



Botanical  
Ingredients 

## CURCUSHINE™ microcapsules Bioavailable and soluble anti-aging curcumin

### Description

CURCUSHINE™ microcapsules is a bioavailable microencapsulated curcumin source with proven anti-aging benefits.

### Composition

Whey protein, Curcumin, Maltodextrin, Rosemary Extract and Ascorbic Acid.

\*Product contains 25% of curcumin

### A nutritional view

Turmeric is one of the most revered plants in Ayurveda. Curcumin is turmeric's main bioactive polyphenol with numerous anti-aging health benefits.

It is commonly accepted that the ageing process is driven by the lifelong accumulation of molecular damages mainly due to Reactive Oxygen Species (ROS). In addition, high levels of ROS lead to the activation of hyaluronidase, collagenase and elastase, which can further contribute to skin damage. On the other hand, protein glycation contributes to skin aging as it deteriorates the existing collagen by crosslinking.

Antioxidant properties of curcumin have shown to reduce ROS in cells and eliminate the effects of advanced glycation species (AGEs) on the divergent regulation of gene expression of receptors of AGEs by several mechanisms.

Furthermore, curcumin has been shown to delay skin aging by protecting it from oxidative and inflammatory damages, however the potential of curcumin is limited by its low bioavailability. In this respect, CURCUSHINE™ microcapsules innovative delivery system transforms curcumin into a bioavailable product thanks to the completely natural encapsulant matrix that protects and embeds the curcumin. CURCUSHINE™ microcapsules has been proven to reduce significantly ROS and glycation levels on human dermal cells, thus preventing skin aging from within.

### Applications

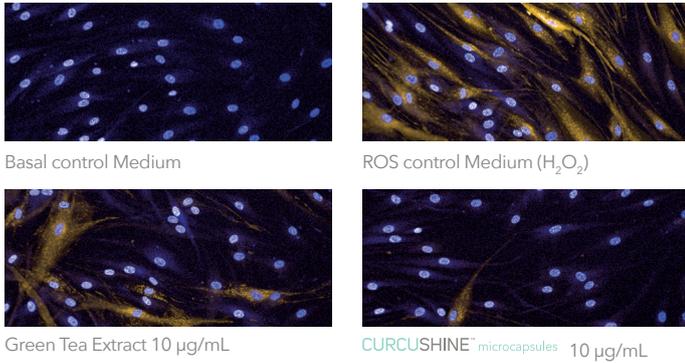
Dietary supplements, functional beverages and nutricosmetic applications.

### Competitive advantages

- Superior curcumin absorption
- High solubility in water
- Protection vs oxidative stress
- Collagen care

### In vitro efficacy - ROS reduction effect

Measurement of ROS levels is a good predictor of oxidative stress and to test anti-oxidant properties in live cells. After inducing an oxidative stress in Human Dermal Fibroblasts (HDFa) with hydrogen peroxide, the antioxidant effect of CURCUSHINE™ microcapsules was tested and benchmarked against Green Tea Extract by measuring the inhibition of ROS accumulation.

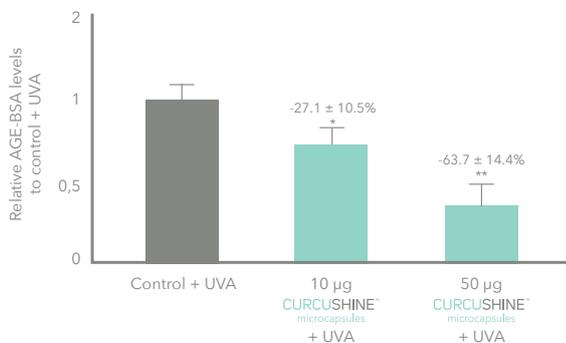


**CURCUSHINE™ microcapsules shows significant protection vs oxidative stress on HDFa cell cultures**

CURCUSHINE™ microcapsules exhibits better anti-oxidant performance compared to another well-known extract, thus preventing skin ageing from within.

### In vitro efficacy - UVA-induced glycation protection

The detoxifying and protective effects of CURCUSHINE™ microcapsules on UVA-induced protein or lipid glycation, were determined through quantification of AGEs (Advanced Glycation End-products) by ELISA. Human keratinocytes (HaCaT) cells were treated during 24 hours with CURCUSHINE™ microcapsules at 10 µg/ml and 50 µg/ml. After the incubation period, cells were exposed to UVA irradiation to induce oxidative stress and protein glycation for 3 hours and 30 minutes (20 J/cm<sup>2</sup>).

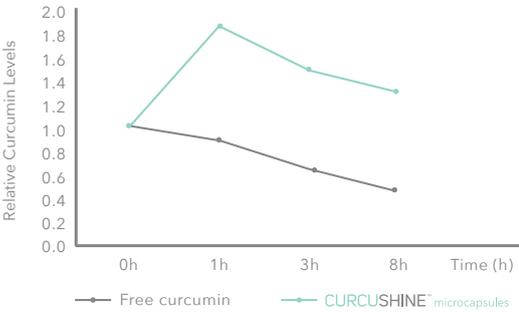


**CURCUSHINE™ microcapsules significantly protects from UVA-induced glycation**

The in vitro treatment with CURCUSHINE™ microcapsules significantly protects from UVA-induced glycation, by decreasing Advanced Glycation End products (AGEs) up to 63.7%, compared to the untreated control.

### In vivo efficacy - Bioavailability test

A panel of volunteers ingested 750 mg of curcuminoids as free curcumin and CURCUSHINE™ microcapsules and the curcumin absorbed in blood was determined. Blood samples were obtained through fingerstick from the volunteers and were later analyzed through UPLC-Q/ToF to obtain curcumin retention profile, according to its level in serum at different timepoints.



**CURCUSHINE™ microcapsules bioavailability is much higher than control, lasting until 8 hours after the intake**

CURCUSHINE™ microcapsules displays a pharmacokinetics profile of slow release of curcumin compared to the quick absorption, metabolism and removal of free curcumin.



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