



YJ LAB

Where skin health begins

COMPANAY PROFILE

YJ LAB

Where skin health begins, YJ LAB

VISION 7

1. A company offers the best value for customers
2. A company technically contributes for the industry
3. Profit and growth are means to realize the corporate value and accountability
4. Innovation based on novelty
5. A company provides products and services with the best quality at reasonable prices
6. Honesty, morality and social contribution
7. Balance responsibilities among customers, employees, society and shareholders



COMPANY INTRODUCTION

YJ LAB, The Research Institute for Youth and Pleasure!

It has been 6 years since YJ LAB has been made. Starting business from nowhere but having meetings and study for cosmetic raw materials in cafés and sales at the same time, we have been running hard till now under our slogan 'Where skin health begins!' to make and provide decent cosmetic products to our partners and customers.

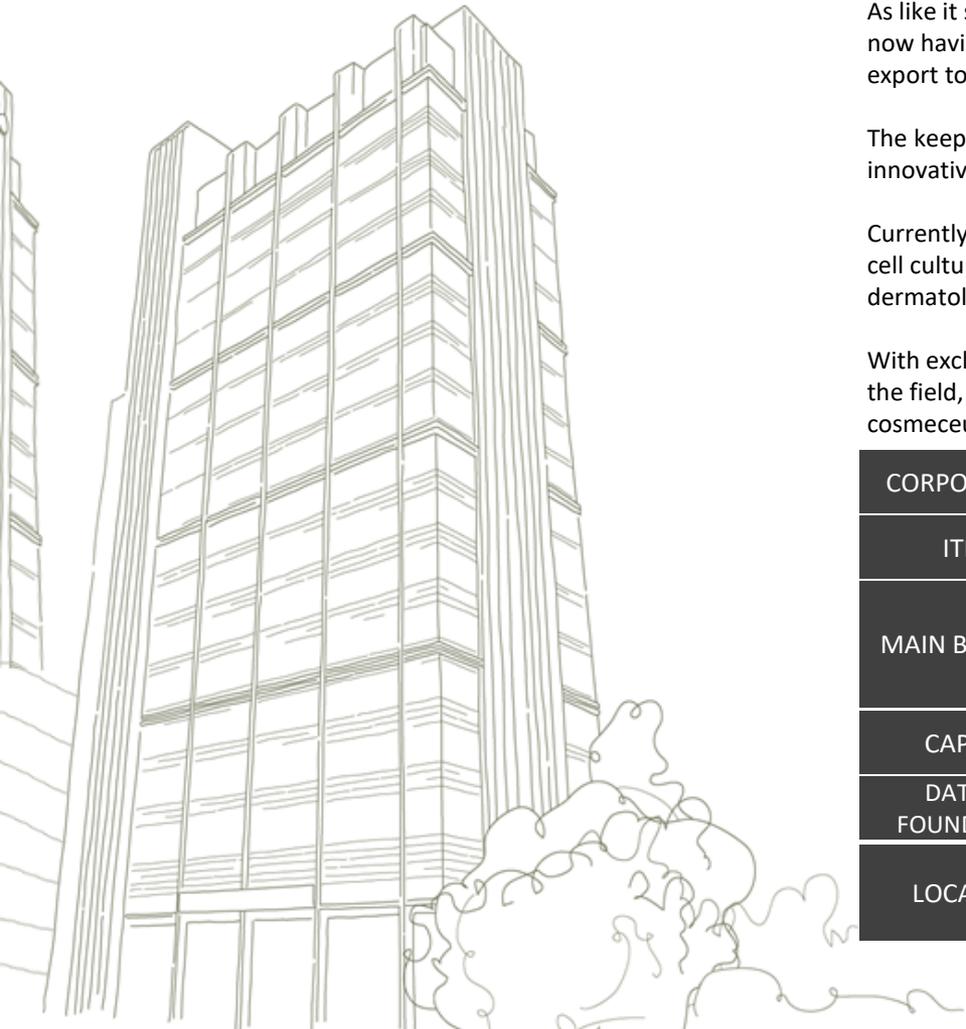
As like it shows our efforts for the passing time, we are keep expanding our business now having dermatology and plastic surgery clinic partners over 2,000 in Korea and export to China, South Asia, Central Asia and North America.

The keep growing YJ LAB is a cosmeceutical specialized company that talented young and innovative people are working in a family-like atmosphere.

Currently, the regeneration, brightening, acne and hair removal procedures using stem cell culture fluids and growth factors from human body are becoming popular as dermatology and cosmetic surgery products.

With exclusive supply of CELLAPY products, the brand having the largest market share in the field, we are a developing, manufacturing, distributing company of new generation cosmeceutical brand 'NEWSTEM'

CORPORATION	YJ LAB
ITEM	Cosmetics, Medical Devices, Pharmaceutical products
MAIN BUSINESS	Cosmetics Manufacturing / Production Stem Cells & Growth Factors development
CAPITAL	KRW 153,500,000 (US\$ 143,000)
DATE OF FOUNDATION	JUL 8 th , 2013
LOCATION	B-802, 70 Doksan-ro, Geumcheon-gu Seoul 08573 South Korea





NEWSTEM INTRODUCTION

Real beauty begins from healthy skin.

HEALTHY SKIN, what **NEWSTEM** only cares about.

Where Skin Health begins, NEWSTEM





NEWSTEM Rx Skin M-Solution

- Pore Reduction, Skin Rejuvenation + Acne Scar + Rhytids Improvement + Anti-Aging + Pigmentation + Skin Brightening
- 7th Generation 'Agi Injection Pore treatment'
- Containing 100,000ppm of Human Fat derived Stem Cell Culture Fluid
- Dermatologic Treatment program with MTS, Dermal stamp etc.
- Stem Cell Culture + Multi Growth Factors + Hyaluronic Acid + Multi Peptide + Vitamins + Nutrition



* Silver capping

- [HMGF Activator]
5,000mg / 10vials**
- Skin Regeneration M.G.F
 - Skin Brightening M.G.F
 - EGF
 - bFGF
 - TANNIN
 - Hyaluronic acid
 - SONITIN
 - TGF- β 1
 - TGF- β 3



* Gold capping

- [Water Activator]
5,000mg / 10vials**
- Human-derived Stem Cell Culture Fluid
 - Copper-Tripeptide
 - Multi-Peptide
 - Mineral
 - Amino Acid
 - Nutrition



NEWSTEM + Clinic Skin Program

NEWSTEM stimulates collagen synthesis, wound healing, skin tone improvement by regenerating cell regeneration ability and synthetic ability to make baby-like skin. In addition, it could be combined with fractional laser in clinics or auto MTS to maximize the effect.





NEWSTEM Rx Hair M-Solution

- 98.9% High dissolution rate of main ingredients
- DHT-Blocking with various peptides and nutrition
- Rapid hair cycle normalization of Early Anagen with multi-growth factors
- Promoting hair matrix cell division with human-derived stem cell culture fluids
- Maximizes hair loss treatment effect by 54% antioxidant concentration of Vitamin C Peptide + Glutathione combination



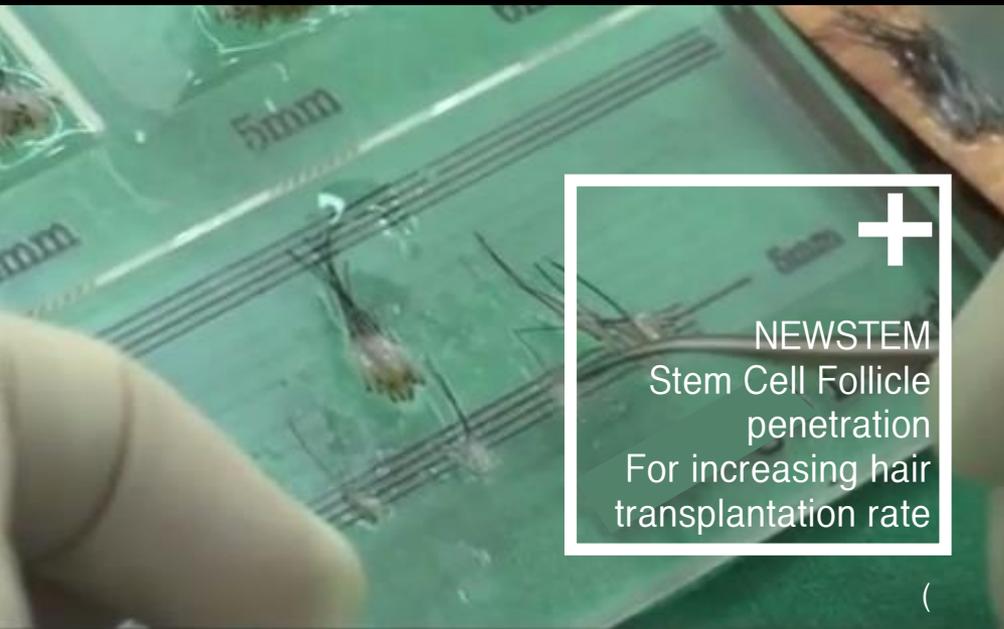
* Silver capping

[Powder]
400mg / 10vials
- 10 Multi-Growth Factors
- Cytokines
- Vitamin C Peptide
- Glutathione



* Gold capping

[Water Activator]
5,000mg / 10vials
- Human-derived Stem Cell Culture Fluid
- Copper-Tripeptide & Multi-Peptide
- Mineral
- Amino Acid
- 19 Nutrition



NEWSTEM
Stem Cell Follicle
penetration
For increasing hair
transplantation rate

NEWSTEM

Clinic Hair Loss Program

NEWSTEM helps to DHT Blocking, normalization of hair growth cycle and promotion of divide of hair cells by prescribing human stem cell culture fluid, multi-growth factor, antioxidant, peptide, vitamins, minerals and amino acids. Used in dermatology and hair transplantation centers, hair loss hair transplantation is used for mesenchymal and hair transplantation, which helps to increase the rate of engraftment.



NEWSTEM
Mesotherapy for
Hair Loss Treatment



NEWSTEM Rx FRACTIONAL Cream 100ml

- Human-derived stem cell culture solution Nanoliposome 50,000 ppm
- YJ-Fractional Complex™ 5000ppm
: EGF, bFGF, TGF-β1, IGF-1, Neoendorphin
- YJ-Moist Complex™ 2000ppm
: Aquaporin, Niacin Enkephalin, Vitamin peptide
- YJ-Moist Cell Complex™ 2000ppm
: Red mangrove callus, Boulder callus, Lily callus
- YJ-Calmfla Complex™ 3000ppm
: NP7, Galloyl Exorphin, h-BD3H
- Soothing & Repair for irritated skin, Skin barrier improvement, Sensitive skin protection, Hypoallergenic moisturizing

Regeneration 50 : Moisturizing 30 : Anti-Inflammation 20





NEWSTEM Rx INTENSIVE Cream 15ml

- Human-derived stem cell culture solution Nanoliposome 40,000 ppm
- YJ-Fractional Complex™ 7000ppm
: EGF, bFGF, TGF-β1, IGF-1, Neoendorphin
- YJ-Calmfla Complex™ 3000ppm
: NP7, Galloyl Exorphin, h-BD3H
- Soothing & Repair for irritated skin, Strong Anti-inflammatory action
- Eye Cream & Spot

Regeneration 70 : Anti-inflammation 30





NEWSTEM Rx CERAMIDE Lotion 200ml

- **Human-derived stem cell culture solution Nanoliposome 30,000ppm**
- **YJ-Fractional Complex™ 1000ppm**
: EGF, bFGF, TGF-β1, IGF-1, Neoendorphin
- **YJ-Moist Complex™ 1500ppm**
: Aquaporin, Niacin Enkephalin, Vitamin peptide
- **YJ-Moist Cell Complex™ 1500ppm**
: Red mangrove callus, Boulder callus, Lily callus
- **YJ-Calmfla Complex™ 1000ppm**
: NP7, Galloyl Exorphin, h-BD3H
- **Hypoallergenic moisturizing, Skin barrier improvement, Itching relief**

Moisturizing 50 : Regeneration 30 : Anti-Inflammation 20





NEWSTEM Hydrocell MGF Mask

- Transparent gel mask pack that perfectly adheres to skin
- Strong synergy of MGF (EGF, FGF) and stem cell culture fluid components
- 3rd Generation hydrogel mask for skin soothing, moisturizing and regenerating
- Could be used synergistically when MJF mask is applied to 'Agi injecting pore treatment' or stem cell toning treatment.

A person in a dark blue suit is seated at a wooden desk in a bright, modern office. They are holding a white ceramic cup of tea. On the desk, there is a silver laptop with a black screen, a newspaper, and several documents, including one with a blue bar chart. A silver coffee grinder and a white coffee cup are also visible. The background shows a window with a view of a building and some potted plants.

NEWSTEM
FDA Approval & Press Introduction

National Drug Code Directory

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Proprietary Name	NDC Package Code	Strength	Dosage Form	Route	Appl. No.	Labeler Name	Product NDC	Nonproprietary Name	Substance Name	Product Type Name	Start Marketing Date	End Marketing Date	Market Category	Package Description	Pharm Class	DEA
NEWSTEM Rx Ceramide	71759-010-02	1 g/100mL, .5 g/100mL	CREAM	TOPICAL	part347	YJ Lab Co., Ltd.	71759-010	Dimethicone, Allantoin	DIMETHICONE; ALLANTOIN	HUMAN OTC DRUG	09-01-2017	N/A	OTC MONOGRAPH FINAL	1 TUBE in 1 CARTON (71759-010-02) > 100 mL in 1 TUBE (71759-010-01)	N/A	N/A
NEWSTEM Rx Ceramide	71759-020-02	4 g/200mL, 1 g/200mL	LOTION	TOPICAL	part347	YJ Lab Co., Ltd.	71759-020	Dimethicone, Allantoin	DIMETHICONE; ALLANTOIN	HUMAN OTC DRUG	09-01-2017	N/A	OTC MONOGRAPH FINAL	1 BOTTLE, PUMP in 1 CARTON (71759-020-02) > 200 mL in 1 BOTTLE, PUMP (71759-020-01)	N/A	N/A
NEWSTEM Rx Fractional	71759-030-02	3 g/100mL, .5 g/100mL	CREAM	TOPICAL	part347	YJ Lab Co., Ltd.	71759-030	Dimethicone, Allantoin	DIMETHICONE; ALLANTOIN	HUMAN OTC DRUG	09-01-2017	N/A	OTC MONOGRAPH FINAL	1 TUBE in 1 CARTON (71759-030-02) > 100 mL in 1 TUBE (71759-030-01)	N/A	N/A
NEWSTEM Rx Intensive	71759-040-02	.075 g/15mL	CREAM	TOPICAL	part347	YJ Lab Co., Ltd.	71759-040	Allantoin	ALLANTOIN	HUMAN OTC DRUG	09-01-2017	N/A	OTC MONOGRAPH FINAL	1 TUBE in 1 CARTON (71759-040-02) > 15 mL in 1 TUBE (71759-040-01)	N/A	N/A



Certificate of Drug Listing & Registration

Awarded to
#802, B-dong, Hyundai JS Center 70, Dusan-ro, Geumcheon-gu, 08584 Seoul, South Korea

Products
NEWSTEM Rx Ceramide Cream ; NDC : 71759-010-01

Products Type Name HUMAN OTC DRUG	Market Category OTC MONOGRAPH FINAL
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This certificate affirms that the above stated facility is registered with the U.S. Food and Drug Administration pursuant to section 305 of the U.S. Public Health Security and Bioterrorism Preparedness and Response Act of 2002, PL 107-188, such registration having been verified as effective by Provision Consulting Group as of the date hereof, and Provision Consulting Group will confirm that such registration remains effective upon request and presentation of this certificate until December 31st, unless such registration has been terminated after issuance of this certificate. Provision Consulting Group makes no other representations or warranties nor does this certificate make any representations or warranties to any person or entity other than the named certificate holder, for whose sole benefit it is issued. Provision Consulting Group assumes no liability to any person or entity in connection with the foregoing. The U.S. Food and Drug Administration does not issue a certificate of registration, nor does the U.S. Food and Drug Administration recognize a certificate of registration. Chemron FDA Korea is not affiliated with U.S. Food and Drug Administration.

Presented by official correspondent, US FDA designated Agent,



Chemron FDA Korea
Office in Korea : Chemron FDA Korea Co., Ltd. / Tel : 02-568-7744

Grace Ahn



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Products
NEWSTEM Rx Ceramide Lotion ; NDC : 71759-020-01

Products Type Name HUMAN OTC DRUG	Market Category OTC MONOGRAPH FINAL
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Grace Ahn



Certificate of Drug Listing & Registration

Awarded to
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Products
NEWSTEM Rx Fractional Cream ; NDC : 71759-030-01

Products Type Name HUMAN OTC DRUG	Market Category OTC MONOGRAPH FINAL
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Certificate of Drug Listing & Registration

Awarded to
#802, B-dong, Hyundai JS Center 70, Dusan-ro, Geumcheon-gu, 08584 Seoul, South Korea

Products
NEWSTEM Rx Intensive Cream ; NDC : 71759-040-01

Products Type Name HUMAN OTC DRUG	Market Category OTC MONOGRAPH FINAL
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Office in Korea : Chemron FDA Korea Co., Ltd. / Tel : 02-568-7744

Grace Ahn

[Rx Ceramide Cream]

[Rx Ceramide Lotion]

[Rx Fractional Cream]

[Rx Intensive Cream]

NEWSTEM Introduction / NEWSTEM on media

[Herald Business]

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Korea Herald Business

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Cosmeceuticals are in high demand in the personal care industry

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The global cosmeceuticals (medi cosmetic) market was valued at 42.24 billion dollars in 2016 and is expected to reach a value of 68.72 billion by 2022, witnessing a Compound Annual Growth Rate (CAGR) of 8.52% during the forecast period from 2017-2022. Cosmeceuticals are products with benefits similar to pharmaceuticals and are available as over the counter (OTC) products. The highly developed markets of Western Europe, the United States and Japan dominate the global market, marked by the demand for the premium care product line as an alternative to costly surgeries. Additionally, research innovations with the help of advances in technologies like nanotechnology, plant stem cell technology, and the emergence of new active ingredients are significantly aiding in the growth of the global cosmeceuticals market. Nowadays, the pharmaceutical cosmetics are focused globally by several companies such as South Korean company YJ Lab, where they are coming up with cosmeceutical products. They are using new ingredients such as peptides and extracts from plant stems for the manufacture of topical skincare products. With the rising preference for physician recommended products and organic cosmeceuticals, the market will witness massive growth in the coming years.

YJ LAB
Where skin health begins.

The researchers at YJ Lab in Korea have been researching skin diseases for about 10 years and have tried to develop new products by complementing medicines, which have several side effects, and ineffective cosmetics. In the past three years, they have studied a number of ingredients to maintain healthy and beautiful skin from external factors of skin troubles from air pollution and water environmental pollution and internal factors of skin aging. As a result of these efforts, they have developed and tested a new combination of human-derived culture fluid stem cell, 10 high purity growth factors, and the most suitable ingredients for skin pH for healthy and beautiful skin. NEWSTEM is the brand that was created after a strict production process similar to pharmaceuticals with these main active-ingredients. The general cosmetic brands use the main active, but the actual usage is usually 0.1 to 1%, but NEWSTEM uses between 5% and 6% and they indicated the total active ingredient content in the product. YJ Lab has a philosophy of making products properly as indicated by concentration and purity, not by the percentage of the main active-ingredient. They are also working on OTC products, which is generally recognized as safe and generally recognized as effective (GRAS/GRAE), in the Food and Drug Administration (FDA). Additionally, they have already been certified by plastic surgeons and dermatologists, and have been supplying products to more than 2,000 clinics and hospitals in Korea.

- ▲ YJ Lab Co., Ltd
- ▲ Brand Name: NEWSTEM
- Have already certified by plastic surgeons and dermatologists, and have been supplying products to more than 2,000 clinics and hospitals in Korea.
- ▲ YJ Lab Co., Ltd
- ▲ Brand Name: NEWSTEM
- ▲ CEO: Young Jo Park
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Sunny Seon and Irene Kim
K-Herald Korea
(Los Angeles Times Advertising Supplement)

[Los Angeles Times]

Los Angeles Times

Plan to shrink federal lands is detailed

Ban on trans troop may limit

State high court largely upholds Proposition 66

Supporters predict executions will resume in months

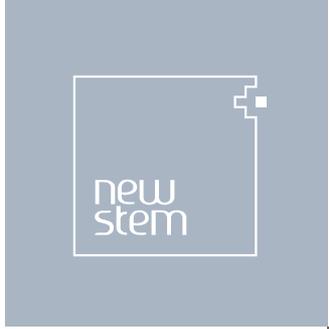
SMART-ECO develops an eco-drive app that helps improve driving habits

Cosmeceuticals are in high demand in the personal care industry

YJ LAB
Where skin health begins.

Money

Medical cosmetic for
Dermatology & Plastic surgery
NEWSTEM



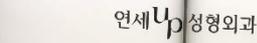
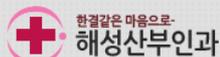
NEWSTEM Introduction / NEWSTEM using clinics



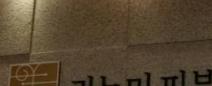
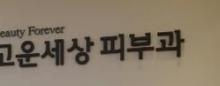
2000 nationwide Clinics
using NEWSTEM

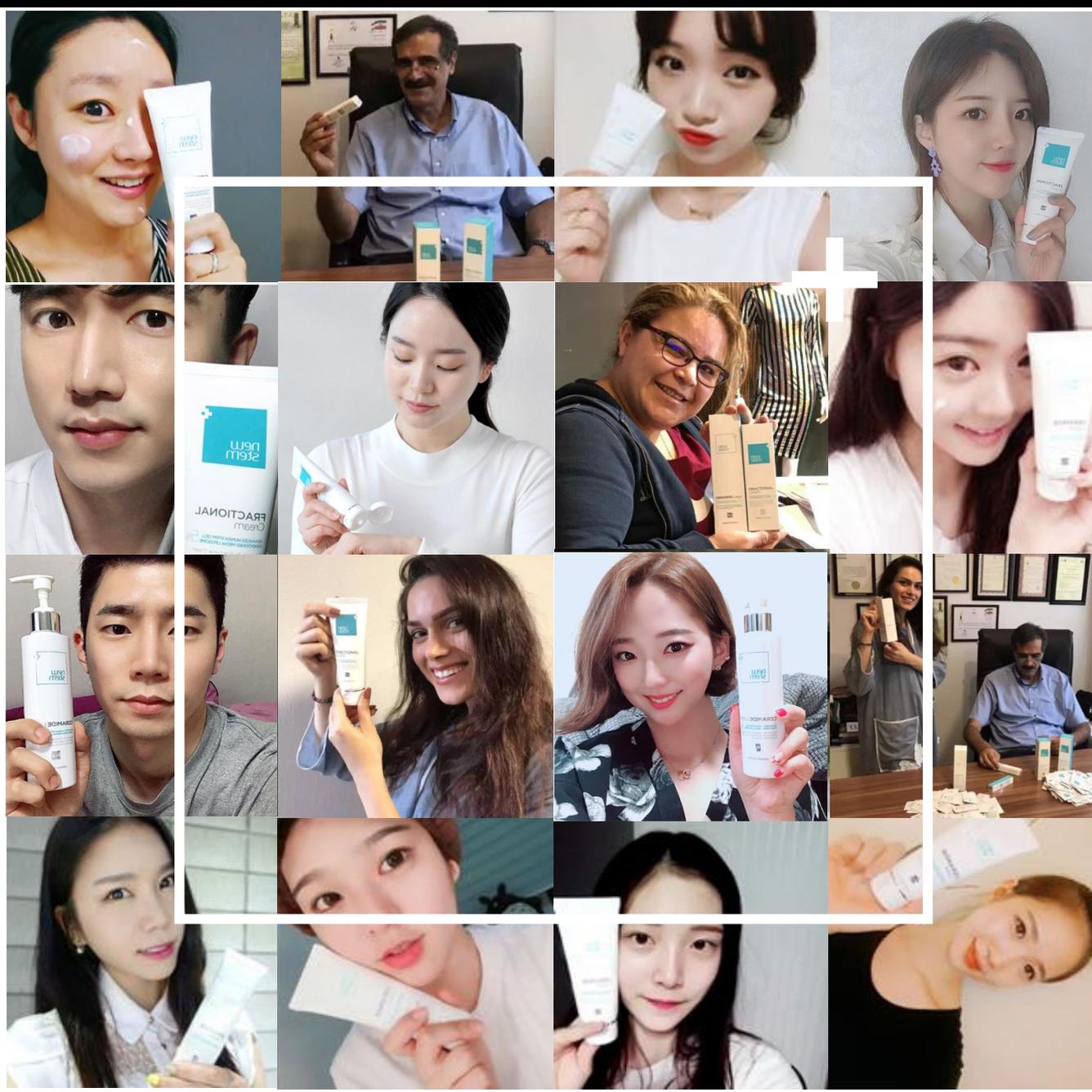
 연세킹의원	 Prime Clinic 프라임클리닉	 연세마이뷰의원	 E & EYE Clinic innovation program
 토브美의원	 사인필의원 피부·성형외과	 울산S의원성형외과 TRIO & PLASTIC SURGERY	 myer's my beauty solution
 연세아르미안 Yonsei ARMIAN Dermatology & Aesthetic	 동대구S美의원 피부과 비만클리닉	 Samsung Royal	 IOU 성형외과 피부과



 연세엘 피부·비뇨기과 Dermatology & Urology	 아름다운 피부과 Total Skin & Beauty Clinic	 연세N성형외과	 Shan Clinic & Esthetic	 MOJELIM 모제림뷰티의원	 수원제일산부인과	 3미 피부과 성형외과
 Channel 성형외과·피부과 Plastic Surgery & Dermatology	 MIND 피부과의원 MIND SKIN CLINIC		 CELL 셀 클리닉 - Cell Skin & Laser, Esthetic Clinic -	 한결같은 마음으로 해성산부인과	 돌움돌움의원 DOTEUM CLINIC	 샤인클리닉

 오체안피부과	 VAROM	 YONSEI S CLINIC 연세 에스 의원 피부·성형외과	 닥터나인9플 피부과 Dermat. Med. Center	 퓨린피부과 PURE SKIN GREEN CLINIC	 조인식내과의원 WWW.DRCHOMC.COM	 Foxmi	 자연美
 HUMAN Dermatology Clinic 휴먼피부과의원	 H&U 홍안유 CLINIC	 연세참고운의원 피부과 피부·성형 비만 에스텍	 MANDERSON MAN CLINIC	 MH1 클리닉	 Oacle	 nine form Skin Clinic	 Boniel 아름다움이 머무는 곳

 리뉴미 피부과 RENEWME SKIN CLINIC	 EL MARE 의원 수원점 E/L/M/A/R/E/C/L/I/N/I/C	 리뉴미 피부과 RENEWME SKIN CLINIC	 Beauty Forever 고운세상 피부과	 연세 메디노블의원 YONSEI MEDINOBLE CLINIC	 고은미래
 GOOD LINE 굿라인 GOOD LINE PLASTIC SURGERY	 RICH MORE 리치모아 모발·아식센터		 SAMSUNG	 선크림피부클리닉의원	 수원제일 산후조리원 SUWON CHEIL POSTNATAL CARE CENTER



NEWSTEM+ MANIA

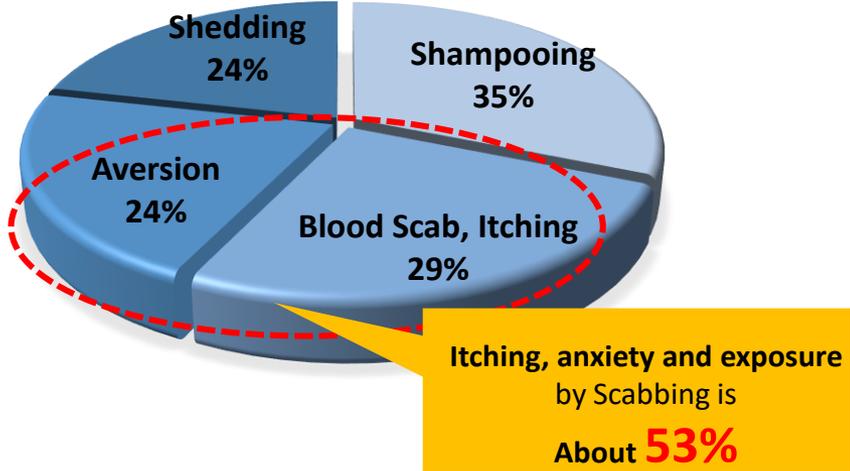
NEWSTEM Program

NEWSTEM programs draw effectiveness and high satisfaction. The gratification leads to purchase of Home Care lines and builds loyal manias.



NEWSTEM UPCOMING PRODUCTS

Patients anxieties could be expected to occur after hair transplant that doctors assuming



NEWSTEM Rx transtem Solution
NEWSTEM Rx Transtem Shampoo

Specially designed shampoo & solution to relieve patients' worries after hair transplant



Transtem Solution



Transtem Shampoo

- Prevention of Crust occurrence
- A solution that helps increasing rate of engraftment
- Easy to use antibacterial spray type shampoo
- Used milder surfactant than baby shampoo
- Instant sedative & anti-inflammatory
- High concentration solution keeping scalp moist condition

NEWSTEM Rx Antical Shampoo

The white powder on shoulders of the Chinese is
Not dandruff but **lime!**

Because of a high lime content in the general living water in China,
It is easy to see Chinese people with lime on their hair or shoulder
looking like dandruff.

The lime worsens scalp environment, and it affects on scalp condition

- Specially designed shampoo to dissolve lime on scalp
- Mild formulations using low-irritant surfactants
- pH 4.5 to 5.0 acid balanced hypoallergenic shampoo





NEWSTEM Rx Aczium Cleanser

NEWSTEM Rx Aczium Lotion

NEWSTEM Rx Aczium Spot Cream

-
- Customized balance for oily skin
 - Quick relieving problematic skin and redness
 - Refreshing moisturizing without greasing
 - Subacid pH cleansing (cleanser)
 - Sebum control on troubled skin

NEWSTEM Rx Deep Fresh Cleansing Foam

- Remove excessive sebum and dirt left on the skin with fewer stimulants
- Pore care effect by cleansing pores clogged with sebum
- Quick calming for troubled skin
- Mild cleansing effect with acidulous pH4.5 to 5.0



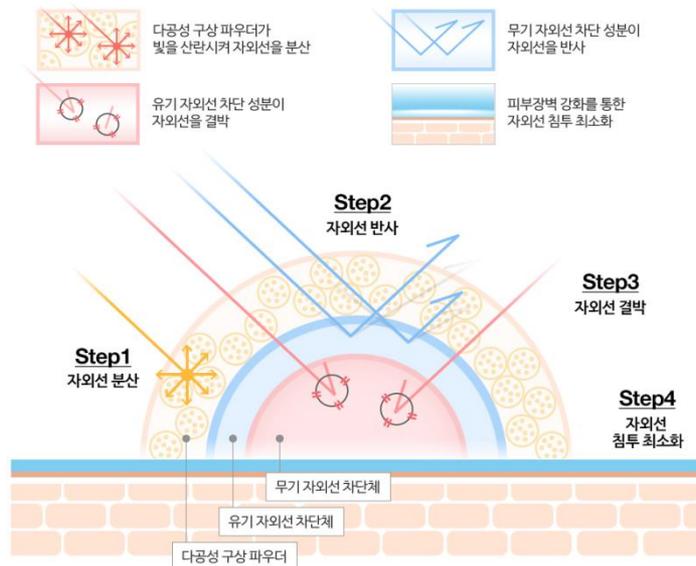


NEWSTEM Rx Laser Mild Sun Care

Chemical UV Protecting ingredients may cause skin troubles on extremely sensitive skin after dermatologic laser treatment. Therefore, it is necessary to use a dermatologic exclusive product which could effectively protect skin from the sun without skin pungency and prevent skin trouble.

- Helping moisturization and strengthen skin barrier with high nutrition
- Triple functional : Brightening, Wrinkle improvement, Anti-UV
- Oily and white cast Down! Smooth texture

■ UV Protection 4 Stages





Main Ingredients Technology And Clinical Data



01.

YJ Bio R&D Part

- Human-derived stem cell culture fluid
- Plant-derived stem cell culture fluid (Callus culture solution)
- Multi-growth factor (skin biologically active factor) complex
- Recombinant protein, Growth factor-like Peptide
- Skin penetration rate increased Nanoliposome

YJ Medical Cosmetics Part

- Atopy
- Seborrheic dermatitis
- Striae
- Anti Melanism (Skin brightening, Anti-PIH)
- Acne scar, fine wrinkles improvement, Skin Regeneration, Anti-aging
- Hair Loss
- Laser Post Treatment
- Skin barrier improvement



02.

YJ Nano liposome

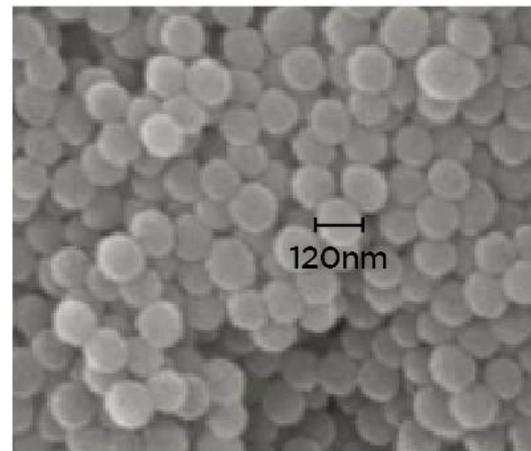
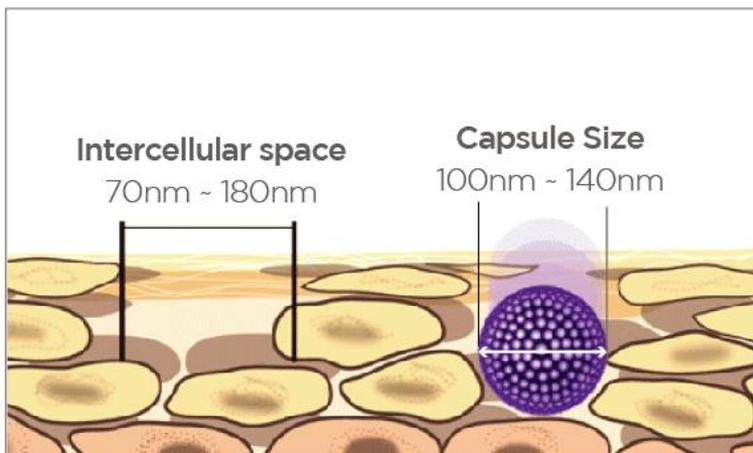
- YJ Nano Liposome Characteristics

No matter how effective an ingredient is, it is no longer effective if it could not enough to penetrate into the skin, so the active ingredient must penetrate deep into the skin through the keratinous cell gap.

As a typical technique for skin absorption, Liposome is not only hydrophil with lipid-bimedial form, the most similar to cell membrane of the skin, it also absorbable oil soluble ingredients.

There is also a great deal of effort to nanoize the size of the active ingredient to facilitate skin cell clearance.

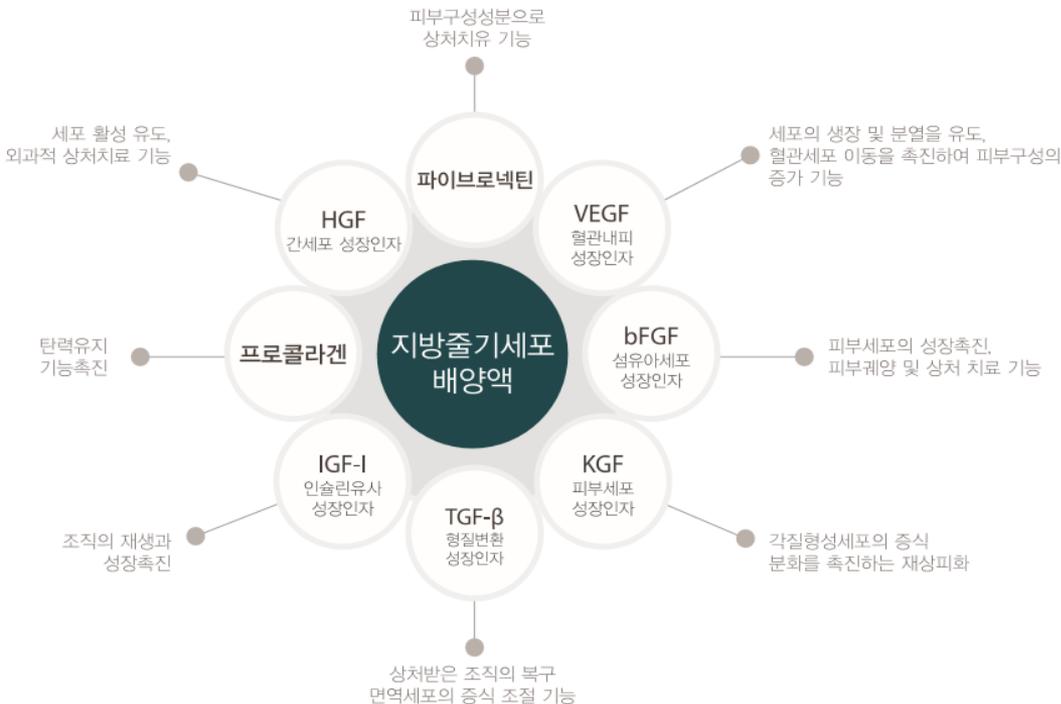
The nano liposome technology adopted in NEWSTEM products is nano-sized about 180nm on average, and applied not only at the raw material stage but also at the cosmetic production stage, it has good affinity to the skin gap and has excellent skin penetration ability.



03.

Human-derived stem cell culture fluid

Human body fat derived stem cell cultures containing 180 kinds of growth factors, peptide and cytokine are used as skin components to induce wound healing function / cell growth and division, promote vascular cell migration, Surgical wound repair function / promoting resilience / promoting tissue regeneration and growth, restoration of wounded tissue, regulation of proliferation of immune cells / proliferation differentiation of keratinocytes.



04.

YJ Complex Lines

(Repair, Moisturizer, Anti-inflammation, Anti-hairloss)

- YJ-Fractional Complex™
- YJ-Fractional Cell Complex™
- YJ-Moist Complex™
- YJ-Moist Cell Complex™
- YJ-Calmfla Complex™
- YJ-Calmfla Cell Complex™
- YJ-Hairgrowth Complex™

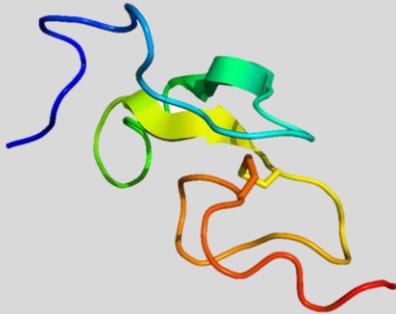




YJ-Fractional Complex™

- rh-Oligopeptide-1 (EGF)
- rh-Polypeptide-1 (b-FGF)
- rh-Polypeptide-22 (TGF-beta1)
- rh-Polypeptide-2 (IGF-1)
- sh-Decapeptide-9 (Neoendorphin)

Growth Factor – EGF



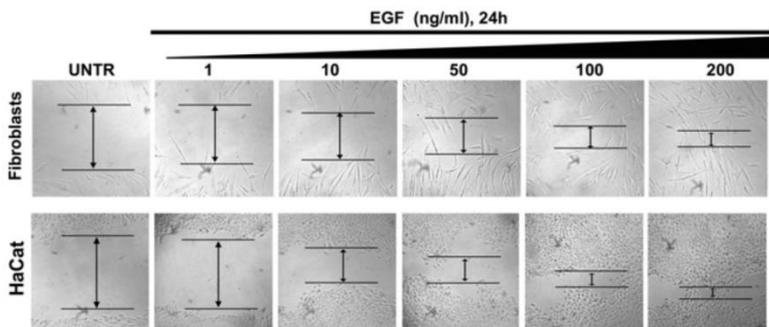
EGF

EGF (Epidermal Growth Factor)

- INCI name : rh-Oligopeptide-1
- Molecular weight : 6.2 kDa
- Majorly related growth factor to cell division, differentiation and survival having close relationship with wound regeneration on wounded body parts. In particular, it promotes regeneration of epidermal keratinocytes in the skin.

Biochemical Journal (2006) 400: 225-234

In vitro Wound healing effect



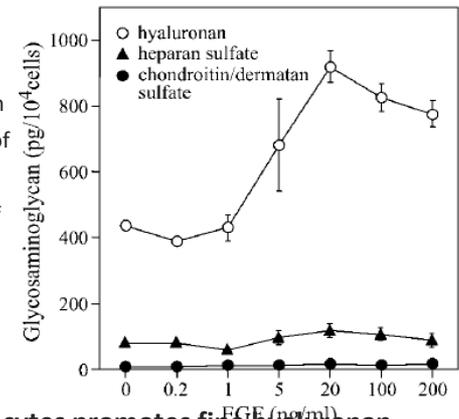
The Journal of Biological Chemistry (2001) 276(23): 20428-20435

> Wound healing process is speeded with EGF treatment

SKIN FIRMING EFFECT (Strengthen elasticity)

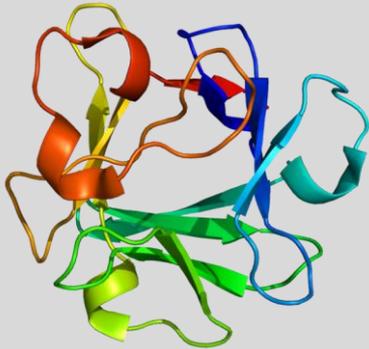
HYALURONAN

- As a component presenting in skin, it works for lubrication of joints or flexibility of skin incorporating with amount of water



> EGF treatment on keratinocytes promotes fine hyaluronan production for skin moisturization and elasticity

Growth Factor – bFGF



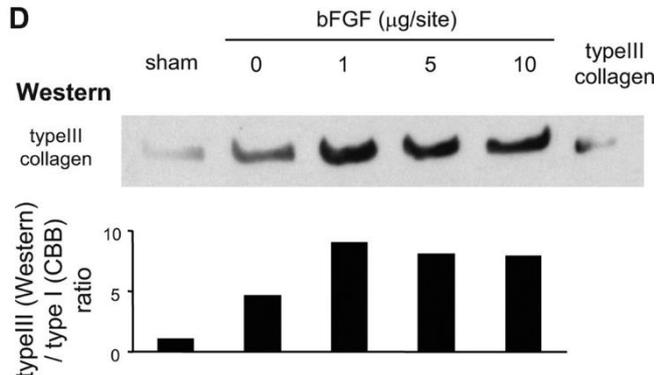
bFGF

bFGF (basic Fibroblast Growth Factor)

- INCI name : rh-Polypeptide-1
- Molecular weight : 16.0 kDa
- One of the FGF family members
- As a kind of FGF family including 22 kinds of growth factors, it promotes synthesis of collagen type III in fibroblast. It also promotes epidermal cell division and is closely related to wound regeneration.

American Journal of Physiology: Renal Physiology (2007) 293: F1007-F1017

SKIN FIRING EFFECT (STRENGTHEN SKIN ELASTICITY)

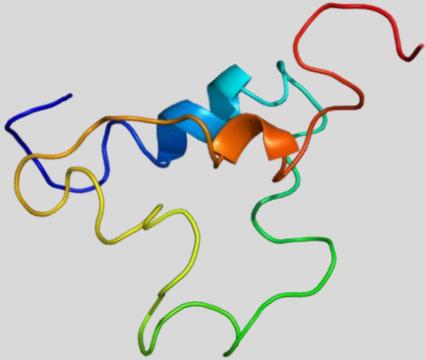


- Collagen production is important for strengthening skin elasticity
- Experimental result on the left shows that the production of Type III collagen is increased in cells treated with bFGF.

> As it is proved that bFGF is involved in production of Type III Collagen, bFGF is considered to be a potent skin elasticity enhancing component

The American Journal of Physiology. Renal Physiology (2007) 293: F1007-F1017

Growth Factor – IGF-1



IGF-1

IGF-1 (Insulin-like Growth Factor-1)

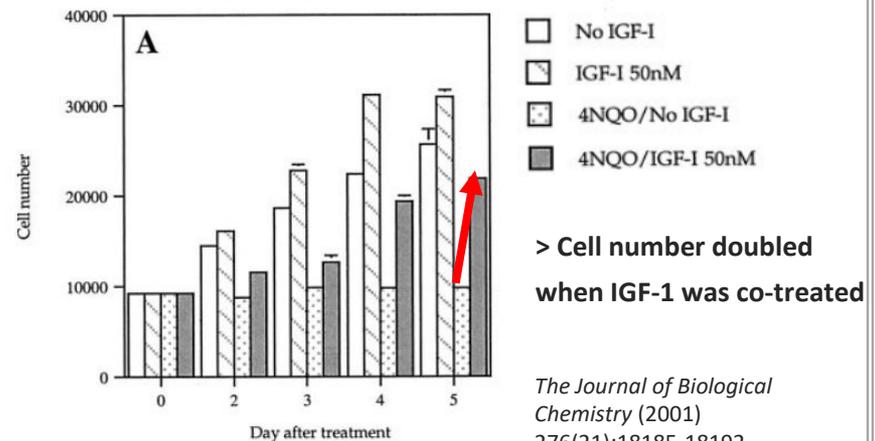
- INCI name : rh-Oligopeptide-2
- Molecular weight : 7.6 kDa
- Similar to insulin, it is called insulin-like growth factor
- It is closely related to cell growth and differentiation, promotes the breakdown of fibroblast
- Especially, known to promote the recovery of UV-damaged DNA.

The Journal of Biological Chemistry (2001) 276(21): 18185-18192

The New England Journal of Medicine (1999) 341(10): 738-746

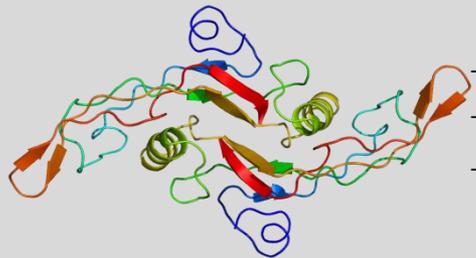
SKIN PROTECTION FROM UV

- Exposure of the skin to UV may causes DNA damage and skin irritation
- **4NQO**: As DNA damaging inducer, often used in experiments with UV-mimicking carcinogen
- Number of cells increased when 4NQO-treated cells are further treated with IGF-1
- The study result shows that IGF-1 protects cells against DNA damage



The Journal of Biological Chemistry (2001) 276(21):18185-18192

Growth Factor – TGF-β1



TGF-β1

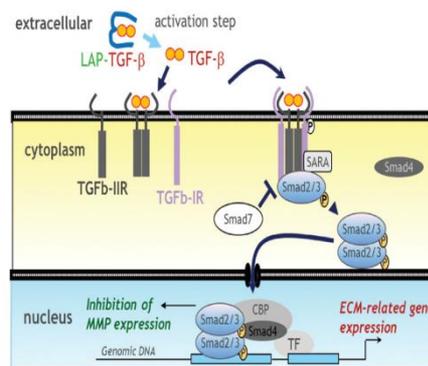
TGF-β1 (Transforming growth factor beta 1)

- INCI name : rh-Polypeptide-22
- Molecular weight : 27 kDa
- It is closely related to cell growth, division and differentiation, and promote wound-healing.

"Transforming growth factor-beta in human platelets. Identification of a major storage site, purification, and characterization". *J. Biol. Chem.* **258** (11): 7155–60 [PMID 6602130](#)

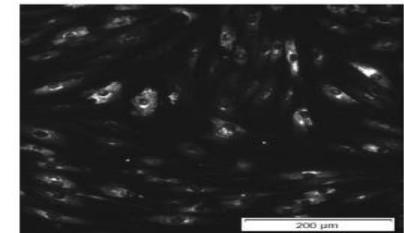
Suppressing wrinkle formation & promotion of collagen production

- Wrinkle of the skin is produced by proteolysis of collagen or elastin by an enzyme called MMPs
- TGF-β1 inhibits MMPs enzyme expression and prevent wrinkle formation
- As an effective material that helps skin elasticity to promote production of fibroblast that collagen production occurs.

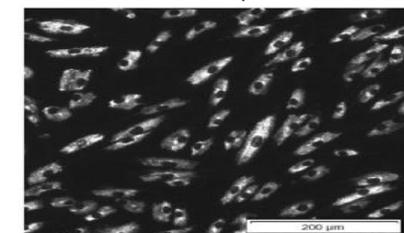


- Inhibition procedure of wrinkle formation by TGF-β1 (inhibition of MMP expression)

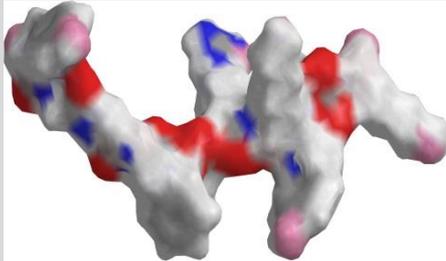
▪ Control



▪ TGF-β1



Peptide – Neoendorphin



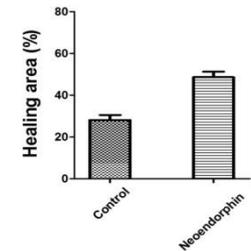
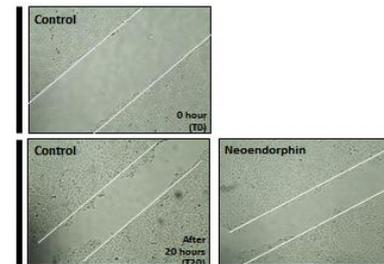
Neoendorphin

- INCI name : sh-Decapeptide-9
- Molecular weight : 1228.44 Da
- Known to control skin itching and promote wound-healing

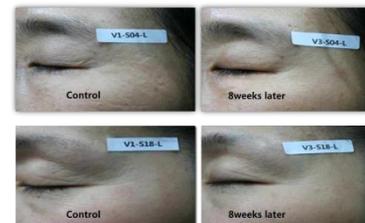
Neoendorphin

Wound-healing / Anti-wrinkle EFFECT

- **Inducing wound healing through Zyxin**
 - Zyxin is a protein that acts as a mediator in the intracellular signaling pathway and is involved in the intracellular distribution of Actin in the process of promoting cell mobility, which is very important in the wound healing process
- Clinical results in serum containing Neoendorphin proves it is excellent for improving eye wrinkles.



- Neoendorphin is checked to promote migration of a skin cell, keratinocyte
→ **More than 20% faster procedure than the untreated group**



- Neoendorphin serum was treated for 8 weeks on eye wrinkle area. As a result, the wrinkles of the eyes are improved comparing to untreated Neoendorphin serum group.



YJ-Fractional Cell Complex™

- Leontopodium Alpinum Callus Culture Extract
- Panax Ginseng Callus Culture Extract
- Vitis Vinifera (Grape) Callus Culture Extract

Plant Cells (Callus)

SKIN AGING & FREE RADICAL

- The skin is aged by various causes such as genetic, dysfunction, free radical accumulation, external factors, etc. In particular, as the metabolism progresses, free radicals such as reactive oxygen species accumulate inside the cell, which causes the cell to stop dividing and promote senescence.



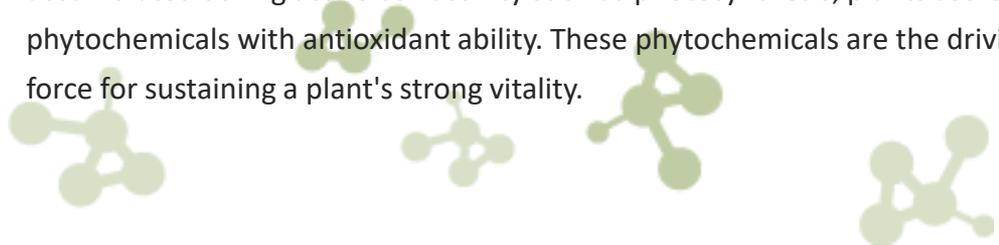
Secrets of plants: Phytochemicals



Why do plants live longer than animals?



- It is because of the phytochemical. In order to remove active oxygen accumulated during active cell activity such as photosynthesis, plants secrete phytochemicals with antioxidant ability. These phytochemicals are the driving force for sustaining a plant's strong vitality.



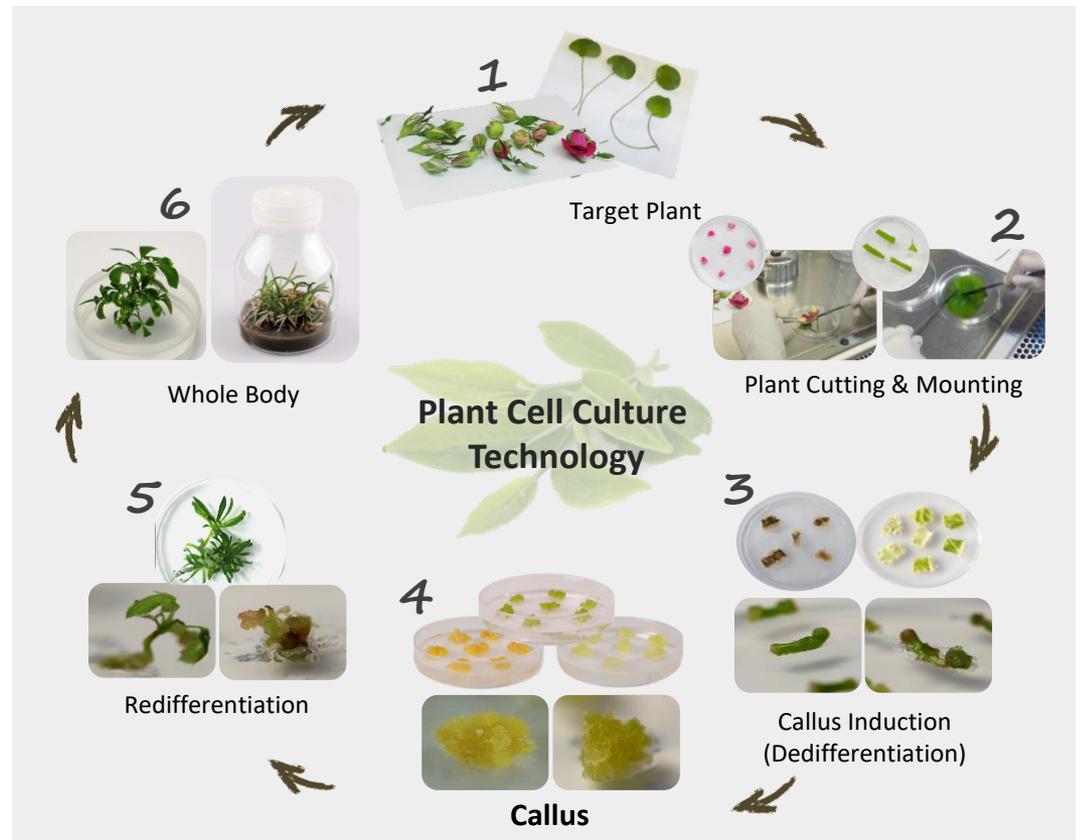
Plant Cells (Callus)

What is a plant callus?

- Plants produce undifferentiated cell masses at wounded area for healing. This cell mass is called a callus, each cell making up a callus has a totipotency that could grow itself into a complete plant.

STRENGTHS OF PLANT CALLUS

- Plant callus is an environmentally friendly and sustainable raw material in that could continue to grow from the cell to the adult.
- Plant callus contains a large amount of anti-aging ingredients, and unique technology of BioFDNC could produce more phytochemicals than other plants extracts.



Leontopodium Alpinum Callus Culture Extract

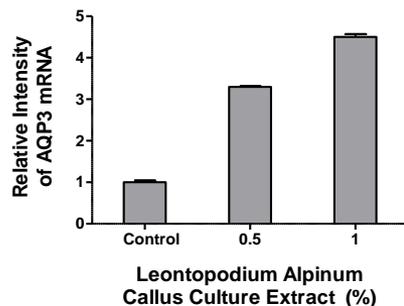


Leontopodium Alpinum Callus Culture Extract

- INCI name : Leontopodium Alpinum Callus Culture Extract
- Common name: Edelweiss
- **EFFICACY: Moisturizing, Anti-aging (Anti-wrinkle)**
- Folk remedies: Edelweiss (Somber flowers) have been used for abdominal and respiratory diseases since ancient times
- Language of the flower : Precious memory

SKIN MOISTURIZING EFFECT

Aquaporin3, AQP3 : It acts as a channel for water / glycerol, and is related to the intracellular delivery of water, which is closely related to skin moisturization. Mainly distributed in the epidermis

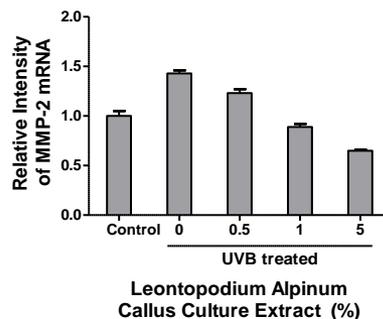


> Extract of Edelweiss callus increases mRNA expression of aquaporin 3, a protein related to moisturization in keratinocytes

(More than 4 times as much as the untreated group at 1% concentration)

ANTI-AGING EFFECT (Wrinkle improvement)

- **MMPs** : Skin constituent proteases such as collagen, elastin etc.
- **TIMPs** : Inhibitory enzyme of MMP



- In order to maintain the integrity of the skin, maintenance and regeneration process of skin constituent proteins such as collagen and elastin by MMP and TIMP is very important. If the balance is broken, skin aging is accelerated.
- MMP activity is relatively high and TIMP activity is low in aged skin.

> **Leontopodium Alpinum Callus** could reduce the expression of MMP-2 (gelatinase) increased by UV, and may reduce wrinkles.

Panax Ginseng Callus Culture Extract

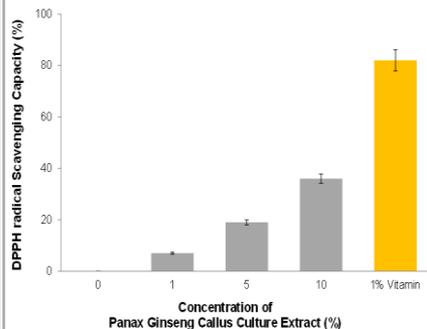


Panax Ginseng Callus Culture Extract

- INCI name : Panax Ginseng Callus Culture Extract
- Common name: Panax Ginseng
- **Efficacy: Antioxidant, Anti-aging (Skin elasticity)**
- Folk remedies: Have been used for various drugs such as pick-me-up, cold etc in Korea, China and Japan

ANTIOXIDATIVE EFFECT

Natural antioxidants are present in plants and prevent fatal consequences of oxidative stress. These substances include polyphenols, flavonoids and phenolic compounds, and many of these substances have various functions.

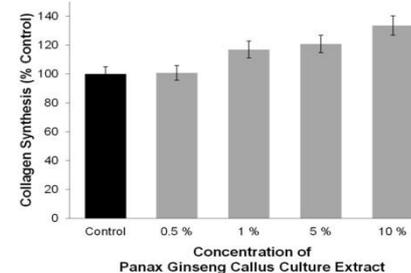


>1,1-Diphenyl-2-picrylhydrazyl (DPPH) is one of the stable free electrons and is oxidized by antioxidants. At this time, DPPH loses the specific index purple light, lambda max 515-517 nm. Using this property, the antioxidant capacity of Panax Ginseng Callus Culture Extract is verified.

ANTI-AGING EFFECT (SKIN ELASTICITY)

Collagen

- Proteins produced from fibroblast of the dermal layer in the skin
- Major constituent for structural maintenance of the skin
- Skin aging destroys collagen abnormally and incomplete resynthesis
- New collagen must be continuously synthesized to maintain skin firmness



> Panax ginseng callus culture extract is proved to be a material could help maintain skin elasticity by promoting collagen production.

Vitis Vinifera (Grape) Callus Culture Extract

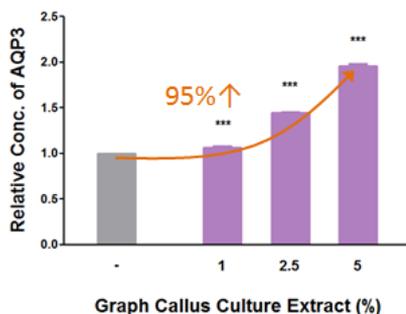


Vitis Vinifera (Grape) Callus Culture Extract

- INCI name : Vitis Vinifera (Grape) Callus Culture Extract
- Common name: Grape
- **Efficacy : Moisturizing, Wrinkle improvement**
- Folk remedies: Ointments made by sap of vine used to treat skin and eye disease in Europe.

SKIN MOISTURIZING EFFECT

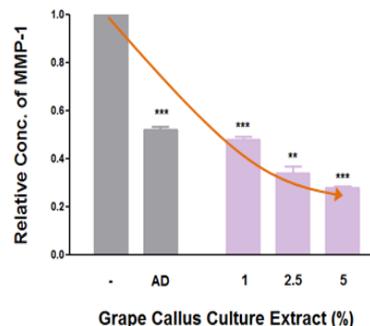
- **Aquaporin3, AQP3** : It acts as a channel for water/glycerol, and is related to the intracellular delivery of water, which is closely related to the moisturization of the skin. Mainly distributed in the epidermis.



> **Vitis Vinifera callus culture extract enhances mRNA expression of aquaporin 3, a protein related to moisturization in keratinocytes (95% increase in expression compared to untreated group at 5% concentration)**

ANTI-AGING EFFECT (WRINKLE IMPROVEMENT)

- **MMPs** : Skin constituent proteases such as collagen, elastin etc.
- **TIMPs** : Inhibitory enzyme of MMP



- In order to maintain the integrity of the skin, maintenance and regeneration process of skin constituent proteins such as collagen and elastin by MMP and TIMP is very important. If the balance is broken, skin aging is accelerated.
- MMP activity is relatively high and TIMP activity is low in aged skin.

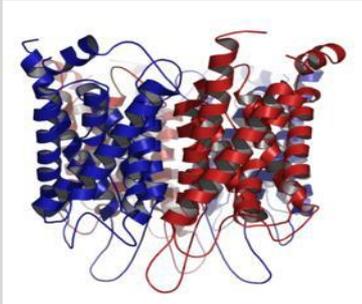
> **Vitis Vinifera Callus could reduce the expression of MMP-2 (gelatinase) increased by UV, and may reduce wrinkles.**



YJ-Moist Complex™

- **rh-Polypeptide-64 (Aquaporin1)**
- **Nicotinoyl sh-Pentapeptide-19(Niacin Enkephalin)**
- **Nicotinoyl Tripeptide-1 (Vitamin Peptide)**

Protein – Aquaporin1

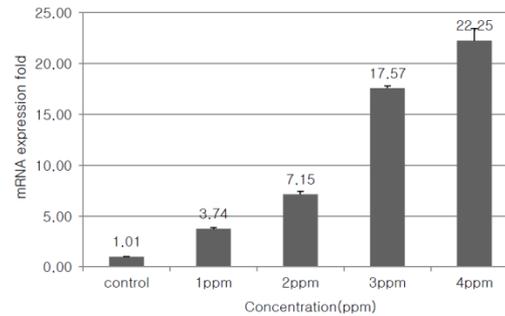
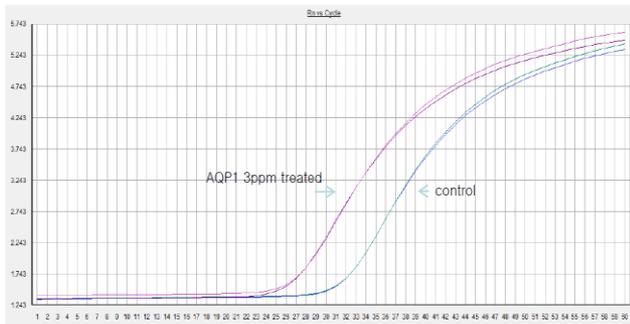


Aquaporin

Aquaporin

- INCI name : rh-Polypeptide-64
- Molecular weight : 28.5 kDa
- As a water channel for moisture reabsorption in skin cells, it maintains for skin moisturization

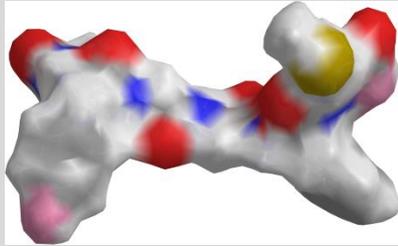
Aquaporin expression increase



- **AQP-1 enhanced the expression of aquaporin in skin cells (3.7 ppm for 1 ppm and 22.2 times for 4 ppm)**

Peptide - Niacin Enkephalin

Niacin Enkephalin



Nicotinic acid (Niacin, vitamin B₃)

- Water-soluble vitamin kind
- Known for effectiveness of skin brightening and hair loss prevention

Niacin Enkephalin (Nicotinoyl sh-Pentapeptide-19)

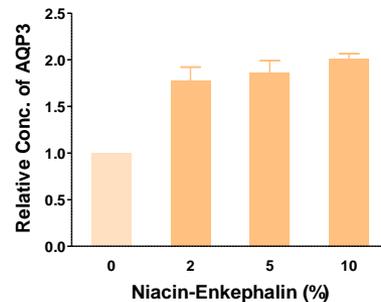
- Peptides synthesized by combination of Enkephalin and Nicotinic acid
- Skin moisturizing effect increasing Aquaporin 3
- Wound healing effect
(In vitro wound healing assay)

Enkephalin

- Acting on Neuropeptide receptor kind, DOR, Delta opioid receptor
- Relevant in pain relief & Wound healing
- Neuropeptides acting on DOR is also associated with skin permanence

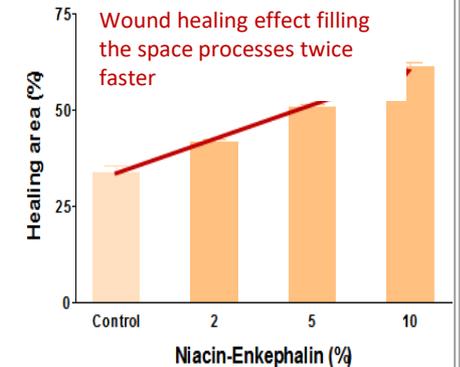
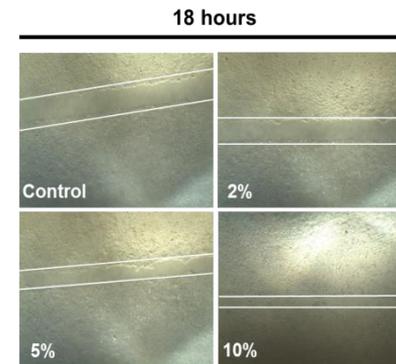
SKIN MOISTURIZING EFFECT

- **Aquaporin3, AQP3** : It acts as a channel for water/glycerol, and is related to the intracellular delivery of water, which is closely related to the moisturization of the skin. Mainly distributed in the epidermis.



> Niacin Enkephalin is verified to increase the expression of aquaporin3 in keratinocyte

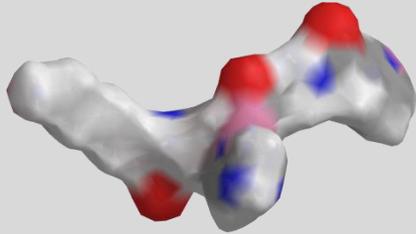
WOUND HEALING EFFECT



➤ Niacin Enkephalin promotes keratinocyte movement and helps wound healing

Peptide – Vitaminpeptide

Vitamin Peptide



Vitamin B3 (Niacin)

- Nicotinic acid, Nicotinamide or derivatives thereof

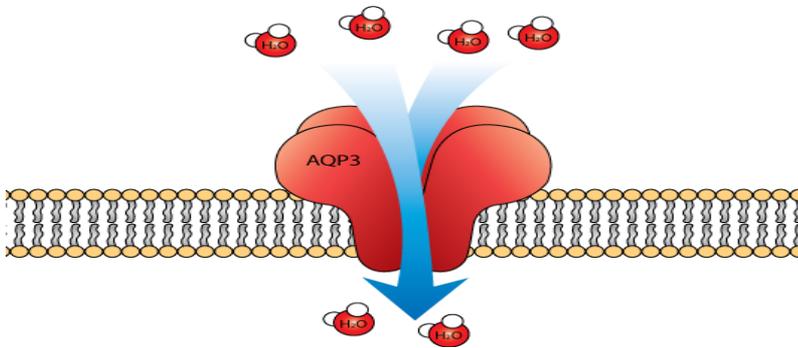
Vitamin Peptide (Nicotinoyl Tripeptide-1)

- Peptide binding of GHK and Niacin
- Skin moisturizing effect
- Collagen synthesis promotion (Elasticity increasing effect)

Tripeptide-1

- Improving skin function
- Increasing collagen synthesis

SKIN MOISTURIZING EFFECT



Aquaporin-3(AQP3)

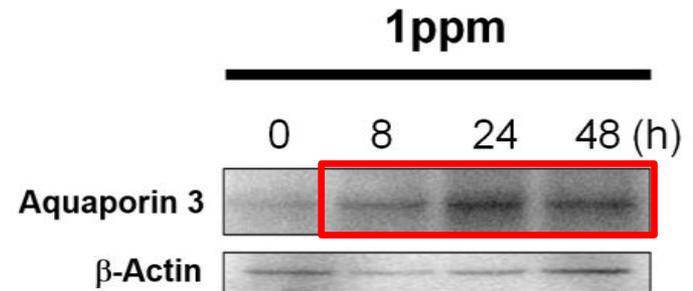
- Expression in keratinocyte presenting in Epidermis layered from Stratum spinosum to Stratum basale

Function of AQP3

- A passage in cell membrane of water and glycerol
- In particular, glycerol transferred into the cell induces external water into cells.

Structure of AQP3

- Four identical aquaporin3 molecules constitute one channel



> Increasing Aquaporin-3 expression by Vitamin Peptides → Expected moisturizing effect



YJ-Moist Cell Complex™

- Rhizophora Mangle Callus Culture Extract
- Orchid Callus Culture Extract
- Liliun Candidum Callus Culture Extract

Rhizophora Mangle Callus Culture Extract

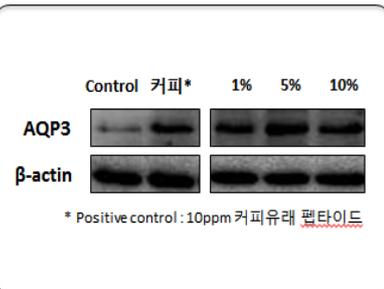


Rhizophora Mangle Callus Culture Extract

- INCI name : Rhizophora Mangle Callus Culture Extract
- Common name: Red Mangrove
- **Efficacy: Antioxidant, Moisturizing, Anti-aging (Anti-wrinkle)**
- Folk remedies: Used as a natural antibiotic for astringency, angiostasis, anti-bacterial and anti-inflammatory effects. It also helps wound regeneration process and is used to suppress inflammation with excellent antioxidant effect.

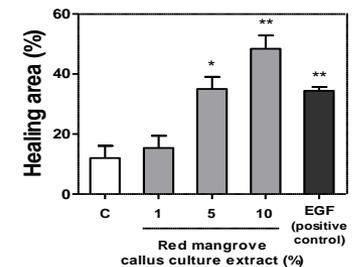
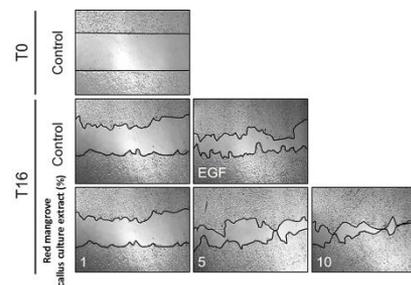
SKIN MOISTURIZING EFFECT

- **Aquaporin3, AQP3** : It acts as a channel for water/glycerol, and is related to the intracellular delivery of water, which is closely related to the moisturization of the skin. Mainly distributed in the epidermis.



> Rhizophora Mangle callus culture extract is verified its moisturizing effect increasomg amount of mRNA expression of aquaporin 3.

ANTI-AGING EFFECT (WOUND HEALING)



> Rhizophora Mangle callus culture extracts is effective for rapid wound healing and could act as an effective material to suppress skin aging.

Orchid Callus Culture Extract

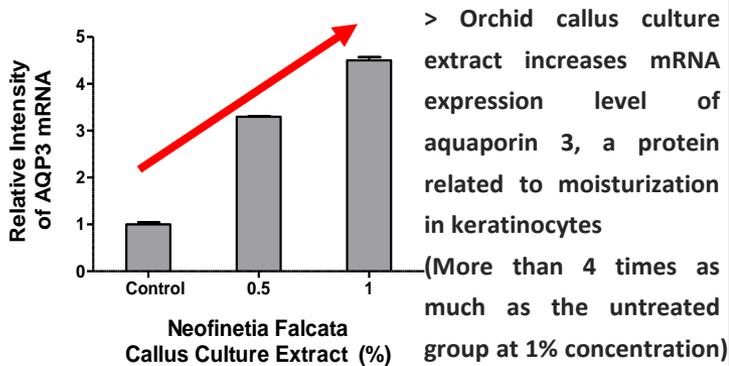


Orchid Callus Culture Extract

- INCI name : Neofinetia Falcata Callus Culture Extract
- Common name: Aerides, Orchid
- **Efficacy: Antioxidant, Moisturizing, Anti-aging (Anti-wrinkle)**
- Folk remedies : It has been used for the treatment of various diseases such as gastrointestinal disorders, diarrhea, indigestion, inflammation, scarring and heavier ones like tuberculosis, paralysis, hepatitis, bone fractures, rheumatism, asthma, malaria and tumors etc.
- Language of the flower : Genuine attraction and belief

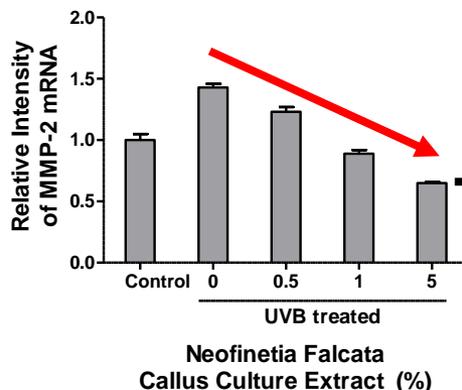
SKIN MOISTURIZING EFFECT

- **Aquaporin3, AQP3** : It acts as a channel for water/glycerol, and is related to the intracellular delivery of water, which is closely related to the moisturization of the skin. Mainly distributed in the epidermis.



ANTI-AGING EFFECT (WRINKLE IMPROVEMENT)

- **MMPs** : Skin constituent proteases such as collagen, elastin etc.
- **TIMPs** : Inhibitory enzyme of MMP



Lilium Candidum Callus Culture Extract

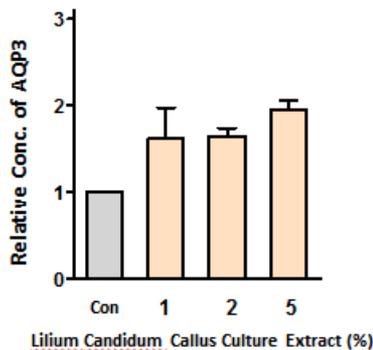


Lilium Candidum Callus Culture Extract

- INCI name : Lilium Candidum Callus Culture Extract
- Common name: Madonna lily
- **Efficacy: Moisturizing, Brightening**
- Folk remedies : Bulbs and flowers have been used as astringents, analgesics, etc and a poultice for various inflammation phenomena. Pollen was also used for epilepsy.
- Language of the flower : Purity, sacrifice, sanctity

SKIN MOISTURIZING EFFECT

- **Aquaporin3, AQP3** : It acts as a channel for water/glycerol, and is related to the intracellular delivery of water, which is closely related to the moisturization of the skin. Mainly distributed in the epidermis.

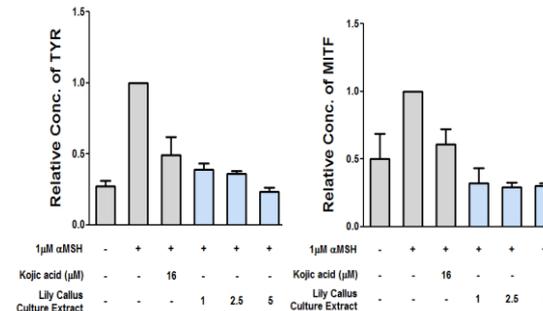


> Lilium Candidum callus culture extract is effective for skin moisturization by increasing mRNA expression of aquaporin3, one of the moisturizing proteins of skin cells.

BRIGHTENING EFFECT

Tyrosinase

- Enzyme kind induces melanin synthesis from melanocyte.
 - Mainly involved in first and second stages of melanin synthesis in the skin.
 - Largely, divided into Eumelanin (black/brown pigment) and Pheomelanin (yellow/red pigment).



> Lilium Candidum callus culture extract effectively inhibits tyrosinase enzyme, which plays a key role in melanin pigment production, and thus could be used as a brightening material.

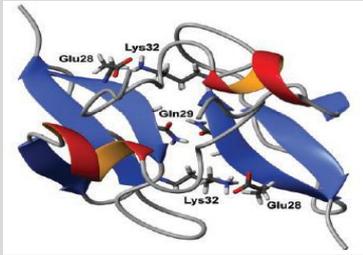


YJ-Calmfla Complex TM

- rh-Oligopeptide-33 (h-BD3H)
- Galloyl Pentapeptide-33 (Galloyl Exorphin)
- Caffeoyl sh-Octapeptide-4 (NP7)

Protein- rh-Oligopeptide-33 (h-BD3H)

h-BD3H



Efficacy

- Antibacterial, anti-atopic, anti-acne

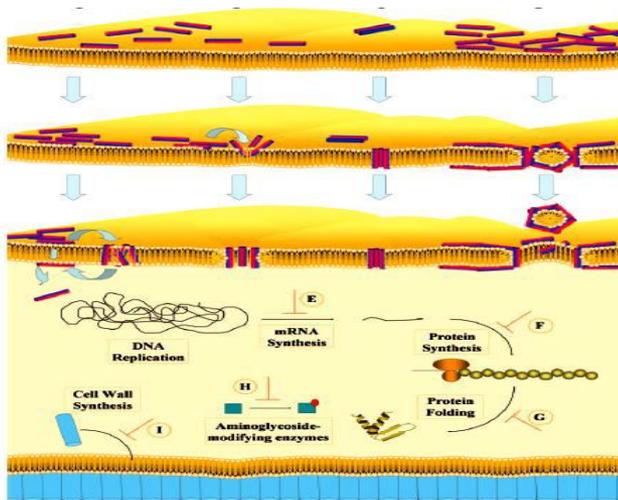
Feature

- Natural antibiotics produced in the body

Mechanism of action

- Inhibition of bacterial cell wall biosynthesis

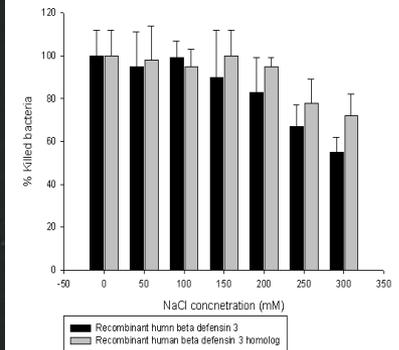
Mechanism of action



> h-BD3H exhibits antimicrobial action by inhibiting biosynthesis of cell wall of bacteria

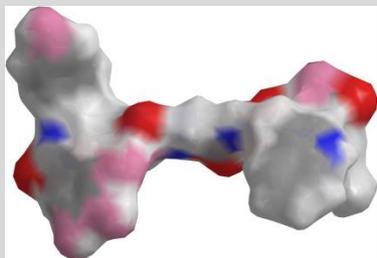
Antimicrobial efficacy

- h-BD3H is found to have better antimicrobial activity against *S. aureus* at the same concentration as h-BD3



Peptide – Galloyl sh-Pentapeptide-33 (Galloyl Exorphin)

Galloyl Exorphin



Gallic acid

- Phytochemicals contained in green tea
- Strong antioxidant and anti-inflammatory effect

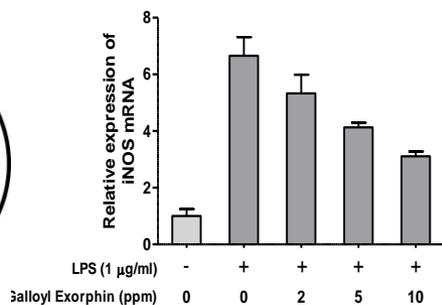
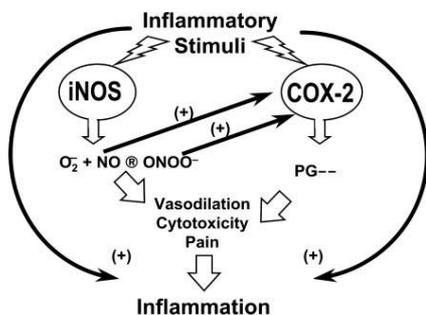
Galloyl Exorphin

- Combination of Gallic acid and Exorphin (Peptide)
- Anti-inflammatory effect
- Antioxidant and wrinkle improvement

Exorphin

- Wound healing effect
- Skin aging control

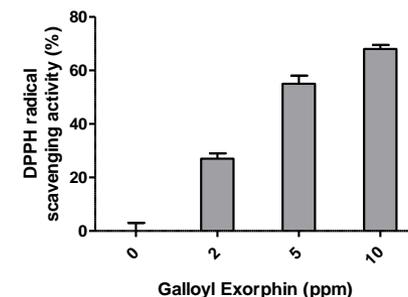
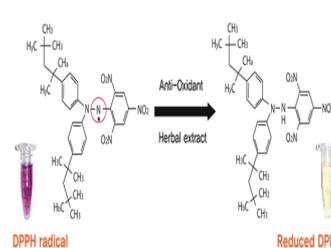
ANTI-INFLAMMATORY EFFECT



< Relationship between inflammation and iNO >

- Galloyl Exorphin effectively inhibits the activity of Inos, one of the inflammation inducers, to relieve skin irritation caused by inflammation.

Antioxidant efficacy

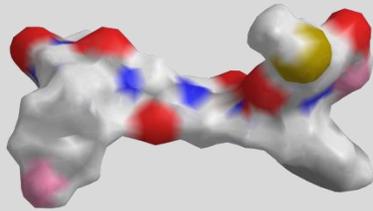


1,1-Diphenyl-2-picrylhydrazyl (DPPH) is a typical free electron species and is widely used for confirming the antioxidant effect. DPPH loses its characteristic index purple (λ_{max} 515-517 nm) as it is reduced to itself. The effect of antioxidants could be checked by this color change.

- Galloyl Exorphin is a material that could reduce skin irritation by effectively inhibiting reactive oxygen species that cause skin inflammation.

Peptide- Caffeoyl sh-Octapeptide-4 (NP7)

NP7



Caffeic acid

- Phytochemicals contained in coffee
- Strong antioxidant & anti-inflammatory effect

NP7

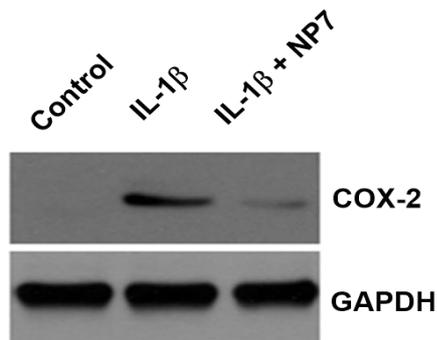
- Peptide binding of Caffeic acid and Neurovax
- Anti-inflammatory effect
- Improve blood circulation in skin

Neurovax

- Peptide components of BIO-FD & C
- Enkephalin + Tripeptide-1
- Wound healing effect

ANTI-INFLAMMATORY EFFECT

- IL-1 β : Inflammation inducer
- COX-2 (Cyclooxygenase-2): Inflammatory indicator substance

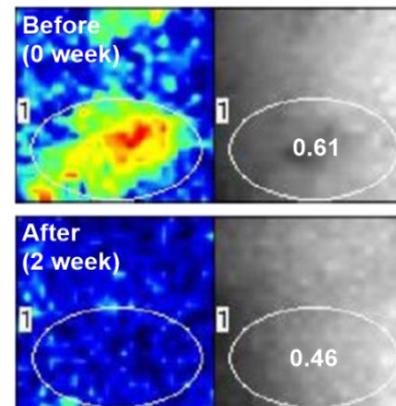


- Inflammatory response could be checked seeing COX-2 increase with treatment of IL-1 β .
- When NP7 is further treated, COX-2 is reduced and inflammation is suppressed.

> NP7 is verified anti-inflammatory effect to suppress inflammation

IMPROVEMENT OF SKIN CIRCULATION

- Skin blood circulation improved when treated with NP7 (Clinical trial source: ELLEAD Skin Clinical Laboratory)
- Skin blood circulation was measured and analyzed before and after NP7 treatment with Laser Doppler Perfusion Imager



> After 2 weeks of treatment with NP7, improvement of blood circulation is checked with evenly spreads blood



YJ-Calmfla Cell Complex™

- Camellia Sinensis Callus Culture Extract
- Opuntia Ficus-Indica Callus Culture Extract
- Lotus Callus Culture Extract

Camellia Sinensis Callus Culture Extract

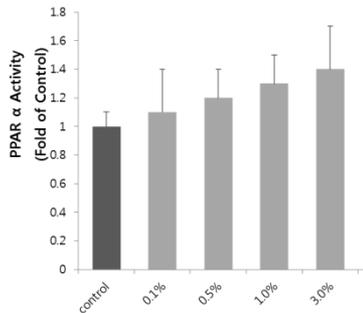


Camellia Sinensis Callus Culture Extract

- INCI name : **Camellia Sinensis Callus Culture Extract**
- Common name: Green tea
- **Efficacy: Anti-inflammation, Antioxidant, Anti-aging (Anti-wrinkle)**
- Folk remedies: It has been used for clearing head, preventing obesity by fat decomposition promotion action and people heaving weaken kidney function requires diuretic effect.
- Language of the flower : Memory

ANTI-INFLAMMATORY EFFECT

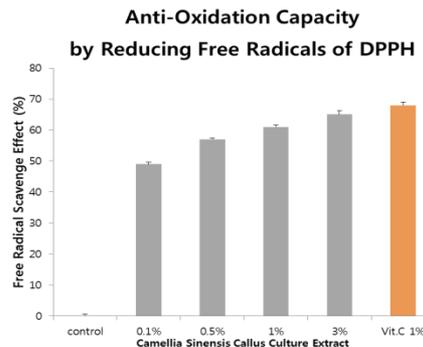
Peroxisome proliferator-activated receptor (PPAR) α is a transcription factor that is activated by fatty acids and has various functions. Activation of PPAR- α alleviates atopic symptoms associated with skin inflammation and erythema caused by UV exposure being.



► Camellia Sinensis callus extract may exhibit anti-inflammatory effects by increasing the expression of PPAR- α in keratinocytes.

ANTIOXIDATIVE EFFECT

Natural antioxidants are present in plants and prevent fatal consequences of oxidative stress. These substances include polyphenols, flavonoids and phenolic compounds, and many of these substances have various functions.



>1,1-Diphenyl-2-picrylhydrazyl (DPPH) is a stable free electron kind and is oxidized by antioxidants. At this time, DPPH loses the specific index purple light (λ_{max} 515-517 nm). Using this property, we checked the antioxidant capacity of Camellia Sinensis Callus Culture Extract.

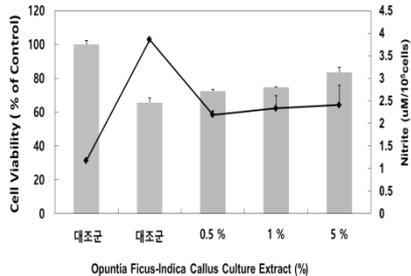
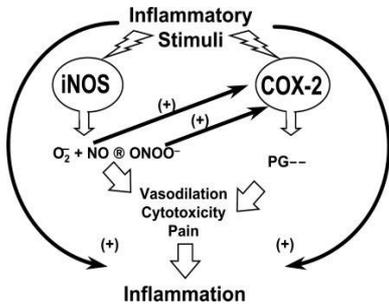
Opuntia Ficus-Indica Callus Culture Extract



Opuntia Ficus-Indica Callus Culture Extract

- INCI name : **Opuntia Ficus-Indica Callus Culture Extract**
- Common name: Cactus
- **Efficacy: Anti-inflammatory, Anti-aging (Anti-wrinkle)**
- Folk remedies : It is used as anti-inflammatory and antipyretic drugs in civilian medicine. In Jeju Island, it is used to prevent infestation of snakes, rats or thieves by growing on the stone wall that is the boundary of house. Nopal and Nopalitos of cactus has been widely used in folk medicine and oriental medicine since ancient times.

ANTI-INFLAMMATORY EFFECT



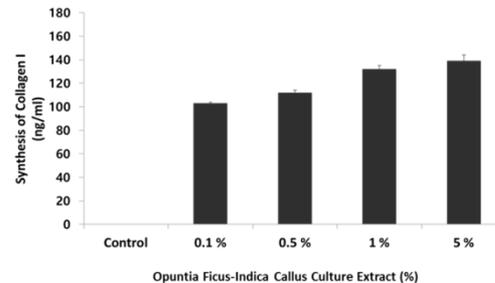
< Relationship between inflammation and iNOS >

► LPS treatment increases the production of NO, and increased NO promotes inflammation. This NO production amount is reduced by Opuntia Ficus-Indica Callus Culture Extract, and it is effective for anti-inflammatory effect.

ANTI-WRINKLE EFFECT

Collagen

- As one of the protein components essential for elasticity and firmness of the epidermal layer, it is accelerated decomposition of Collagen and not properly regenerated by aging, thus, collagen production could slow down skin aging.



► Collagen synthesis in fibroblast cell is increased by treatment with Opuntia Ficus-Indica Callus Culture Extract

Lotus Callus Culture Extract

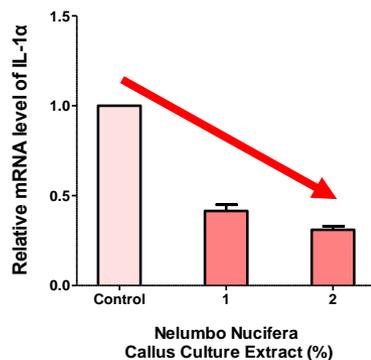


Lotus Callus Culture Extract

- INCI name : Nelumbo Nucifera Callus Culture Extract
- Common name: Lotus
- **Efficacy: Anti-inflammatory, Moisturizing, Brightening**
- Folk remedies : Lotus petal have been used for medicinal purposes in Asia for a long time.
Fruit is used to relieve anxiety and heat and the seed is known as for lower cholesterol and relieves tender uterus muscles
- Other active ingredients : **Gallic acid**, Alkaloids, Flavonoids, Glycosides, Triterpenoid, Vitamins

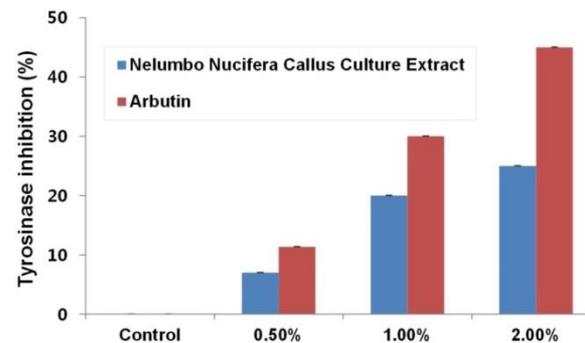
ANTI-INFLAMMATORY EFFECT

- **IL-1a** : Inflammation inducer
- Lotus Callus Culture Extract reduces mRNA expression of IL-1a



> Lotus Callus Culture Extract is checked that has anti-inflammatory effect against inflammation.

SKIN BRIGHTENING EFFECT



- Tyrosinase is involved in the synthesis of melanin, and suppression of Tyrosinase results brightening effect by decrease in melanin synthesis.
- In the clinical study, lotus callus inhibited Tyrosinase activity more than Arbutin known as brightening effect.

> Lotus callus inhibits Tyrosinase and could be an effective ingredient for skin brightening

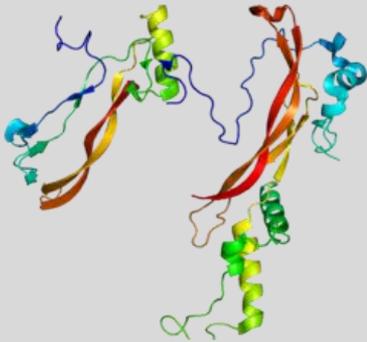
YJ Hairgrowth Complex™ Lines



- sh-Polypeptide-13 (Noggin)
- sh-Polypeptide-9 (VEGF)
- sh-Polypeptide-62 (HGF)
- sh-Polypeptide-1 (b-FGF)
- sh-Oligopeptide-2 (IGF-1)
- sh-Polypeptide-3 (KGF)
- sh-Polypeptide-4 (SCF)
- sh-Polypeptide-8 (PDGF-A)
- sh-Polypeptide-59 (PDGF-B)
- sh-Polypeptide-74 (NGF)



Protein – Noggin



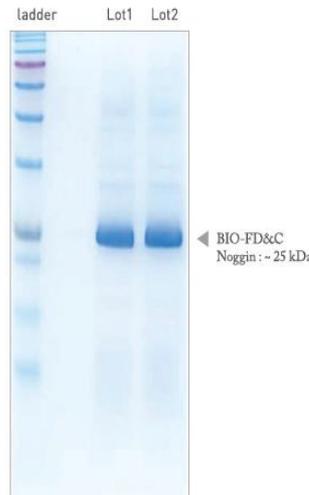
Noggin

Noggin

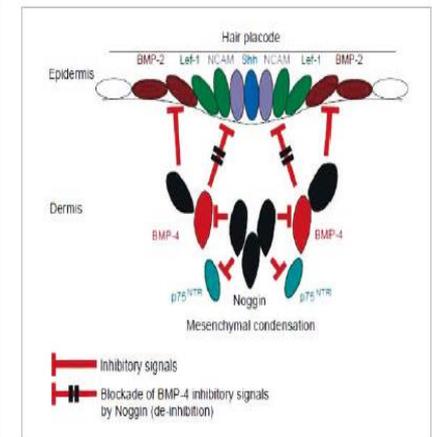
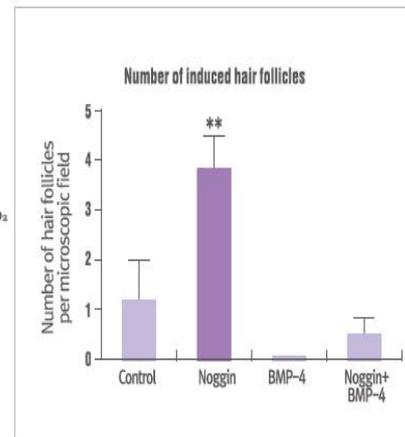
- INCI name : sh-Polypeptide-13
- Molecular weight : 25 kDa
- Involved in hair follicle formation and induces transition from hair telogen phase to anagen phase

PROMOTING HAIR GROWTH

- Noggin is important for inducing hair follicle formation and acts as an inhibitor to BMP-2/4, which inhibits the onset of the anagen phase, leading to the transition from telogen to anagen. Noggin could be used to promote hair growth.

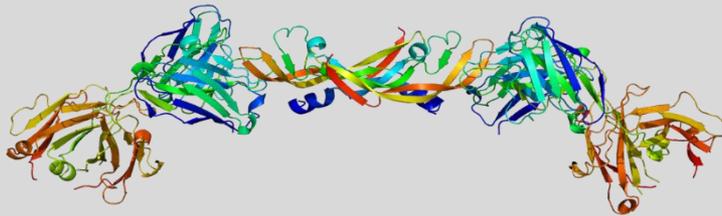


Mechanism of Noggin's Hair Growth Promotion



Ref : Nature Cell Biology, 1999

Protein – VEGF



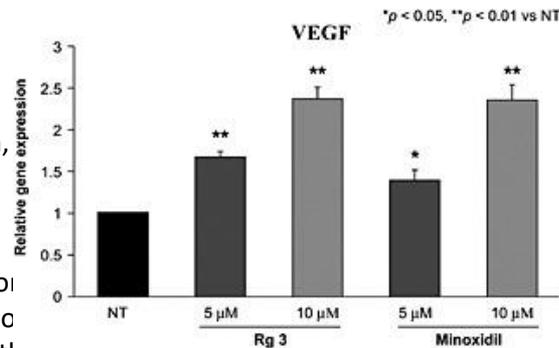
VEGF

- INCI name : sh-Polypeptide-9
- Molecular weight : 27 kDa
- Increasing angiogenesis and microvascular permeability and contributing to anti-aging and hair rebuilding & growth

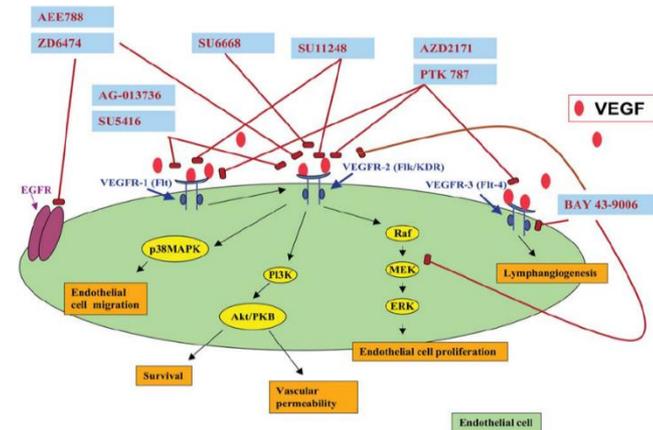
VEGF

Anti-aging and hair regeneration & growth promotion

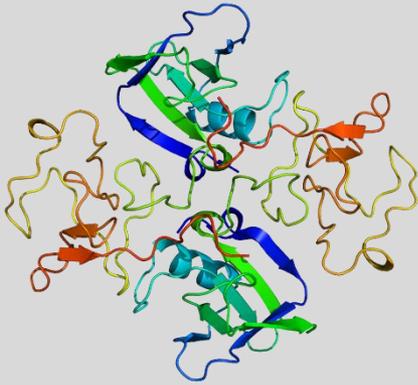
- VEGF (Vascular Endothelial Growth Factor-A) is a growth factor that is highly related to PDGF. It induces cell migration as a growth factor that induces angiogenesis, and physiologically functions to lower blood pressure and increase microvascular permeability. Any physiological phenomenon, such as skin regeneration or hair growth, is necessary for the supply of oxygen and nutrients through the neovascularization of vascular tissue, and thus is an important factor for regeneration of damaged skin, regenerative of damaged skin, and regeneration and growth of hair.



Mechanism of hair regeneration and stimulation of VEGF



Protein – HGF



HGF

HGF (Hepatocyte Growth Factor)

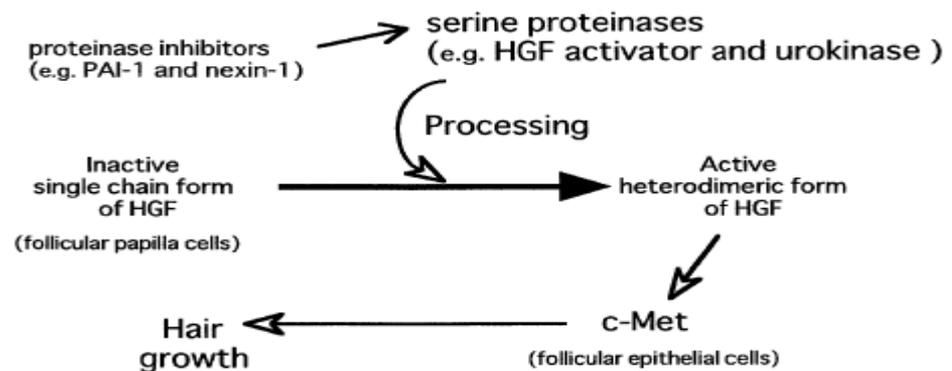
- INCI name : sh-Polypeptide-62
- Molecular weight : 79.7 kDa
- contributing to prevention of hair loss and hair growth
- Contributing acting as a growth factor in epidermis and endothelial cells

Anti-aging and hair regeneration & growth promotion

HGF is secreted by mesenchymal cells in various tissues and circulates through the bloodstream.

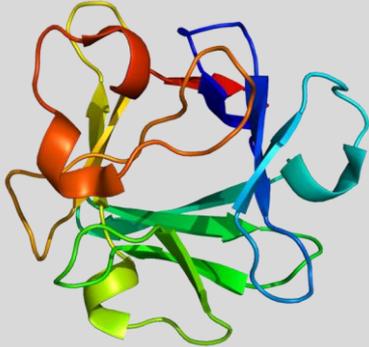
As a growth factor that works in epidermal and endothelial cells that require cleavage and growth, it especially performs essential functions for regeneration of damaged skin as a material rehabilitation material of wounded skin and new formation of hair follicle cells and prolongation of hair growth cycle, also maintenance of healthy hair condition.

Mechanism of hair regeneration and promotion of HGF



A schematic diagram indicating the cascade of HGF-dependent hair growth.

Growth Factor – bFGF (FGF-2)

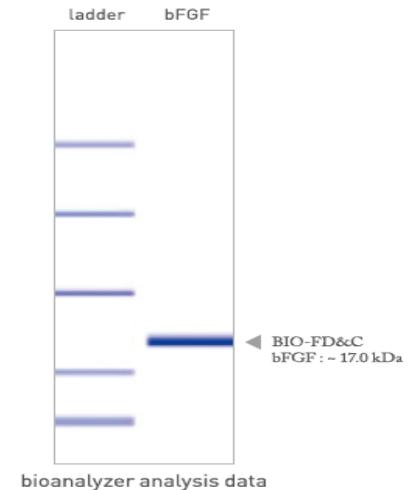
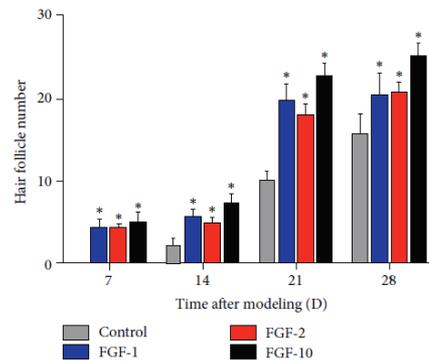
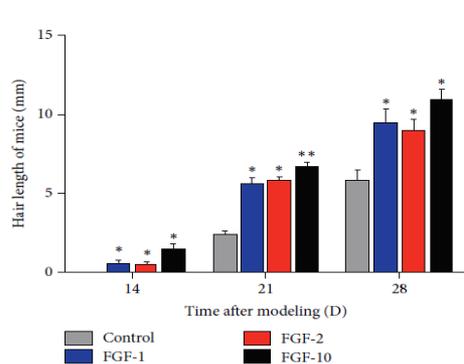


bFGF

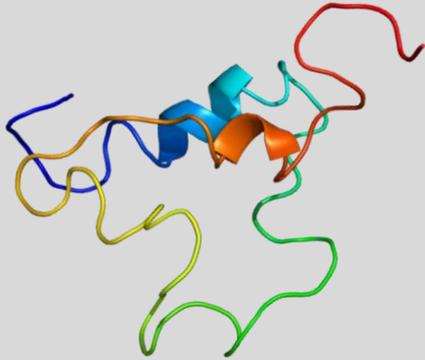
bFGF (basic Fibroblast Growth Factor)

- INCI name : sh-Polypeptide-1
- Molecular weight : 17 kDa
- One of the FGF family members
- bFGF belongs to the FGF family including 22 growth factors, and promotes synthesis of collagen type III in fibroblast

HAIR FOLLICLE PROLIFERATION EFFECT



Growth Factor – IGF-1



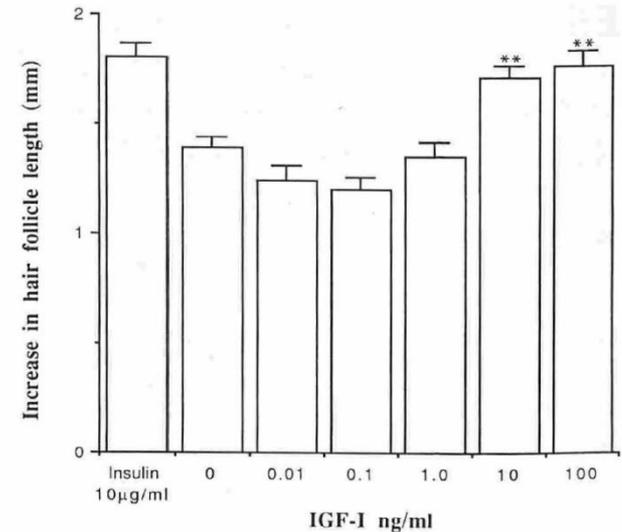
IGF-1

IGF-1 (Insulin-like Growth Factor-1)

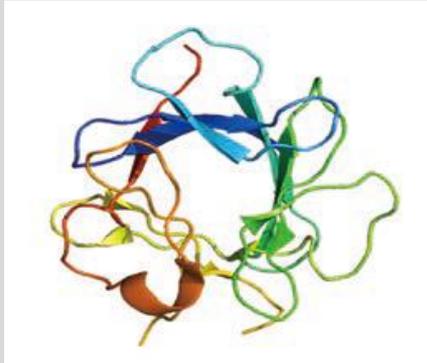
- INCI name : sh-Oligopeptide-2
- Molecular weight : 7.3 kDa
- IGF-1 is a growth factor called Somatomedin C and also known as Sulfation factor. Unlike EGF, IGF-1 helps healthy hair formation and is effective in preventing hair damage & loss.

PROMOTING HAIR FOLLICLE CELL GROWTH

- Promoting keratinocyte proliferation and regulating hair follicle growth
- IGF-1 stimulates hair follicle growth in concentration-dependent manner, which is effective for hair damage and prevention of hair loss..



Growth Factor – KGF (FGF-7)



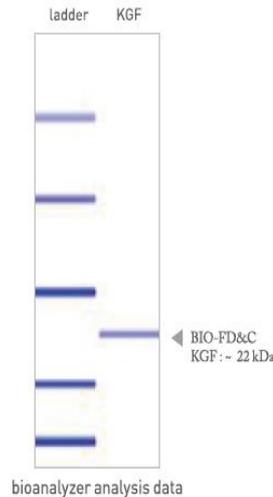
KGF

KGF (Keratinocyte Growth Factor)

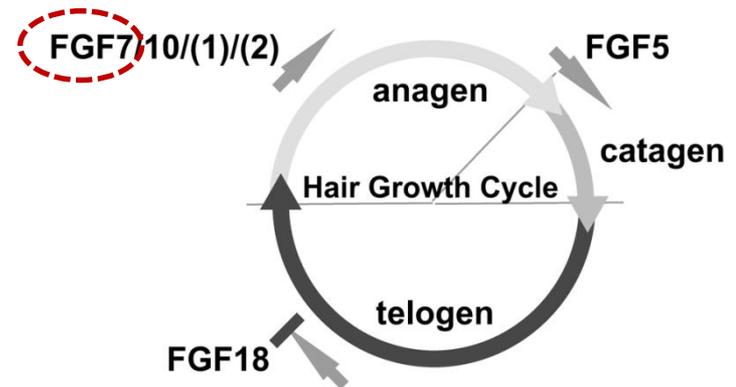
- INCI name : sh-Polypeptide-3
- Molecular weight : 22 kDa
- One of the FGF family members
- Increased expression in hair growth phase

HAIR FOLLICLE CELL GROWTH PROMOTION

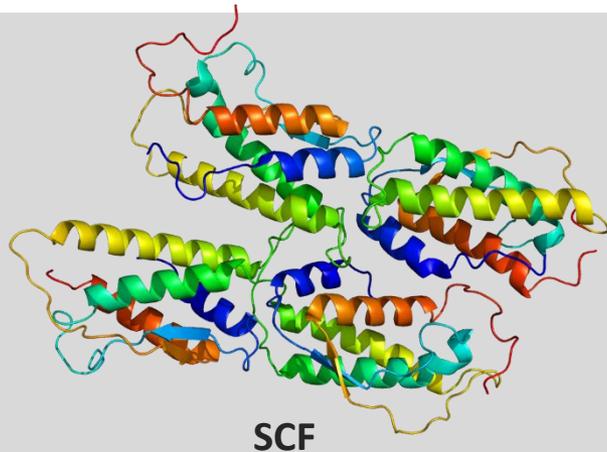
- KGF(FGF-7) is increased its expression level in anagen stage, and excellent in hair cell proliferation ability
- Reduced function of KGF Receptor may lead to hair thinning and hair loss



Proposed Model of FGF Signaling in the Regulation of the Hair Growth Cycle



Growth Factor – SCF



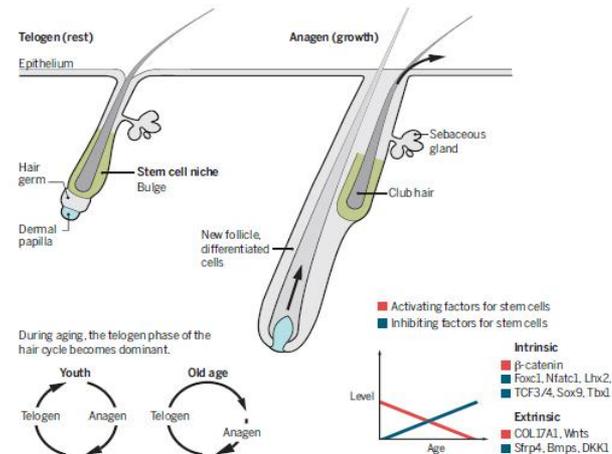
SCF (Stem Cell Factor)

- INCI name : sh-Polypeptide-4
- Molecular weight : 18.5 kDa
- Activating stem cells to promote anti-aging and new hair follicle formation

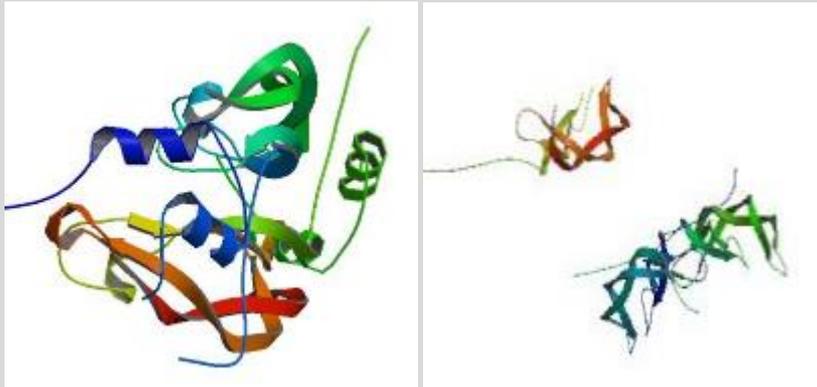
PROMOTING HAIR FOLLICLE CELL GROWTH

SCF, known as kit-ligan, KL or steel factor, is a major growth factor that binds to c-Kit receptor (CD117) as a growth factor. SCF is a growth factor that is involved both in membrane-bound form and in water-soluble protein form and also in blood formation, spermatogenesis and melanin formation. As an essential element to activate stem cells present in almost all tissues including skin, it prevents aging and promotes formation of new hair follicles in hair.

Proposed Model of SCF Signaling in the Regulation of the Hair Growth Cycle



Growth Factor – PDGF-A/B



PDGF-A

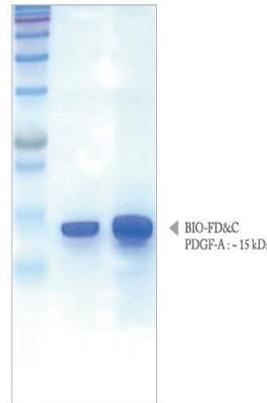
PDGF-B

PDGF(Platelet derived growth factor)-A/B

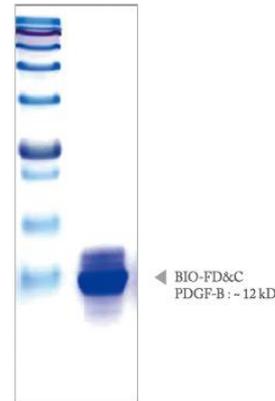
- INCI name : sh-Polypeptide-8 / sh-Polypeptide-59
- Molecular weight : 15 kDa / 12kDa
- Major growth factor kind regulating cell division that produced mainly in mesenchymal cell

PROMOTING HAIR GROWTH

- A major factor that regenerates aged skin and mediates wound recovering of damaged skin being involved in angiogenesis with VEGF .



SDS-PAGE electrophoresis

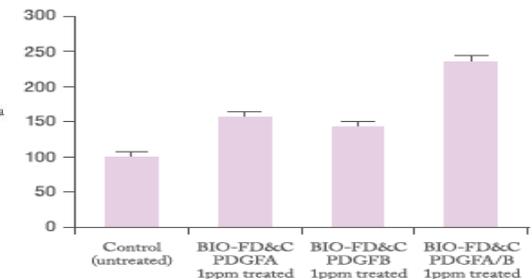


SDS-PAGE electrophoresis

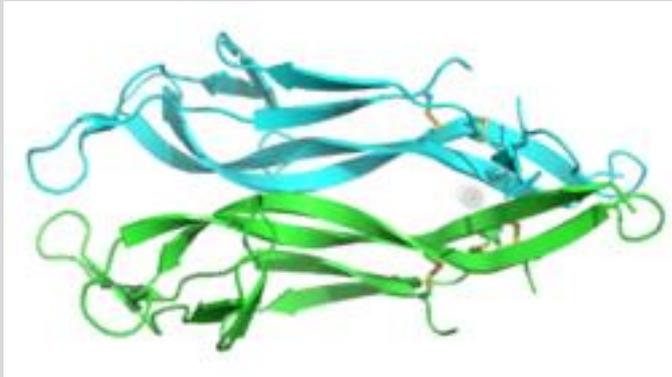


Control (untreated)

BIO-FD&C PDGFA/B 1ppm treated



Growth Factor –NGF



NGF

NGF (Nerve Growth Factor)

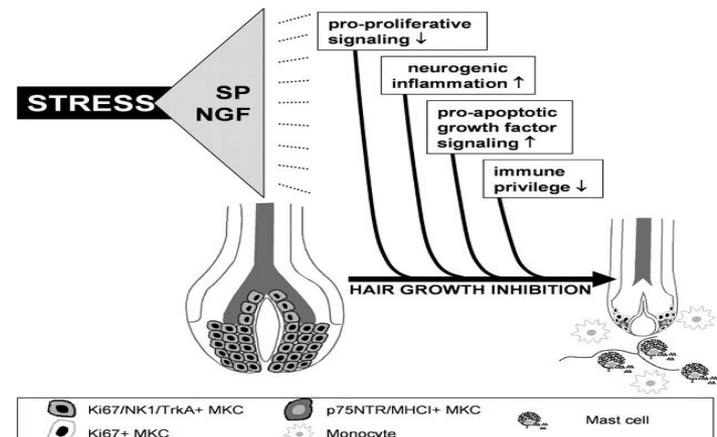
- INCI name : sh-Polypeptide-74
- Molecular weight : 130 kDa
- Induction of cell recovery and regeneration by nerve cell stimulation

PROMOTING HAIR GROWTH

NGF, also known as Neurotrophins, promotes the growth and division of nerve cells and nerves. In recent studies, it is verified that decreased skin reactivity, wrinkling and physiological activity of aged skin are directly related to aging and activity reduction of nerve cells presenting in the skin.

NGF supplied by the cosmetic is a deeply involved growth factor in stimulating the growth and promoting of various nerve cells to prevent aging and keeping young and healthy skin condition.

It is especially essential material for regeneration of damaged skin that requires startups and division of the nerve cells, and also is deeply involved in hair growth.



The American journal of pathology 171.6 (2007): 1872-1886.



R&D CENTER & PRODUCTION FACILITY

Development of cosmetic materials

Microbial separation and screening system

- Various microorganism screening for efficacy substance discovery possible

Installation of microbial culture system

- Construction of various microorganism culture system
- Capable of mass culture, culturing ovum-positive microorganisms
- Efficiency and productivity increase through study of efficient microbial culture conditions



Research on efficacy of cosmetic

Efficacy analysis system establishment based on activation test

- Ability to analyze efficacious substances with various efficacies such as brightening, wrinkle and preservation based on the previously identified efficacious substances
- Functional cosmetics could be listed
- Able to develop effective products



Structural analysis of functional materials

- Identify mechanism and structure of functional materials by cutting-edge analysis equipment
- New functional materials could be discovered

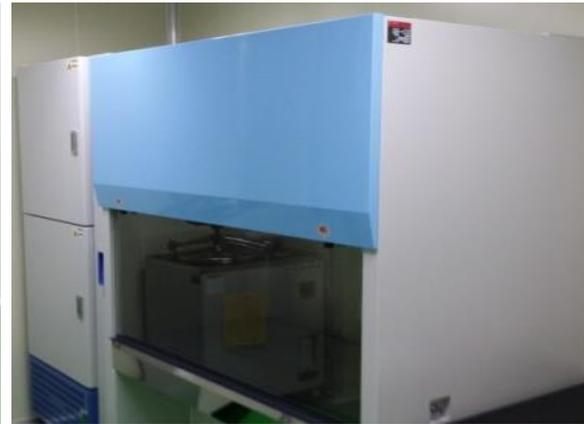


Research and development of cosmetic raw material production and raw material conversion technology

Protein purification technology research

- Research on highly purified purification technology to obtain pure substance
- Able to produce high-purity materials

High-tech professional system ; laboratory, clean bench, autoclave, incubator etc.



The latest automated production system





“Where skin health begins, YJ LAB”

YJ LAB provides sincere value of impression to you.

THANK YOU