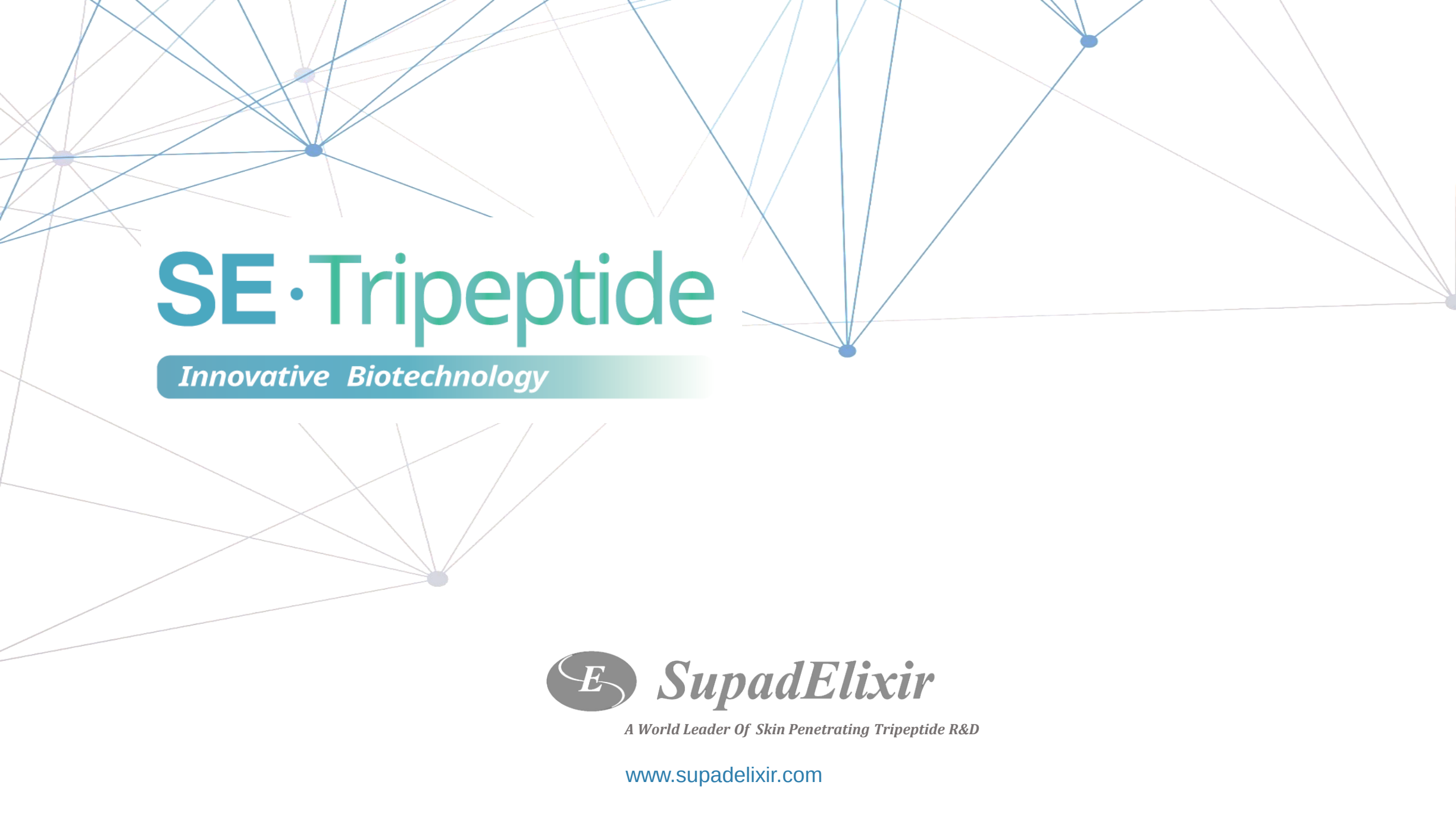




SE·Tripeptide

Innovative Biotechnology



A World Leader Of Skin Penetrating Tripeptide R&D

www.supadelixir.com

CEO : Dr. Jang Hee, Hahn



2009 ~ present SupadElixir CEO

1997 ~ present Professor of Kangwon National University (School of Medicine)

1994 ~ 1997 Seoul National University Cancer Research Institute

1992 ~ 1994 Colombia University Post-doctoral Fellow Patent with

Dr. Martin's at Anti-aging (US06319708)

1986 ~ 1991 Ph.D. in Indiana University (Developmental genetics)

1983 ~ 1985 Master Degree in San Diego University (Developmental genetics)

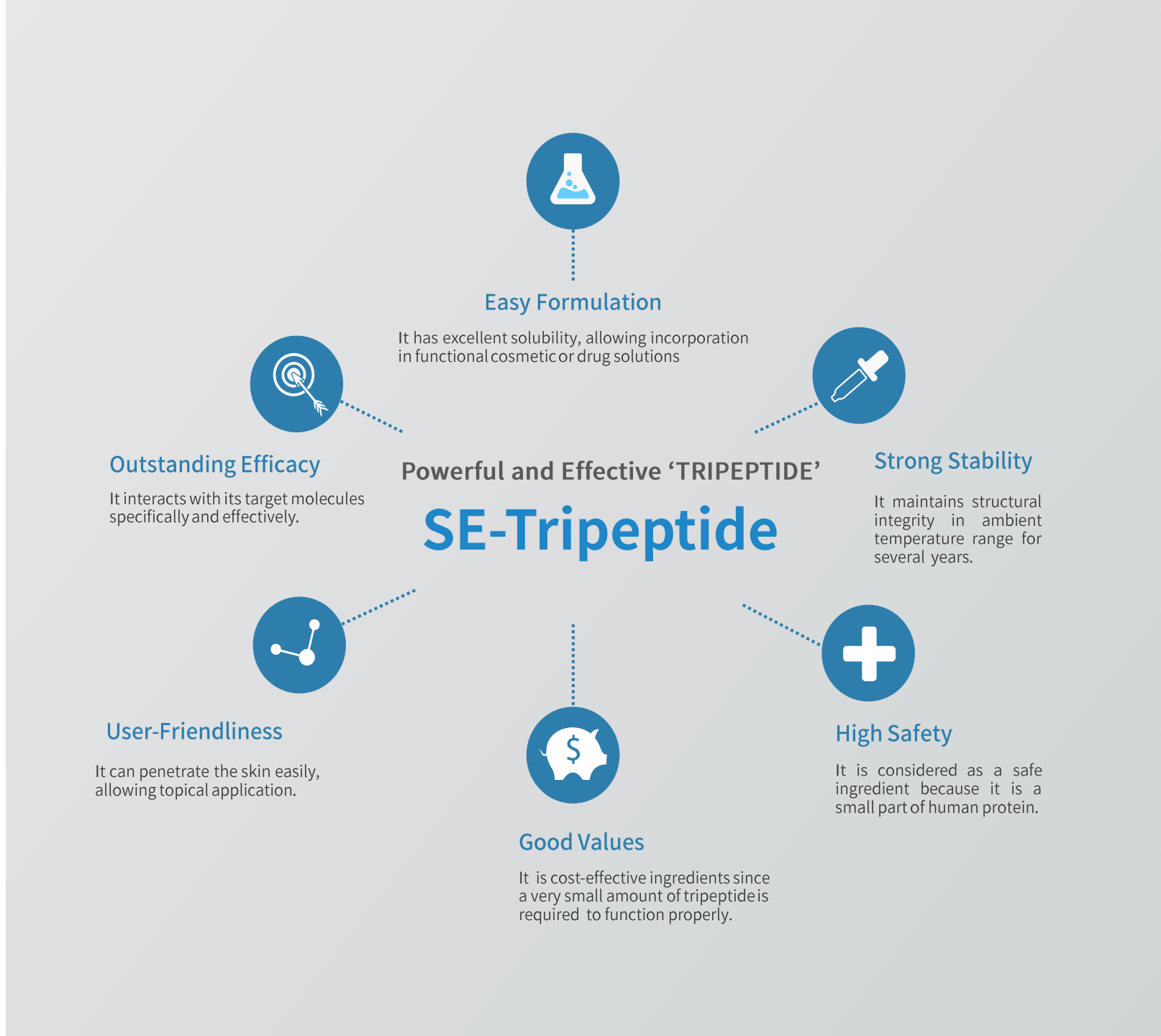
1974 ~ 1981 Seoul National University (Microbiology)

About our Core Bio-Science

What's special in our Tripeptide?

SupadElixir Co. has developed many excellent low molecular weight tripeptides of less than 500 Daltons. Such percutaneously deliverable tripeptides are quite innovative and effective not only for the development of new bio-drugs, but also for their cosmetic and OTC drug applications as skin-permeable active ingredients.

- Less than 500 Dalton (deliver to dermis)
- Safe as originated from human proteins
- Exclusive patented peptides
- INCI registered ingredients

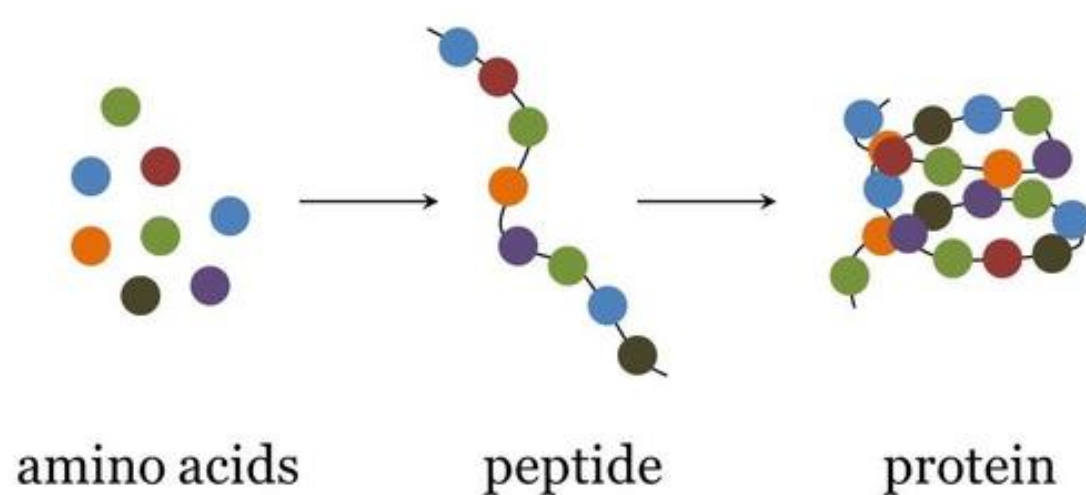




Cosmeceuticals R&D

Core Bio-Science of SE-TRIPEPTIDE

A peptide is a short chain of 2 to 50 amino acids, each of which serves as a building block of protein.

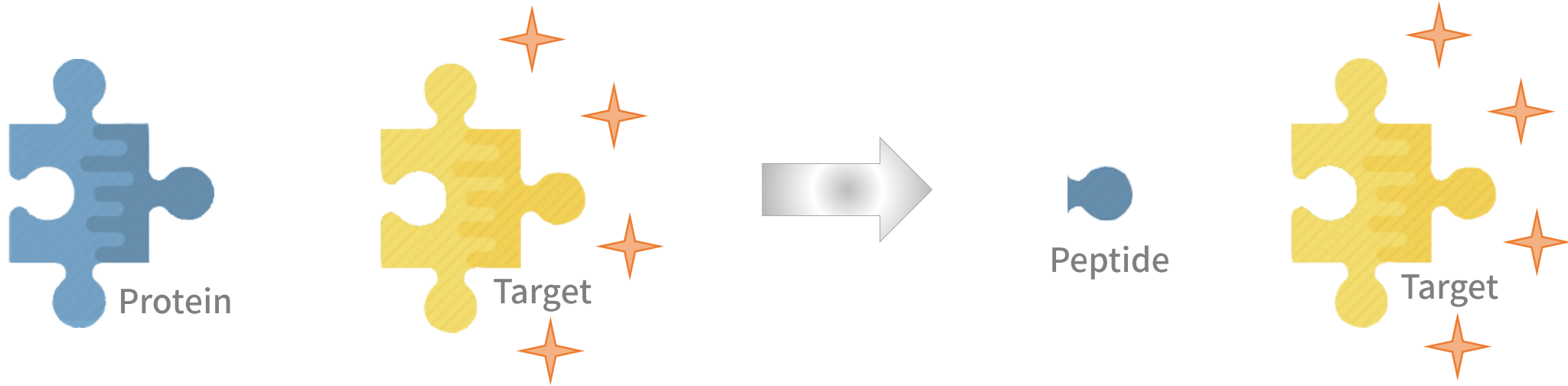


Tripeptide

Tripeptides are small enough to diffuse through the skin efficiently, so that they are beneficial skin care ingredients.

Core Bio-Science of SE-TRIPEPTIDE

Peptides are structurally similar to active site of natural proteins in human body.
Due to their structure, they have the ability to interact exactly where we want and can act the same as proteins.
This enables peptide to perform the same functions and regulate cellular metabolism as effectively as proteins.

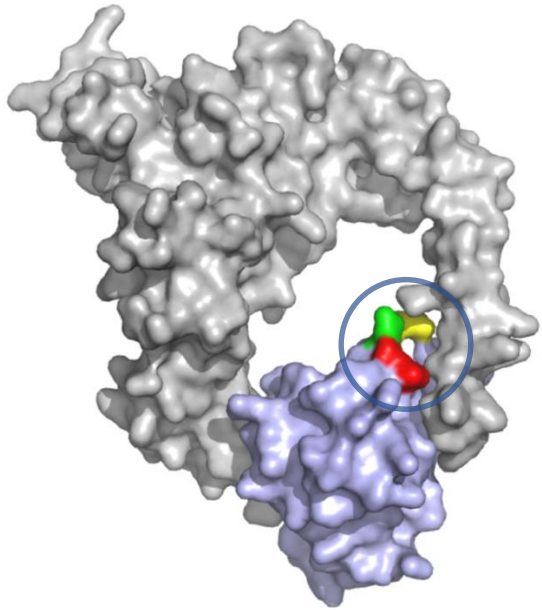


Protein-Protein interaction

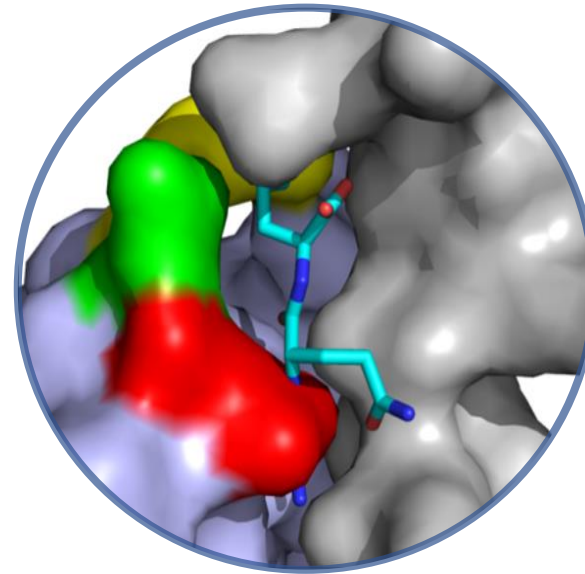
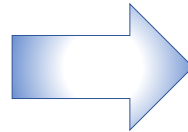
Protein-Peptide interaction

Core Bio-Science of SE-TRIPEPTIDE

Techniques for conversion of useful human proteins to 3-mer functional peptides, which contain unique advantages over small molecule and protein agents.



Identification of PPI Hotspots



Translation into Peptide

Pioneering The Development of Tripeptides

Core Bio-Science of SE-TRIPEPTIDE

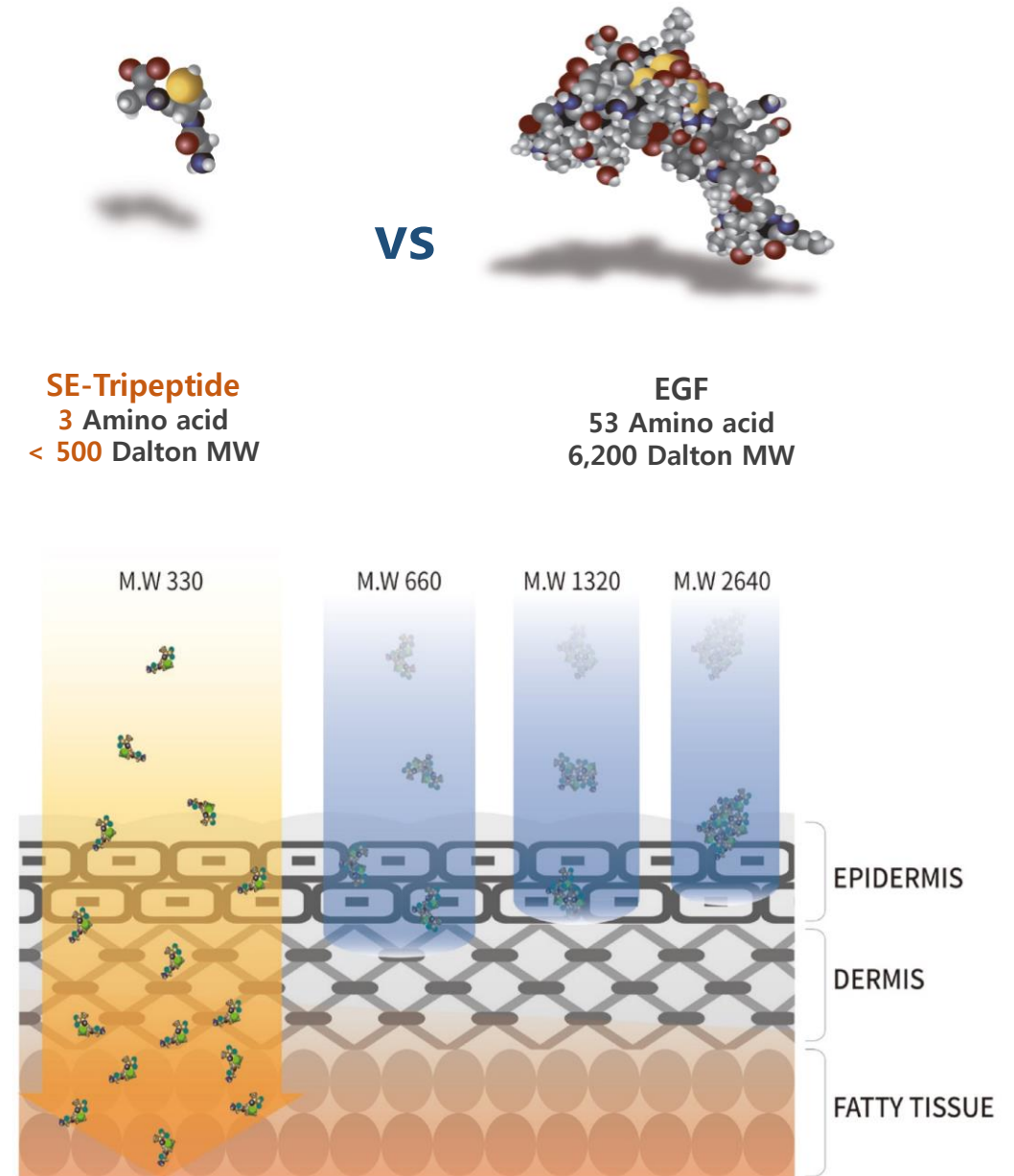
Even the best materials cannot function unless they are properly absorbed through the skin.

Tripeptides are small enough to be effectively absorbed through the skin.

On the other hand, protein-based cosmetic products do not often produce optimal effects because they are too large to penetrate the skin.

Although liposome or meso-roller helps to increase skin absorption, they have limitations.

SupadElixir uses advanced technology to overcome these limitations.



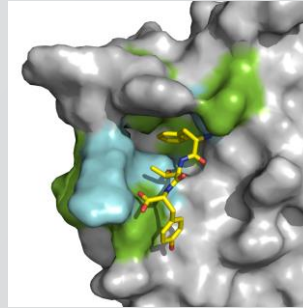
The 500 Dalton rule for the skin penetration

About our Core Bio-Science



Low molecular weight
Enhanced Percutaneous Absorption

SE-TRIPEPTIDE



Molecular weight of SE-tripeptide is less than 500 Da, which enhances percutaneous absorption of peptides.



Appropriate Target Protein
Core active site of Protein

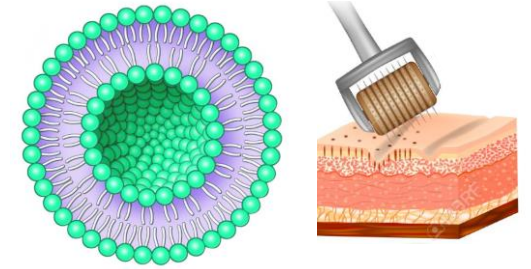
We have high bio-techniques for searching the appropriate target proteins to show superior efficacy we want and converting target proteins into 3-mer functional peptides, which contain core active sites to control protein functions.



Outstanding Efficacy

It interacts with its target molecules specifically and effectively.

vs **Other Peptides**



Protein-based cosmetic products have little or no beneficial effect on the skin because they are not efficiently absorbed through the skin. Although liposome or meso-roller helps to increase skin absorption, they have limitations. Liposomes are unstable during storage in cosmetics. Meso-roller is not user-friendly. In contrast, SE-tripeptides are very stable and topically applicable.

According to a study published in the Journal of Research Dermatology in the University of Southern Denmark in 2013*, it was confirmed through raster image correlation spectroscopy experiment that the liposome was destroyed when it hit the skin. Also liposomes are most likely to break down when they begin to mix with the ingredients of common cosmetic formulations.

Without expertise in biological knowledge, it is difficult to select the target protein and identify core active sites of the protein.

* Jonathan Brewer, Journal of Investigative Dermatology (2013), Spatially Resolved Two-Color Diffusion Measurements in Human Skin Applied to Transdermal Liposome Penetration

Tripeptide Journal

	Journal	Title
'19	Mol Cells	Allevation of Ultraviolet-B Radiation-Induced Photoaging by a TNFR Antagonistic Peptide, TNFR2-SKE
'17	Molecular and Cellular Biology	CD99-Derived Agonist Ligands Inhibit Fibronectin-induced Activation of 1 Integrin through the Protein Kinase A/SHP2/Extracellular Signal-regulated Kinase/PTPN12/Focal Adhesion Kinase signaling pathway
'16	Mol Cells	Paired Ig-Like Type 2 Receptor-Derived Agonist Ligands Ameliorate Inflammatory Reactions by Downregulating β 1 Integrin Activity
'14	J Derm Science	A Nuclear Factor Kappa B-Derived Inhibitor Tripeptide Inhibits UVB-Induced Photoaging Process
'14	BMB reports	YAC Tripeptide of Epidermal Growth Factor Promotes The Proliferation of HaCaT Keratinocytes Through Activation of EGFR

Pioneering The Development of Tripeptides

Cosmeceutical Ingredients

Biotechnology based cosmeceutical ingredients

SupadElixir Co. has many INCI(International Nomenclature of Cosmetic Ingredients)-named and PCPC (Personal Care Products Council)-registered tripeptides as cosmetic ingredients and will apply for INCI names for more new tripeptides in the near future.

Trade Name	INCI Name	Target Molecule	Anti-Wrinkle	Whitening	Soothing
Enfibin™	Propanediol (and) Palmitoyl-Tripeptide-52 Amide	NFκB (Nuclear factor κB)			○
Ilonerin™	Propanediol (and) Palmitoyl-sh-Tetrapeptide-2 Amide	IL-1R (Interleukin-1 receptor)			○
Syndermin™	Propanediol (and) Palmitoyl-sh-Tripeptide-1 Amide	FGF (Fibroblast Growth Factor)	○		
Tenefrin™	Propanediol (and) Palmitoyl-sh-Tripeptide-2 Amide	TNFR (Tumor Necrosis factor Receptor)			○
Synepin™	Propanediol (and) Palmitoyl-sh-Tripeptide-3 Amide	EGF (Epidermal Growth Factor)	○		
Binterin™	Propanediol (and) Palmitoyl-sh-Tripeptide-4 Amide	CD99			○
Adiponin™	Propanediol (and) Palmitoyl-Tripeptide-54 Amide	Adiponectin	○	○	
Winhibin™	Propanediol (and) Palmitoyl-Tripeptide-53 Amide	sFRP5 (Secreted frizzled-related protein 5)	○	○	○

The Powerful Multifunction Ingredient

BINTERIN™



Soothing
Sun-Care
Anti-inflammation

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1. BINTERIN™
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3. Cosmetic Property & Application
4. Efficacy (*In vitro* / *In vivo*)
5. Safety

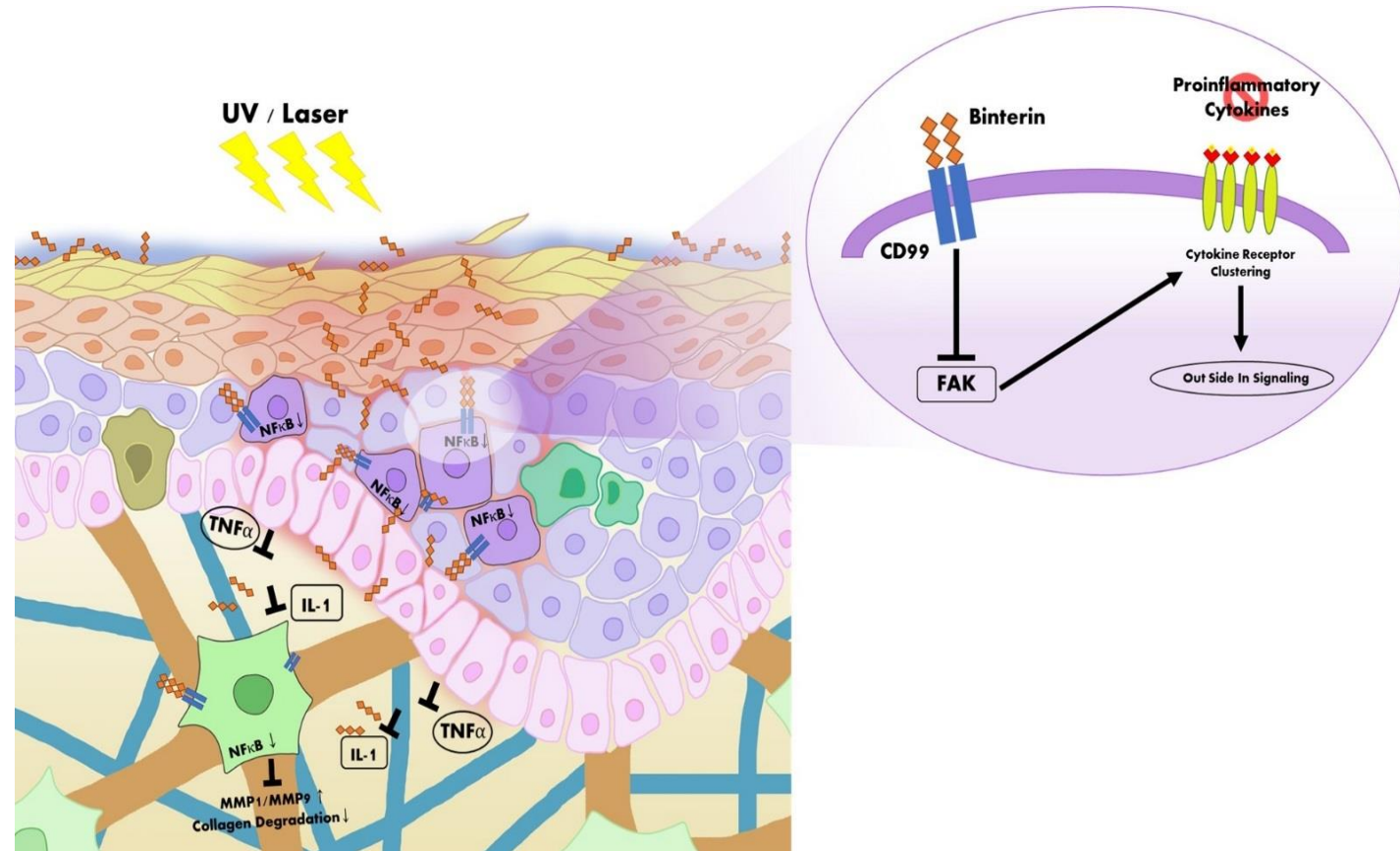
1. BINTERIN™

GENERAL INFORMATION:

Binterin™ is a palmitoyl-tripeptide of the CD99 agonist class, an anti-inflammatory molecule that is expressed in all human cells.

Binterin™ activates CD99, which inhibits clustering of various pro-inflammatory cytokine receptors such as TNFR and IL-1R, thereby exhibiting anti-inflammatory effects.

It helps soothe irritated skin and relieve discomfort by modulating inflammatory reactions.



<Effect of the Binterin™>

2. Technical Data _Specification

Index		Binterin™
INCI	Peptide	Palmitoyl sh-Tripeptide-4 Amide
	Solvent	Propanediol (Zemea® Propanediol)
Origin		Synthesized peptide
Application		Anti-inflammation, Sun-Care, Soothing, lipolysis
Recommend Dosage		2 - 4%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

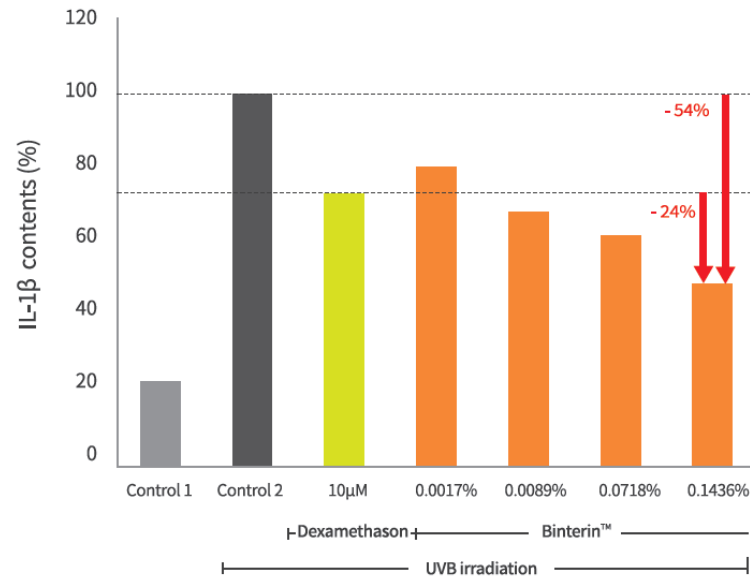
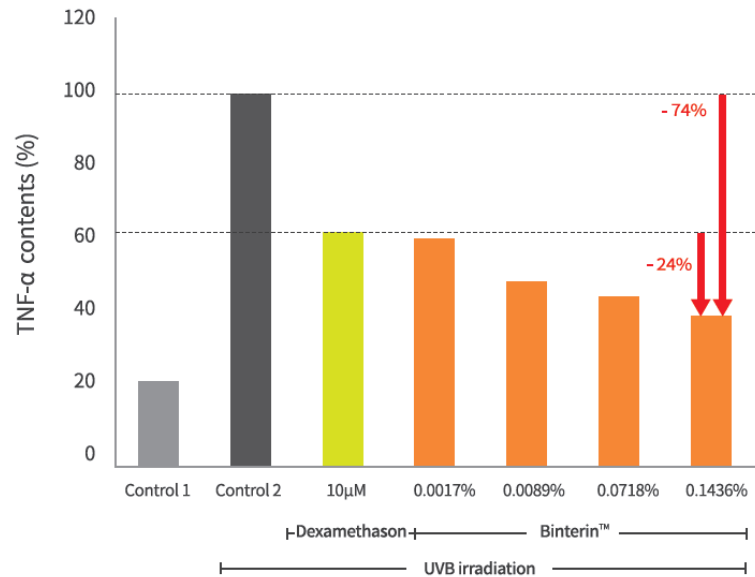
- 1) 'Binterin™' helps soothe irritated skin and relieve discomfort by modulating inflammatory reactions.
- 2) 'Binterin™' prevents skin photoaging by suppressing UVA-induced breakdown of extracellular matrix proteins in dermis.
- 3) In addition, it can reduce skin redness by inhibiting angiogenesis.

Applications

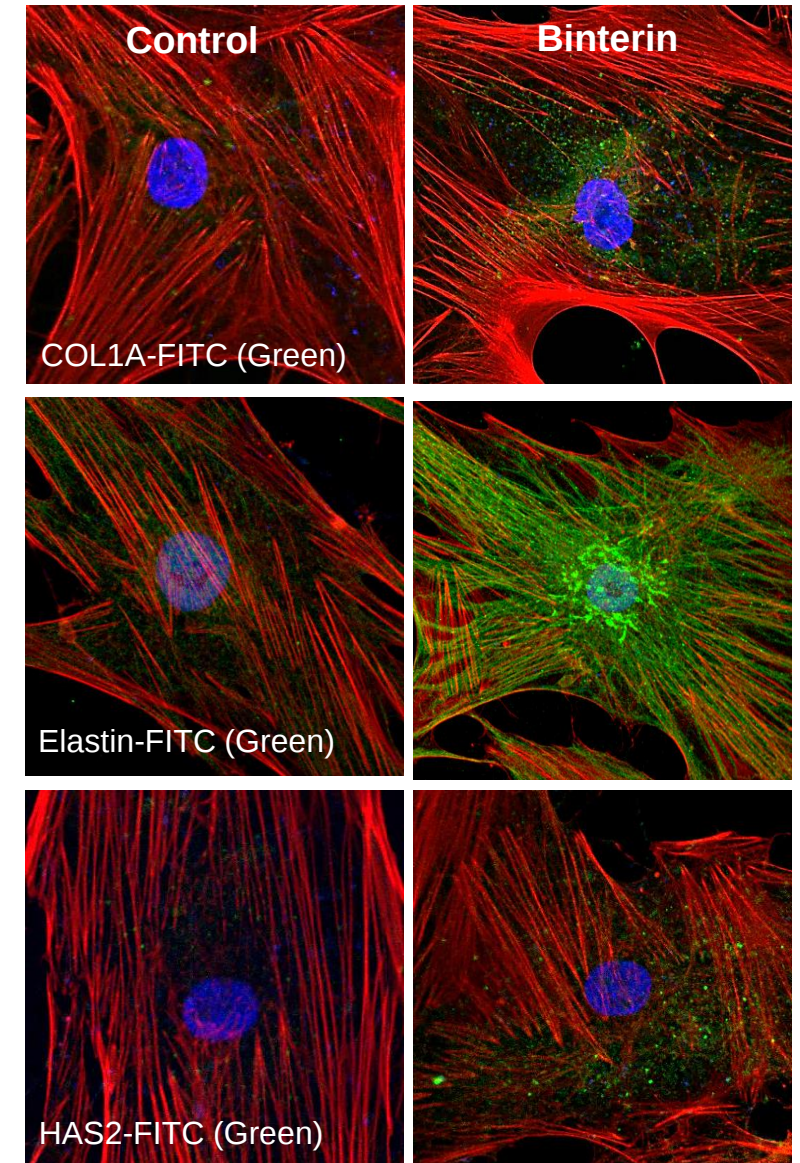
- 1) Rapid soothing and anti-inflammatory effects after clinical treatments such as laser, microdermabrasion, skin exfoliation, tattooing and tattoo removal.
- 2) Recovery serum, cream and facial mask for personal care.
- 3) OTC topical analgesic gel, serum or cream for arthritic pains, slight bruising or inflammation / pain after outdoor sports activities
- 4) Cosmetics or OTC products for sunburn or sun-damage.

4. Efficacy (*In vitro*)

Suppression of UVB-induced expression of proinflammatory cytokines, TNF- α and IL-1 β

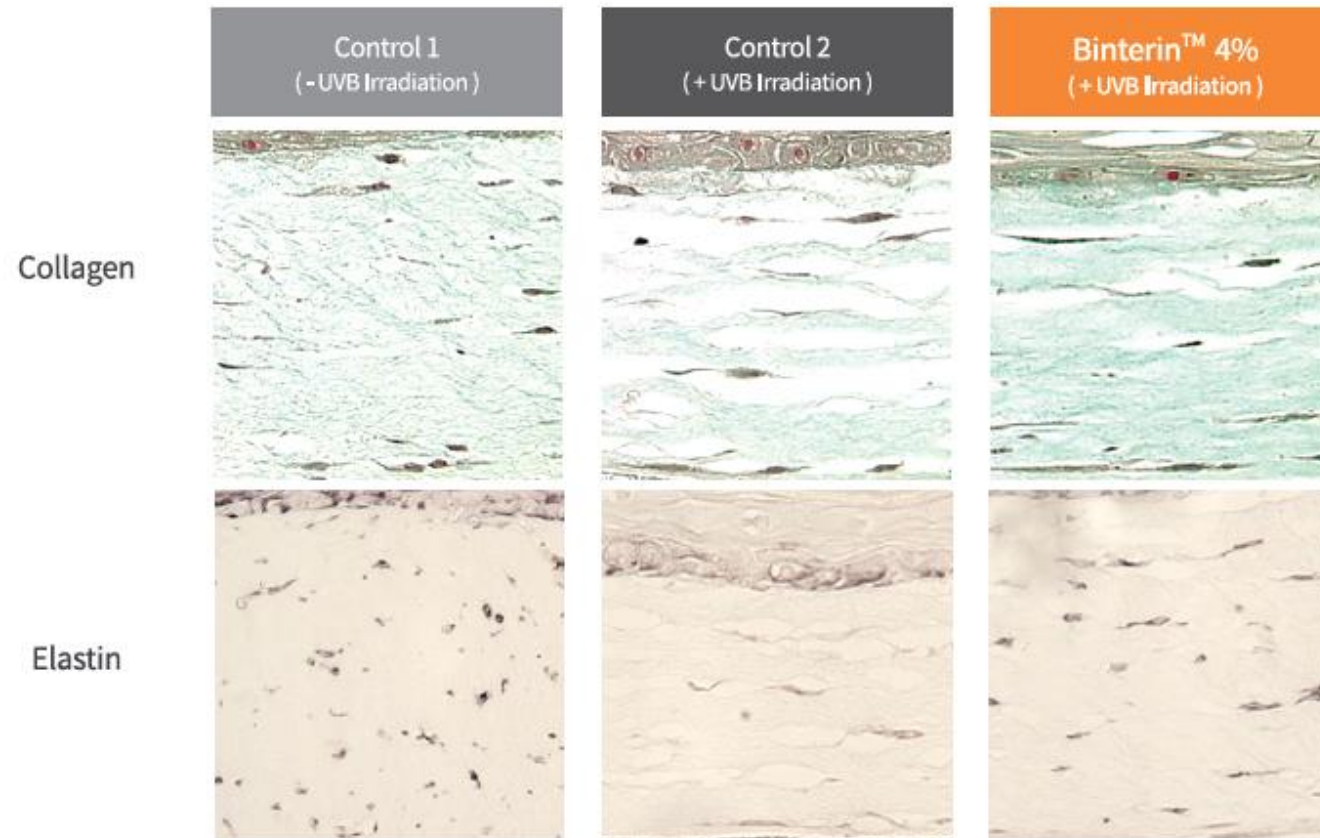


The effects of Binterin on the expression of Collagen, Elastin, HAS2 (Hyaluronan synthase 2) in human fibroblast, CCD-986sk



4. Efficacy (*Ex-vivo*)

Suppression of UVB-induced breakdown of collagen fiber in 3D human skin cell culture system



* Collagen fiber (Masson's trichrome staining, blue), Elastin (IHC, brown)

* UVB Irradiation: 0.05 J/cm²

4. Efficacy (*Testimonials*)

Improvement of the stressed skin by micro-needling



*Mask sheet containing 4% Binterin™ applied immediately after the fractional micro needling

Reduction of inflamed acne lesions



* Once daily application of a cream containing 3% Binterin™

5. Safety

In Vivo Test

Skin Irritation

A safety test of 'Binterin™ 4%' after 48 hours treatment on human skin

Method

Thirty three healthy volunteers participated in the patch test using Finn Chamber on skin. Each of Finn Chambers containing a test material were fixed on the upper back of the subjects after cleaning up the test area with 70% ethanol and drying. 20 µL of a test material was dropped into a filter paper disc fixed on 8 mm Finn chamber. The test area was assessed at 30 minutes, 24 hours after a single application during 48 hours patch on the subjects. Skin reactions were scored by a dermatology specialist, following the Frosch & Kligman, CTFA guidelines.

Result

According to the criterion the Frosch & Kligman, CTFA guidelines, mean score was calculated after categorizing the degree of skin reaction. 3 subjects in this test substance showed 1+ grade skin reaction at 30 minutes, 24 hours after removing patch of 'Binterin™' on the test area and the mean score obtained was 1.1. Thus, the test material can be considered as **non irritant**.

References

1. The 500 Dalton rule for the skin penetration of chemical compounds and drugs , Jan D. Bos Marcus M. H. M. Meinard *Exp Dermatol*, 9(3):165-9 Jun 2000
2. UVB and pro-inflammatory cytokines synergistically activate TNF- α production in keratinocytes through enhanced gene transcription, Muhammad M. Bashir *J Invest Dermatol*, 129(4): 994–1001 Apr 2009
3. CD99-Derived Agonist Ligands Inhibit Fibronectin-induced Activation of 1 Integrin through the Protein Kinase A/SHP2/Extracellular Signal-regulated Kinase/PTPN12/Focal Adhesion Kinase signaling pathway, Lee KJ, Hahn JH *Molecular and Cellular Biology*, 37(14) Jun 2017
4. CD99 inhibits CD98-mediated β 1 integrin signaling through SHP2-mediated FAK dephosphorylation, Lee KJ, Hahn JH, *Experimental Cell Research* 15;336(2):211-22 Aug 2015
5. The activation of CD99 inhibits cell-extracellular matrix adhesion by suppressing β 1 integrin affinity, Lee KJ, Hahn JH, *BMB reports* 45(3):159-64 Mar 2012
6. A splice variant of CD99 increases motility and MMP-9 expression of human breast cancer cells through the AKT-, ERK-, and JNK-dependent AP-1 activation signaling pathways. Byun HJ, Hahn JH, *J Biol Chem*, 281(46):34833-47 Nov 17 2006



Moisture Forever

ADIPONIN™

Moisturizing
Enhancing Skin Barrier
Firming

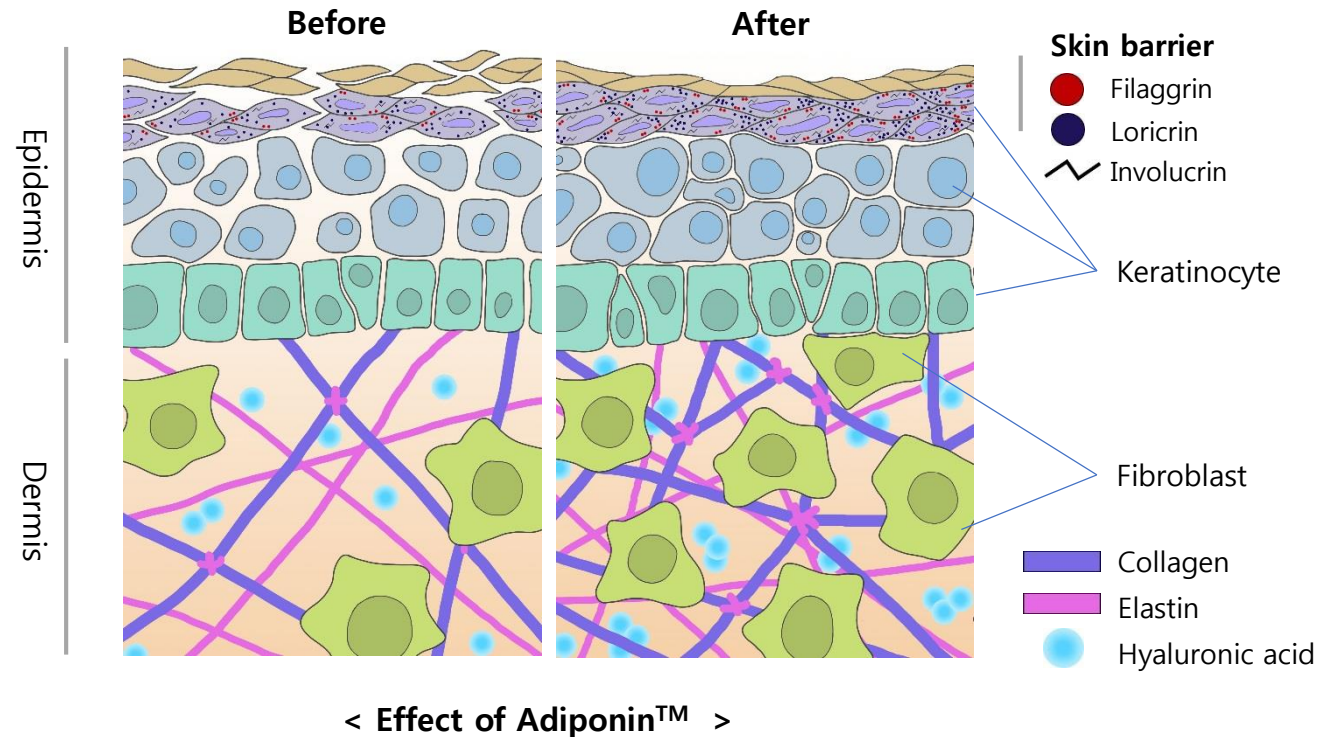
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1. ADIPONIN™
2. Technical Data (Specification)
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4. Efficacy (*In vitro* / *In vivo*)
5. Safety

1. ADIPONIN™

GENERAL INFORMATION:

Adiponin™ is a palmitoyl-tripeptide of the adiponectin receptor agonist class, facilitates the proliferation of epidermal cells and generation of ceramides, collagens, and hyaluronic acid in the dermis. In addition, it helps increase the production of filaggrin, an essential molecule for the skin barrier function.



2. Technical Data (Specification)

Index		Adiponin™
INCI	Peptide	Palmitoyl Tripeptide-54 Amide
	Solvent	Propanediol (Zemea® Propanediol)
Origin		Synthesized peptide
Application		Moisturizing, Enhancing Skin Barrier, Firming
Recommend Dosage		1 - 3%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

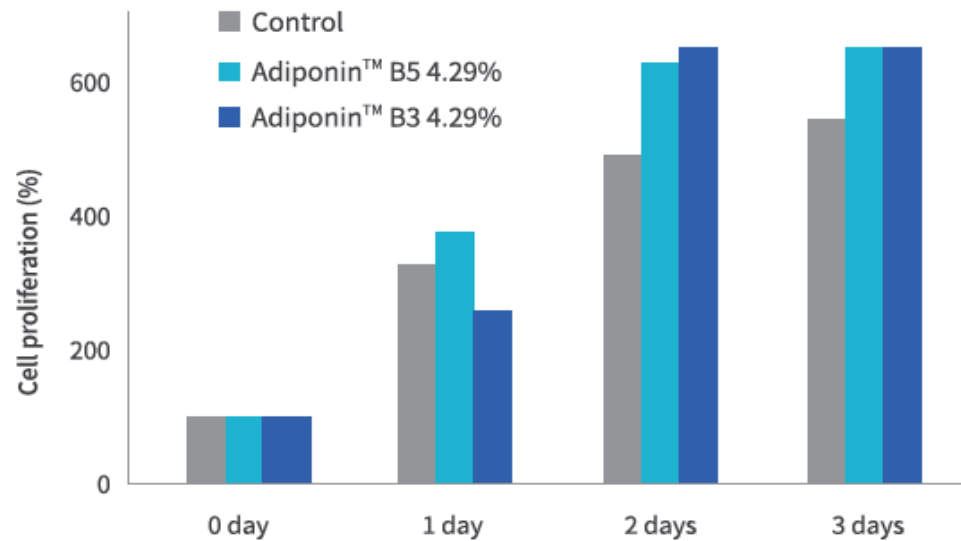
- 1) 'Adiponin™' strengthens the skin barrier, and maintains skin moisture by promoting synthesis of natural moisturizing factors such as profillagrin and involucrin.
- 2) 'Adiponin™' also improves skin elasticity by increasing extracellular matrix protein and glycosaminoglycan production in dermis.
- 3) In addition, it enhances skin renewal by promoting keratinocyte proliferation.

Applications

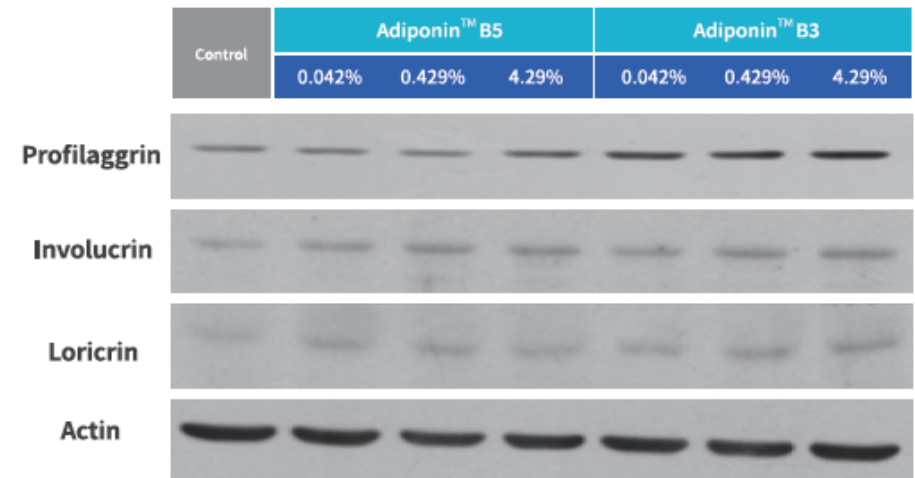
- 1) Moisturizing serum and cream for strengthening the skin barriers
- 2) Recovery serum and cream for facilitating the proliferation of the epidermal cells and the generation of collagens and ceramide
- 3) Cosmetics or OTC products for skin protection through inhibiting the inflammatory reactions

4. Efficacy (*In vitro*)

Proliferation of the fibroblast NIH3T3

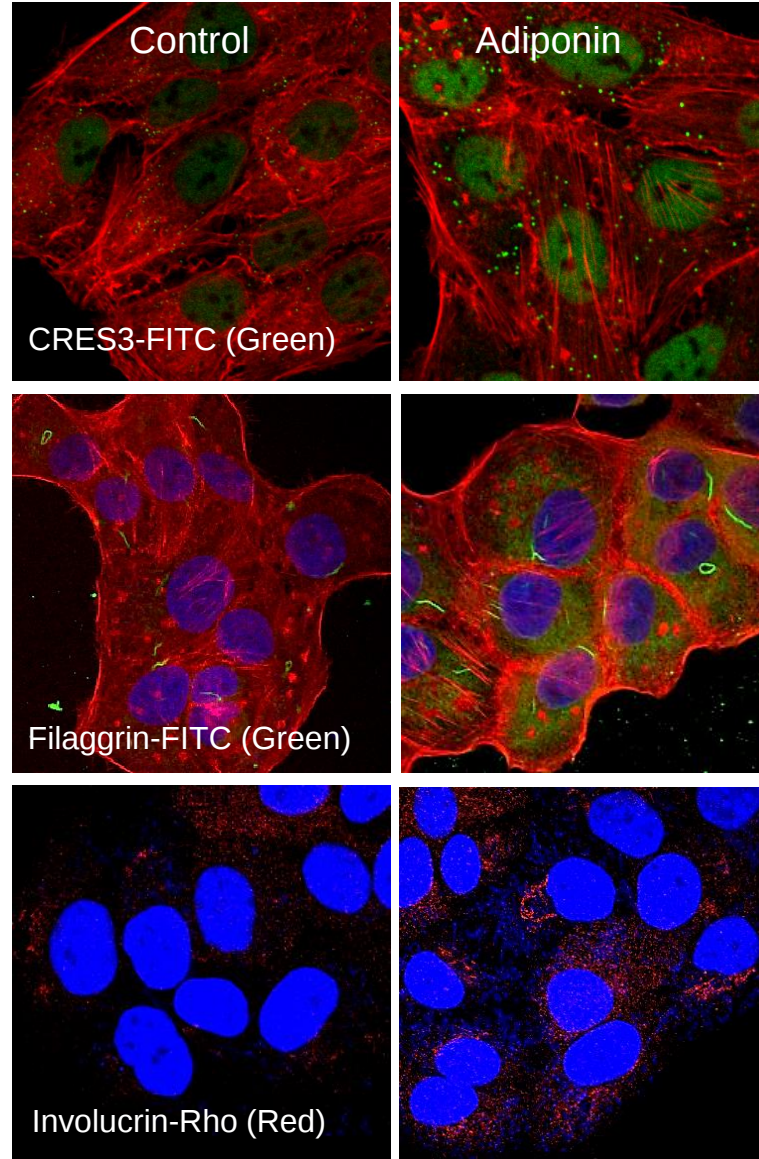


Upregulation of expression of the skin-barrier proteins, profilaggrin, involucrin and loricrin

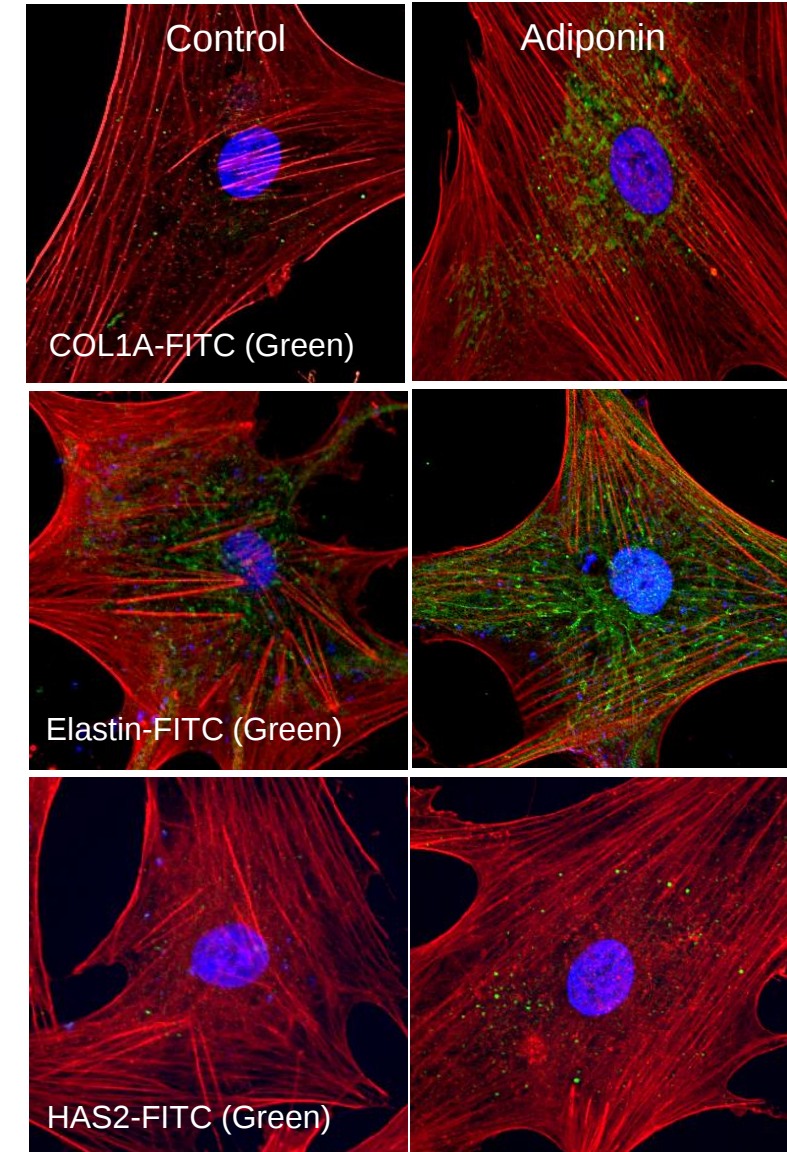


4. Efficacy (*In vitro*)

■ Upregulation of filaggrin, loricrin, involucrin which are essential for the skin barrier function and Ceramide synthase3 in human fibroblast, HaCaT

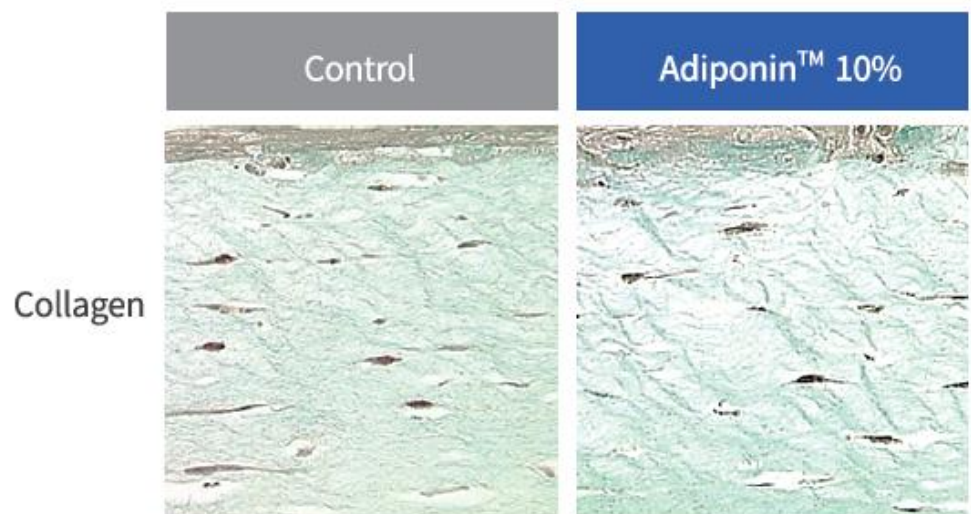


■ Upregulation of Collagen, Elastin, HAS2 in human fibroblast, CCD-986sk

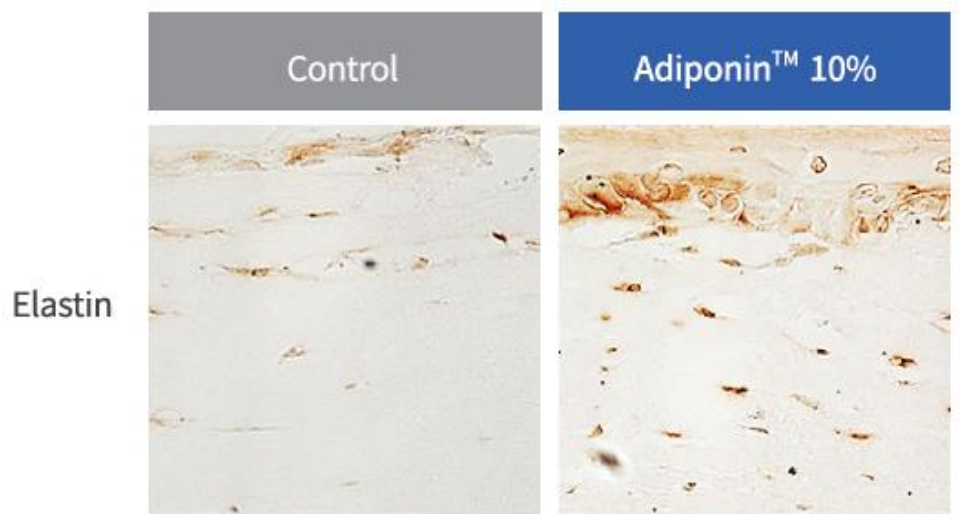


4. Efficacy (*Ex vivo*)

■ Upregulation of collagen fiber and elastin in a human skin equivalent model.



* Collagen fiber (Masson's trichrome staining, blue)



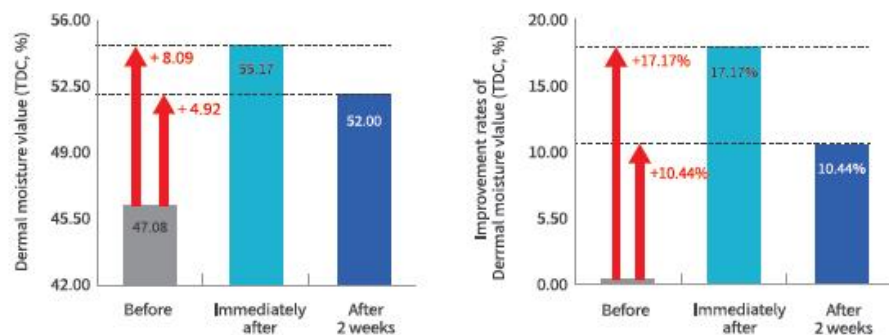
* Elastin (IHC, brown)

4. Efficacy (*In vivo*)

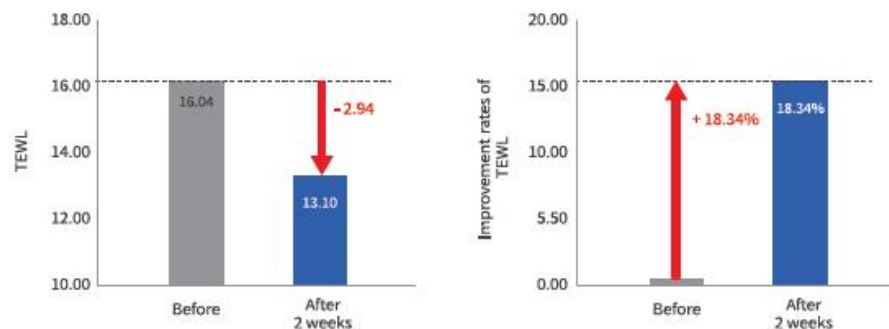
The Effects on the Improvement of Dermal Moisture & TEWL (Transepidermal Water Loss)

Test protocol

- 24 volunteer (Women, 32 to 54 years old)
- Application of a solution containing 5% Adiponectin™, 2x/day on the cheek
- Dermal moisture measurement using MoistureMedterD Compact
- TEWL measurement using Vapometer



* Statistically significant when compared to control $p < 0.001$

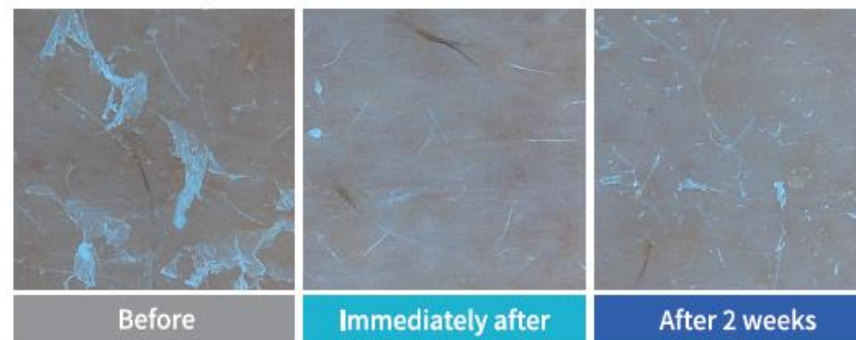
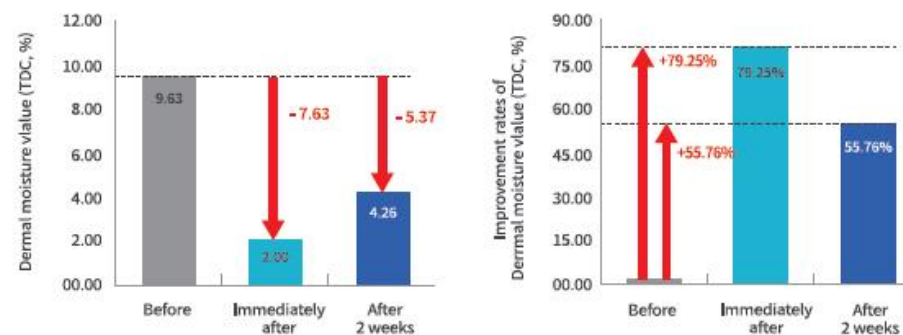


* Statistically significant when compared to control $p < 0.001$

The Effects on the Improvement of flaky skin

Test protocol

- 24 volunteer (Women, 32 to 54 years old)
- Application of a solution containing 5% Adiponectin™, 2x/day on the side of the lip
- Dermal moisture measurement using MoistureMedterD Compact
- TEWL measurement using Video Microscope and the Analyzing Program



5. Safety

A safety test of 'Adiponin™ 5%' after 24 hours patch on human skin

Method

Thirty four healthy volunteers participated in the patch test using Finn Chamber on skin. Each of Finn Chambers containing a test material were fixed on the upper back of the subjects after cleaning up the test area with 70% ethanol and drying. 20 µL of a test material was dropped into a filter paper disc fixed on 8 mm Finn chamber. The test area was assessed at 30 minutes, 24 hours and 48 hours after a single application during 24 hours patch on the subjects. Skin reactions were scored by a dermatology specialist, following the criterion of International Contact Dermatitis Research Group (ICDRG).

Result

According to the criterion of International Contact Dermatitis Research Group (ICDRG), mean score was calculated after categorizing the degree of skin reaction. No skin reaction was noticed at 30 minutes, 24 hours and 48 hours after removing patch of 'Adiponin™' on the test area and the mean score obtained was 0.00. Thus, the test material can be considered as **non irritant**.

References

1. The 500 Dalton rule for the skin penetration of chemical compounds and drugs , Jan D. Bos Marcus M. H. M. Meinard *Exp Dermatol.* 2000 Jun;9(3):165-9
2. Adiponectin Upregulates Filaggrin Expression via SIRT1-Mediated Signaling in Human Normal Keratinocytes Taewon Jin, Seong Jun Seo, *Ann Dermatol* Vol. 29, No. 4, 2017
3. Adiponectin and leptin up-regulate extracellular matrix production by dermal fibroblasts, Tomonobu Ezure, Satoshi Amano *BioFactors* 229–236 2007
4. Adiponectin Suppresses UVB-Induced Premature Senescence and hBD2 overexpression in Human Keratinocytes, MinJeong Kim, Seong Jun Seo *PLOS ONE*, August 15, 2016
5. UV-induced inhibition of adipokineproduction in subcutaneous fat aggravates dermal matrix degradation in human skin, Eun Ju Kim, Jin Ho Chung, *Scientific Reports* 6:25616 10 May 2016

Lightening up your Skin

WINHIBIN™

Whitening
Brightening
Tone up

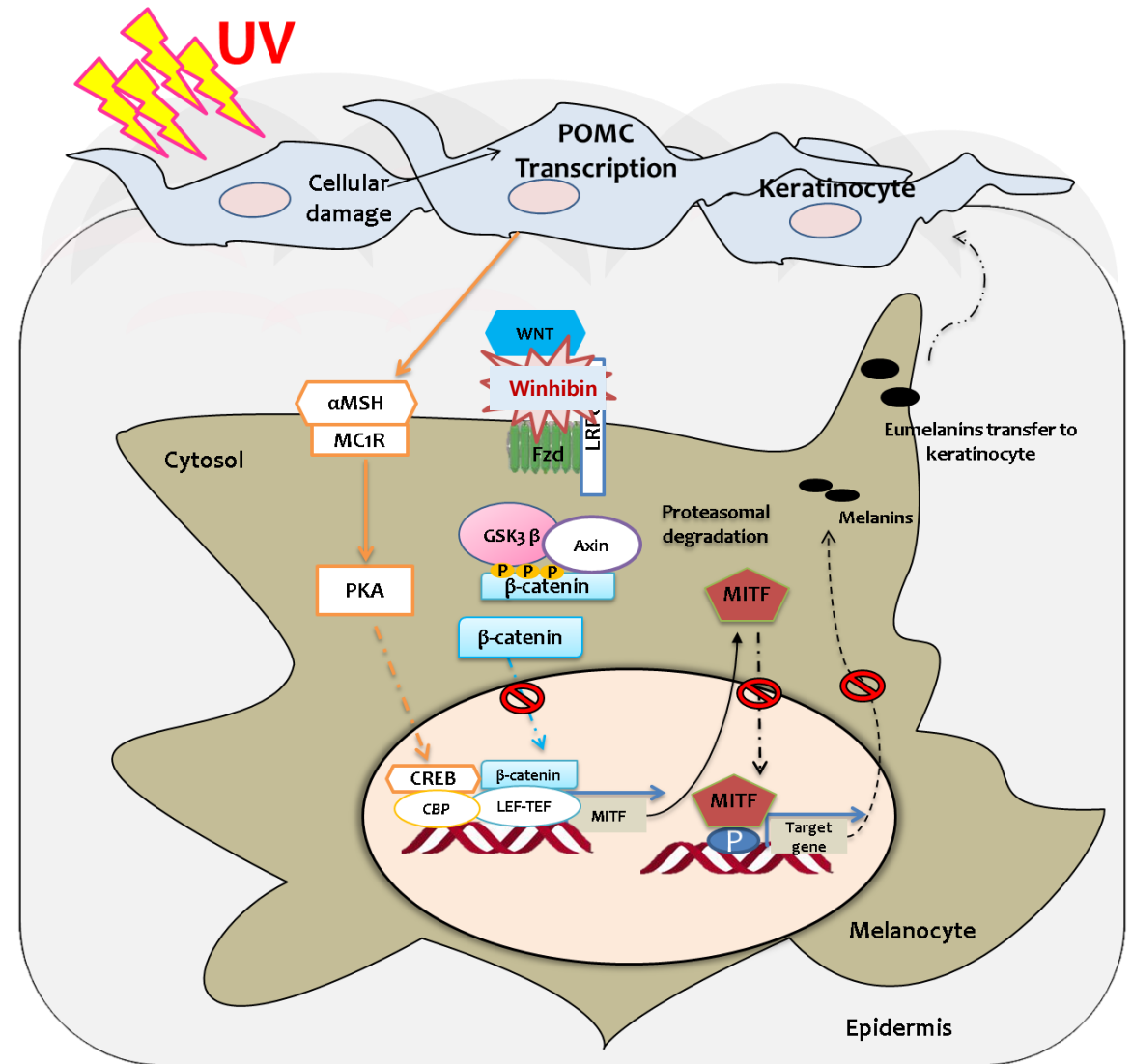
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1. WINHIBIN™

GENERAL INFORMATION:

Winhibin™ is a tripeptide derived from SFRP5, an antagonist of Wnt signaling. It inhibits melanogenesis through the induction of β -catenin degradation and subsequent suppression of microphthalmia-associated transcription factor (MITF) expression



2. Technical Data (Specification)

Index		Winhibin™
INCI	Peptide	Palmitoyl Tripeptide-53 Amide
	Solvent	Propanediol (Zemea® Propanediol)
Origin		Synthesized peptide
Application		Moisturizing, Enhancing Skin Barrier, Firming
Recommend Dosage		1 - 3%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

- 1) Winhibin™ helps to reduce skin pigmentation including formation of freckles and blemishes, thereby exerting a skin-whitening effect.
- 2) In addition, it helps brighten dull skin tone and obtain a clear and translucent skin, resulting in the improvement of skin brightness and clarity.

Applications

- 1) Whitening and tone up serum and cream for anti-pigmentation effect.
- 2) Cosmetics or OTC products for skin protection from sunburn

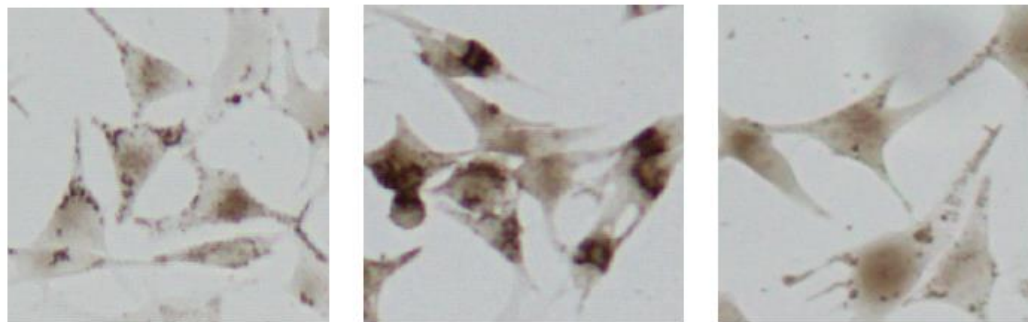
4. Efficacy (*In vitro*)

Inhibitory effect on melanogenesis

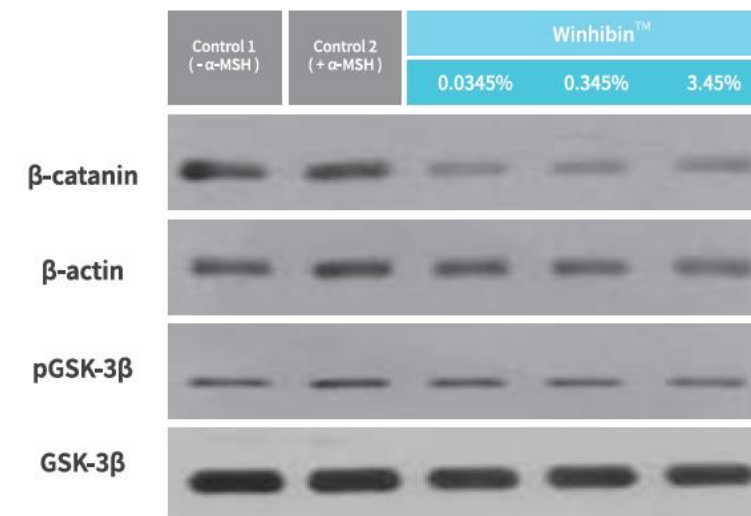
Normal human melanocytes



B16F1 mouse melanoma cell



Inhibitory effect on the expression of beta-catenin and pGSK-2 in Wnt signaling pathway



4. Efficacy (*Testimonial*)

■ Skin whitening effect



*Serum containing 4% winhibin™ applicated

■ Skin brightening effect



*Cream containing 1% Winhibin™ applicated

5. Safety

In Vivo Test

Skin Irritation

Human skin compatibility Evaluation Test of 4 samples including “Winhibin™ 5%”

Method

1. Subject Selection: 32 subjects who met the selection criteria and not included in exemption criteria were selected.
2. Application Method: Single application 24hr occluded patch test.
3. Evaluation Method: Skin reactions were classified according to a pre-defined scoring scale. The irritancy of the product was judged by the calculated irritation index.

Result

- 1) The irritation index of “Winhibin™ 5%” was “0.005”
 - 2) The irritation index of “Winhibin™ 10%” was “0.005”
 - 3) The irritation index of “Winhibin™ 25%” was “0.005”
 - 4) The irritation index of “Winhibin™ 50%” was “0”
- “Winhibin™ 5%”, “Winhibin™ 10%”, “Winhibin™ 25%” and “Winhibin™ 50%” may be considered to have **no irritancy** to human skin.

Regenerate your Skin

SYNEPIN™

| Skin Regeneration
Anti-Aging

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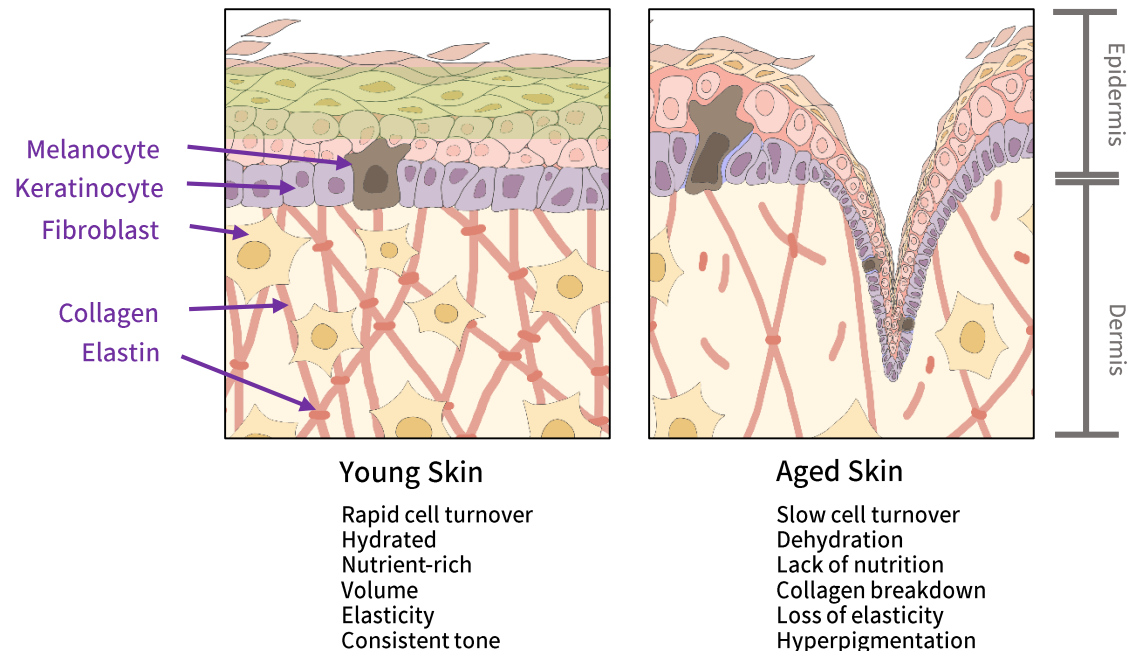
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2. Technical Data (Specification)
3. Cosmetic Property & Application
4. Efficacy (*In vitro* / *In vivo*)
5. Safety

1. SYNEPIN™

Skin aging and cellular turnover

Cellular turnover is the shedding of dead skin cells and the replacement of those dead skin cells with younger ones. it's natural for cellular turnover to slow as you age. With age, the regeneration of the skin slows, and external damages like sun exposure and free radicals weaken the cellular functions necessary to maintain youthful skin.

For aging skin to begin restoring itself, a fully hydrated, nutrient-rich environment, with robust communication and turnover is required between the epidermis and dermis.

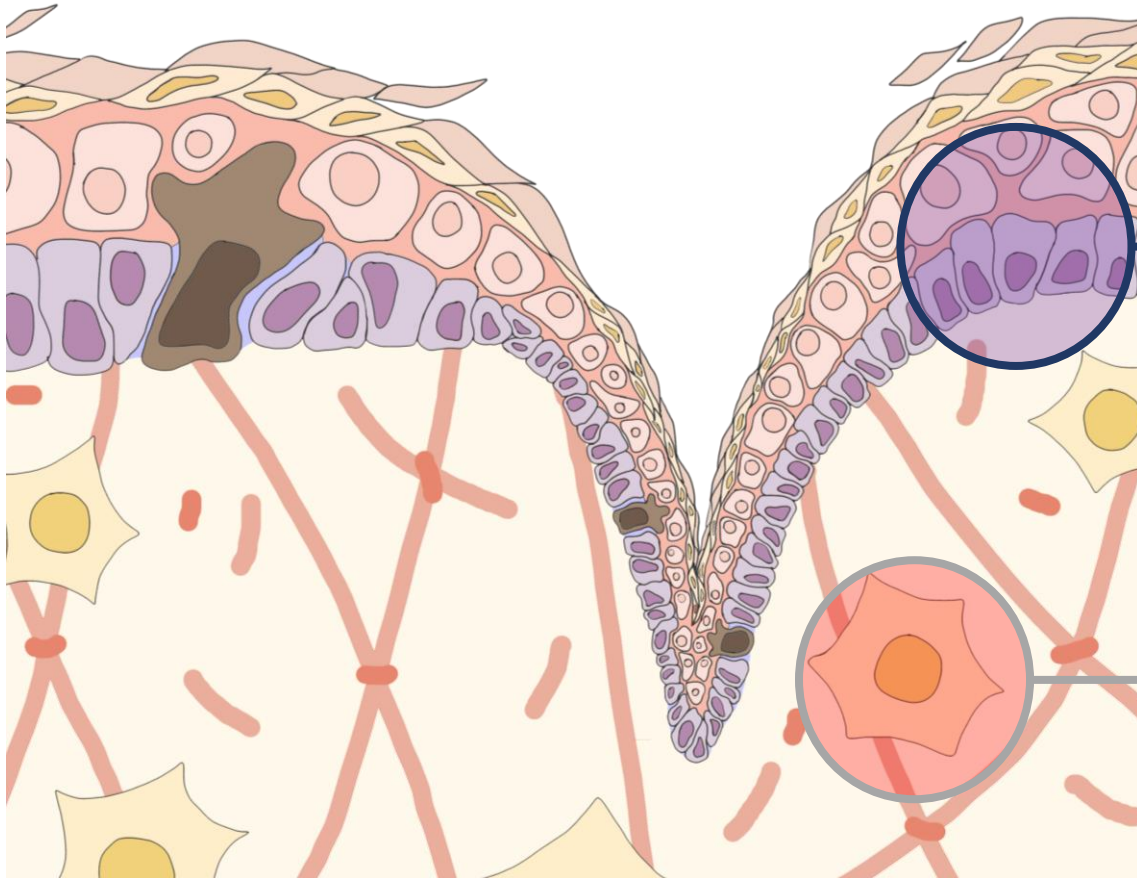


Age	Turn over time
Infants	14 days
Teens	14-28 days
20's	24-30 days
30's	28-35 days
40's	30-42 days
50's+	45-84 days

Skin cell turnover by age

Since it's natural for cellular turnover to slow as you age, we need to use products that boost turnover for anti-aging.

1. SYNEPIN™



SYNEPIN™

As an **epidermal growth factor (EGF) tripeptide**, Palmitoyl sh-Tripeptide-3 Amide from Synepin™ recognizes and binds to a specific site of EGF receptor that lies on the outer layer of the skin. Once this happens, the skin cells' EGF receptors deliver a message to increase the production of cells in a specific area.

Synepin™ boosts cellular turnover by facilitating the growth of keratinocytes and dermal fibroblasts. Synepin™ works by attracting cells to a wound site to initiate repair process, which is an essential part of skin regeneration.

SYNDERMIN™

As a fibroblast growth factor (FGF) agonist tripeptides, Syndermin™ can penetrate the dermis interact with FGF receptors, and boosts cellular turnover inducing the proliferation and differentiation of keratinocytes and dermal fibroblasts, thereby enhancing the synthesis of collagen and elastin.

2. Technical Data (Specification)

Index		Synepin™
INCI	Peptide	Palmitoyl sh-Tripeptide-3 Amide
	Solvent	Propanediol (Zemea® Propanediol)
CAS#		2171458-70-9
Origin		Synthesized peptide
Application		Skin regeneration, Wrinkle reduction
Recommend Dosage		1 - 2%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

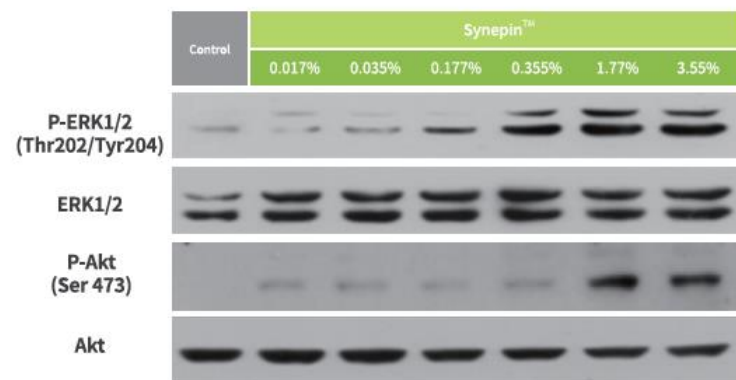
- 1) Synepin™ facilitates the growth of keratinocytes and dermal fibroblasts, as well as collagenous fibers (collagenesis).
- 2) Synepin™ works by attracting cells to a wound site to initiate repair process, which is an essential part of skin regeneration.
- 3) Synepin™ helps reduce wrinkles and fine lines through its potent regenerating properties.

Applications

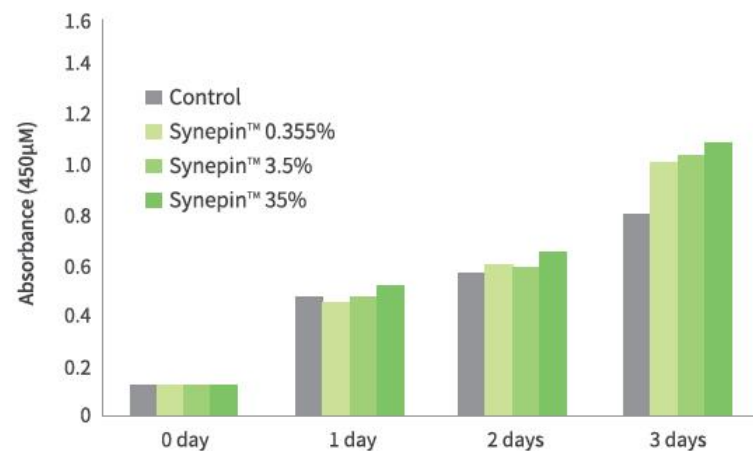
- 1) Skin repair serum and cream for anti-aging effect.
- 2) Cosmetics or OTC products for hair regeneration.

4. Efficacy (*In vitro*)

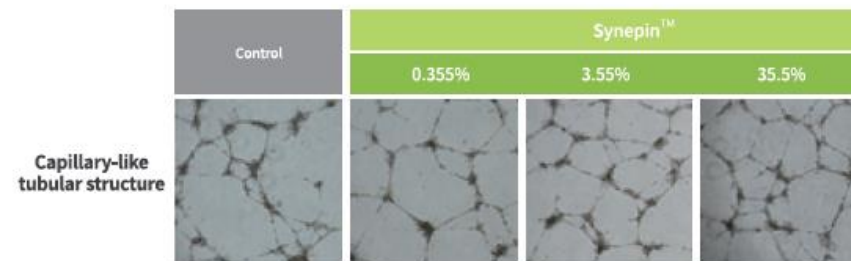
■ Activation of ERK1/2 and Akt



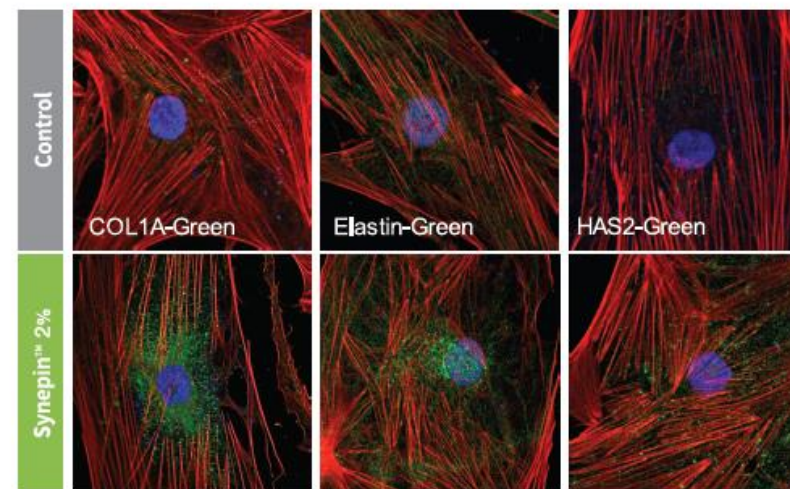
■ Promotion of the proliferation of the human keratinocyte cell, HaCaT



■ Enhancement of neo-angiogenesis in HUVEC



■ Upregulation of Collagen, Elastin and HAS2 synthesis in human fibroblast, CCD-986sk

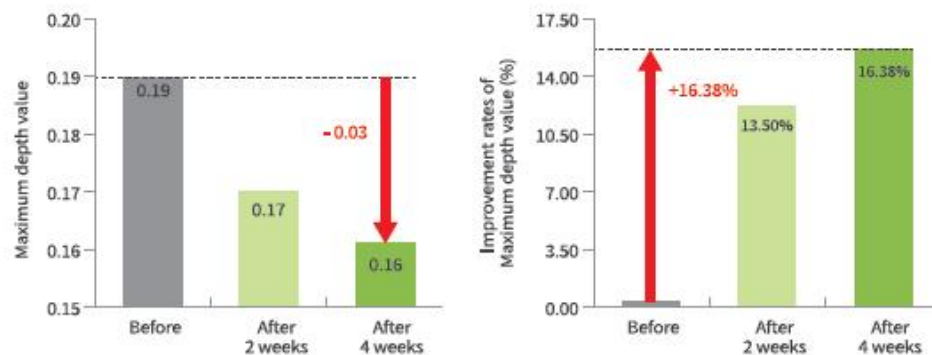


4. Efficacy (*In vivo*)

Effect on the Improvement of Crow's Feet Depth

Test protocol

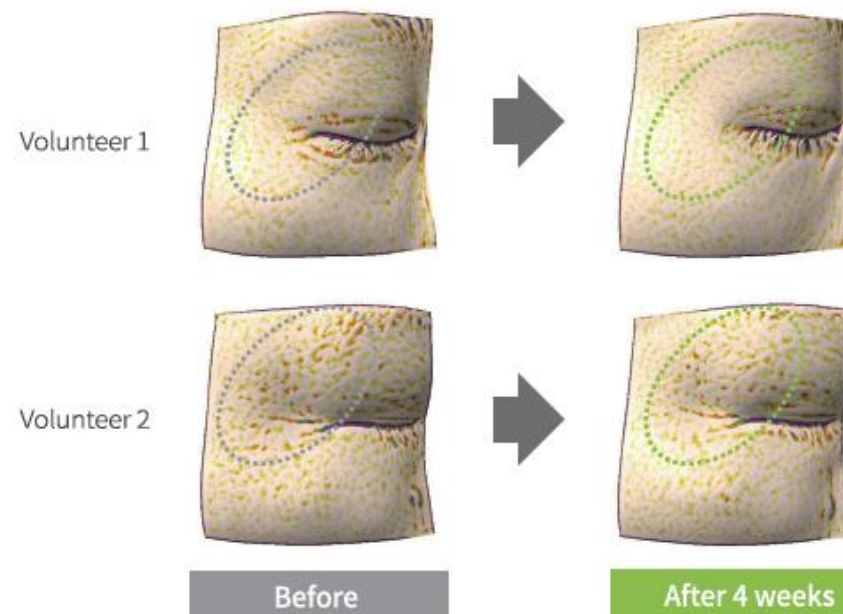
- 24 volunteer (Women, 32 to 59 years old).
- Application of a solution containing 5% Synepin™, 2x/day on the crow's feet area
- Crow's feet depth measurement using ANTERA 3D.



* Statistically significant when compared to control $p < 0.001$

Synepin™ improves crow's feet depth substantially.

Photos of Crow's Feet Depth



Synepin™ significantly reduces the appearance of crow's feet wrinkles and fine lines.

5. Safety

In Vivo Test

Skin Irritation

A safety test of 'Synepin™ 1%' after 24 hours patch on human skin

Method

Thirty four healthy volunteers participated in the patch test using Finn Chamber on skin. Each of Finn Chambers containing a test material were fixed on the upper back of the subjects after cleaning up the test area with 70% ethanol and drying. 20 µL of a test material was dropped into a filter paper disc fixed on 8 mm Finn chamber. The test area was assessed at 30 minutes, 24 hours and 48 hours after a single application during 24 hours patch on the subjects. Skin reactions were scored by a dermatology specialist, following the criterion of International Contact Dermatitis Research Group (ICDRG).

Result

According to the criterion of International Contact Dermatitis Research Group (ICDRG), mean score was calculated after categorizing the degree of skin reaction. No skin reaction was noticed at 30 minutes, 24 hours and 48 hours after removing patch of 'Synepin™' on the test area and the mean score obtained was 0.00. Thus, the test material can be considered as **non irritant**.

Rejuvenate your Skin

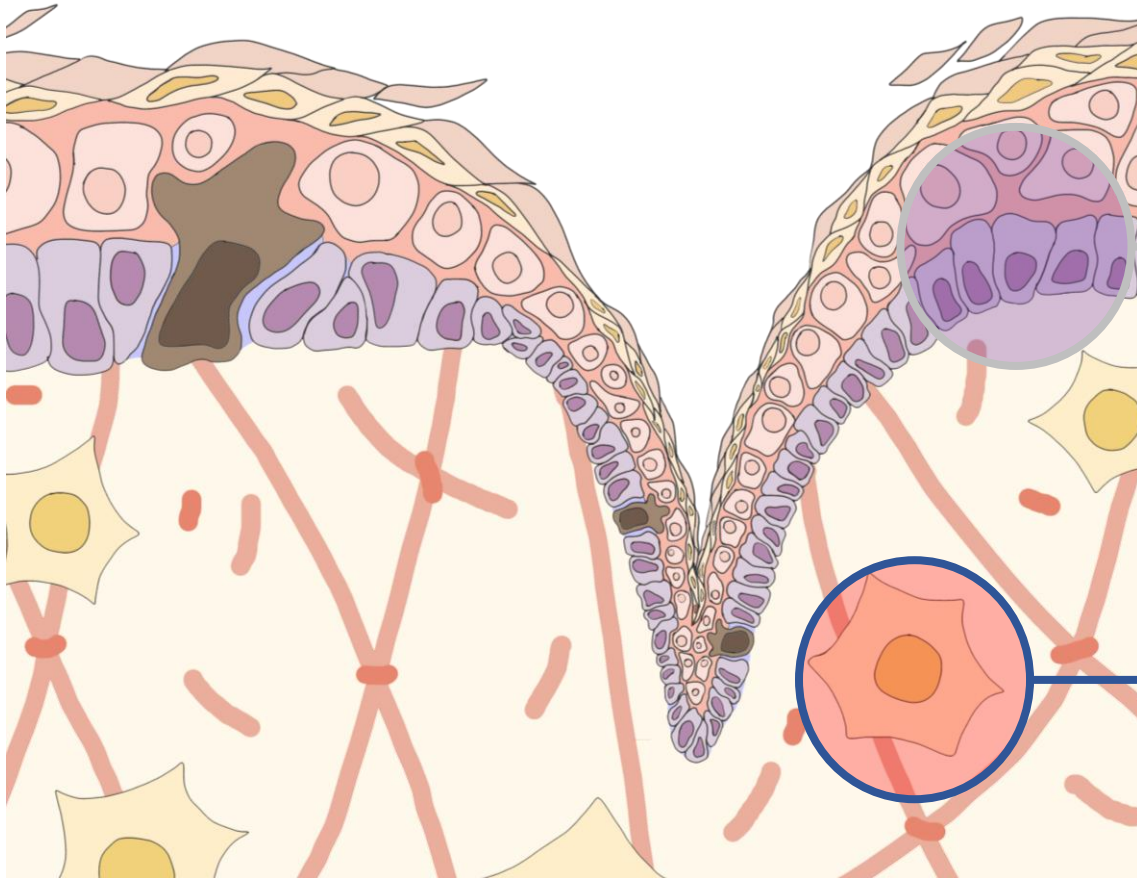
SYDERMIN™

 Skin Rejuvenation
Anti-Aging

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3. Cosmetic Property & Application
4. Efficacy (*In vitro* / *In vivo*)
5. Safety

1. SYNDERMIN™



SYNEPIN™

As an epidermal growth factor (EGF) tripeptide, Palmitoyl sh-Tripeptide-3 Amide from Synepin™ recognizes and binds to a specific site of EGF receptor that lies on the outer layer of the skin. Once this happens, the skin cells' EGF receptors deliver a message to increase the production of cells in a specific area.

Synepin™ boosts cellular turnover by facilitating the growth of keratinocytes and dermal fibroblasts. Synepin™ works by attracting cells to a wound site to initiate repair process, which is an essential part of skin regeneration.

SYNDERMIN™

As a **fibroblast growth factor (FGF)** agonist tripeptides, Syndermin™ can penetrate the dermis interact with FGF receptors, and **boosts cellular turnover** inducing the proliferation and differentiation of keratinocytes and dermal fibroblasts, thereby **enhancing the synthesis of collagen and elastin**.

2. Technical Data (Specification)

Index		Syndermin™
INCI	Peptide	Palmitoyl sh-Tripeptide-1 Amide
	Solvent	Propanediol (Zemea® Propanediol)
Origin		Synthesized peptide
Application		Skin regeneration, Wrinkle reduction
Recommend Dosage		1 - 4%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

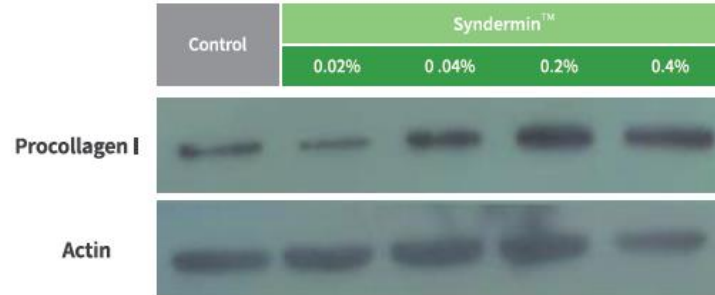
- 1) Syndermin™ can penetrate the dermis interact with FGF receptors, and induce the proliferation and differentiation of keratinocytes and dermal fibroblasts resulting in regeneration of skin
- 2) Syndermin™ induces the proliferation and differentiation of dermal fibroblasts, which in turn enhances the synthesis of collagen and elastin resulting in the reduction of wrinkles and rejuvenation of skin tone and texture.

Applications

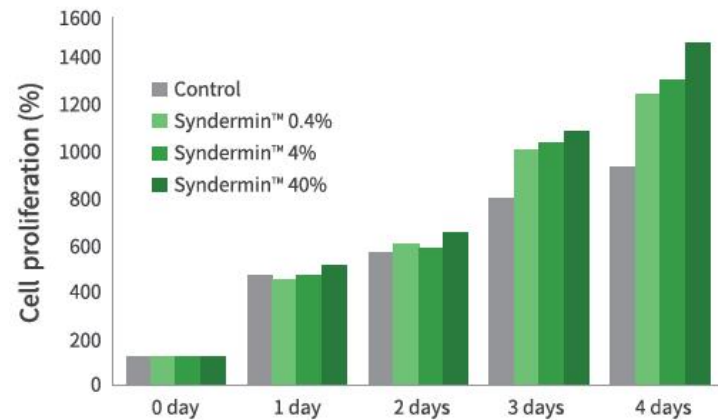
- 1) Skin repair serum and cream for anti-aging effect.
- 2) Cosmetics or OTC products for hair regeneration.

4. Efficacy (*In vitro*)

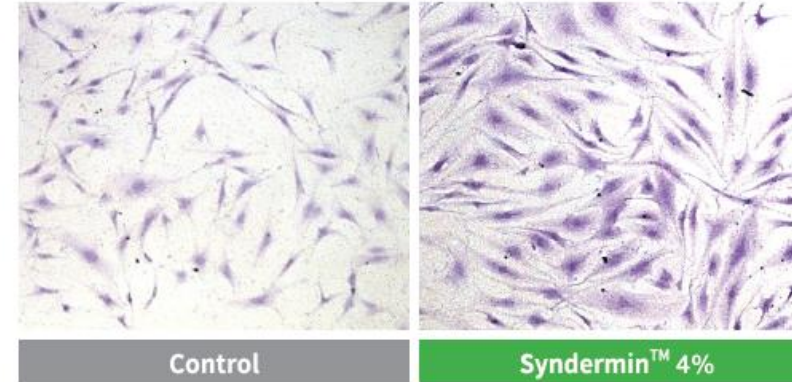
■ Increase in the expression of type 1 procollagen in human dermal fibroblasts



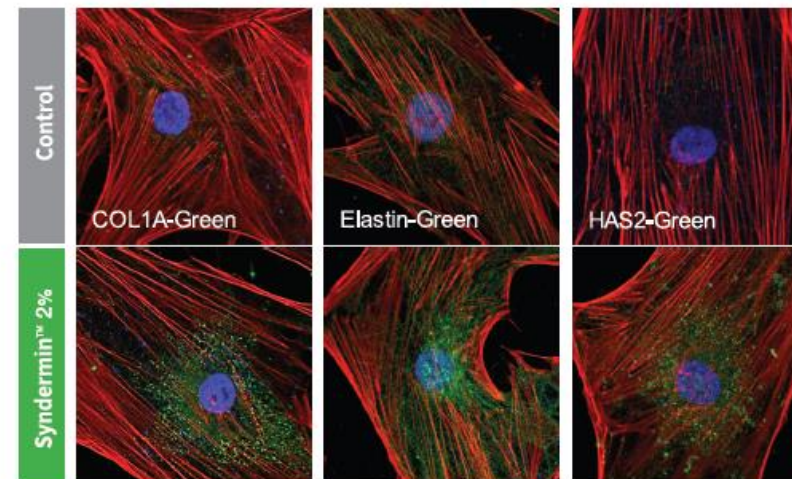
■ Promotion of the cultured human keratinocyte cell line, HaCaT



■ Promotion of the proliferation of the human fibroblast cell, CCD-986sk



■ Upregulation of collagen, elastin, and HAS2 expression in human fibroblast, CCD-986sk

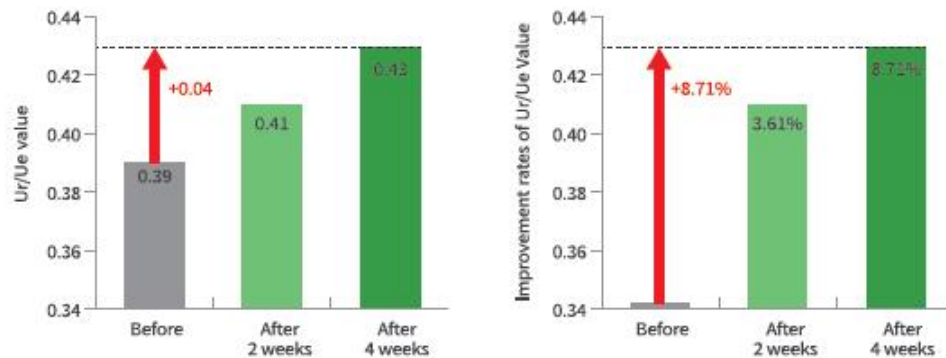


4. Efficacy (*In vivo*)

The Effects on the Improvement of Dermal Elasticity

Test protocol

- 24 volunteer (Women, 32 to 59 years old).
- Application of a solution containing 1% Syndermin™, 2x/day on the cheek
- Dermal Elasticity measurement using Dermal Torque Meter.



* Statistically significant when compared to control $p < 0.001$

Syndermin™ increases dermal elasticity substantially

The Reduction of the Crow's Feet

Test protocol

- 1 volunteer (Men, 40s).
- Application of a serum containing 2% Syndermin™, 2x/day on crow's feet



Syndermin™ significantly reduces the appearance of crow's feet wrinkles and fine lines.

5. Safety

In Vivo Test

Skin Irritation

A safety test of ‘Syndermin™ 1%’ after 24 hours patch on human skin

Method

Thirty four healthy volunteers participated in the patch test using Finn Chamber on skin. Each of Finn Chambers containing a test material were fixed on the upper back of the subjects after cleaning up the test area with 70% ethanol and drying. 20 µL of a test material was dropped into a filter paper disc fixed on 8 mm Finn chamber. The test area was assessed at 30 minutes, 24 hours and 48 hours after a single application during 24 hours patch on the subjects. Skin reactions were scored by a dermatology specialist, following the criterion of International Contact Dermatitis Research Group (ICDRG).

Result

According to the criterion of International Contact Dermatitis Research Group (ICDRG), mean score was calculated after categorizing the degree of skin reaction. No skin reaction was noticed at 30 minutes, 24 hours and 48 hours after removing patch of ‘Syndermin™’ on the test area and the mean score obtained was 0.00. Thus, the test material can be considered as **non irritant**.

Soothe your skin

ENFIBIN™



Soothing
Sun-Care
Anti-inflammation

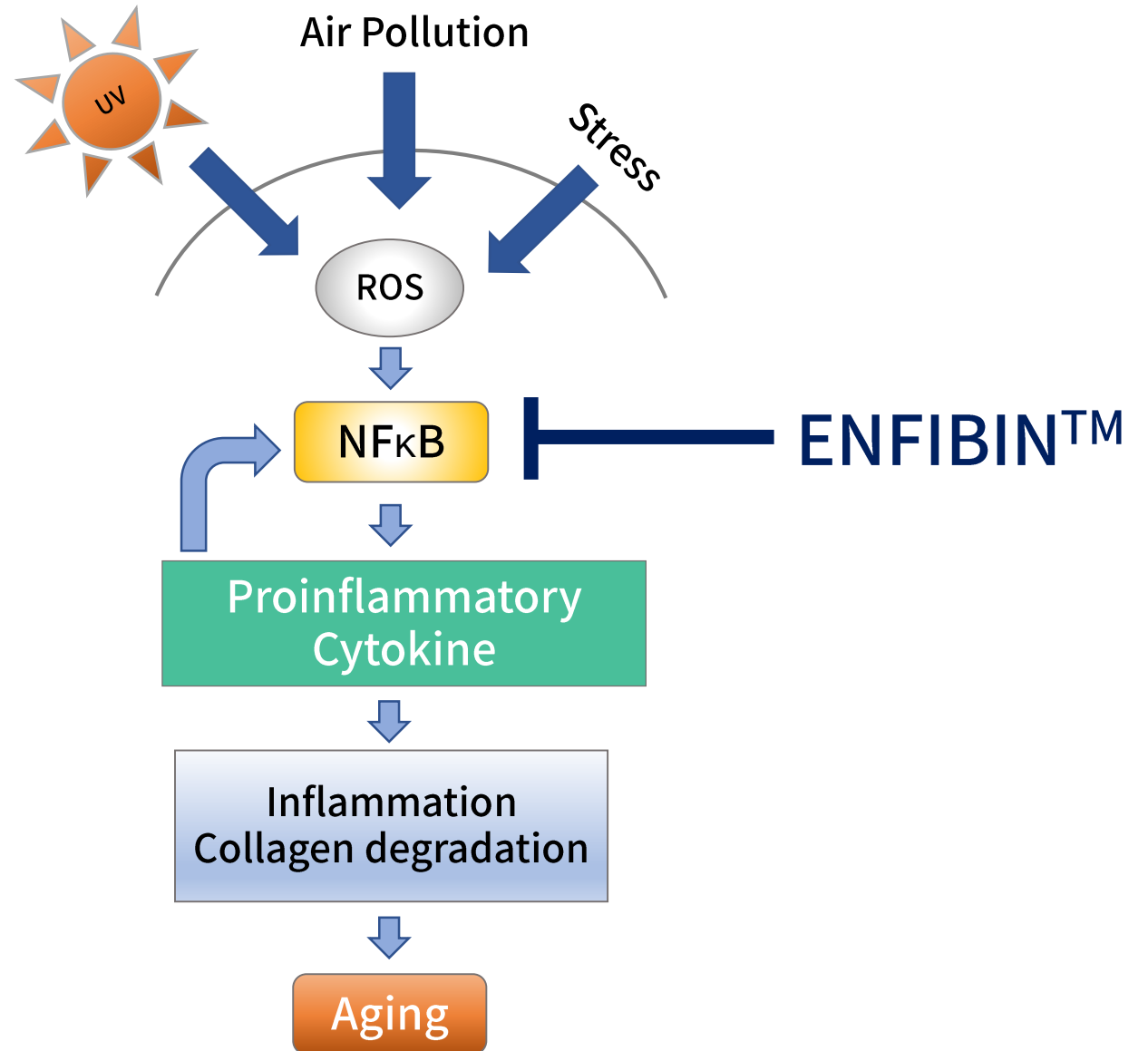
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3. Cosmetic Property & Application
4. Efficacy (*In vitro*)

1. ENFIBIN™

GENERAL INFORMATION:

Enfibrin™ Tripeptide inhibits the pro-inflammatory function of NFκB, a transcription factor involved in the proinflammatory responses. NFκB is a transcription factor involved in the proinflammatory responses causing the skin aging and inflammation. Enfibrin inhibits NFκB activity, thereby functions as cosmetic ingredients for skin soothing, anti-inflammation, and anti-photoaging.



2. Technical Data (Specification)

Index		Binterin™
INCI	Peptide	Palmitoyl Tripeptide-52 Amide
	Solvent	Propanediol (Zemea® Propanediol)
Origin		Synthesized peptide
Application		Anti-inflammation, Sun-Care, Soothing, lipolysis
Recommend Dosage		1 - 5%
Appearance		Transparent
Specific Gravity		1.000 ± 0.100
Total Aerobic Microbial Count		0 (Less than 100 cfu/g)
Heavy metals	Pb	Not Detected (ug/g)
	As	Not Detected (ug/g)
	Hg	Not Detected (ug/g)
Storage		In Clean, Cool and Dark place
Shelf Life (at 25 °C)		24 Months
Solubility		Water-soluble

3. Cosmetic Property & Application

Cosmetic Properties

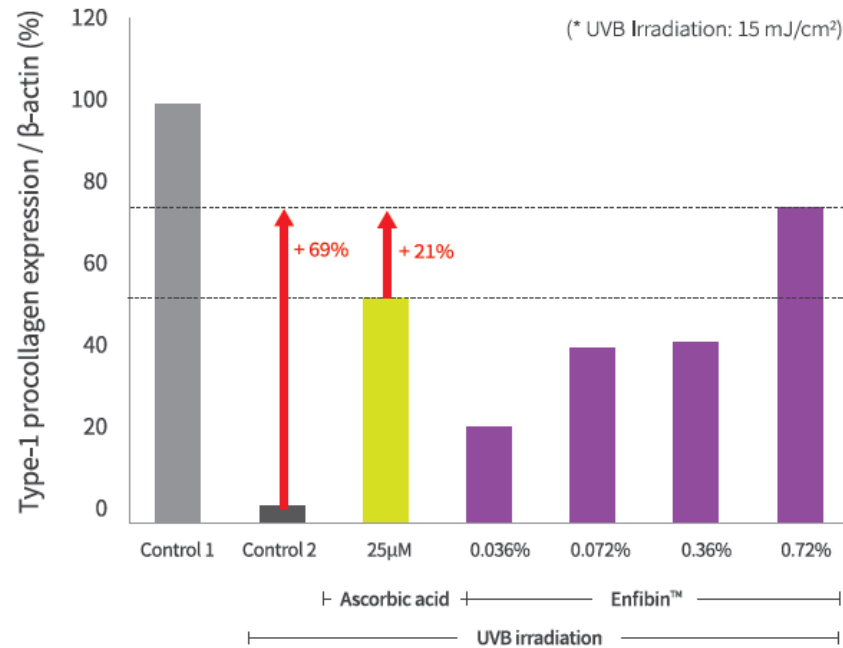
- 1) 'Enfibrin™' helps soothe irritated skin and relieve discomfort by modulating inflammatory reactions.
- 2) 'Enfibrin™' prevents skin photoaging by suppressing UV-induced breakdown of extracellular matrix proteins in dermis.

Applications

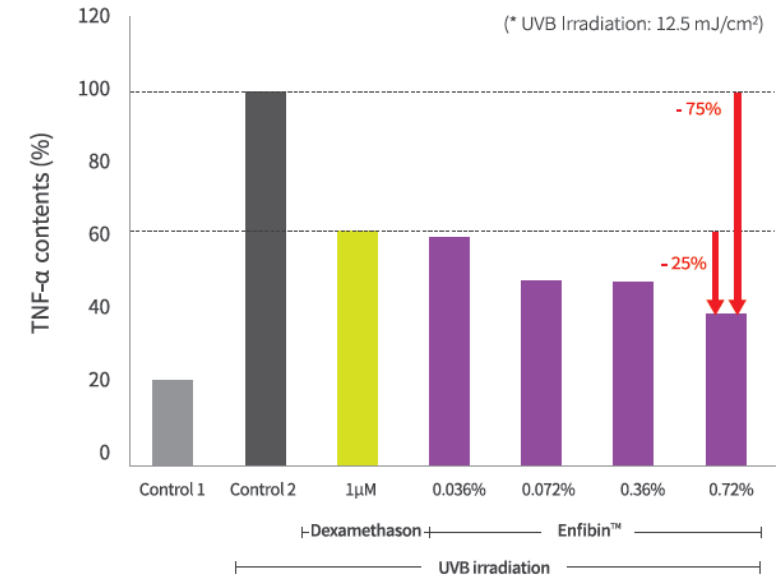
- 1) Rapid soothing and anti-inflammatory effects after clinical treatments such as laser, microdermabrasion, skin exfoliation, tattooing and tattoo removal.
- 2) Recovery serum, cream and facial mask for personal care.

4. Efficacy (*In vitro*)

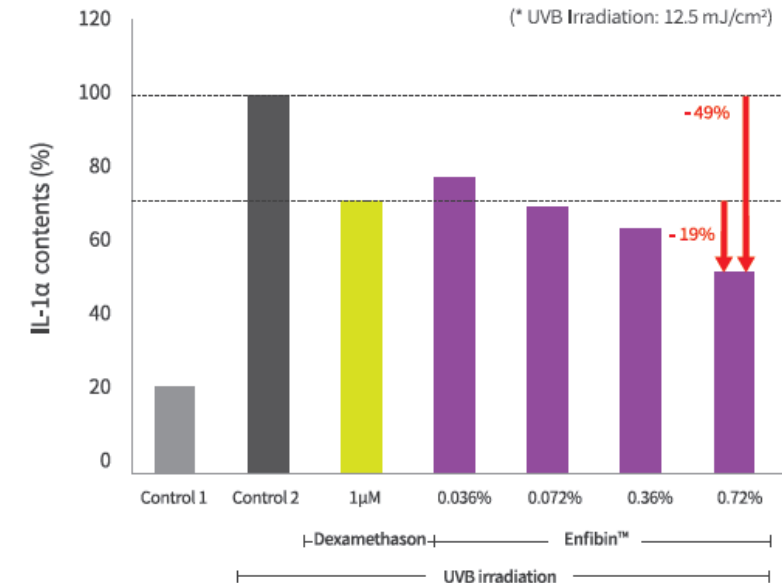
Inhibition of UVB-induced MMP-1 expression



Inhibitory effect on increase of TNF-α induced by UVB irradiation



Inhibitory effect on increase of IL-1α induced by UVB irradiation



THANK YOU

