

PowerExtension **HSB + R**

Stimulating cell metabolism reduced by ageing



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A STORY

“Blue bird” Hibiscus syriacus + rutin

For the development of this innovative product, Naolys created an unusual new plant cell complex. The objective was to use the plant cell as a natural vector and to merge two natural, complementary sources of activity. This plant cell complex is composed of an active cell of “Bluebird” hibiscus, a recent ornamental hybrid species (hibiscus syriacus) into which a rutin molecule extracted from Japanese knotweed has been introduced. It is a 100% plant active ingredient, made from a cell created by Naolys biotechnology and a rutin molecule, a well-known naturally occurring bioflavonoid. This enriched plant cell increases the bioavailability of all the active molecules in the cell.

Key points

A biotechnological complex

A reinforced assimilation of active molecules.

Innovative design

An ornamental plant species little used in cosmetics, combined with a well-known active plant molecule.

A general anti-ageing action

Increases energy, slows oxidation, reduces the development of wrinkles.

With ageing, cell metabolism slows down and changes; all the mechanisms for skin cell development gradually deteriorate. To maintain skin cell function, it is necessary to restimulate the basic metabolic mechanisms, while reducing the main cause of their deterioration: natural and induced oxidation. PowerExtension [HSB+R]: a transverse action to fight skin ageing.



PRODUCT BENEFITS

General anti-ageing action

Energizing

Restimulates internal metabolic mechanisms, boosts the overall activity of skin cells, reinforces energy production.

Anti-oxidant

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

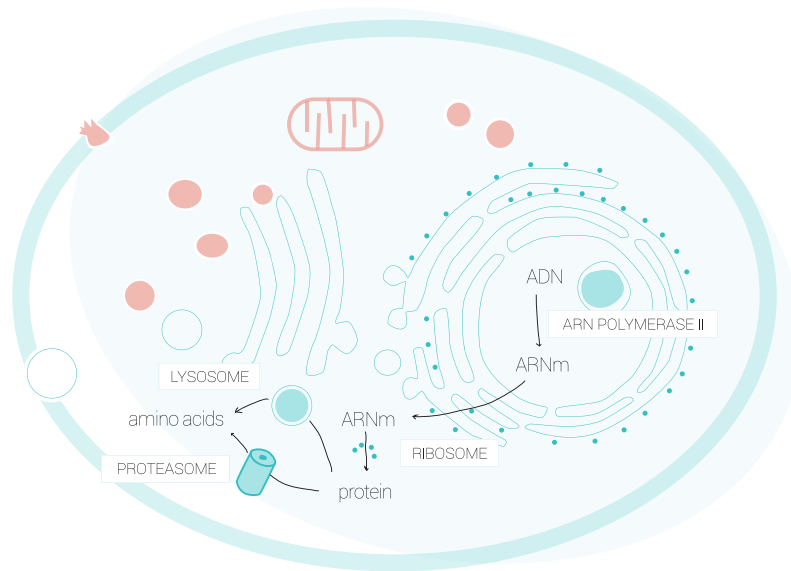
Anti-wrinkle

Decreases deep and superficial wrinkles on the face, including mature skins, especially crow's feet.

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 relaunching skin cell activity and to fighting skin ageing.

HOW IT WORKS

PowerExtension [HSB+R]: a transverse action.
To fight against the weakening of skin cell functions
due to ageing



THE PROTEASOME IN THE CELL ORGANIZATION
(LOCALIZATION OF PROCESSES, TRANSCRIPTION, SYNTHESIS AND BREAKING DOWN)

Acts in 2 ways

Reinforces general cell metabolism

Cell growth and metabolism are not only dependent on the presence and activation of critical proteins but also their breaking down. Indeed with ageing, due to the effect of free radicals, proteins become less stable and less functional. The proteasome, a macro-molecular complex that assembles proteolytic activities, located in the nucleus and cytoplasm of cells, is responsible for cleaning the cell and the breaking down of oxidized, modified, obsolete proteins. But with ageing, its action slows down. At the same time, it has been proven that cell respiration decreases with ageing, inducing a decrease of cell energy production.

PowerExtension [HSB+R] increases the activity of the proteasome and cell respiration thereby maintaining cell metabolism at an optimum level.

Reduces cell oxidation

When they breathe, cells absorb oxygen to create energy. Nevertheless oxygen can be toxic and its use requires protective mechanisms against its oxidant power (such as superoxide dismutase, vitamins C and E). Actually, some of this molecular oxygen is not completely reduced and results in the production of molecules that appear in the respiratory mitochondrial chain and are toxic for cells.

PowerExtension [HSB+R] decreases the damages induced by cell oxidation by decreasing the creation of free radicals.

Thanks to its numerous effects on cell metabolism and oxidation, PowerExtension [HSB+R] decreases the formation of wrinkles.

CLINICAL TESTING RESULTS

An overall decrease in wrinkles of 20% in 28 days

Declaration of the women in the panel:

95% of women declared that dehydration wrinkles seemed to soften

85% of women declared that wrinkles seemed reduced

At a concentration of 0.1%

IN VITRO TESTING RESULTS

An overall increase in cell metabolism

Activity of the proteasome, cell respiration and energetic metabolism

Anti-ageing effect

→ Thanks to the increase in the proteasome activity on senescent cells (62 year-old donor) and also cells with photo-induced senescence (15 year-old donor).

Energizing effect

→ Thanks to an improvement in respiration proven by an increased release of CO₂ of **40%**, in physiological and asphyxia conditions.
→ Thanks to an increase of energetic metabolism illustrated by an increase of ATP synthesis at the cellular and mitochondrial levels.

Anti-oxidant effect

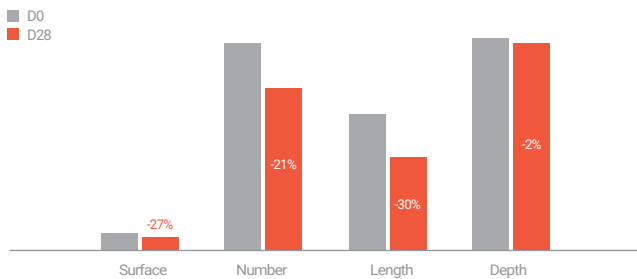
→ Decrease in the creation of free radicals proven by a decrease in the production of MDA by **40%**, endogenous production and production induced by UVB.

At a concentration of 0.1%

Clinical testing results

Decrease of wrinkles (crow's feet)

Assessment of anti-wrinkle effect (mean data)



At all levels (surface, number, length, depth)

- Decrease in wrinkle area of **27%**
- Decrease in total number of wrinkles of **21%**
- Decrease in total length of wrinkles of **30%**
- Decrease in average depth of wrinkles of **2%**

Study conditions:

- Emulsion with 0.1% of PowerExtension [HSB+R]
- Testing for 28 days on 20 women from 40 to 65 years, with crow's feet
- Application twice a day
- Assessment made by analysis of cutaneous prints (Quantirides)

Technical information on the formulation of Power Extension [HSB+R]

INCI name

Hibiscus Syriacus Callus Extract
(and) Rutin

Form

Powder of cells (100%)

Aspect

Beige powder

Concentration

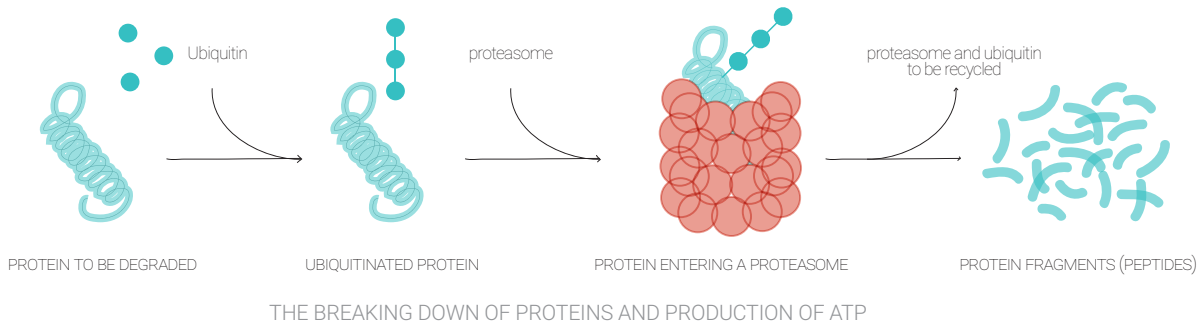
Starting at 0.1%

Dispersible

in any formulation
(emulsion, lotion, fluid)

In vitro testing results

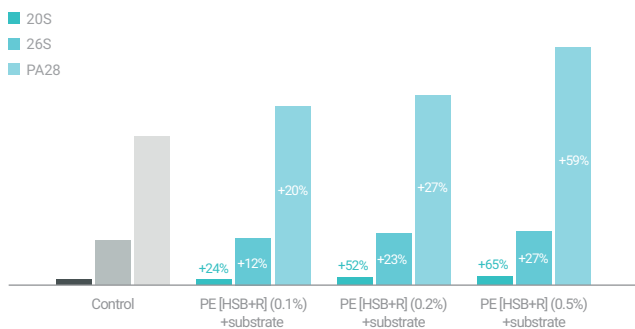
Study of the proteasome



The proteins damaged by oxidative components accumulate in cells, because of an increased production of proteins modified by free radicals or a decrease in the activity of enzymes (or proteases) responsible for breaking them down or a combination of these two mechanisms. The proteasome or Ubiquitin-Proteasome is a macromolecular complex with a high number of proteolytic activities involved in the breaking down of damaged proteins, which become its substrates. They are hydrolyzed in peptides in 3 to 25 amino acids and then partially hydrolyzed in amino acids, which can be used by cells. The proteasome is made of 3 units: 26S, 20S and PA28, Naolys chose to study all 3 of them.

In the conditions of natural senescence (62 year-old donor)

Activity of proteasome (nmoles/min/mg)



Increase of the activity of the proteasome

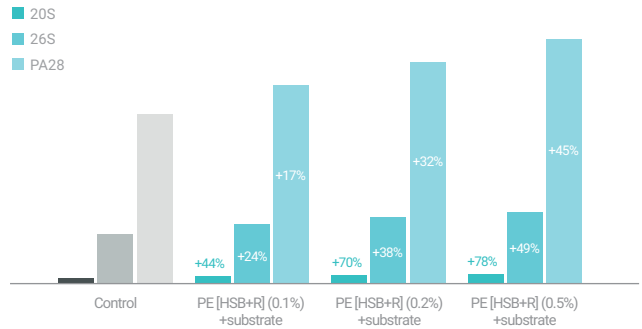
→ At concentration of 0.1%, increase in the activity of the proteasome 20S of 24%, of the proteasome 26S of 12%, of the proteasome PA28 of 20%.

→ At concentration of 0.2%, increase in the activity of the proteasome 20S of 52%, of the proteasome 26S of 23%, of the proteasome PA28 of 27%.

→ At concentration of 0.5%, increase in the activity of the proteasome 20S of 65%, of the proteasome 26S of 27%, of the proteasome PA28 of 59%.

In the conditions of photo-induced senescence (UVB 100mJ/cm²) - 15 year old donor

Activity of proteasome (nmoles/min/mg)



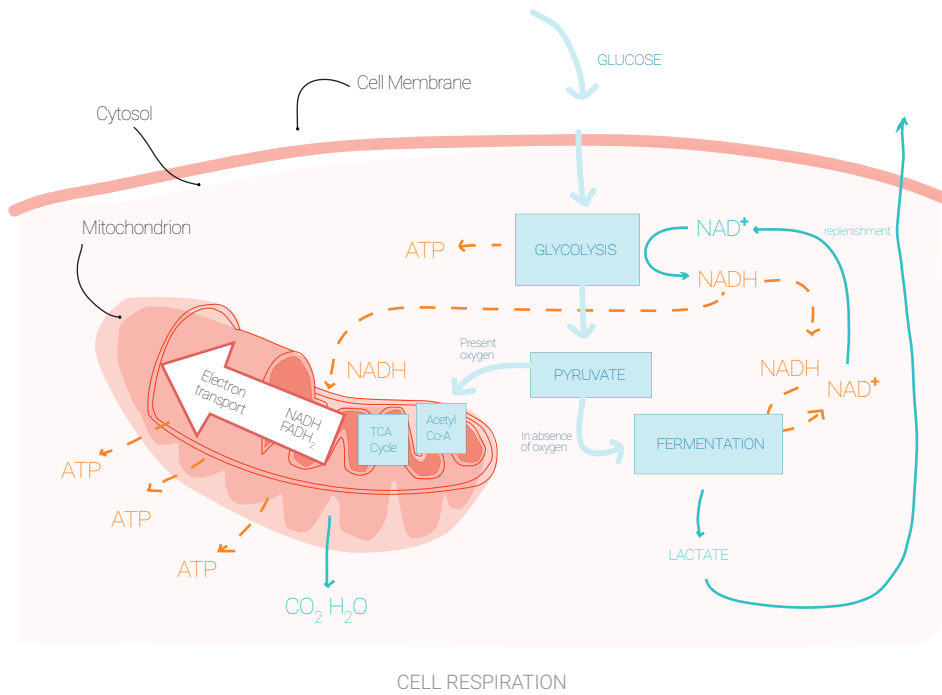
Increase of the activity of the proteasome

→ At concentration of 0.1%, increase of the activity of the proteasome 20S by 44%, of the proteasome 26S by 24%, of the proteasome PA28 by 17%.

→ At concentration of 0.2%, increase of the activity of the proteasome 20S by 70%, of the proteasome 26S by 38%, of the proteasome PA28 by 32%.

→ At concentration of 0.5%, increase of the activity of the proteasome 20S by 78%, of the proteasome 26S by 49%, of the proteasome PA28 by 45%.

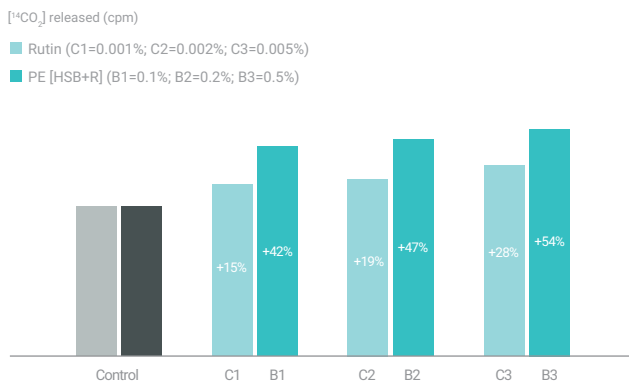
Study of cellular metabolism



Study of cellular respiration

This is a redox chemical reaction which supplies energy to cells to grow and to function. Cells produce energy with glucides, as ATP through cell respiration. The activity of PowerExtension [HSB+R] on the cell and respiratory metabolism has been evaluated by the metabolization of glucose by the cells of the epidermis in hypoxia conditions. In vitro hypoxia conditions induce deep alterations of cell electromechanical functions, with an increase in the production of lactate, a fall in the quantity of ATP, ADP, and a loss of LDH. The reoxygenation of hypoxiated cells (a reversible state) normalizes the loss of lactate, induces a resynthesis of ATP and a reduction in the release of LDH. The decrease in superoxyde dismutase and glutathion peroxydase activity is reduced.

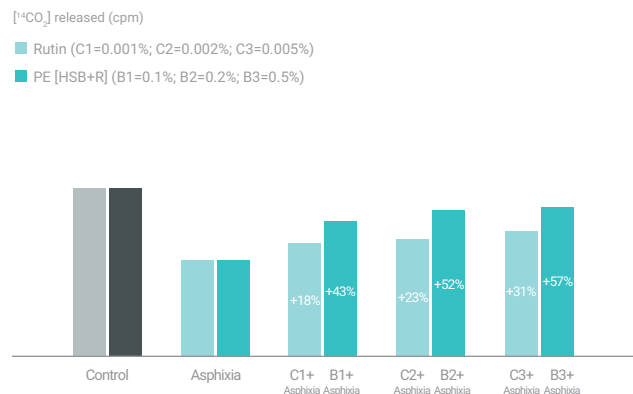
In the physiological conditions



Increase of the release of CO₂

→ At concentrations of 0.1%, 0.2% and 0.5%, increase in the release of CO₂ in physiological conditions respectively by 42%, 47% and 54% VS rutin only increased respectively by 15%, 19% and 28%.

In the asphixia conditions



Increase of the release of CO₂

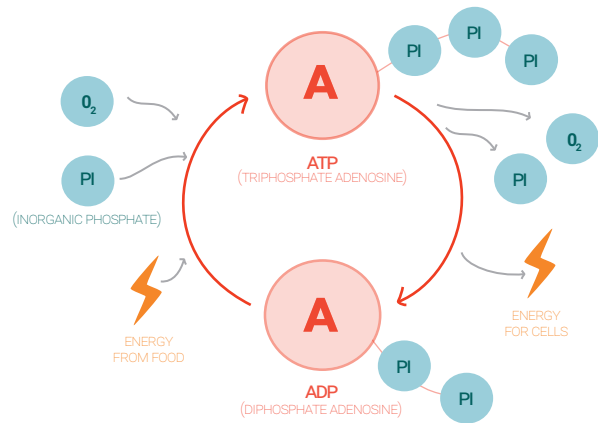
→ At concentrations of 0.1%, 0.2% and 0.5%, increase in the release of CO₂ in asphixia conditions of respectively by 43%, 52% and 57% VS rutin only increased respectively by 18%, 23% and 31%.

Study of energetic metabolism

To go deeper in the study of the activity of PowerExtension [HSB+R] on the cellular metabolism, Naolys also studied cellular respiration in the consumption of oxygen and the synthesis of ATP that takes place at the end of the respiration process, to the ATP/ADP cycle.

Indeed the energy released during oxidation of nutrients cannot be used directly by cells. It has to be caught by a transitional element, which is in majority, ATP (adenosine triphosphate), a nucleotide produced by mitochondrions, as its hydrolysis releases a high quantity of energy. But that transitional play and the fact that ATP stocks are not very important induce an intense renewal of that molecule. Therefore a continuous, quick and big production of ATP is needed. But that production decreases with ageing, as well as the ATP formation/regeneration cycle.

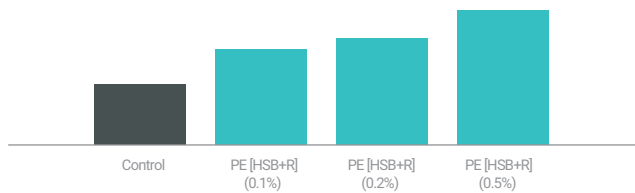
The ATP production never stops and ATP is continuously regenerated thanks to the cycle in cells.



ATP FORMATION/REGENERATION CYCLE

Speed of cell basal respiration

Basal respiration (natomes/mn/10⁶ cell)

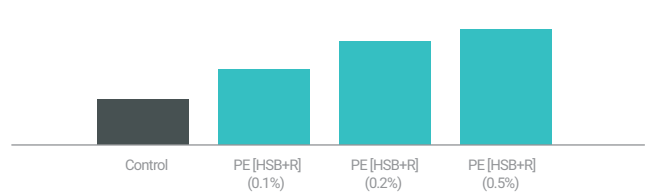


Increase of the speed of cell basal respiration

Results show that the product PowerExtension [HSB+R] at different doses increases the speed of respiration (consumption of oxygen) at the level of whole cells non permeabilized (with glucose) translating an increase of cellular respiration, and at the level of permeabilized cells (with pyruvate malate), translating an increase of mitochondrial respiration.

Speed of the mitochondrial respiration

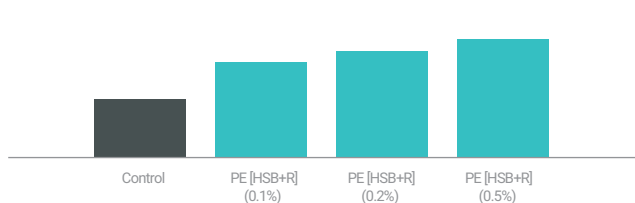
Pyruvate respiration (natomes/mn/10⁶ cell)



Increase of the speed of mitochondrial respiration

Speed of ATP synthesis (rate of cellular basal synthesis)

Basal respiration (natomes/mn/10⁶ cell)

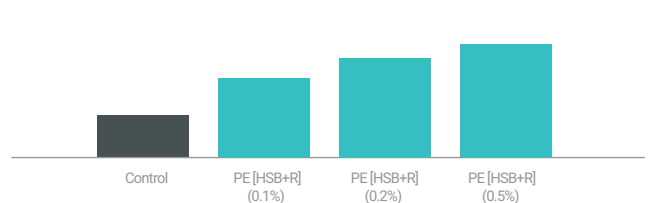


Increase of the speed of the synthesis of basal cell ATP

Results show that the product PowerExtension [HSB+R] at different doses increases the speed of synthesis of ATP at the level of whole cells non permeabilized (with glucose) translating an increase of the synthesis of cellular ATP, and at the level of permeabilized cells (with pyruvate malate), translating an increase of mitochondrial synthesis.

Speed of mitochondrial ATP synthesis

Pyruvate respiration (nmolesATP/mn/10⁶ cell)



Increase of the speed of the synthesis of mitochondrial ATP

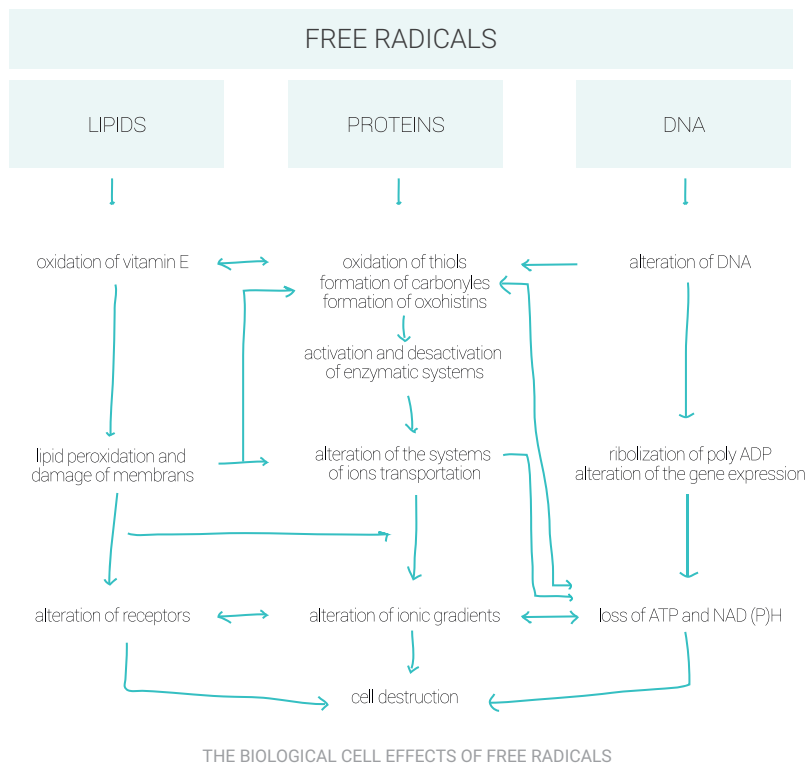
At 0.1% concentration:
Stable energetic balance (stable EC)

- Increase of the speed of cell basal respiration
- Increase of the speed of mitochondrial respiration
- Increase of the speed of the synthesis of ATP (cell basal and mitochondrial)
- Simultaneous increase of ATP, ADP and AMP concentrations

Study of lipid peroxidation

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.

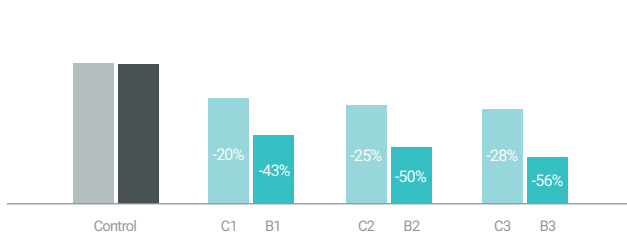
Normally, the endogenous production of free radicals (physiological lipid peroxidation) is counterbalanced by various defense mechanisms. However, many situations can induce the appearance of an excess of free radicals (induced lipid peroxidation) such as intense exposition to sun, intoxication by certain 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.).



Physiological lipid peroxidation

MDA (mm/mg of proteins)

■ Rutin (C1=0.001%; C2=0.002%; C3=0.005%)
 ■ PE [HSB+R] (B1=0.1%; B2=0.2%; B3=0.5%)



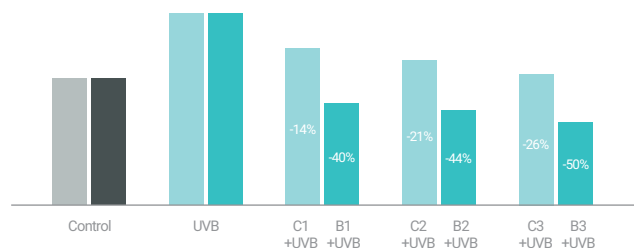
Decrease of MDA

→ At concentrations of 0.1%, 0.2% and 0.5%, decrease in the release of MDA respectively by 43%, 50% and 56%
 VS rutin only decreased respectively by 20%, 25% and 28%.

Lipid peroxidation induced by UVB

MDA (mm/mg of proteins)

■ Rutin (C1=0.001%; C2=0.002%; C3=0.005%)
 ■ PE [HSB+R] (B1=0.1%; B2=0.2%; B3=0.5%)



Decrease of MDA

→ At concentrations of 0.1%, 0.2% and 0.5%, decrease in the release of MDA respectively by 40%, 44% and 50%
 VS rutin only decreased respectively by 14%, 21% and 26%.



See also

All Even Sweet iris
All Fiber Booster Tea
All Fiber Booster Olive tree
All Fiber Booster Chinese hibiscus
Fiber Booster Plus Hardy orchid
Fiber Booster Plus Saffron
Fiber Booster Plus Sequoia and Vitis flower
Foreseen Shield Nopal
InitialE [PT+TMG]
Inside Heart Egyptian blue lily
Inside Heart Gardenia
Keep Smooth Vitis flower
Keep Smooth White water lily and Indian jasmine
NewRegeneration Cocoa
Revive Commiphora and Rose from Damas
Revive Sequoia
StandStill Rose from Damas
StandStill White water lily
Total Generation Sequoia and Egyptian blue lily
Total Generation Curry plant
Total Generation Centella asiatica



