



# Light&Energy Coffee

*Relaunching the global skin activity*

## A STORY

**The Coffee | *Coffea arabica*, Rubiaceae**  
**A popular taste all over the world**

*Very recently discovered, coffee is a shrub with little short-lived white flowers, born in Ethiopia and in the South tropical Africa, it used to live in the shadow under high trees between 500 and 1600 m. Arabica is the most ancient sort of coffee, it was placed in the 15th century in Arabia, then cultivated by Dutch people in the 17th century. Cultivated in monoculture, coffee is first dedicated to be prepared as a universal drink. It contains caffeine, an alkaloid, which is a heart booster. It has also diuretic and analgesic properties. Coffee is a rich plant: grains contain essential oils, glucose, proteins and vitamin PP too.*

## 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 general energizing action**

Increases cell energy and limits free radicals to producing radiant tone.

Because skin is sometimes tired, it is necessary to give it energy back, maintaining its original energetic balances and improving cell respiration. To get a skin more active, looking more radiant.



## PRODUCT BENEFITS

### Energy

#### **Energizing**

Improves skin metabolism. Helps to stimulate cell regeneration and all cell functions in the epidermis.

#### **Anti-oxidant**

Limits the creation of free radicals due to the physiological processes and free radicals induced by UVB.

#### **Radiance**

Helps skin to get a tone more radiant, by detoxifying and oxygenating skin cells.

*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.*

**NÆOLYS**

**Related products |** BALANCING ENERGY ASIAN GINSENG | REVIVE COMMIPHORA AND ROSE FROM DAMAS | PURIFY VITIS FLOWER

**HOW IT WORKS**

# Light&Energy Coffee: increasing cell metabolism through essential compatible actions

Light&Energy Coffee acts at the level of epidermis on three main activities: the production of energy, respiration and oxidation. First, it stimulates the production of global cell energy: it relaunches the synthesis of ATP, the energy form that is necessary to skin cells, at the level of mitochondria - the organits which degrade sugars to make energy. Second, it improves cell respiration, even when skin experiences hard conditions, which helps to increase the production of energy in the same time. Third, it protects epidermis against oxidation, the physiological oxidation and the one induced by UV rays, by limiting the creation of free radicals. And free radicals lead to deleterious effects in long and short terms, especially in the process of cell respiration. Thanks to those actions, skin cells can get a level of activity enough to perform all their functions, including those limited by ageing.

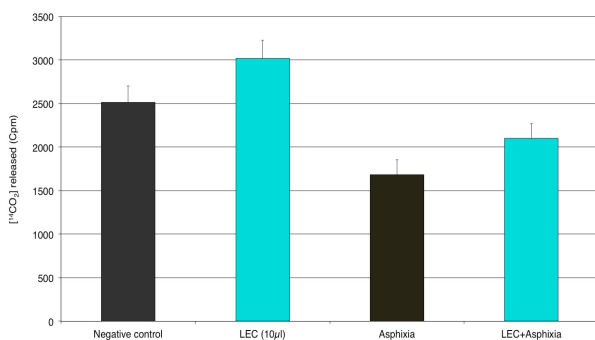
## *in vitro* testing results

### 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 Light&Energy Coffee 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 and in the conditions of asphixia



#### Increase of CO<sub>2</sub> release

→ At a concentration of 0.5%, in physiological conditions, increase of CO<sub>2</sub> release by 20%, and in conditions of asphixia, increase of CO<sub>2</sub> release by 25%

### Technical information Formulating Light&Energy Coffee

**INCI name of cells**  
coffea arabica leaf cell extract

**form**  
cells (20%) in glycerin or sunflower oil (80%)

**aspect**  
liquid

**concentration**  
starting at 0.5%

**dispersible**  
in any formulation

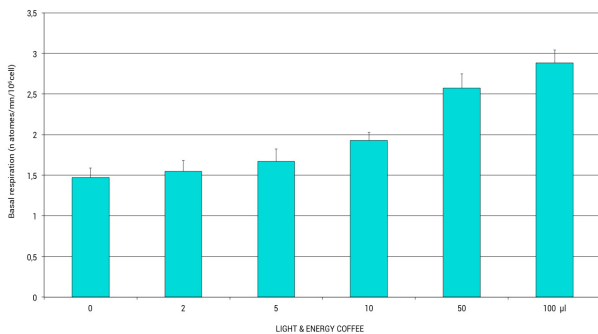
## Study of cellular metabolism

### Study of the energetic and respiratory metabolism of keratinocytes

To study cellular metabolism, Naolys 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.

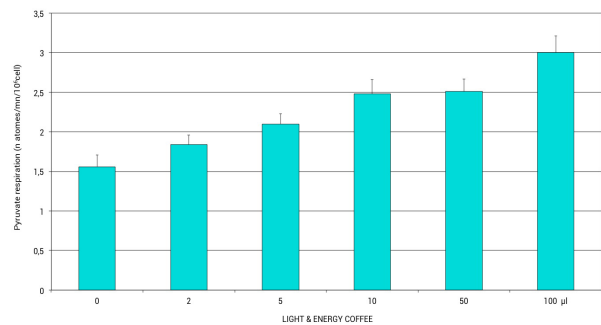
Cellular respiration is a redox chemical reaction which supplies energy to cells to grow and to function. Cells produce energy with glucides. But the energy released during oxidation of nutrients cannot be used directly by cells. It has to be caught by a transitional element, which is in majority, ATP (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.

#### Respiration speed - oxygen consumption



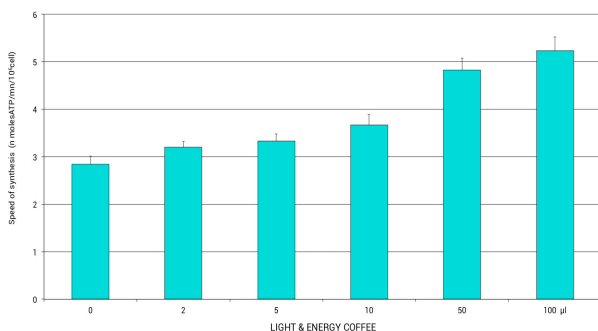
Increase of the speed of cell basal respiration

#### Respiration speed - oxygen consumption



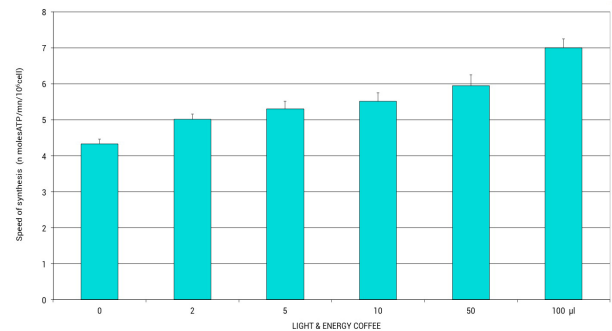
Increase of the speed of mitochondrial respiration

#### Speed of synthesis of ATP - basal cellular synthesis rate



Increase of the speed of the synthesis of ATP

#### Speed of synthesis of mitochondrial ATP



Increase of the speed of the synthesis of ATP

→ **0.5% concentration:**

- 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
- Stable energetic balance (stable EC)

## Study of the 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.

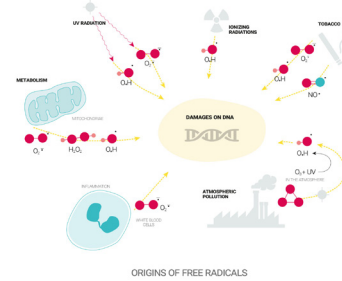
When we measure the MDA (malondialdehyde), one of the chemical products created by the chemical chain reaction induced by the free radicals, indicating of cytotoxicity by oxidative processes, then we have a good information about the anti-oxidant activity of a substance.

Normally, the endogenous production of free radicals (physiological lipid peroxidation) is counterbalanced by various defense mechanisms.

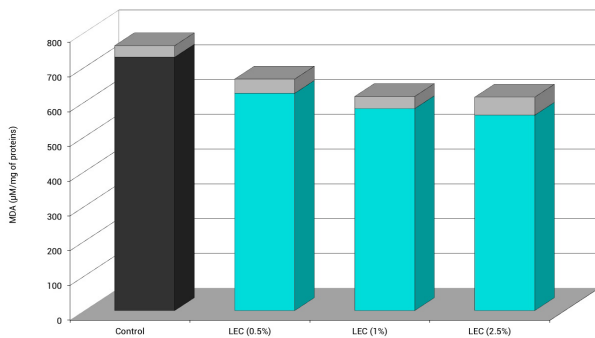
However, many situations can induce the appearance of an excess of free radicals (induced lipid peroxidation) such as intense exposition to sun, intoxication by certain chemical products, contamination by toxins, intense inflammatory reactions, etc.

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.)



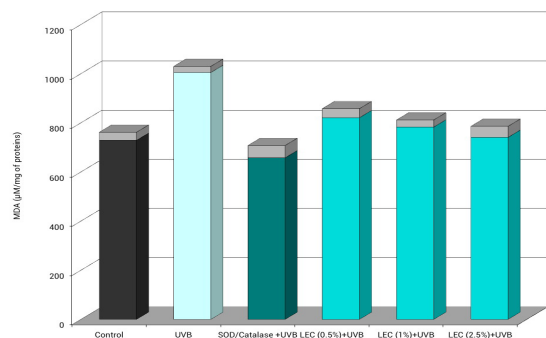
### Lipid peroxidation in the physiological conditions



#### Decrease of MDA 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 by 14%, 20% and 23% respectively.

### Lipid peroxidation induced by UVB



#### Decrease of MDA rate

→ At concentrations of 0.5%, 1% and 2.5%, decrease of the lipid peroxidation induced by UVB (150mJ/cm<sup>2</sup>) which was translated by a decrease of the MDA rate by 18%, 22% and 26% respectively compared with protective enzymes SOD/catalase (-35%).