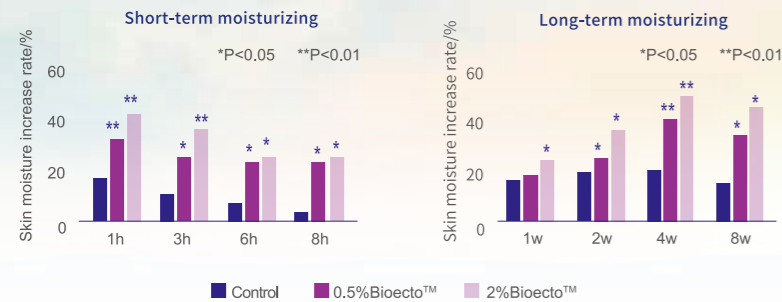


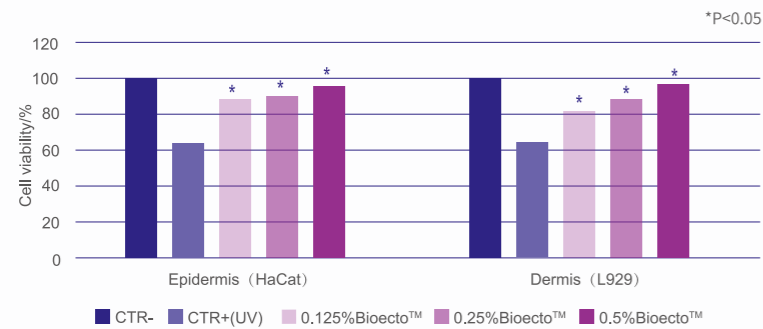
## Repair & Anti-aging

### 1 Highly hydrophilic with long-term moisturizing ability



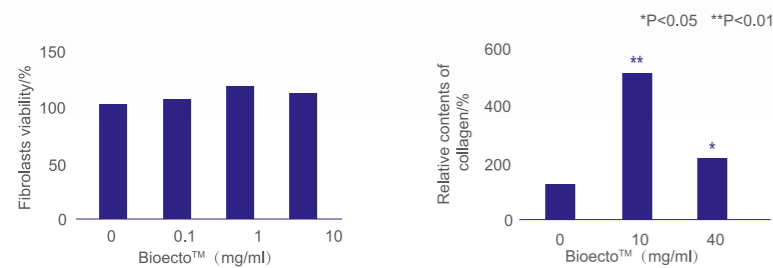
The test results showed that Bioecto™ can significantly increase skin moisture content and has long-term moisturizing effect. After 1 hour of use 2% Bioecto™ cream, skin moisture increased by 43.7%. After 4 weeks of continuous use 2% Bioecto™ cream, the skin moisture increased by 50.5%.

### 2 Repairs UV damage to skin cells



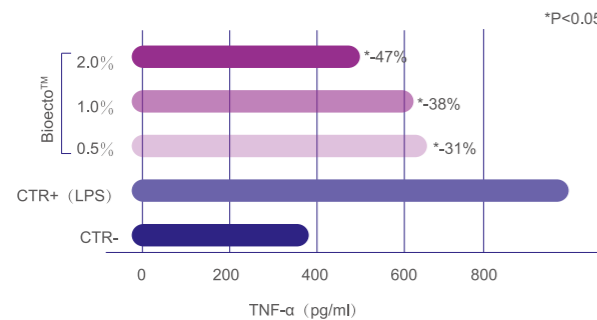
The test results showed that Bioecto™ had significant repairing effects on cell damage caused by UV radiation, and the repair effect increased with the increase of concentration.

### 3 Promotes the production of collagen and resists aging



The test results showed that low concentration of Bioecto™ can significantly improve the activity of fibroblasts, stimulate the proliferation of fibroblasts, and promote the synthesis of collagen. 10mg/ml Bioecto™ can increase the synthesis of collagen by almost five times.

### 4 Inhibits the release of inflammatory factor



The test showed that, Bioecto™ in the range of concentration 0.5%-2.0% had a good inhibiting effect on TNF-α, the inhibit rate of 0.5% Bioecto™ could reach up to 31%.



# Bioecto™ Ectoin

Natural, found in extremophiles  
Multi-functional amino acid derivate  
**Protection & Anti-stress**  
**Repair & Anti-aging**



Prevents damage

from UV and visible light

Protects Langerhans cell to enhance skin immunity function

## Improves anti-stress ability of cells

Inhibits the release of inflammatory factors

Promotes the synthesis of collagen, anti-aging

Keeps skin hydration



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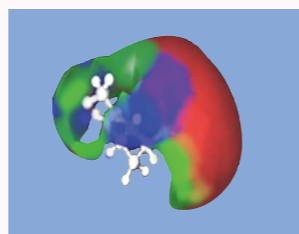
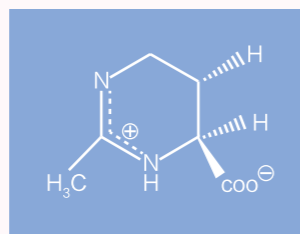
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*The Science of Beauty*



## Introduction

Bioecto™ is a highly pure Ectoin developed by a professional fermentation platform technology, with high stability and safety profile. Ectoin is an amino acid derivate and belongs to the group of extremolytes. Tests prove that Bioecto™ has remarkable protective and repairing effects, helps skin resist against external pressure, and can be widely used in personal care products such as repair, anti-pollution, sun care, anti-aging products and color cosmetic products.

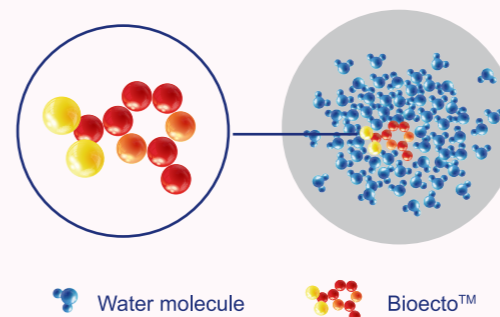


The molecular formula and electron distribution diagram of Ectoin

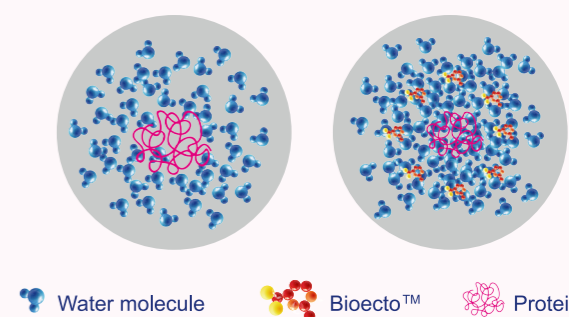
## Action mechanism

Bioecto™ easily forms hydrogen bonds with water molecules because of its great electronegativity. Therefore, Bioecto™ enhances the association of water molecules allowing water molecules to orientate around them forming protective shells around cell membranes, DNAs, enzymes, proteins and other biomolecules. This is called the "Kosmotropic effect".

Bioecto™ promotes the association of water molecules



Protection shell around protein

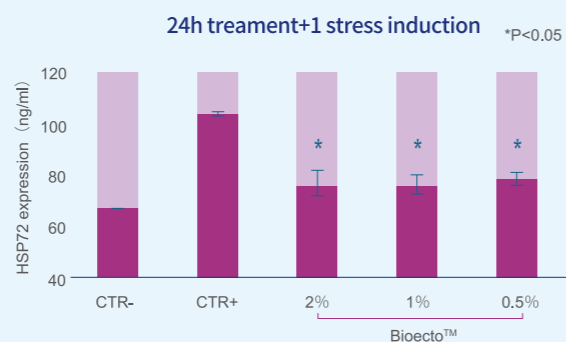


## Protection & Anti-stress

### 1

**Improves anti-stress ability of cells and resists external pressure**

Human skin cells produce heat shock proteins (HSP) when exposed to external stress like sun-radiation or other physical and chemical stress factors. When the cells were stimulated by heat, the expression of HSP increased rapidly in time and gradually recovered to the normal levels. The higher the final expression of HSP, the more obvious the stimulation was.

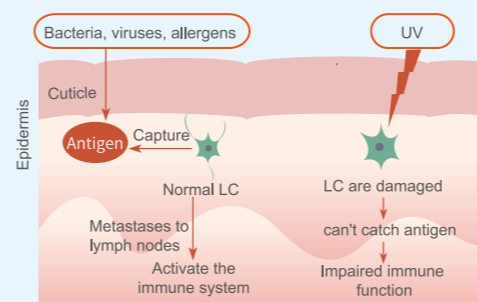


The experimental results showed that the heat tolerance of cells improved after treatment with Bioecto™. Compared with the positive control group (CTR+), the HSP72 expression was significantly reduced.

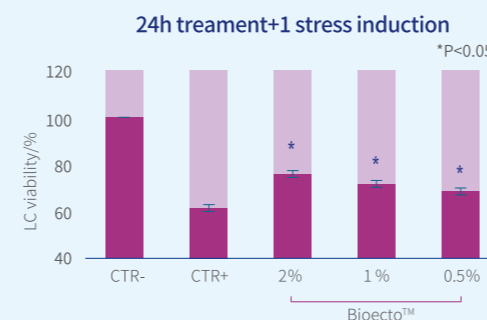
### 2

**Protects Langerhans cell and enhances skin immunity function**

Skin immune system activation mechanism



In normal skin, Langerhans cell (LC) can capture antigens and selectively induce the activation and proliferation of skin resident regulatory T cells to maintain normal skin immune tolerance. UV irradiation can reduce the number and density of LC and their ability to present antigens, resulting in a weakened skin immune function.



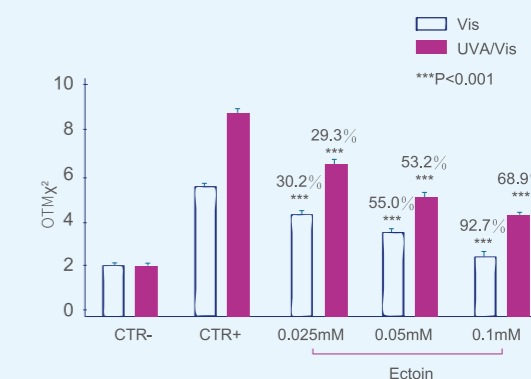
The tests showed that UV irradiation damaged Langerhans cells and reduced their activity. After the treatment with Bioecto™, the damage was significantly reduced. Compared to the positive control group, 1% Bioecto™ increased cell activity by 10.5% after 6 hours.

### 3

**Prevents DNA damage from UV and visible light**

UV or visible light radiation can damage the DNA in skin cells to varying degrees, causing cancer in severe cases.

All the tested concentrations showed a highly significant level of photoprotection against UVA/visible light and visible light with a dose-response relationship. At 0.1mM, the photoprotection levels of visible and UVA/visible irradiations correspond to 92.7% and 68.9% respectively.



OTM: Olive tail moment, evaluation index of cell DNA damage degree

## Specification

**INCI name:**

Ectoin

**Appearance:**

White or off-white crystals or powder

**Recommended dosage:**

0.1%-2%

**Usage:**

Can be added directly to aqueous phase

**Application:**

Skin care products, hair care products and color cosmetics. It brings functions of anti-stress, repairing, anti-inflammation, soothing, moisturizing and anti-aging.