

# InnerRenewal CC + AA

*Revitalizing damaged skin cells*

**NÆOLYS**  
NATURE EXPANDED



NAOLYS ACTIVE SHELLS

# Inner Renewal

CC + AA

*Revitalizing damaged skin cells*

Skin cells are damaged all the time, specifically because of their exposure to free radicals that modify their structure, causing them to function less efficiently and ultimately affecting their DNA. Essentially, they are ageing rapidly. While we cannot stop oxidation, we can slow it down and stimulate the repair of cell functions, especially the fibroblasts.

This helps to keep skin firmer, with less wrinkles, and younger looking.

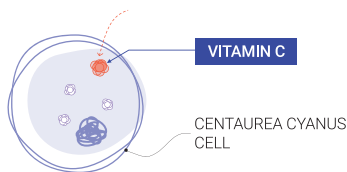
## A VEGETAL STORY

### High Tech Natural Cornflower + Vitamin C

*As a complete natural delivery system, plant cells can integrate a lot of molecules, including high tech and pharmaceutical molecules. Naolys created this new shell based on Cornflower cells delivering vitamin C (1%) to help key skin cells maintain their functions for longer, especially keeping the skin naturally firm.*

*Cornflowers are a wild herbaceous plant that often grows near cereals and attracts pollinating insects.*

*Vitamin C is a natural molecule that occurs in several varieties of fruits, such as citrus.*



## PRODUCT BENEFITS

### Anti-ageing

#### Anti-wrinkle

Helps to reduce wrinkles and fine lines, especially crow's feet (face).

#### Anti-ageing

Firming, enhanced suppleness, helps to relaunch collagen and GAG synthesis.

#### Regenerating

Increases epidermal cell renewal.

#### Anti-oxidant

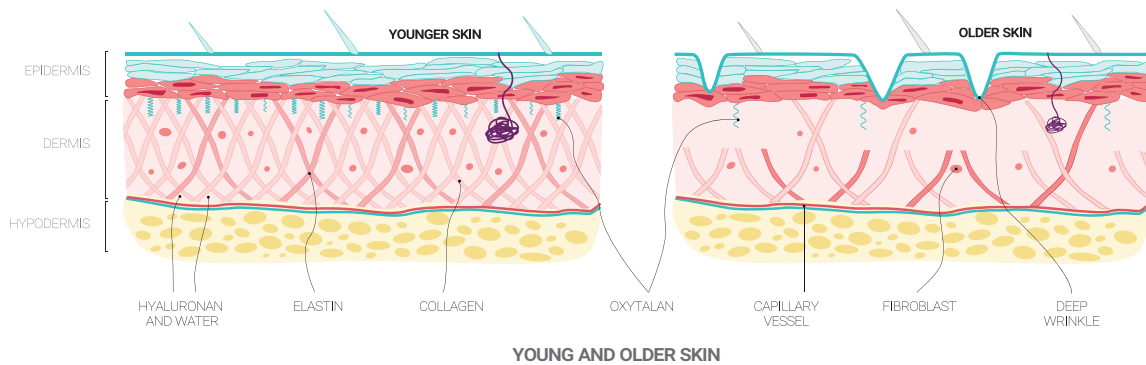
Limits damage caused by oxidative stress.

NAOLYS

## HOW IT WORKS

# Inner Renewal [CC+AA]: the cause of skin densification, in the heart of the dermis

**Ageing first becomes apparent in our skin.** It sags, folds, forms fine lines and then wrinkles, and becomes drier and more sensitive. Our faces and entire bodies are affected by these changes.



The majority of these changes are in fact due to deterioration in the key layer of the skin: the dermis.

The dermis is the intermediate layer under the epidermis (four times thicker) which nourishes the skin, protects the vascular network and nerve fibres, as well as containing the pilosebaceous system and the sweat glands. There is also connective tissue (in the deep and middle layers of the dermis). This tissue consists of an interlocking network of collagen fibres which create the scar tissue to repair cuts or abrasions, and elastic fibres that enable the skin to stretch; fibres that are synthesized by the most common type of cell in the dermis: the fibroblasts.

### **At birth, the skin is tight, smooth and without wrinkles.**

If it changes, it is because the fibroblasts have changed, becoming damaged and reduced in number by the daily oxidation, that in the first place is generated by our own bodies. They then no longer manufacture enough collagen fibres and support substances such as the proteins that hold water, for example hyaluronic acid. The epidermis is then no longer sufficiently irrigated by the dermis, and also deteriorates.

To slow down the ageing process in the dermis, it is therefore necessary to act on these cells and support their general operation.

# Inner Renewal [CC+AA]: maintaining the health of fibre-producing and support cells for better skin quality

### **Increasing the presence and efficiency of fibroblasts**

Like all human cells, dermis cells are attacked by free radicals generated by "physiological" oxidation, i.e. that comes from respiration and stress, every day, and every night. Furthermore, with age, they multiply less and less. They are therefore less able to function properly.

**Inner Renewal [CC+AA] improves fibroblast function by protecting them from physiological oxidative stress and by stimulating their multiplication.**

### **Increase the skin's firmness**

If the number of fibroblasts decreases and they are damaged by attacks from free radicals, they manufacture less collagen and less water-bearing molecules, and so the dermis sags and becomes susceptible to wrinkles.

**Inner Renewal [CC+AA] restores the synthesis of components essential to the skin's firmness: collagens fibres and polysaccharides.**

### **Improves the density and suppleness of the epidermis**

Above the dermis, the epidermis is the outer layer of the skin that we see. Its quality is also essential for the skin's general firmness. With age, it renews itself more slowly, hydration becomes less efficient and the skin has a rough appearance.

**Inner Renewal [CC+AA] relaunches the proliferation of keratinocytes, essential for the skin's density and surface hydration.**

Thanks to its targeted action in the heart of the dermis, Inner Renewal [CC+AA] enables the skin to retain a younger, less wrinkled appearance.

### CLINICAL TEST RESULTS

## An anti wrinkle effect on the face

#### Declaration of the panel

- **96%** of women reported that their skin was firmer
- **95%** of women reported that their skin was more toned
- **88%** of women reported that their wrinkles were reduced

At the concentration of 0.5%

### IN VITRO TEST RESULTS

## Overall regeneration

#### Regenerating, revitalizing action

- Proliferation of fibroblast cells increased by **13%** and keratinocytes by **20%**

#### Firming effect

- Increase in the synthesis of proteoglycans (**average 25%**), of glycosaminoglycans by **28%**, and collagens of type 1 by **21%** and collagens of type 3 by **29%**

#### Antioxidant effect

- **30%** decrease in lipid peroxidation (malondialdehyde)

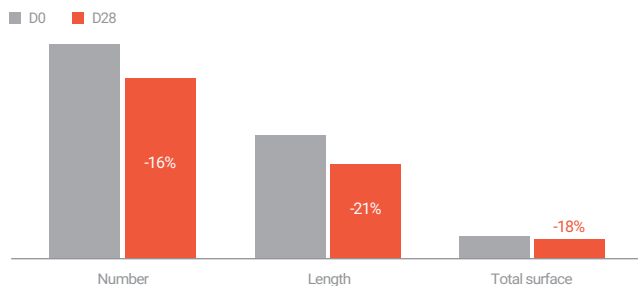
At the concentration of 0.5%

## Clinical test results

### Decrease of wrinkles on the face after 28 days (application twice a day)

#### Decrease of wrinkles (crow's feet)

Assessment of the anti-wrinkles effect by cutaneous replicats and image analysis (Quantirides® software)



- Decrease of the length of wrinkles of **21%**
- Decrease of the total wrinkle area of **18%**
- Decrease of the number of wrinkles of **16%**



DAY 0



DAY 28

#### Conditions of the study:

- Tests were carried out for 28 days on a sample of 20 women aged 42 to 63 years
- Assessment made by analysis of cutaneous prints (Quantirides®)
- Application twice a day
- Emulsion with 0.5% of Inner Renewal [CC+AA] (20% shells)

### Technical information on the formulation of Inner Renewal [CC+AA]

#### INCI name of shells

Centaurea Cyanus Callus Lysate Extract (and) Ascorbic Acid

#### form

shells (20%) in glycerin or sunflower oil (80%)

#### aspect

liquid

#### concentration

starting at 0.5%

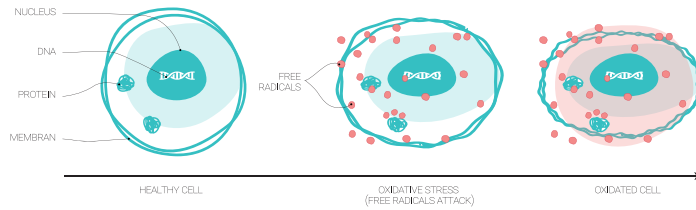
#### dispersible

in any formulation (emulsion, lotion, fluid)

## In vitro tests results

### Restoration of the viability of fibroblasts affected by internal oxidation

The majority of ageing in human cells, in this case fibroblasts, results from their oxidation, that may be of external or internal origin (due to metabolism, stress, or diet for example). This is called oxidative stress: a threat caused by reactive oxygen species (superoxide anions  $O_2^{\cdot-}$ , hydrogen peroxide  $H_2O_2$ , or hydroxyl radicals  $HO$ ) every day. When free radicals (reactive oxygen species) are not counter-attacked by internal antioxidants, they cause wide-ranging cellular damage: lipid peroxidation, oxidation of cell's membranes, their proteins, and ultimately their DNA.



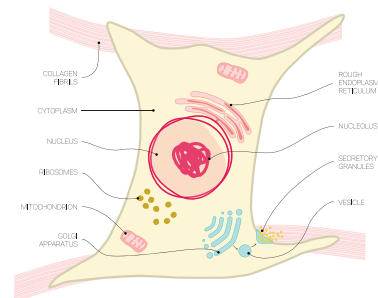
CELL MODIFICATION BY FREE RADICALS ATTACK

The cell is then oxidized: it can no longer function properly and dies.

In the context of natural (or physiological) oxidative stress, it is ROS such as hydrogen peroxide that attack the cells. Hydrogen peroxide is the simplest of the peroxides, existing naturally in living beings, since it is a by-product of cellular respiration. It is therefore generated continuously by skin cells.

Naolys decided to test InnerRenewal [CC+AA]'s effect on fibroblasts after exposure to hydrogen peroxide not only in terms of the oxidation of lipids in the cells (synthesis of malondialdehyde), but also their multiplication. Because their decline over time due to this oxidation caused by hydrogen peroxide results in less synthesis of support components for the dermis.

All the tests have been carried out on culture of aged human fibroblasts used between P2 and P4.

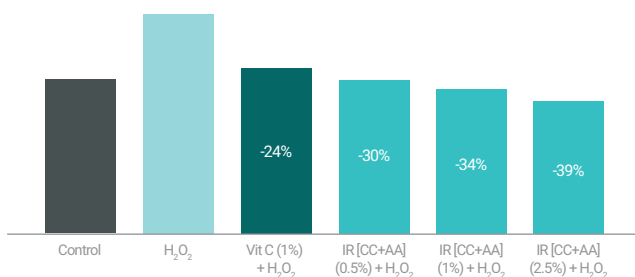


FIBROBLAST

#### By decreasing their oxidation

##### Study of lipid peroxidation in fibroblasts by hydrogen peroxide

MDA ( $\mu M$ /mg of proteins)



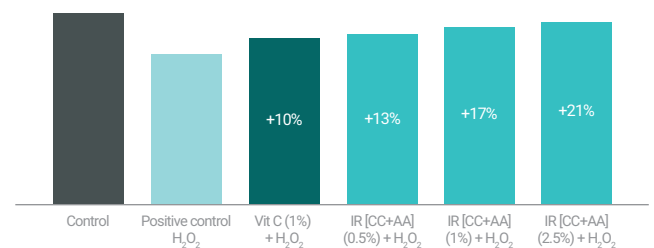
##### Decrease of MDA

→ At concentrations of 0.5%, 1% and 2.5%, after exposure to hydrogen peroxide, decrease of MDA of 30%, 34% and 39% (VS vitamin C only: decrease of 24%).

#### By increasing their multiplication

##### Study of fibroblast cell proliferation after exposure to hydrogen peroxide

Optical density (OD)



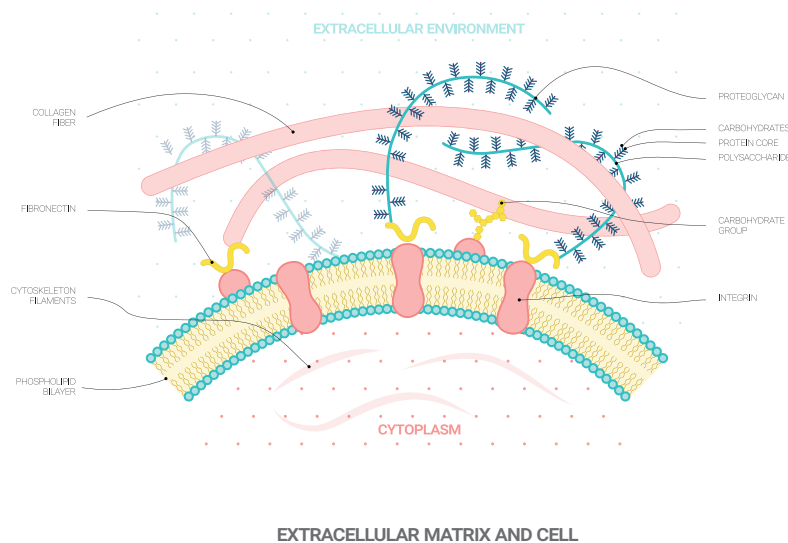
##### Increase of cellular proliferation

→ At concentrations of 0.5%, 1% and 2.5%, after exposure to hydrogen peroxide increase of proliferation of fibroblasts of 13%, 17% and 21% (VS vitamin C only: increase of 10%).

## Increases the skin firmness by densifying the extracellular matrix

Fibroblasts have a dual function: the first is a strong synthesis activity. Through exocytosis, they secrete all the components of the extracellular matrix (ECM): collagen, elastin, fibrillin, ground substance, growth factors and enzymes, including collagenases and matrix proteases inhibitors to break down the extracellular matrix, renew it and reorganize it. They also have a breakdown activity that enables them to recover (by endocytosis) extracellular elements that they have broken down; this is important in healing.

By causing damage to fibroblasts, ROS also damage the ground substance consisting of polysaccharides (like proteoglycans and glycosaminoglycans-GAGs) and collagen fibres (used in tissue repair), elastin and adhesion proteins (fibronectin and laminin), essential components of the ECM.



### Study of the constituents of the extracellular matrix

Naolys studied two types of essential components of the extracellular matrix: polysaccharides (proteoglycans and glycosaminoglycans-GAGs), and collagens of type 1 and collagens of type 3.

Polysaccharides enable cell-matrix interactions, cell movement and control of the cellular environment in terms of hydration and ionic balance.

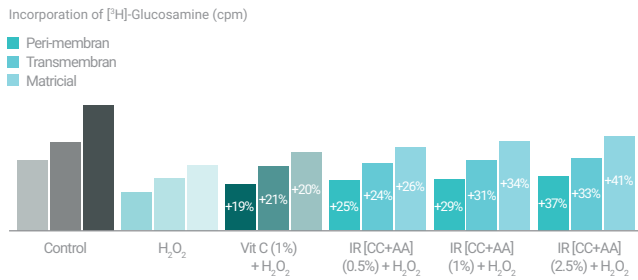
Naolys studied the synthesis of three types of proteoglycans.

Proteoglycans are the result of a combination of a protein and GAGs. As they are made of long O-glycosylated chains, they act as "water traps".

They have moisturizing, buffering, liaison and resistance properties. GAGs are large acidic chains that have a substantial capacity to attract water.

There are many GAGs, hyaluronic acid is an example.

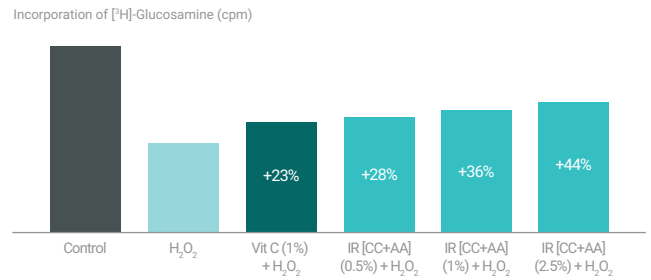
### Study of perimembran, transmembran and matricial proteoglycans



#### Increase of proteoglycans

→ At concentrations of 0.5%, 1% and 2.5%, after exposure to hydrogen peroxide, increase of perimembran proteoglycans respectively of 25%, 29% and 37% ; increase of transmembran proteoglycans respectively 24%, 31% and 33% ; increase of matricial proteoglycans of 26%, 34% and 41%.

### Study of glycosaminoglycans



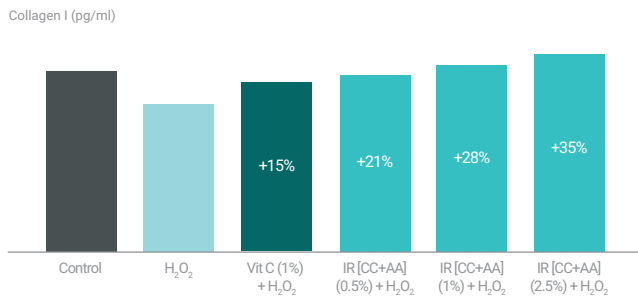
#### Increase of GAGs

→ At concentrations of 0.5%, 1% and 2.5%, after exposure to hydrogen peroxide, increase of the neosynthesis of glycosaminoglycans respectively of 28%, 36% and 44% (VS vitamin C only: +23%).

### Study of collagens of type 1 and collagens of type 3

Collagens provide resistance to stretching, regulate cell adhesion (the process by which cells attach to the ECM), support chemotaxis and cellular migration, and help to direct tissue growth. Collagens are the most abundant fibrous proteins in the interstitial ECM and constitute the ECM's main structural component, in particular the fibrillar collagens: type I collagen represents 60% to 80% of collagens in the dermis, type III collagen from 15% to 25%. Type I, III, and V fibrillar collagen self-assemble in thicker fibres that form a three-dimensional network in the entire thickness of the dermis. They give the skin its resilience and are essential to its tissue integrity.

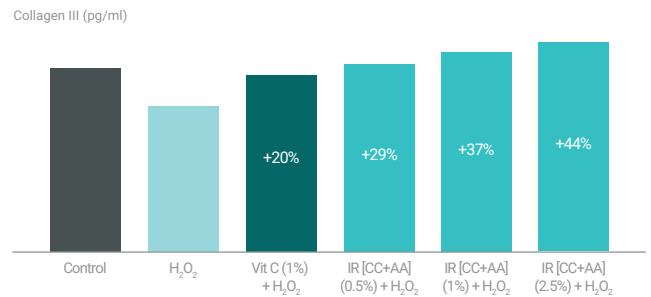
### Study of collagens of type 1



#### Increase of collagens of type 1 and type 3

→ At concentrations of 0.5%, 1% and 2.5%, after exposure to hydrogen peroxide, increase of collagens of type 1 respectively of 21%, 28% and 35% and increase of collagens of type 3 respectively of 29%, 37% and 44%.

### Study of collagens of type 3



## Improves skin density by regenerating the epidermis

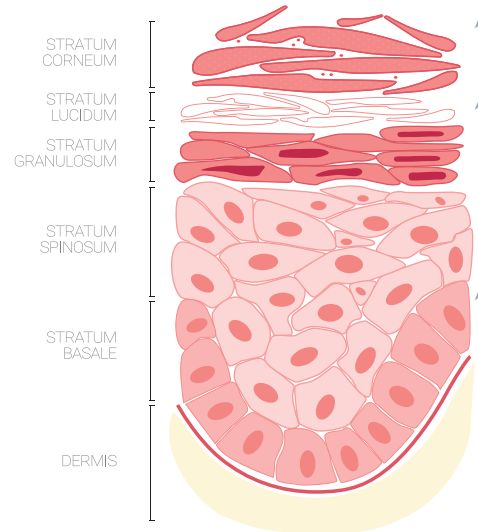
The papillary dermis (uppermost layer of the dermis) is the intermediary layer rich in nerve endings and in permanent symbiosis with the epidermis, from which it is separated by the dermal-epidermal junction.

If the dermis is functioning optimally, then the cells in the basal layer of the epidermis are better irrigated with nutrients, and renew themselves more efficiently and more quickly.

This is very important because if this cellular renewal is less efficient, it will be reflected in the skin's surface with obvious signs of ageing: withering of the skin due to the reduction in the proliferation of epidermal cells, poor healing in the event of injury, hair loss, etc.

To monitor the condition of the epidermis, Naolys studied its renewal via the nuclear protein Antigen Ki-67, a marker for cell proliferation.

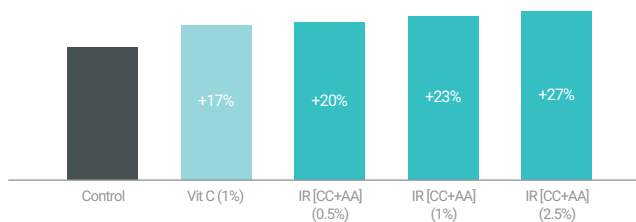
### Study of cellular renewal



THE CELL RENEWAL IN THE EPIDERMIS

### Study of the proliferation of keratinocytes on reconstructed epidermis

Number of labelled cells (Ki-67)



#### Increase of Ki-67

→ At concentrations of 0.5%, 1% and 2.5%, stimulation of the proliferation of keratinocytes of the basasl layer, respectively of 20%, 23% and 27%.

Thanks to healthier, more numerous fibroblasts, the dermis and then the epidermis can regain normal function, and the skin a more youthful appearance.



## See also

All Even Sweet iris  
Foreseen Shield Nopal  
InitialE [PT+TMG]  
Inside Heart Egyptian blue lily  
MReload Sequoia  
Optimum Life Angelica  
PowerExtension [HSB+R]  
StandStill Rose from Damas



