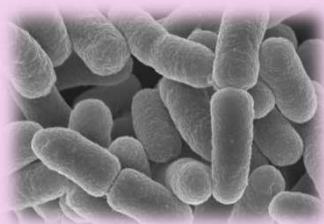


A material that is an immunostimulant. It reduces wrinkles, restores skin firmness, and improves the barrier function, moisture retention function, and metabolism function of the skin.

IMMUNOL®-CO

It is a material made by fermenting plant-based raw materials using acetic acid bacteria isolated from fruit (persimmon). It has beauty effects, such as stimulating the immune system, reducing wrinkles, restoring skin firmness, and improving the barrier function, moisture retention function and metabolism function of the skin.



Characteristics of IMMUNOL®-CO

- Lipopolysaccharide (LPS), one of the active ingredients of acetic acid ferments, is a component of the cell walls in gram-negative bacteria such as acetic acid bacteria. It normalizes the balance of your body's immune system, stimulating self healing and skin metabolism.

Beauty effects- works well on the dermis and epidermis

- Effects on the dermis (fibroblasts): "Reduces wrinkles and restores skin firmness"

It stimulates the immune system, thereby activating cells and promoting the production of hyaluronic acid.

- Effects on the epidermis (keratinocytes): "Improves the barrier function, moisture retention function, and metabolism function"

Promotes the production of ceramide, involucrin, and filaggrin.

It has cell activation effects and improves the metabolism function.

Product name		IMMUNOL®-CO		Standard items	Standard	Test method
Cosmetics	Name on the label	INCI name	Component ratio %	Appearance	Light yellow to yellow liquid with slight odor	Sensory test
	Gluconobacter culture	Gluconobacter Ferment filtrate	50%	Contamination	Not c ontamination	Visual check
	BG	Butylene Glycol	50%	LPS*(Limulus test)	More than 4.0µg/mL	Measurement by Limulus method
Nominal capacity		1L/brown bottle		pH	6.8~8.0	JSQI general test method
Preservation method		Cold storage		Evaporation residue	More than 0.3%	Atmospheric heating drying method
SAFETY TEST ITEM		RESULT		Heavy metals (as Pb)	Not more than 20ppm	JSQI general test method
Skin irritation test (OECD TG 439)		Non-irritant(concentration : 10%)		Arsenic (as As ₂ O ₃)	Not more than 2.0ppm	ICP emission spectrometry
Eye irritation test (OECD TG 492)		Non-irritant(concentration : 10%)		Aerobic plate count	Not more than 100cfu/ml	SCDLP agar culture method
Phototoxicity test (OECD TG 432)		Negative(concentration : 50%)		Coliform organisms	Negative	AOAC method (petrifilm method)
Human patch test (24 hours occlusion 20 human)		Safety (concentration : 50%)		Viable molds and yeasts count	Not more than 10cfu/ml	AOAC method (petrifilm method)
Repeat insult patch test (50 human)		Primary irritancy,Non-irritant and non-sensitizer(concentration : 10%)				

(Concentration: as Gluconobacter Ferment Filtrate)

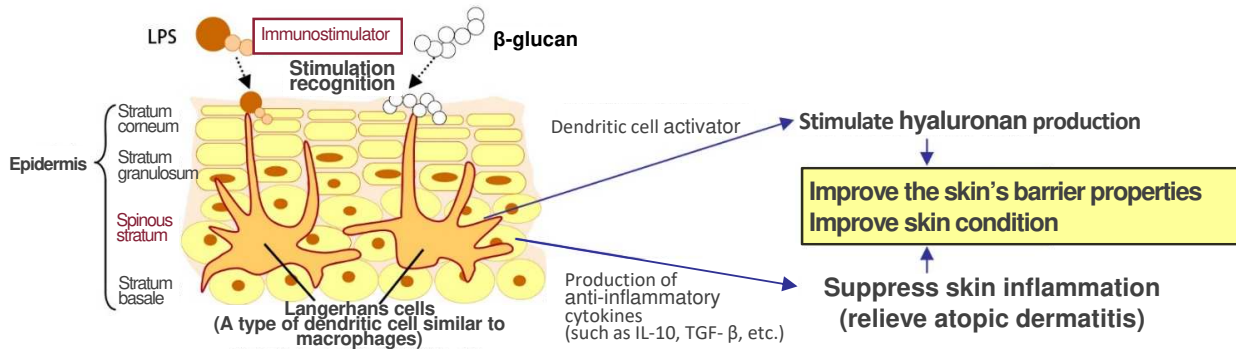
URL <http://www.toyohakko.com/en>

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IMMUNOL®-20200101s

(1) Beautiful skin effect of LPS

Your skin's Langerhans cells are a type of dendritic cell similar to macrophages. These immune cells produce cytokine in response to foreign enemies on the surface of your skin. The cytokine produced by Langerhans cells contains anti-inflammatory cytokines IL-10 and TGF-β, which function to suppress excessive immune reactions and skin inflammation. Meanwhile, by stimulating fibroblasts and producing agents that stimulate hyaluronan production, these cells are thought to be effective for preserving moisture in your skin and maintaining its barrier function. Immunostimulators such as LPS and β-glucan are also believed to suppress inflammation and help maintain good skin condition by stimulating the Langerhans cells and producing cytokine.



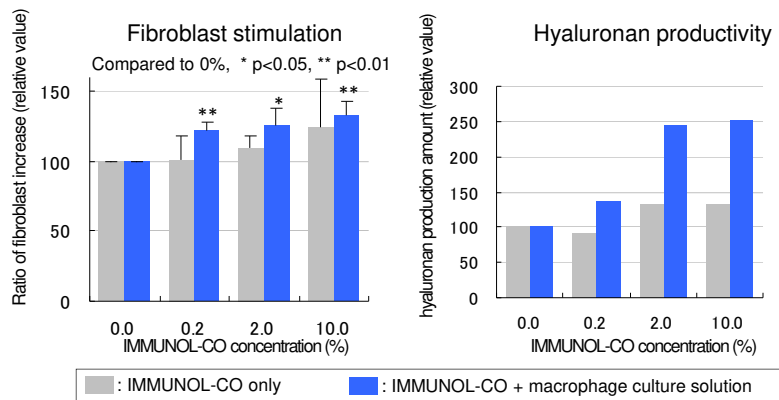
(2) Beauty effect of natural immunity activation (macrophage activation)

Test method

Acetic acid ferment (for cosmetics) was added to the immune cell macrophages and cultured for 24 hours. The culture solution was then added to fibroblasts and cultured and the ratio of fibroblast increase and hyaluronan productivity was measured. For comparison, fibroblasts with only acetic acid ferment added (without stimulation macrophage) were also measured.

Results

Even when the macrophages were not stimulated and only acetic acid ferment was added, promotion of fibroblast growth and hyaluronan productivity was confirmed. It was also confirmed that these effects were further increased by the activation of immune cell macrophages. As a result, the acetic acid ferment is expected to have a beauty effect by stimulating skin turnover through activation of the immune system.



(3) Promotes the growth of epidermal keratinocytes

The epidermis, which is outermost layer of the skin, is composed of the basal layer, prickle layer, granular layer, and horny layer. The epidermal keratinocytes separate in the basal layer, and after a period of differentiation and maturation, they move to the upper layer. Upon reaching the horny layer, they fall off. This turnover process is repeated to form the epidermis. When the metabolism function of the epidermal keratinocytes weakens, skin conditions such as small wrinkles, dullness, pigmentation, and rough skin occur. As a result of a cell proliferation test using normal keratinized human epidermal keratinocytes, it was found that the increase of cell activation is concentration-dependent on IMMUNOL-CO. Given this, IMMUNOL-CO is expected to prevent and improve the aging symptoms of the skin such as small wrinkles, dullness, pigmentation, and roughness by recovering the skin metabolism function.

