Biomimetic Fluid Tears+

New Approach to Moist Your Skin

Find plant extract solution with

DermaLab

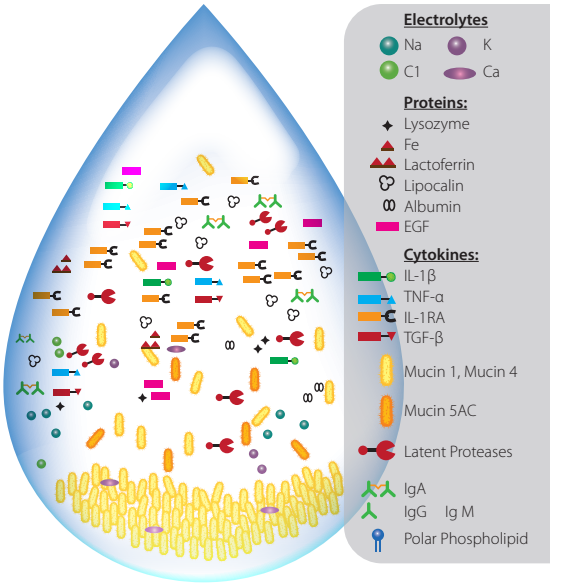
BIO-MIMICKED TEARS-LIKE LIPOSOMAL SKIN SHIELD

Tears, the innate immune substance, protect our eyes from foreign substances

Our bodies are truly mysterious. Tears appear naturally any time our vision is blurry, our eyes are bloodshot or even when foreign substances enter the eye. So our eyes can quickly feel relief. Tears have various roles. Beginning with the lubrication of the eye ball, tears also have the function of absorbing oxygen from the air to assist with cornea metabolism and supply oxygen. Tears have the additional function of removing corneal metabolic material and of course, cleansing and antibacterial functions.

Tears do not only flow when we are sad. Tears are absolutely necessary in maintaining our moist, beautiful eyes and cleansing them from a host of outside substances to maintain eye health. In tears, we can find the answer to keeping other organs such as skin healthy.

These days consumers wanting healthy skin for a high quality life are increasing. As the concern of these consumers for fundamental healthy skin care rises, they are increasingly searching for a product that provides skin barrier strengthening functions which keep the epidermis healthy and protect it from stresses and harmful environments. Therefore, the components and functions of tears can be a good solution for the negative effects of harmful environments and lifestyle elements.

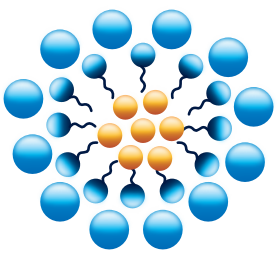


<The Three Distinct Layers of the Tear Film>

Name	Container	Secretor	Function
Lipid layer	Oils	Meibomian glands	Protects tears from evaporating / Creates a smooth barrier
Aqueous layer	Water, vitamins, salt, other minerals, nutrients	Lacrimal gland	Promotes osmoregulation (salt balance) / Prevents invasion and infection by microbes / Supplies nutrients to the barrier
Mucous layer	Mucin	Conjunctival goblet cells	Helps the tear stay on the eye / Keeps the tissue moisturized and prevents dryness

Biomimetic Fluid Tears+ mimics the functions and components of tears.

Inspired by the innate immunity substances, functions and components of tears, DermaLab has developed Biomimetic Fluid Tears+ to alleviate the negative effects of harmful environments and lifestyle elements, and assist with preventative skin care. Biomimetic Fluid Tears+ helps creating healthy skin by forming a smooth barrier which reinforces the supply of nutrients to the epidermis as well as its moisturizing ability.



Aqueous layer

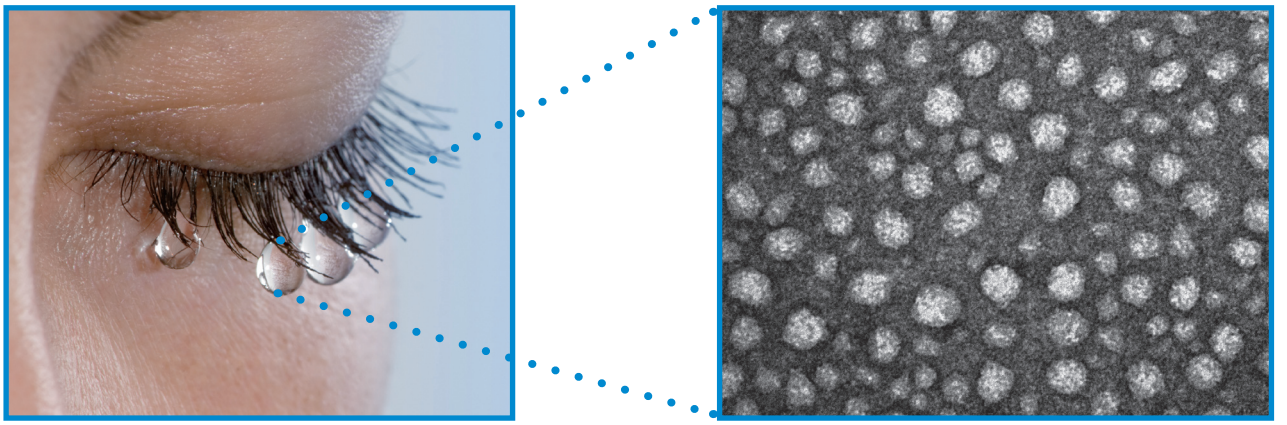
Lipid layer

Mucous layer

Component	Efficacy
Sugar Alcohols, Sugar Amino Acid, Organic Acid Mineral, Nucleotide Vitamin, Peptide	Moisturizing Abirritation Revitalizing
Lipid	Shielding
Polysaccharide	Moisturizing

Biomimetic Fluid Tears+ was made using Micro DeBEE (high pressure homogenizer) to improve solubility and sense of use.

EF-TEM IMAGE of Biomimetic Fluid Tears+



Energy Filter Transmission Electron Microscope
(Model : LEO 912AB OMEGA)

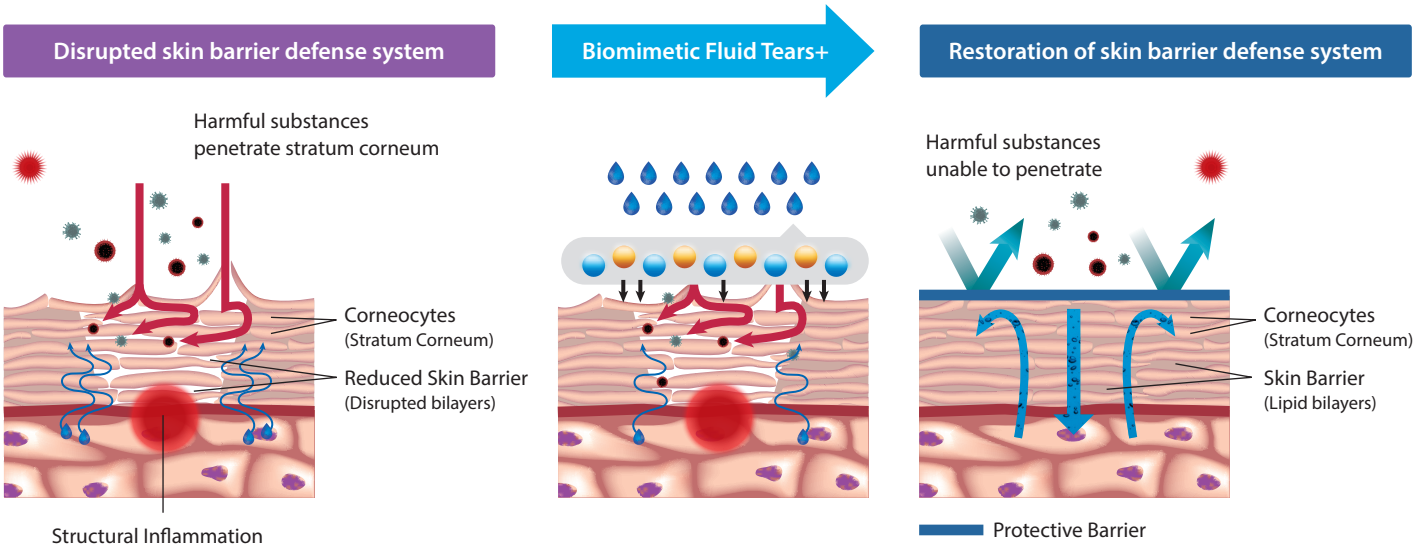
MECHANISM

The skin barrier function refers to the outermost layer of epidermis. It is mainly composed of corneocytes and intercellular lipids. The barrier is impermeable, and designed to prevent the loss of water out of skin and to prevent the entrance of harmful microorganisms or irritants. The Barrier Function is an extremely important concept in skin care.

There are many negative effect on skin health that result from the changed external environments(UV, pathogens, pollutants…) and lifestyle(smoking, light pollution…) in modern society.

Skin barrier function is disrupted by the above harmful substances. Skin loses its ability to protect and defend itself due to lake of intercellular lipids and decreased water holing ability. This skin barrier dysfunction ends up with skin ageing.

Biomimetic Fluid Tears+ restores the defense system and maintains healthy skin structure.



Biomimetic Fluid Tears+ helps to build the healthy skin by restoring skin barrier defense system.

1. Biomimetic Fluid Tears+ enhances the skin barrier function by restoring epidermal lipids
2. Biomimetic Fluid Tears+ regains the cell activity by reducing inflammatory reaction.
3. Biomimetic Fluid Tears+ holds the water balance by increasing moisturizing activity.
4. Biomimetic Fluid Tears+ protects the epidermal cells against harmful substances.

IN-VITRO TEST

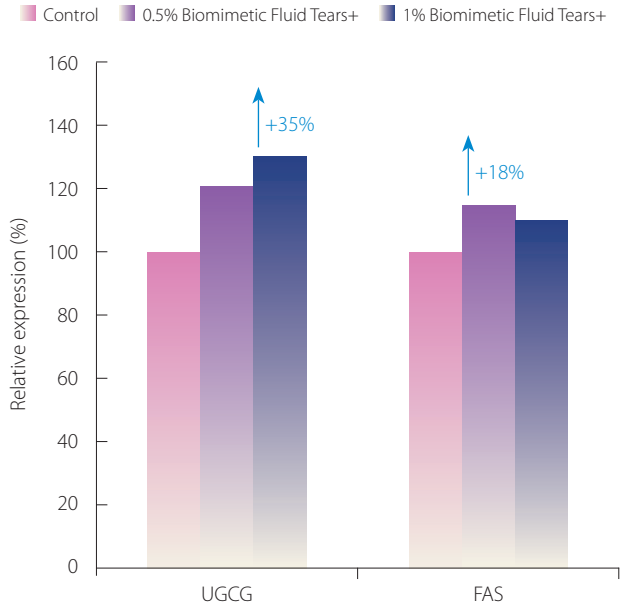
EPIDERMAL LIPIDS RESTORATION EFFECT

Biomimetic Fluid Tears+ INCREASES UGCG and FAS EXPRESSION

Ceramide Glucosyl Transferase (UGCG) and Fatty Acid Synthase (FAS) have a key role in the production of the lipids of the stratum corneum, which strengthens the epidermal barrier.

UGCG : 35% ↑
FAS : 18% ↑

Protocol: *Human epidermal keratinocyte (HaCaT) cultures were incubated during 48 hours (at 37℃, CO_2: 5%) in presence of Biomimetic Fluid Tears+. The expression levels of mRNA were analyzed by RT-PCR.*



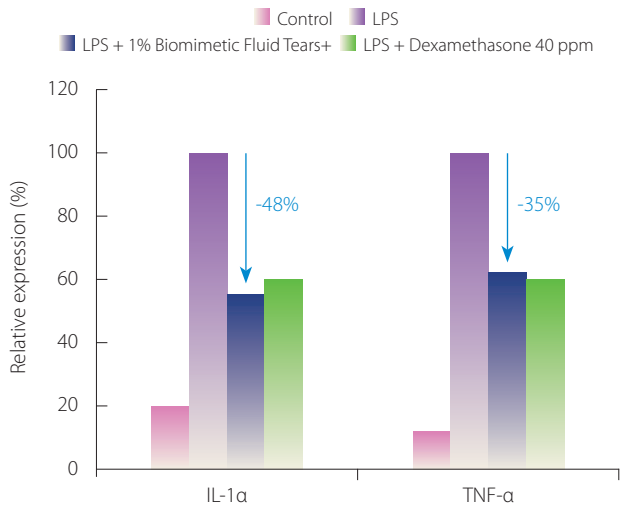
ANTI-INFLAMMATORY EFFECT

Biomimetic Fluid Tears+ DECREASES IL-1α and TNF-α EXPRESSION

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

The expression of IL-1α : 48% ↓
The expression of TNF-α : 35% ↓

Protocol: *Human epidermal keratinocyte (HaCaT) cultures were incubated during 48 hours (at 37℃, CO_2: 5%) in presence of 1% Biomimetic Fluid Tears+ with 100ng/mℓ lipopolysaccharide (LPS) . The expression levels of mRNA were analyzed by RT-PCR.*



IN-VITRO TEST

MOISTURIZING EFFECT

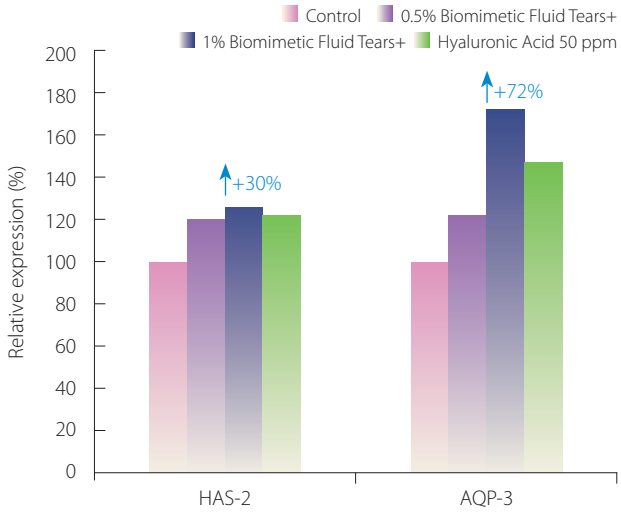
Biomimetic Fluid Tears+ INCREASES HAS-2 & AQP-3 EXPRESSION

Hyaluronan synthase-2 (HAS-2) 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.

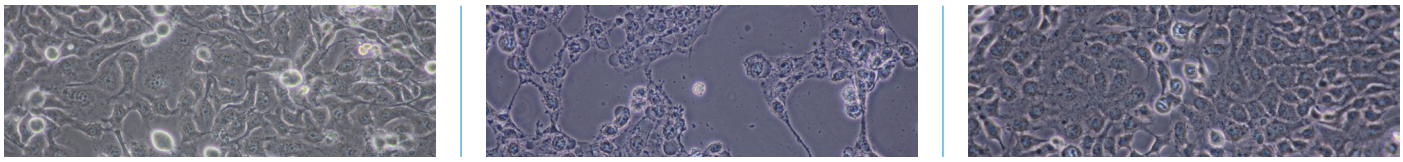
The expression of HAS-2 : 30% ↑
The expression of AQP-3 : 72% ↑

Protocol: *Human epidermal keratinocyte (HaCaT) cultures were incubated during 48 hours (at 37℃, CO_2: 5%) in presence of Biomimetic Fluid Tears+. The expression levels of mRNA were analyzed by RT-PCR.*



CELL PROTECTION EFFECT

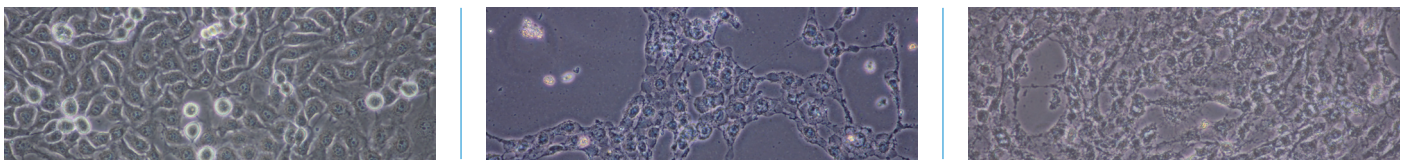
Biomimetic Fluid Tears+ PROTECTS EPIDERMIS AGAINST CHEMICAL INJURY



Control | Formaldehyde 10 ppm | Formaldehyde 10 ppm + 1% Biomimetic Fluid Tears+

Protocol: *Human epidermal keratinocytes (HaCaT) were incubated during 18 hours (at 37℃, CO_2: 5%) in the presence of 1% Biomimetic Fluid Tears+. After incubation with formaldehyde 10 ppm for 3hrs, changes in cellular morphology of each group were determined using microscopy.*

Biomimetic Fluid Tears+ PROTECTS EPIDERMIS AGAINST PHYSICAL INJURY



Control | UVB | UVB + 1% Biomimetic Fluid Tears+

Protocol: *Human epidermal Keratinocytes (HaCaT) were incubated during 18 hours (at 37℃, CO_2: 5%) in the presence of 1% Biomimetic Fluid Tears+. After irradiation with 10 mJ/cm^2 of UV-B for 1hrs, changes in cellular morphology of each group were determined using microscopy.*

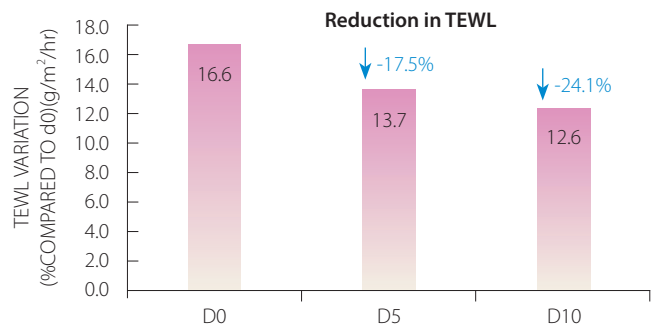
IN-VIVO TEST

SKIN MOISTURIZING EFFECT

Biomimetic fluid tears+ decreases TEWL on facial skin

- Volunteers : 12 male & female aged between 27 and 49 years old
- Formulation : Lotion containing 2% Biomimetic Fluid Tears+
- Application : Twice a day for 10 days on face
- Analysis : Measure Forehead with Dermalab TEWL Probe

Decrease of TEWL Average -24.1% Up to -48.5%



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Cosmetic activities	• Restoration effect of epidermal lipids • Anti-inflammatory effect • Stimulation of HAS2 & AQP3 expression • Protection effect of epidermal cells
INCI name	Water (and) 1,2-Hexanediol (and) Glycerin (and) Caprylic/Capric Triglyceride (and) Hydrogenated Lecithin (and) Glucose (and) Arginine (and) Hydroxypropyl Methylcellulose (and) Citric Acid (and) Calcium Carbonate (and) Acetyl Glucosamine (and) Ascorbic Acid (and) Glutathione
Recommended % of use	1 % ~