

SKINPRO QM

Skin Shield against Environmental Stresses



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SKINPRO QM is a rich source of natural glycosaminoglycans from jellyfish.

Jellyfish has a reproducibility of the shape. So, it has a feature that can be restored to the original shape even if the part is cut. The body of jellyfish consists of a hemispherical transparent umbrella. When jellyfish swollen to equilibrium, the water content of jellyfish's body amounts to 96~97%.

The mucin is served to maintain the hydration and to provide lubrication and anti-adhesive properties between the cells.

Here, as we got inspired from the ecological characteristics of jellyfish, we have focused on **qniumucin** as the component to be able to this function.

A qniumucin has been isolated from jellyfish and its structure has been characterized (Masuda et al., 2007). Qniumucin is similar to human mucin, MUC5AC. MUC5AC is one of the major contributors to the rheological properties of the mucus that has a critical role in the defense against pathogenic and environmental challenges.

This marine mucin from jellyfish exhibits three times more moisturizing and hygroscopic activity than hyaluronic acid (Ushida et al., 2008).

Furthermore, chemical and biophysical properties of this marine mucin can lead the way of utilization and application of this compound as a protective biomaterial with lubrication and moisturizing effects.

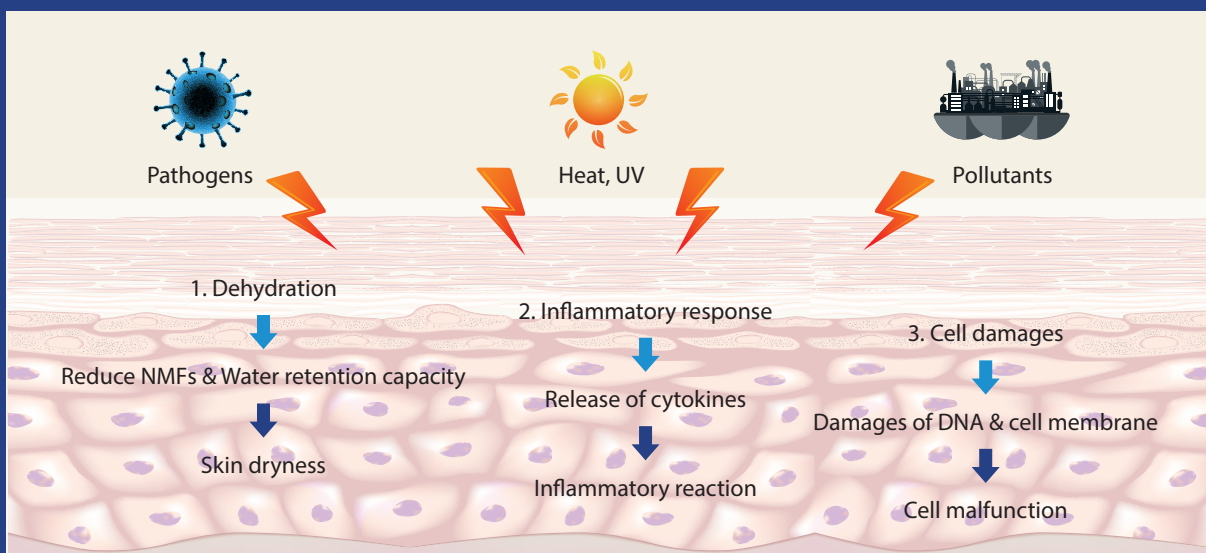
Benefits of Mucin

1. Mucins protect cells against infection by microorganisms.
2. Mucins protect cells against dehydration.
3. Mucins protect cells against physical or chemical injury.

MECHANISM

Human skin is subjected to be damaged by external chemical or physical stimulation such as pathogens, UV, heat, pollutants and etc..

1. Environmental stresses decrease the water holding capacity of epidermis and result in dry skin.
2. Environmental stresses promote the aging of the cell by cellular inflammatory.
3. Environmental stresses induce the production of free radicals and DNA damages.



SKINPRO QM protects the skin from environmental stresses.

1. SKINPRO QM restores the NMFs and binding proteins of keratinocytes, and increases the moisturizing activity.
2. SKINPRO QM protects the epidermal cells from aging by reducing the inflammatory reaction.
3. SKINPRO QM reduces the cellular damage induced from environmental stresses and increases the cell viability.

IN-VITRO TEST

MOISTURIZING EFFECT

SKINPRO QM STIMULATES THE SYNTHESIS OF FILAGGRIN

Filaggrin undergoes further processing in the upper stratum corneum to release free amino acids that assist in water retention.

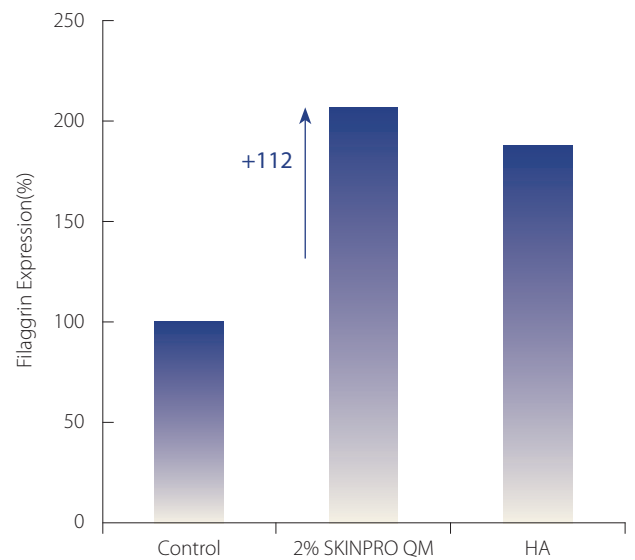
SKINPRO QM increases the expression of Filaggrin by 112%.

Protocol

Human epidermal keratinocyte (HaCaT) cultures were incubated during 36 hours (at 37°C, CO₂: 5%) in presence of 2% SKINPRO QM.

The expression levels of mRNA were analyzed by RT-PCR.

HA : Hyaluronic Acid 50 ppm



SKINPRO QM INCREASES THE EXPRESSION OF CASPASE 14

Filaggrin is broken down in the stratum corneum by Caspase 14 which plays an important role in skin barrier formation.

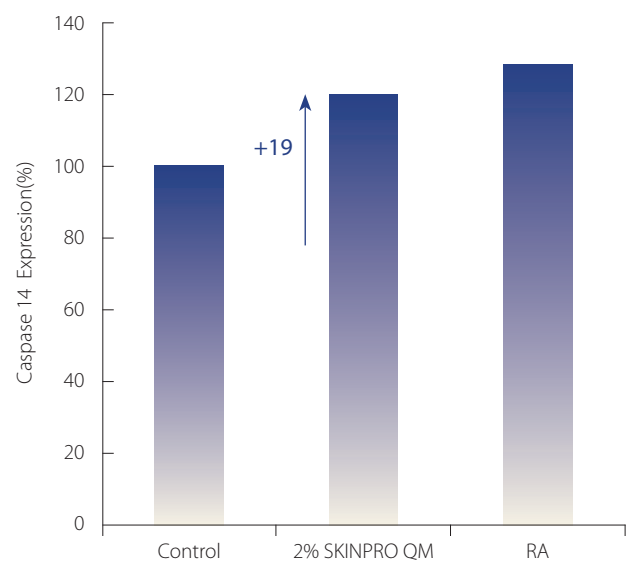
SKINPRO QM increases the expression of Caspase 14 by 19%.

Protocol

Human epidermal keratinocyte (HaCaT) cultures were incubated during 36 hours (at 37°C, CO₂: 5%) in presence of 2% SKINPRO QM.

The expression levels of mRNA were analyzed by RT-PCR.

RA : Retinoic Acid 50 ppm



SKINPRO QM INCREASES THE EXPRESSION OF HAS-3 & AQP-3

Hyaluronan synthase-3 (HAS-3) is an enzyme involved in hyaluronic acid synthesis.

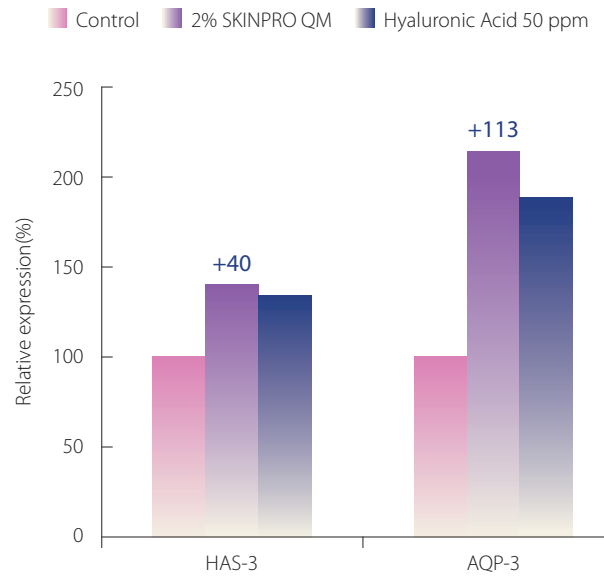
Aquaporin-3 (AQP-3) is a water/glycerol transporting protein expressed strongly at the plasma membranes of basal epidermal cells in skin.

SKINPRO QM increases the expression of HAS-3 by 40%.

SKINPRO QM increases the expression of AQP-3 by 113%.

Protocol

Human epidermal keratinocyte (HaCaT) cultures were incubated during 36 hours (at 37°C, CO₂: 5%) in presence of 2% SKINPRO QM. The expression levels of mRNA were analyzed by RT-PCR.



SKINPRO QM INCREASES THE SYNTHESIS OF DSC, BINDING PROTEIN

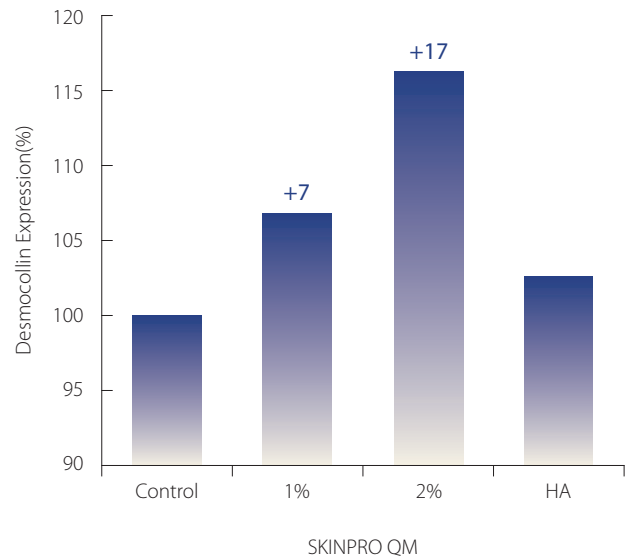
Desmocollin (DSC), Binding protein is involved in inter-keratinocyte adhesions.

2% SKINPRO QM increases the expression of DSC by 17%.

Protocol

Human epidermal keratinocyte (HaCaT) cultures were incubated during 36 hours (at 37°C, CO₂: 5%) in presence of 1% & 2% SKINPRO QM. The expression levels of mRNA were analyzed by RT-PCR.

HA : Hyaluronic Acid 50 ppm



ANTI-INFLAMMATORY EFFECT

SKINPRO QM DECREASES THE RELEASE OF IL-1 α , TNF- α and IL-6

Interleukin-1 alpha (IL-1 α) and tumor necrosis factor alpha (TNF- α) are major proinflammatory cytokines.

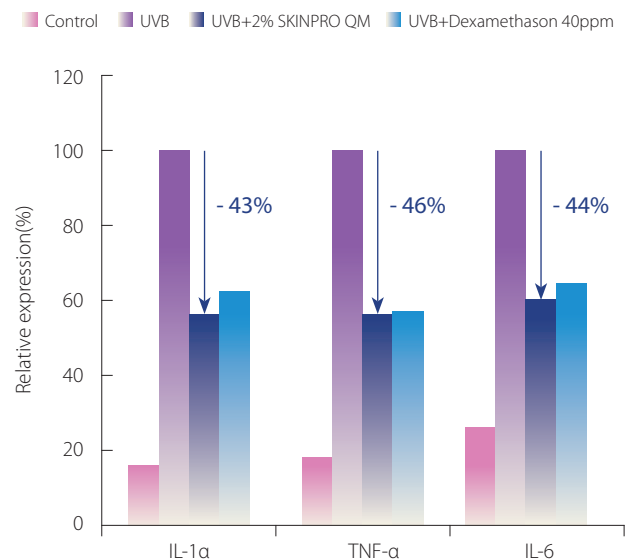
Interleukin-6 (IL-6) is one of key mediators of the "acute-phase response" in inflammation.

SKINPRO QM decreases the expression of IL-1 α , TNF- α and IL-6 by 43%, 46% and 44%, respectively.

Protocol

Human epidermal keratinocyte (HaCaT) cultures were incubated during 36 hours (at 37°C, CO₂: 5%) in presence of 2% SKINPRO QM.

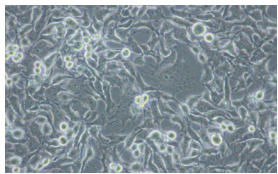
After irradiation with 100 mJ/cm² of UV-B for 3hrs, the expression levels of mRNA were analyzed by RT-PCR.



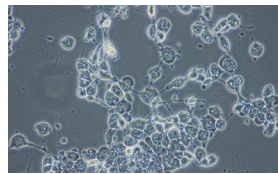
IN-VITRO TEST

CELL PROTECTING EFFECT OF SKINPRO QM

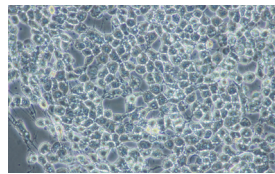
SKINPRO QM PROTECTS THE EPIDERMIS AGAINST CHEMICAL INJURY



Normal keratinocyte



Normal keratinocyte
+ Formaldehyde 50ppm

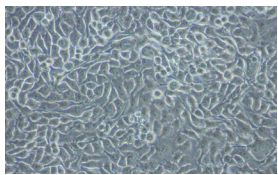


Keratinocyte
with 2% SKINPRO QM
+ Formaldehyde 50ppm

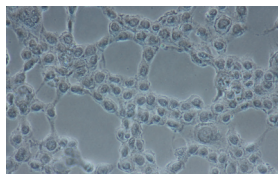
Protocol

Cells were incubated during 18 hours (at 37°C, CO₂: 5%) in the presence of 2% SKINPRO QM. After incubation with formaldehyde 50 ppm for 3hrs, changes in cellular morphology of each group were determined using microscopy.

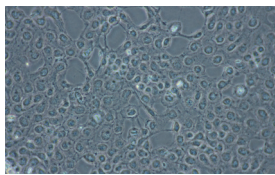
SKINPRO QM PROTECTS THE EPIDERMIS AGAINST PHYSICAL INJURY



Normal keratinocyte



Normal keratinocyte
+ UVB



Keratinocyte
with 2% SKINPRO QM
+ UVB

Protocol

Cells were incubated during 18 hours (at 37°C, CO₂: 5%) in the presence of 2% SKINPRO QM. After irradiation with 100 mJ/cm² of UV-B for 3hrs, changes in cellular morphology of each group were determined using microscopy.

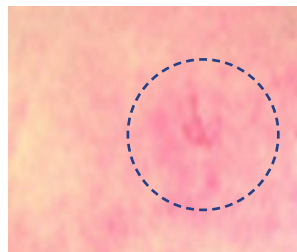
IN-VIVO TEST

PROTECTING EFFECT

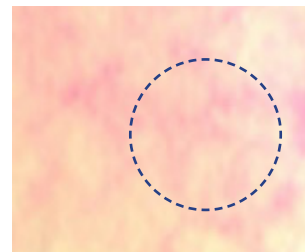
SKINPRO QM PROTECTS THE SKIN FROM IRRITATION

SKINPRO QM effectively protects against SLS irritation. It reduces the reddening intensity.

Method : Measurement of reddening upon SLS(Sodium lauryl sulfate) irritation. Application of 1% SLS solution with 2% SKINPRO QM emulsion vs Placebo during 12 hours and measurements. Reddening images were evaluated by Antera 3D (Miravex Limited).



Placebo



SKINPRO QM

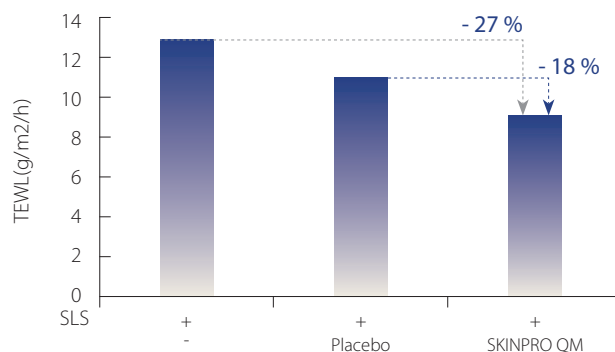
MOISTURIZING EFFECT

SKINPRO QM REDUCES THE TEWL OF SKIN

-27 % of TEWL vs Non-treatment

-18 % of TEWL vs Placebo

Method : Measurement of TEWL (Trans epidermal water loss) upon SLS(Sodium lauryl sulfate) irritation. Application of 1% SLS solution with 2% SKINPRO QM emulsion vs Placebo during 12 hours and measurements. TEWL values were evaluated by Dermalab Combo (Cortex Technologies).



[Cosmetic activities]

- Anti-inflammatory effect
- Enhancement of the NMF via Filaggrin
- Stimulation of HAS3 & AQP3 expression
- Stimulation of Hyaluronic acid synthesis
- Reinforcement of the epidermal cohesion
- Protecting effect of cell damage

[Recommended % of use]

- SKINPRO QM 2%, SKINPRO QM (HD) 2%

[INCI name]

- SKINPRO QM : Water (and) Butylene Glycol (and) Phenoxyethanol (and) Ethylhexylglycerin (and) Glycosaminoglycan
- SKINPRO QM (HD) : Water (and) Butylene Glycol (and) 1,2-Hexandiol (and) Glycosaminoglycan



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Cosmetic activities	<ul style="list-style-type: none">• Enhancement of the NMF via Filaggrin• Stimulation of Hyaluronic acid synthesis• Anti-inflammatory effect• Stimulation of HAS-3 & AQP-3 expression• Reinforcement of the Epidermal cohesion• Protecting effect against Cell damage
INCI name	<p>SKINPRO QM Water (and) Butylene Glycol (and) Phenoxyethanol (and) Ethylhexylglycerin (and) Glycosaminoglycans</p> <p>SKINPRO QM (HD) Water (and) Butylene Glycol (and) 1,2-Hexanediol (and) Glycosaminoglycans</p>
Recommended % of use	SKINPRO QM 2% SKINPRO QM (HD) 2%