

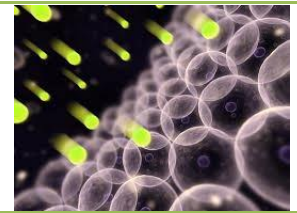


## L carnosine in vitiligo treatment

“YOU CAN’T LIVE WITH THEM, YOU CAN’T LIVE WITHOUT THEM”

Probably the feelings of a patient suffering from Vitiligo. Vitiligo is a disfiguring disorder in which there is a progressive depigmentation of skin. Vitiligo affects between one and four percent of the population, regardless of race or sex. Patches, also known as lesions, of white skin and hair develop unpredictably. It is due to the destruction of melanocytes resulting in the absence of pigment production of the skin and mucosal surfaces. Although not fatal and without any serious health complications, vitiligo can have a profound psychological effect on sufferers. <sup>1</sup>

Although the exact causes are unknown, in most cases, vitiligo is believed to be an autoimmune-related disorder. One of the precipitating factors for vitiligo has been established to be oxidative stress or free radical generation.<sup>2,3</sup>



### Oxidative stress and vitiligo

Oxygen is the lifeline of human existence, wherein we derive energy by burning fuel with oxygen in the cells. This is a controlled metabolic process that, unfortunately, also generates dangerous byproducts which include free radicals - electronically unstable atoms or molecules capable of stripping electrons from any other molecules they meet in an effort to achieve stability. In their wake they create even more unstable molecules that then attack their neighbours in domino-like chain reactions called Reactive Oxygen Species (ROS). There are defences against ROS in the form of body antioxidants which act as physical barriers to contain free radicals at their sites of production within cells; or enzymes that neutralize ROS. However in the wake of these antioxidant defenses falling short, ROS can cause oxidative damage to DNA, proteins and membranes causing complex stress responses that include programmed cell suicide if damage is too great. This is oxidative stress. Thus, oxidative stress is defined as a disturbance in the balance between the production of reactive oxygen species (free radicals) and antioxidant defences.<sup>2,3</sup>



Oxidative stress appears to be one of the reasons behind melanocyte destruction in vitiligo. The excessive ROS production may be damaging the skin's pigment cells (melanocytes) and at the same time telling the body's immune system that these same cells are threats and need to be destroyed. <sup>4</sup>

This theory has been supported by tests showing that vitiligo skin has more ROS present in both the lesions (white patches) and surrounding skin than non vitiliginous skin. It is well established that Vitiligo patients demonstrate a low level of antioxidants in their skin to combat oxidative stress in the skin.

New evidence suggests that antioxidants could be the key to finding a cure for this psychologically devastating chronic skin disorder. The protective action exerted by antioxidant molecules such as **L-CARNOSINE** can therefore be particularly useful in vitiligo in which the melanocytes and skin are subjected to high oxidative stress.



## L carnosine – The super skin antioxidant

L carnosine is a breakthrough in skin antioxidant research having ability to protect cells against oxidative stress and to increase cell resistance to functional exhaustion and cellular rejuvenation. L-Carnosine is a dipeptide consisting of alanine and histidine (beta-alanyl-L-histidine), normally made in the human body and found at high levels in skin, brain, innervated tissues, the eye lens and skeletal muscle tissue.<sup>5,6</sup>



The skin, which is known to be one of the first organs in which the action of radical degeneration is visible, is positively influenced by the action of L-carnosine.

It has also been shown that L-carnosine as part of the diet or applied topically can preserve the skin's immune defences in the presence of exposure to ultraviolet rays (UVB) or chemical agents.

The reduction in oxidative damage on melanocytes during free radical assault can result in an increase in resilience of these cells and consequently enhance their functional abilities.

## Mechanism of action

The mechanisms of this protection are explicable in terms of proton buffering (maintaining pH balance), free-radical and active sugar molecule scavenging (which counters the glycation of proteins), and preventing modification of biomacromolecules (thereby preserving their native functionality under oxidative stress). Carnosine is a key nutrient that helps the body do its normal house cleaning and recovery functions.

L-Carnosine possesses strong and specific antioxidant properties, protects against radiation damage and glycation (Protein modification by free radicals), improves skin function, and promotes the recovery. Carnosine has the ability to chelate copper, zinc and other metals both within and external to the skin tissue which may be an important function of L-Carnosine in preventing and slowing down degenerative sequences in skin melanocytes.<sup>7</sup>

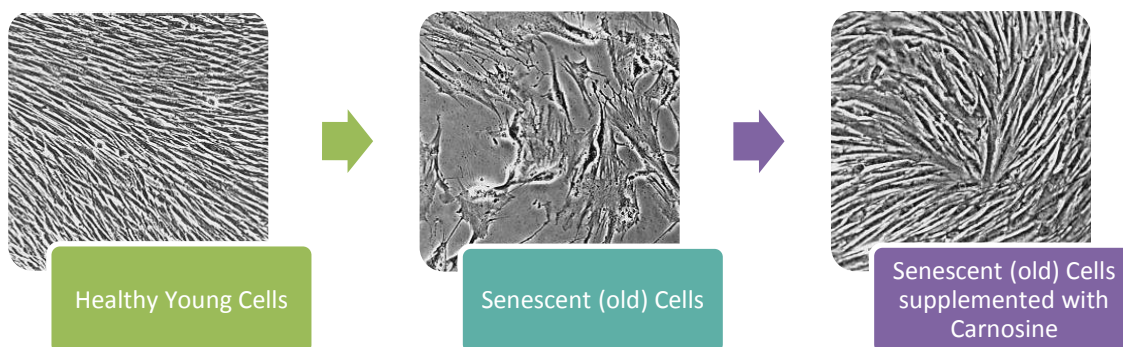
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### Mechanisms of **L- carnosine** protection in vitiligo includes:<sup>7</sup>

- Cellular rejuvenation
  - proton buffering (maintaining pH balance in the skin)
  - heavy metal chelating (especially copper and zinc)
  - free-radical and active sugar molecule scavenging (prevents glycation and carbonylation of proteins)
  - preventing the modification of biomacromolecules thereby keeping their native functionality under oxidative stress
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## **L carnosine** – Extends cellular life span

By preserving the integrity and regular turnover of protein, carnosine is a key defense against the downward spirals of degeneration that occur as part of the vitiligo process. When scientists took old cells, approaching the limits of their life span, and transferred them into culture dishes containing high carnosine concentrations, they found that the cells rapidly became rejuvenated to resemble young cells.<sup>7</sup>



## Skin benefits of carnosine in vitiligo

- Combats cellular damage by helping the skin rid itself of toxic metals
- Protects skin from free radical damage
- Revitalizing effect on skin fibroblasts
- Restores the skins regenerative potential
- Supports healthy skin
- Improves the skin texture

## References

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