

# ECTOINE-MD

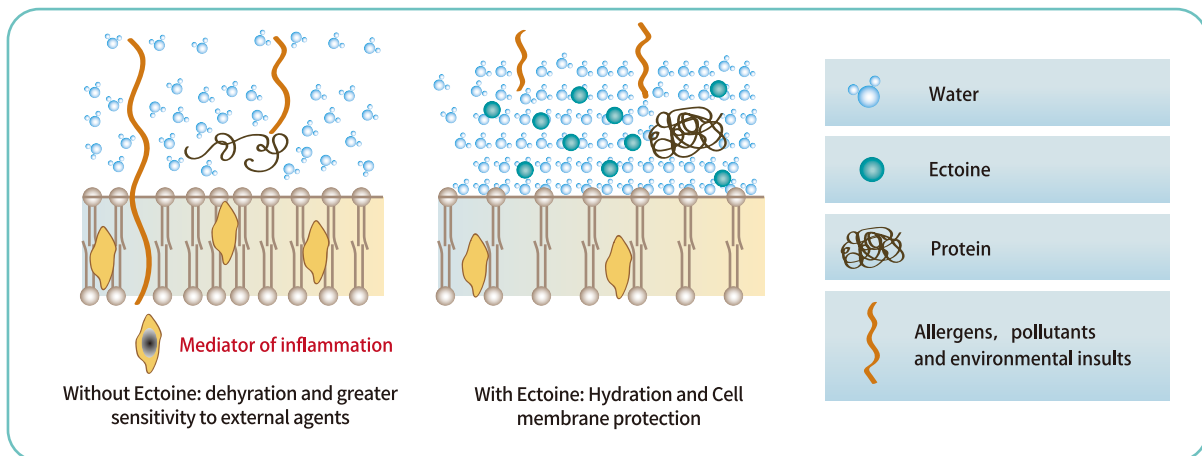
Ectoine-MD is a highly pure Ectoine developed by Bloomage professional fermentation platform technology, with high stability and safety profile. As a compatible solute within extremophiles survived under extreme conditions, ectoine can protect cells from external agents such as allergic stimuli and stabilize macromolecules such as functional enzymes. Therefore Ectoine has broad applications in eye care, nasal and oral health, topical use and private care.



## 1 Mechanism of Action

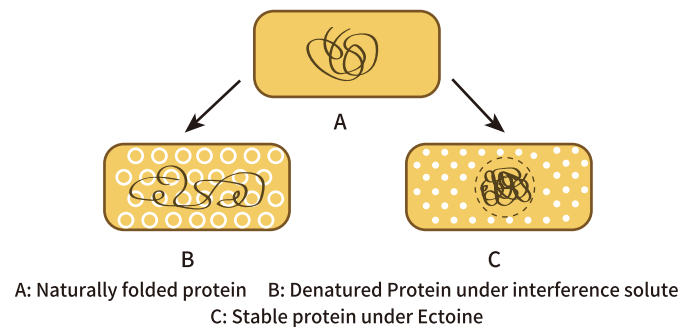
### Cell protection

Ectoine protects the cell by hydrating the cell membranes, protecting the cells from external agents such as allergens, pollutants and environmental insults. In addition, Ectoine binds with water molecules, increasing the hydration of the surface and thus increasing the mobility of the lipid head groups and fluidizing the lipid layer accordingly. This fluidizing effect further protects the cell membrane structure.



### Protein Stabilization

According to the inertial property of Ectoine, it does not react with proteins within the cells like other solute. On the other hand, Ectoine acts as one of the compatible solute, further stabilizes the protein by "preferential exclusion". The number of water molecules is increased by the formation of ectoine water complexes around the protein and Ectoine are excluded to the greatest extent possible, making the protein structure tighter, and preventing its stretch and denaturation.



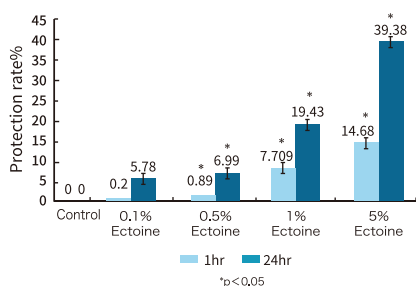
## 2 Efficacy Experiments

### Cell protection

Experiments showed that Ectoine had a protective effect on cell membrane.

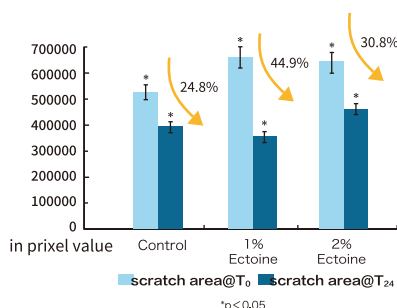
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The red cell membrane was damaged by surfactant treatment. The experimental group added Ectoine can effectively inhibit the rupture of cell membrane hence promotes membrane protection.



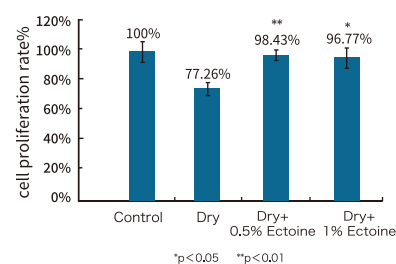
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Ectoine showed a protective effect on nasal mucous epithelial cell in dry environment. The nasal mucous membrane epithelial cells decreased by 22.74% after drying. The addition of different concentrations of ectoine significantly improved post-cell proliferation rate.



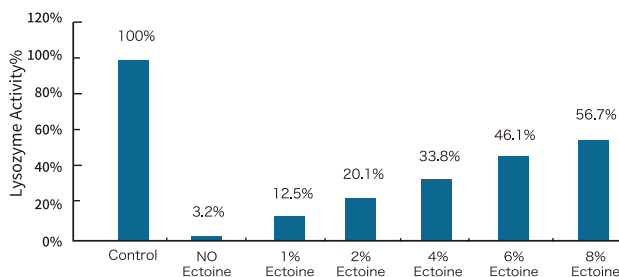
3

Ectoine protects the cell by promoting wound repair of corneal cells. After 24 h of cell culture, at 1.0% and 2.0% concentrations, Ectoine promoted cell migration and wound healing as scratch area diminishing.



### Protein Stabilization

Results showed Ectoine has a stabilizing effect on lysozyme activity. Lysozyme is a functional enzyme that resides in many cells membranes, including tear film. Lysozyme weakens the bacterial cell wall allowing it to rupture, killing the bacteria. Under 2% NaCl solution which mimics the hyperosmotic environment, Lysozyme showed little activity compared to control group. After adding Ectoine, lysozyme activity was significantly increased.



### Recommended uses

Eye drops, contact lens solution, nasal spray, throat spray, topical cream, private care etc.



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