

# lipochroman-6

An active shelter to protect cells



ROS RNS ROS RNS ROS RNS

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## Prevention of premature aging



### Description

Chromane that protects cells from several damages such as structural alteration of proteins, inhibition of enzymatic activity and interferences of the regulatory cellular function.

### Appearance

Powder.

### INCI

Dimethylmethoxy chromanol.

### Properties

Protects cells from reactive species, preventing skin from premature aging.

### Applications

lipochroman-6 can be incorporated in lipophilic based cosmetic formulations to avoid deterioration of skin.

**Dosage** 0.01-0.05%

## Protects cells from irreversible damage

### Science

Radicals and reactive species are responsible for several mechanisms which trigger skin aging. They cause irreversible damages in cells and tissues, affecting organs too, so they are involved in a great number of diseases. Peroxynitrite, a powerful RNS (Reactive Nitrogen Species), exhibits a wide array of tissue harmful effects, ranging from lipid peroxidation and DNA damage to inactivation of enzymes via protein oxidation and nitration. ROS (Reactive Oxygen Species) are free radicals generated from endogenous sources and also from external pro-oxidant stimuli.

lipochroman-6 is designed to capture both types of free radicals, thus avoiding their noxious effects.

### Solubility

Please refer to our technical documentation to get more information about the solubility of the product.

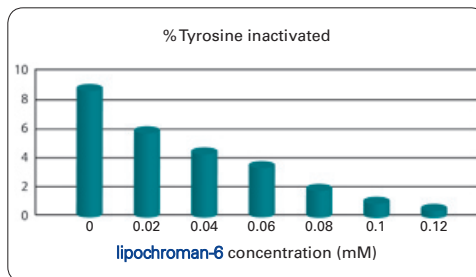


## In vitro efficacy

Molecular-level studies

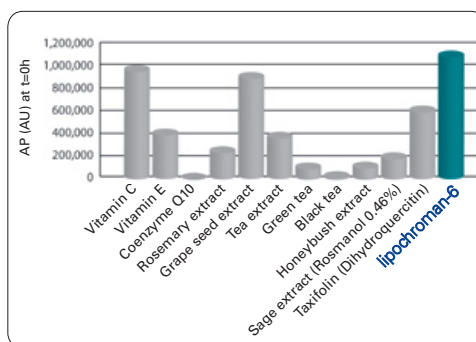
### 1. EFFICACY IN NITRATION BLOCKING

The nitration of tyrosine residues of proteins is an irreversible reaction which compromises activation/deactivation of enzymes and receptors. Evaluation of protecting activity of lipochroman-6 by HPLC.



### 2. ANTIOXIDATIVE POWER (AP)

The AP method was used to assess the AP of lipochroman-6. Because many potent antioxidants lose their activity when stored in solution for longer times, AP was measured for lipochroman-6 samples in solution after 24 and 48h.



### 3. SINGLET OXYGEN QUENCHING ABILITY

Among ROS, there is an exceptionally reactive form known as singlet oxygen ( $O_2(a^1\Delta_g)$ ). The near-infrared emission of  $O_2(a^1\Delta_g)$  was detected by a NIR photomultiplier module working in photon counting mode.

lipochroman-6 protects enzymes from inactivation. Inhibits the reaction between tyrosine and peroxynitrite in a dose-dependent manner.

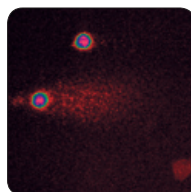
lipochroman-6 is a powerful antioxidant with an excellent long term stability. After being stored, lipochroman-6 enhanced its AP up to 1,470,000, and reaction time values ranged from 0.20 (at 0h) to 0.17 (at 48h).

lipochroman-6 is a potent singlet oxygen scavenger. Its activity is remarkably close to tocopherols, which rank among the most effective molecules.

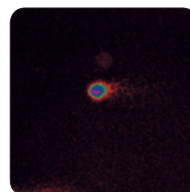
Cellular-level studies

### 1. CELLULAR PHOTOPROTECTION

The internal photoprotection capacity of lipochroman-6 against UVA was evaluated by the Comet assay in primary cultures of human melanocytes.



UVA treated cells (positive control)



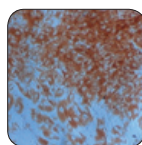
lipochroman-6 (50.0 µg/ml) + UVA

Prevents skin from photoaging. Protects cellular DNA from ROS oxidation, induced by UVA radiation.

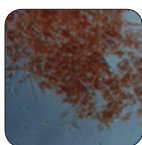
### 2. INHIBITION OF OXIDATIVE STRESS ON HUMAN DERMAL FIBROBLASTS

Oxidative stress is the imbalance between cellular production of free radical species and the ability of cells to eliminate them employing endogenous antioxidant defence mechanisms. This stress damages cells irreversibly.

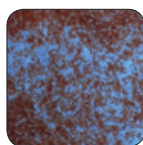
In skin cell cultures, oxidative stress was generated by the addition of  $H_2O_2$  to the culture medium. The protecting effects of the tested compounds (lipochroman-6, Resveratrol, Vitamin E and Ferulic Acid) were measured by a cell viability assay (Calcein-AM assay).



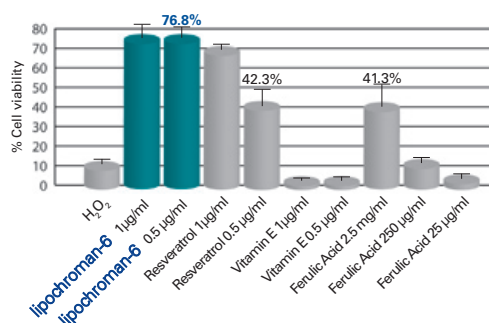
Control



$H_2O_2$ -treated cells



$H_2O_2$ -treated cells + lipochroman-6 (1 µg/ml)



lipochroman-6 is more effective than Resveratrol, Vitamin E and Ferulic Acid against oxidative stress.