblasts to produce collagen (up to 45%) in just 5 days.



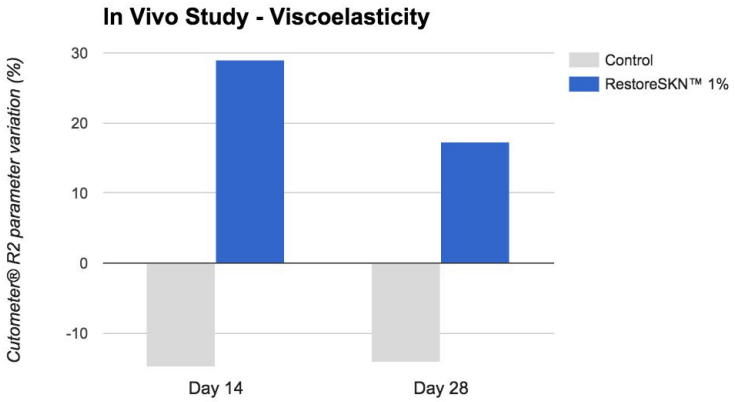
RestoreSKN™ improves elasticity by strongly inducing skin fibroblasts to produce elastin (up to 40%) in just 3 days.

In vivo efficacy

Thirty volunteers of ages between 30 and 60 years were asked to use a lotion containing 1% **RestoreSKN™** twice per day during 4 weeks. In order to eliminate intraindividual variability, volunteers were asked to avoid using lotion in their left arm, area which was used to measure normal variation of the skin of each individual during the study.

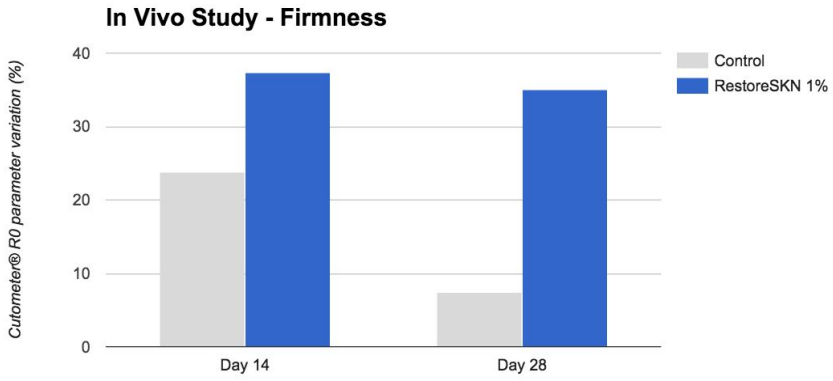
Rejuvenate: Boosting viscoelasticity and firmness

Viscoelasticity is an excellent indicator of the overall skin elasticity including creep and creep recovery and it is directly related to the function of elastic fibers in the skin . Viscoelasticity was obtained with a Cutometer® after 14 and 28 days of use.



N=30. Statistical significance p<0.006.

RestoreSKN™ increased **viscoelasticity** by more than 40% compared to untreated skin after just 14 days of application and increased **firmness** by more than 30%.



N=30. Statistical significance p<0.001.

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