Total Generation Sequoia & Egyptian blue lily

The global skin regeneration

TWO STORIES

The Sequoia | *Sequoia sempervirens, Cupressaceae*

A thousand year old geant famous but now protected

As a survivor of ancient forests, this botanical rarity is a 100 meter high tree that can live more than 1000 years. Oddly it needs fire to reproduce itself: thanks to ashes rich in minerals, its seeds sprout more easily. As it is resistant to fires and able to catch water in the atmosphere, it plays a very important part in the ecosystem of the Californian forest. Natives see it as a sacred tree, a protective spirit, believing it is in contact with their ancestors.

The Egyptian blue lily | *Nymphaea caerulea, Nympheaceae*

A divine symbol in a mythical civilization

Born in Africa, the blue lily comes out of water; and like any lily, its rhizom was cooked for a long time. Its original environment was the calm waters of Nile and it likes hot climates. Very often used in religious rituals, it represented many concepts in Ancient Egypt: a symbol of creation, of god Nefertem, therefore a symbol of power, but also a symbol of renaissance for Egyptians. It is often found on buildings as an ornamental component.

Key points

An active plant cell
Developed to deliver the highest amount of original active molecules.

A high tech natural ingredient
Created to preserve and improve the identity and the benefits of a natural product.

A global anti-ageing action
Reinforces cell activities at the dermo-epidermis level to limit ageing signs.

Because skin limits its renewal process when ageing, it is necessary to maintain it in order that it keeps its supporting functions at their original level. To get a skin looking younger, firmer and soother.

PRODUCT BENEFITS

Anti-ageing

Firming

Contributes to densify the dermis. Helps to improve or restore the dermis functions, skin resistance.

Restructurating

Restores higher levels of the synthesis of fiber and glycoproteins in the extra cellular matrix.

Regenerating

Increases epidermis cell regeneration and reinforces the protective skin barrier.

Anti oxidant

Slows down general cell oxidation, reduces excessive production of free radicals.

To be used in skincare or make-up products such as cream, fluid, serum, balm, lotion, milk, foundation, concealer, etc. In any cosmetic or skincare product dedicated to fighting and preventing skin ageing.

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Related products | FIBER BOOSTER PLUS SEQUOIA & VITIS FLOWER | ALL EVEN SWEET IRIS | ALL FIBER BOOSTER TEA

HOW IT WORKS

Total Generation Sequoia & Egyptian blue lily: reinforcing densities and dermo-epidermic anchorings

Total Generation Sequoia & Egyptian blue lily helps to get back a natural densification thanks to a better cohesion between the two skin layers, dermis and epidermis. It boosts and changes the initial cell and fiber synthesis, the one of keratinocytes and of collagens - the two elements that allow skin to stay young and thick. Therefore it can help that synthesis to recover its initial function: creating skin supporting fibers. But also in order that the contact zone between the two skin layers keeps its anchorage points. In the same time, it limits the creation of free radicals, the 3rd essential factor of skin ageing.
Thanks to those actions, the different layers keep on being linked to each other with cells always operating.

in vitro testing results

Study of the extra-cellular matrix - dermis level

The first chronological ageing expresses basically at the level of dermis through a functional ravage of fibroblastes and the dermo-epidermis junction. The collagen synthesis decreases, especially collagen 3 (called a « young » or « immature» collagen) leading to an increase of the relation between collagen type I and type III. At the level of the dermo-epidermis junction, its lowering leads to a decrease of cohesion between dermis an epidermis inducing a decrease in their exchanges. The visible signs of that ageing are expression wrinkles. Therefore Naolys decided to study many types of collagens involved in chronological ageing.

The extra-cellular matrix (ECM) contains polysaccharides (proteoglycans and GAG) but also structuring fibrous proteins (collagens and elastin) and adhesion proteins (fibronectine and laminine). Collagens bring resitance to stretching, regulates cell adhesion (the adhesion phenomenae of cellsto ECM), sustain cell chemotaxis and migration and also guide tissue development. Collagens are the most abundant fibrous proteins in the interstitial ECM and are the essential structural component in the ECM, especially fibrillar collagens: collagen type I represents 60% to 80% of collagens in dermis, collagen type III represent 15% to 25%. Fibrillar collagens type I, III and V gather in thicker fibres which form a tridimensional network in the whole dermis size. They give to skin its resilience strenght and are essential to its tissue integrity.
At the level of the dermo-epidermis junction, there are collagens type III, reticular fibres, but also collagens type IV (the majority at the level of the *lamina densa*, the intermediate anchorage zone for anchorage filaments coming from epidermis and anchorage fibres coming from the fibrillar zone in the papillar dermis) and collagens type VII (at the level of the fibrillar zone, the closest zone to dermis) that make the connection with anchorage patches in papillar dermis or form tangled loops linking two parts of *lamina densa*.

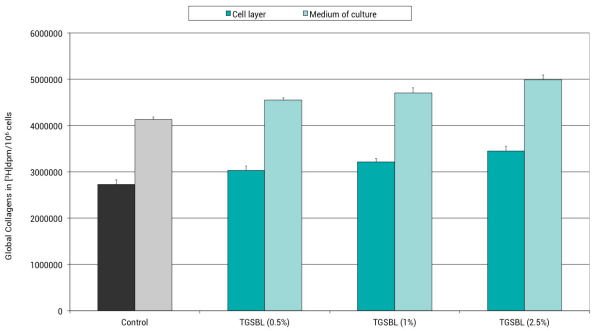
Studies about 2 components of ECM: collagens and MMP3

The different studies on the components of the ECM and MMP3 run by Naolys have been made on culture of fibroblasts.
Collagen is the most abundant fibrous protein within the interstitial ECM and constitutes the main structural element of the ECM; collagens provide tensile strength, regulate cell adhesion, support chemotaxis and migration, and direct tissue development.
MMP3 (or Stromelysin-1) is an enzyme of the ECM that is involved in the breakdown of the ECM and tissue remodeling.
It degrades collagen types II, III, IV, IX and X, proteoglycans and other fibrous proteins.

Technical information Formulating Total Generation Sequoia & Egyptian blue lily

INCI name of cells	form	aspect	concentration	dispersible
sequoia sempervirens leaf cell extract nymphaea caerulea leaf cell extract	cells (20%) in glycerin or sunflower oil (80%)	liquid	starting at 0.5%	in any formulation

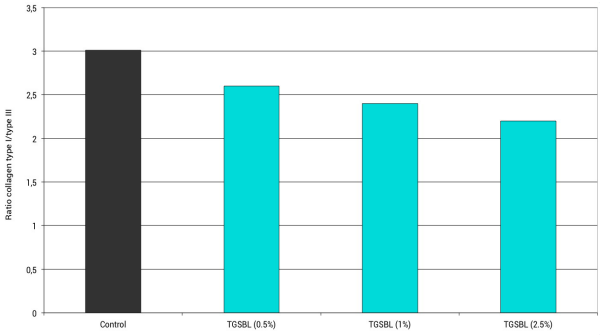
Study of the neosynthesis of total collagens



Increase of the neosythesis of total collagen

→ At concentrations of 0.5%, 1% and 2.5%, induction of the collagens synthesis respectively by 11%, 18% and 27% translated by a release of collagens in culture medium by 10%, 14%, 21%

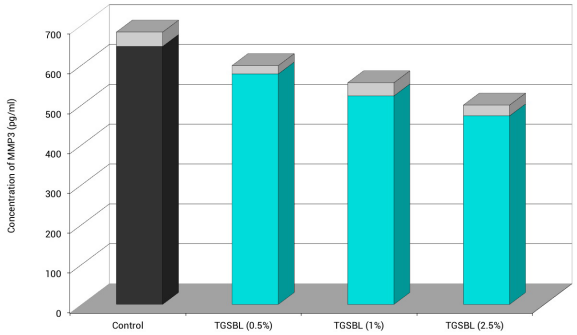
Study of synthesis of collagen type 1 and 3



Decrease of the relation between collagen type 1 and collagen type 3

→ At concentrations of 0.5%, 1% and 2.5%, increase of collagens 1 and 3 with a decrease of the relation between collagen 1 and 3, inducing an increase of collagen 3

Study of MMP3

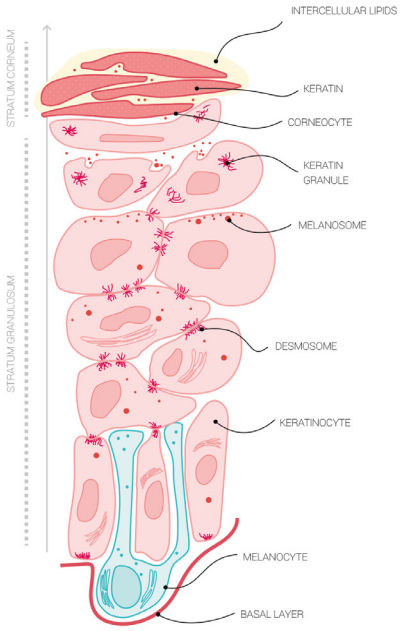


Decrease of MMP3

→ At concentrations of 0.5%, 1% and 2.5%, decrease of MMP3 respectively by 11%, 19% and 27%

Study of cell renewal - epidermis level

The epidermis, the superfical layer of skin is first made of cells called keratinocytes which renew non stop according to a 21 days cycle That renewal of the epidermis is made thanks to the cell proliferation and the differenciation that keep the balance of adult tissues, therefore keratinocytes, divide at the level of the basal layer of the epidermis, which is mainly made of non differenciated cells and migrate to the surface changing their form: they lose their nuclei and load hard filaments of keratine. When they reach the cornified layer, they become corneocytes, dead cells that create a solid membran (thanks to keratine) impermeable and protective: the protective natural barrier of the epidermis. Those built up corneocytes will naturally break away and be shed. The alteration of that balance, essential to the good of tissues called homeostasis is responsible for physical changings linked to ageing: skin wilting because of the decrease of cell proliferation, lack of healing in case of wounds, loss of hair...

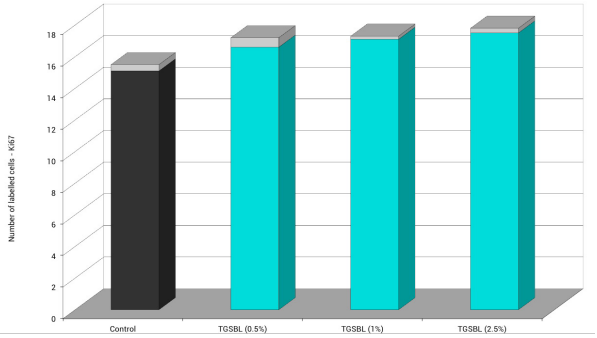


THE EPIDERMIS AND KERATINISATION PROCESS

Study of the proliferation of epidermis cells

KI67 is a anti-gene to mark cell proliferation.
Studies have been made on reconstructed epidermis.

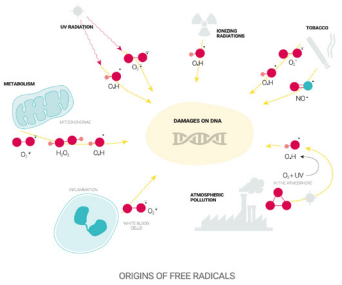
Study of epidermis cell proliferation



Increase of KI 67

→ At concentrations of 0.5%, 1% and 2.5%, stimulation of the proliferation of keratinocytes in the basal layer for treated epidermis respectively by 10%, 13% and 16%

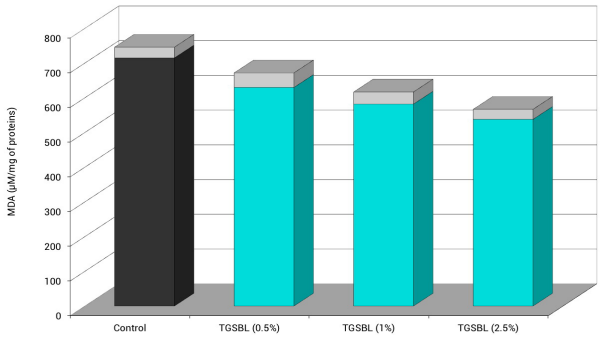
Study of the lipid peroxidation



ORIGINS OF FREE RADICALS

Because it is a reaction indicating oxidative stress, Naolys chose to study the release of MDA during physiological lipid peroxidation and lipid peroxidation induced by UVB.
When we measure the MDA (malondialdehyde), one of the chemical products created by the chemical chain reaction induced by the free radicals, indicating of cytotoxicity by oxidative processes, then we have a good information about the anti-oxidant activity of a substance.
Normally, the endogenous production of free radicals (physiological lipid peroxydation) is counterbalanced by various defense mechanisms.
However, many situations can induce the appearance of an excess of free radicals (induced lipid peroxidation) such as intense exposition to sun, intoxication by certain chemical products, contamination by toxins, intense inflammatory reactions, etc.
These oxygenated free radicals attack phospholipid membranes, thereby altering the properties of the cell membrane.
They also induce the formation of lipid derived cytotoxic mediators which react with proteins. The consequences are numerous and can lead to several pathologies (inflammation, arteriosclerosis, etc.)

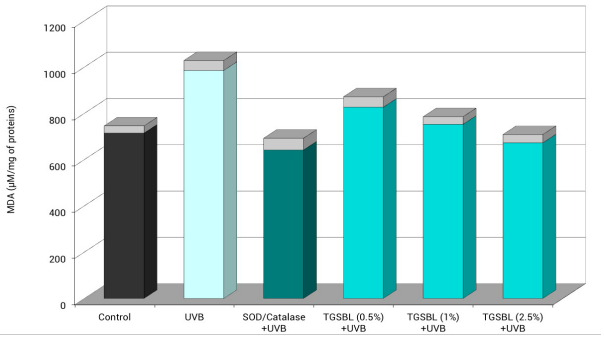
Lipid peroxidation in the physiological conditions



Decrease of MDA (Malondialdehyde) rate

→ At concentrations of 0.5%, 1% and 2.5%, decrease of the physiological lipid peroxidation, which was translated by a decrease of the MDA rate respectively by 12%, 19% and 25%

Lipid peroxidation induced by UVB



Decrease of MDA (Malondialdehyde) rate

→ At concentrations of 0.5%, 1% and 2.5% , decrease of the lipid peroxidation induced by UVB (150mJ/cm²) which was translated by a decrease of the MDA rate respectively by 16%, 24% and 32% compared to protective enzymes SOD/catalase (-35%)

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