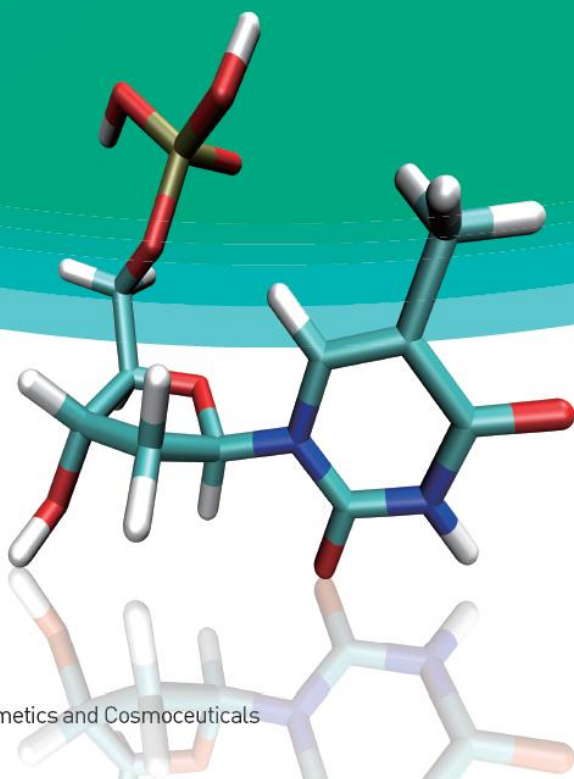


Peptides as Cosmetic Ingredient



Provides Functional Cosmetic Ingredients for High Value Cosmetics and Cosmeceuticals

<http://www.cosmo-bio.com>

<http://www.biofdnc.com>

전남 화순군 화순읍 내평리 121번지(산단길 12-55번지) 전남생물의약품연구센터 내 (주)바이오에프디앤씨 김수정 연구개발이사
Tel: 82-61-373-8381 Fax: 82-61-373-8382 e-mail: sjkim@biofdnc.com homepage: www.cosmo-bio.com

BIO-FD&C Peptides List

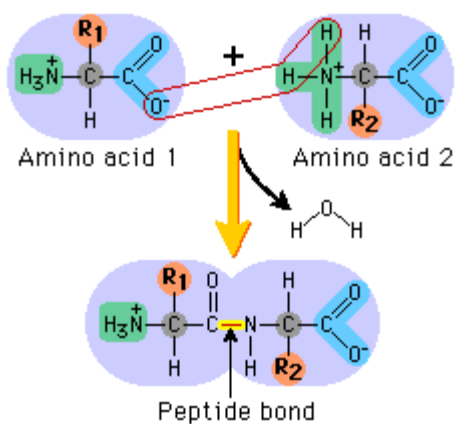
Anti-aging Peptide	Anti-wrinkle peptide	Whitening peptide	Anti-hair loss & hair growing peptide
BF-Dynorphin	Elastin essential peptide	Cyclitol	Anagen
BF-Enkephalin	Elastin anti-wrinkle peptide	ElaX-MV	Elanoren
Epiderm-X	Healix	Gallovac	Elastin scalp peptide
Heal-VB7	Keratin essential peptide	Melabet	Elastin hair peptide
Neuropeptide-1	Lipovax	Purosol	HG-Thymopentin
Neoendorphin	Prospin	Redovax	HG-Phyto-Thymopentin
Polyol	Skinup-US	Respep	Innogrowin
Rejuccell-US	Silk essential peptide	Sonitin	Keratin essential peptide
Retinovax	Sinpep	Symvastin	Keratin scalp peptide
VH-Cellup	Wrinkle-X	Whitening peptide	Phyto-thymosin beta 4

Anti-inflammatory & Anti-oxidant peptide	Anti-microbial and skin protecting peptide	Anti-acne peptide	Anti-atopic dermatitis peptide
Antiox-VH	Anti-Microbial Peptide-Aurein	Acnobet	Phyto-NEP
Qtant		Acnoheal	
Ursolin		Acnoin	
Phytopeptide-1		Hairen	
Therapep			
Vitamin peptide			

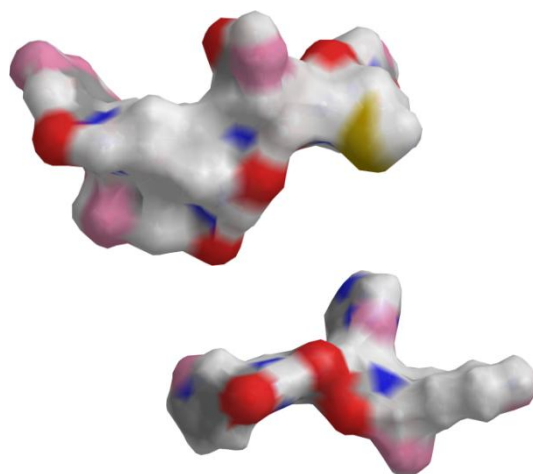


What is Peptides ?

Peptides are short polymer formed from the linking, in a defined order, of α -amino acid. The link between one amino acid residue and the next is known as an amide bond or a peptide bond.



Peptide bond



Molecular structure of BIO-FD&C biomimetic peptide

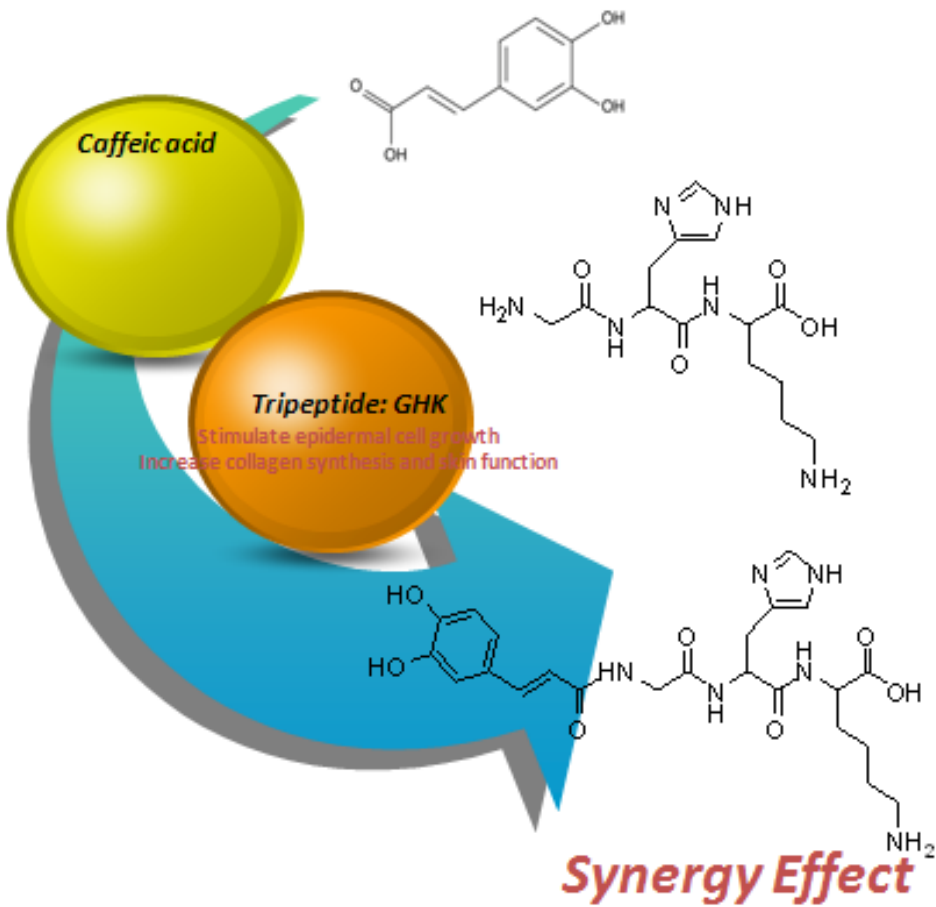
BIO-FD&C Cosmetic Biomimetic Peptides ?

- *highly active biological materials can bind cellular receptors*
- *physically stable in cosmetic chemical conditions*
- *very small to effectively penetrate skin barrier and transdermal layers*
- *highly safe based on amino acid composition*

● General Information

Trade Name	Phytopeptide-1™
INCI Name	Caffeoyl Tripeptide-1
Molecular Characteristics	Skin cell stimulating tripeptide (GHK) conjugated with caffeic acid
Product Type	Pure Peptide Powder or Nanoencapsulated Solution
Cosmetic Function	Strong anti-oxidant and anti-inflammatory effect
Biological Function	Rejuvenating on aged or damaged skin & hair cells by strong anti-oxidant effect
Recommended Dosage	~ 50 ppm

Phytopeptide-1 is caffeoyl tripeptide !



What is GHK ?

GHK Defines the Biochemical Reactions of Tissue Remodeling

Loren Pickart and Francoise Pickart

Skin Biology
4122 Factoria Boulevard — Suite #200
Bellevue, Washington 98006

Skin remodeling follows initial wound events and subsequently restores normal tissue morphology. During tissue breakdown, the extracellular matrix generates GHK, a human peptide, which activates remodeling processes. Published results on GHK actions define the biochemical processes for remodeling.

GHK has a high affinity for copper 2+ and forms of complex GHK-Cu. These two molecules activate remodeling processes: (1) Chemoattraction (macrophages, mast cells, capillary cells); (2) Anti-inflammation (suppresses free radicals, thromboxane formation, release of oxidizing iron, TGF-beta-1, TNF-alpha, protein glycation). Simultaneously, anti-inflammatory actions increase superoxide dismutase, vasodilation, block ultraviolet damage to skin keratinocytes, and increase fibroblast recovery after X-ray treatments; (3) Increased synthesis of collagen, elastin, metalloproteinases, anti-proteases, vascular endothelial growth factor, FGF-2, NGF, neutrotropins 3 and 4, and erythropoietin; (4) Increased proliferation of fibroblasts and keratinocytes; plus increased nerve outgrowth, angiogenesis, and hair follicle size GHK stimulates stem cell proliferation while GHK-Cu induces stem cell differentiation.

GHK-Cu stimulates healing in numerous models and in humans. On aged humans, it tightens skin, improves elasticity and firmness, reduces fine lines, wrinkles, photodamage, and hyperpigmentation. It also improves hair transplant success, protects hepatic tissue from tetrachloromethane poisoning, blocks stomach ulcer development, heals intestinal ulcers and bone tissue.

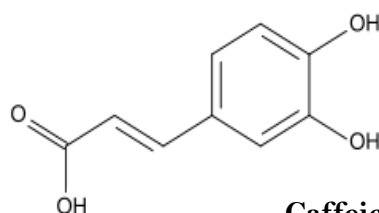
The use of growth factors to heal diabetic ulcers has not been clinically successful, but the above observations suggest alternative therapies. Ulcers could be treated with an initial use of scar forming factors (e.g. TGF-beta-1 or peptides with similar actions) to induce protective covering, followed by the use of GHK-Cu to induce remodeling and remove scar tissue. Also, GHK might be used to lower tissue copper in wounds and stimulate stem cell production, followed by GHK-Cu to induce differentiation.

*Wound Healing Society Meeting
April 24-28th, 2008
San Diego, CA*

What is Caffeic acid ?



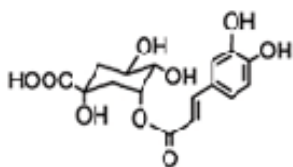
Major physiological active Chlorogenic acids in coffee



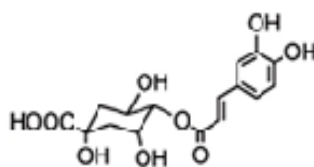
Caffeic acid

Chlorogenic acids

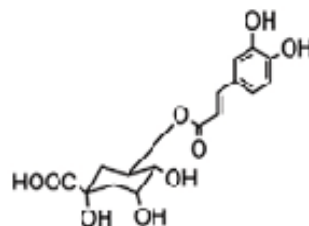
Chlorogenic acids are actually a family of esters formed between quinic acid and phenolic compounds known as cinnamic acids. The most abundant chlorogenic acid in coffee is 5-O-caffeoylquinic acid, an ester formed between quinic acid and caffeic acid.



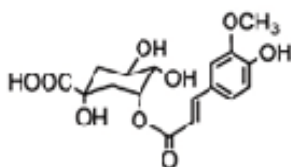
3-O-Caffeoylquinic acid



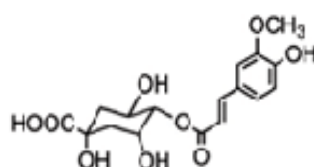
4-O-Caffeoylquinic acid



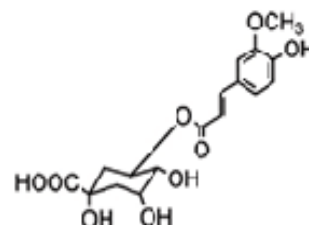
5-O-Caffeoylquinic acid



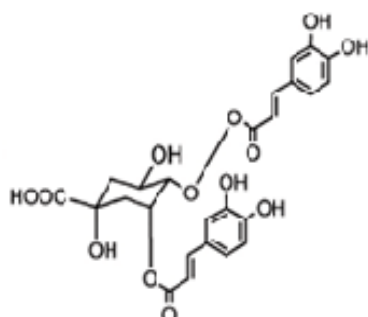
3-O-Feruloylquinic acid



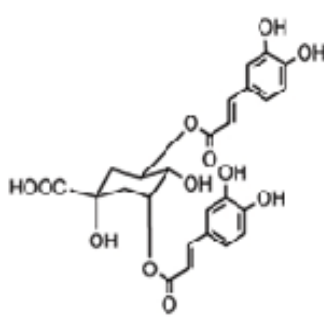
4-O-Feruloylquinic acid



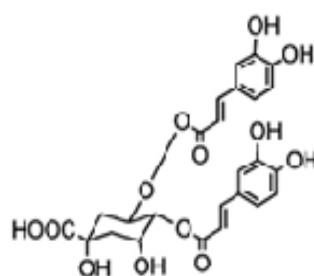
5-O-Feruloylquinic acid



3,4-O-Dicaffeoylquinic acid



3,5-O-Dicaffeoylquinic acid



4,5-O-Dicaffeoylquinic acid

What is Caffeic acid ?

- Support anti-oxidant system in body and skin (Fig. 1)
- Anti-inflammatory effect when skin was exposed by UVB (Fig. 2)
- Anti-Allergy effect (Fig. 3)

Ref) *CARCINOGENESIS*, 27:1803-1811 (2006)

Fig. 1

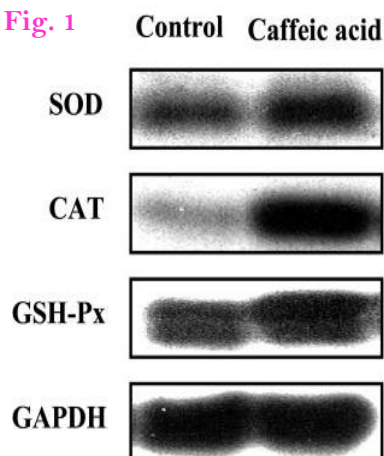


Fig. 2

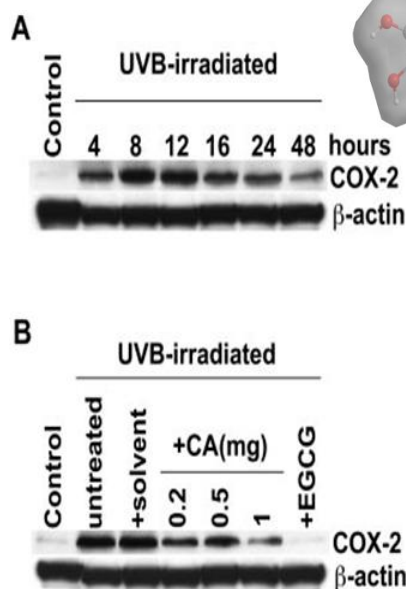
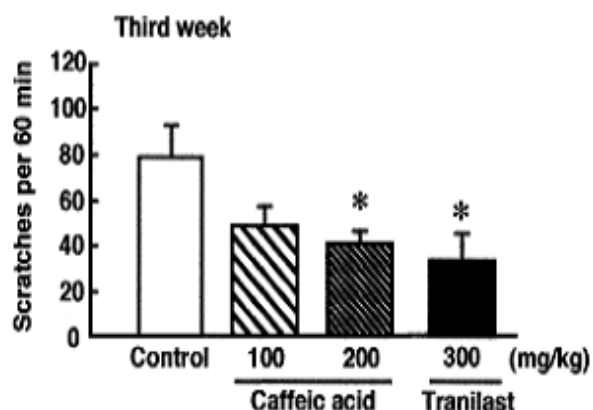
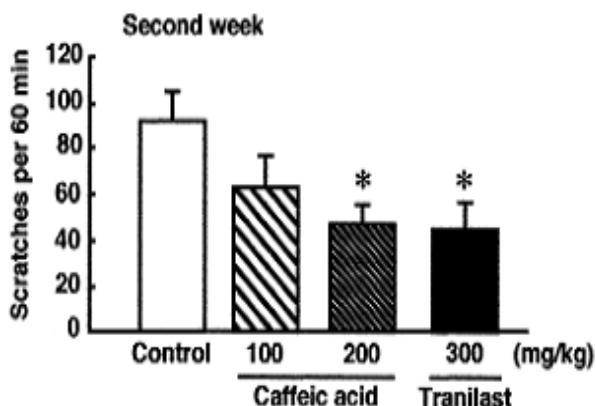
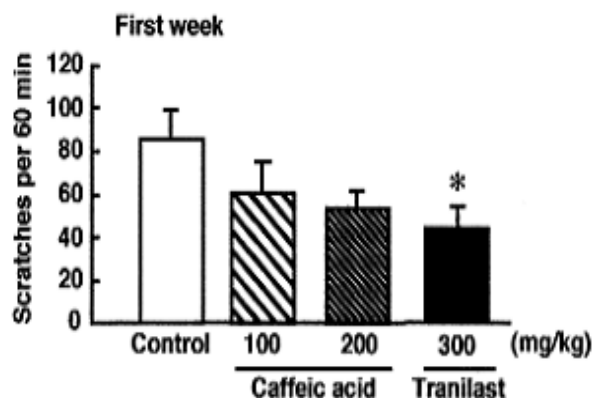
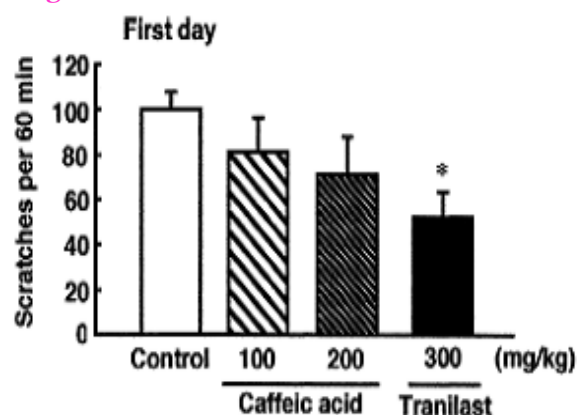
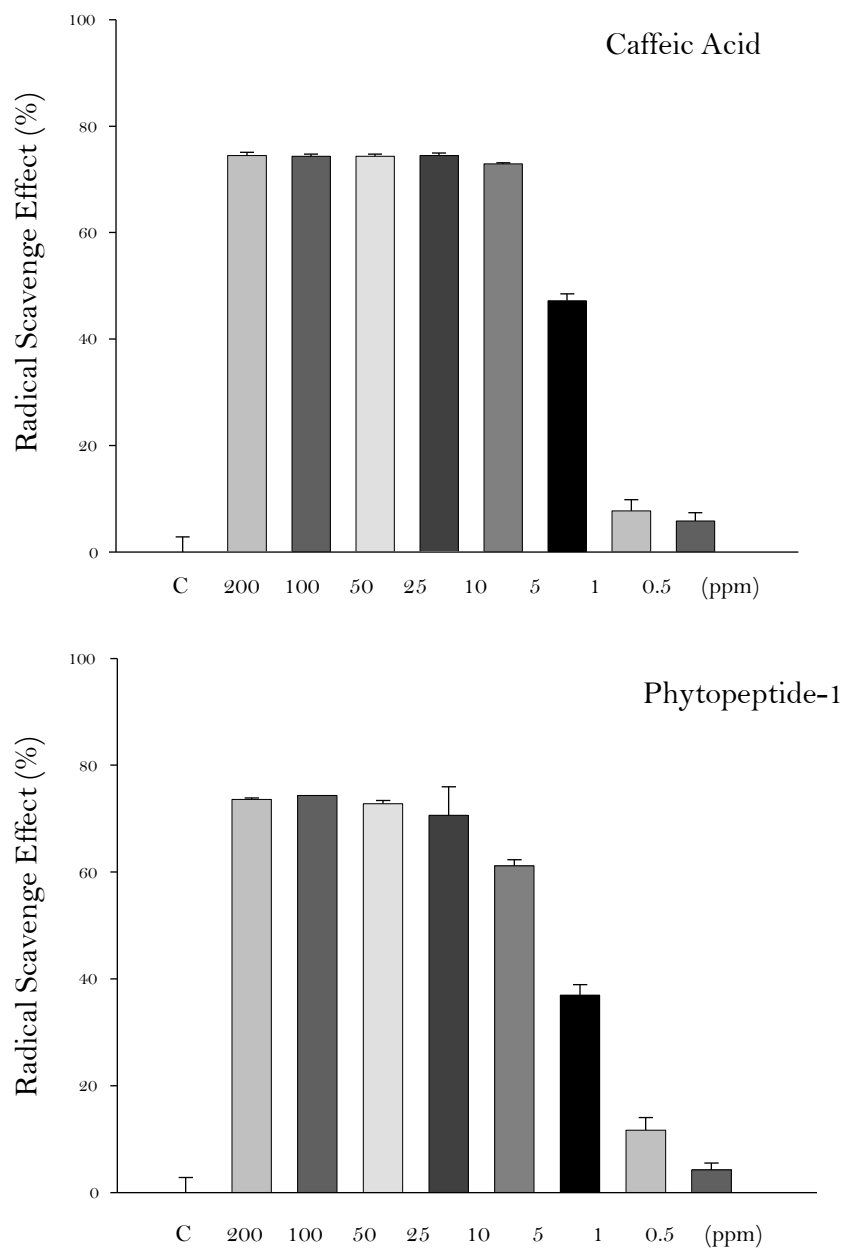


Fig. 3



Ref) *THE JOURNAL OF PHARMACOLOGY AND EXPERIMENTAL THERAPEUTICS*, 318:476-483 (2006)

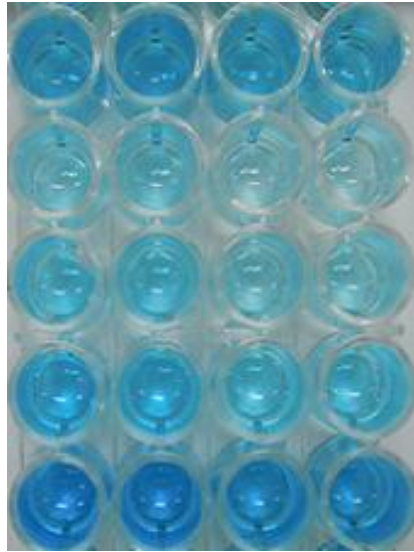
Anti-Oxidant Effect of Caffeic acid and Caffeoyl GHK by Reducing Free-Radicals of DPPH



Phytopeptide show strongest anti-oxidant effect similar natural caffeic acid and prologed stability (more than 10 times) in solution.

Phytopeptide give best anti-oxidant effect and skin cell protecting effect for your skin and hair !

Anti-aging Effect of Phytopeptide-1 by stimulating collagen synthesis



Control: Retinol 50 IU

control: D.W. group

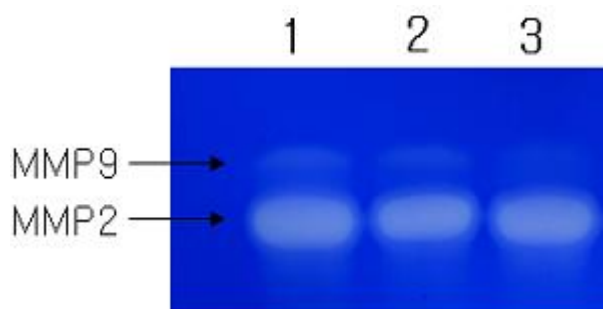
Phytopeptide-1 1ppm

Phytopeptide-1 10 ppm

Phytopeptide-1 25 ppm

25ppm, Phytopeptide-1 stimulated high expression of collagen on fibroblast cell line, CCD-986sk for 48 hrs.

The expression level of collagen was two times higher than control group treated well known **Retinol 50 IU**



Lane 1: D.W. control

Lan2 2: Phytopeptide-1, 1ppm

Lan2 3: Phytopeptide-1, 25ppm

25ppm, Phytopeptide-1 reduced the expression of MMP-9 on fibroblast cell line, CCD-986sk for 48 hrs, also.

Skin trouble reduction (from preliminary clinic study)
by Phytopeptide-1 (Caffeoyl Tripeptide-1)



Before



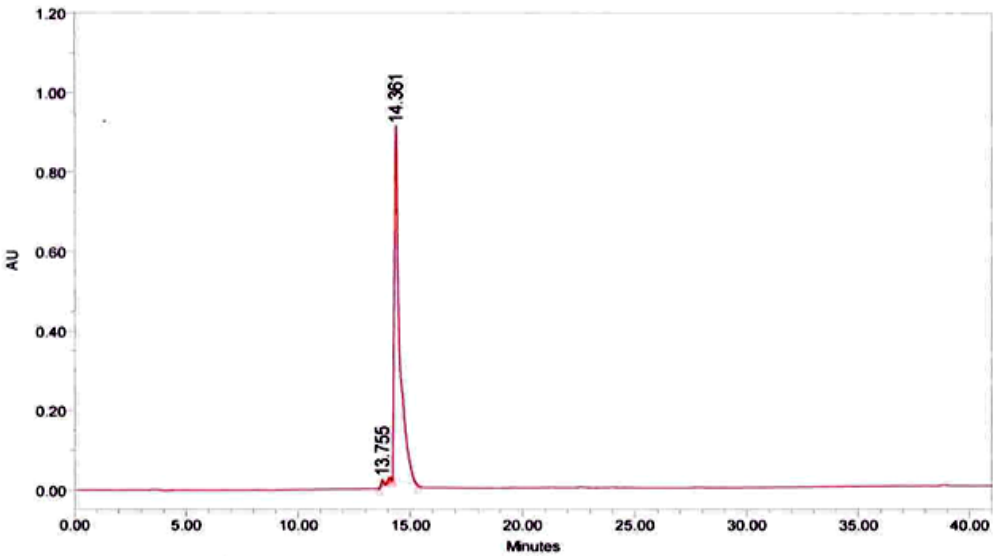
After

Quality control on Phytopeptide-1 (Caffeoyl Tripeptide-1)
By highly qualified system

SAMPLE INFORMATION

Sample Name: Caffeoyl-tripeptide
Sample Type: Unknown
Vial: 1
Injection #: 1
Injection Volume: 20.00 ul
Run Time: 41.0 Minutes

Acquired By: System
Date Acquired: 2010-06-22 오후 1:55:08
Acq. Method Set: condition1_anal
Date Processed: 2010-06-23 오전 10:21:26
Processing Method: Caffeoyl tripeptide
Channel Name: 484



	Retention Time (min)	Area	% Area	Height
1	13.755	224593	1.50	17629
2	14.361	14771188	98.50	891286

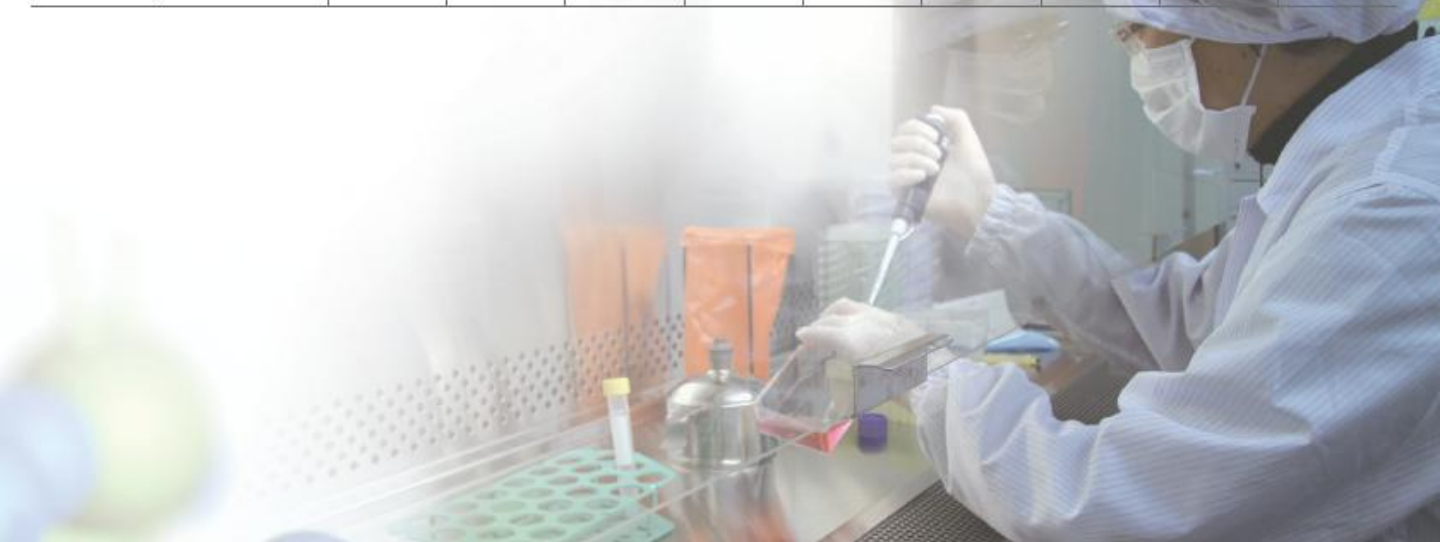
Do you need more peptide ?

BIO-FD&C Peptides Selection Guide

Biomimetic Peptides	Anti-aging	Anti-wrinkle	Whitening	Anti-hair loss & hair growing	Anti-inflammation	Anti-oxidant	Anti-microbial	Anti-acne	Anti-atopy
BF-Dynorphin	★★★	★★		★★					
BF-Enkephalin	★★★	★★		★★					
Epiderm-X	★★★	★★	★	★	★	★★			
Heal-VB7	★★★	★★	★	★★	★	★			
Neuropeptide-1	★★★	★★		★★					
Neoendorphin	★★★	★★		★★					
Polyol	★★★	★	★★		★	★			★
Rejucell-US	★★★	★	★		★	★			
Retinovax	★★★	★★		★	★★	★			
VH-Cellup	★★★	★	★★	★★	★	★		★	
Elastin essential peptide	★★	★★★		★★					
Elastin anti-wrinkle peptide	★★	★★★		★					
Healix	★	★★★	★	★	★★	★★			
Keratin essential peptide	★★	★★★		★★					
Lipovax	★	★★★		★★	★★	★★		★	
Prospin	★★	★★★	★★		★	★			
Skinup-US	★★	★★★	★		★	★		★	★
Silk essential peptide	★★	★★★		★★					
Sinpep	★	★★★		★			★★		
Wrinkle-X	★★	★★★			★	★	★		
Cyclitol	★		★★★		★★	★★		★	★
ElaX-MV		★	★★★		★		★		
Gallowax	★		★★★		★★	★★		★	★
Melabet	★★	★	★★★		★★				
Purosol		★	★★★	★	★	★			
Redovax		★	★★★	★	★★	★★		★	
Respe	★		★★★		★★	★			
Sonitin	★	★	★★★		★	★			
Symvastin		★	★★★		★★	★★		★	★
Whitening peptide	★		★★★						

Peptides Selection Guide

Biomimetic Peptides	Anti-aging	Anti-wrinkle	Whitening	Anti-hair loss & hair growing	Anti-inflammation	Anti-oxidant	Anti-microbial	Anti-acne	Anti-atopy
Anagen	★	★	★★	★★★★					
Elanoren	★	★	★★	★★★★			★★	★	★
Elastin scalp peptide	★	★		★★★★					
Elastin hair peptide	★	★		★★★★					
HG-Thymopentin		★	★	★★★★					
HG-Phyto-Thymopentin		★	★	★★★★	★	★	★		
Innogrowin		★		★★★★	★				
Keratin essential peptide	★	★★		★★★★					
Keratin scalp peptide	★	★	★	★★★★					
Phyto-thymosin beta 4		★	★	★★★★	★	★			
Antiox-VH	★				★★★★	★★★★			
Qtant	★	★	★		★★★★	★★★★		★	
Ursolin		★★	★		★★★★	★★★★		★	
Phytopeptide-1		★★	★		★★★★	★★★★			★
Therapep		★★	★		★★★★	★★★★			★
Vitamin peptide		★★	★★		★★★★	★★★★			
Anti-Microbial Peptide-Aurein							★★★★	★★	★★
Acnobet							★★	★★★★	★
Acnoheal							★★	★★★★	★
Acnoin							★★	★★★★	★
Hairen	★	★					★★	★★★★	★★
Phyto-NEP		★★		★★★★	★★	★★		★★	★★★★



Provides Functional Cosmetic Ingredients for
High Value Cosmetics and Cosmeceuticals



BIO-FD&C

*Innovative Leader
in Cosmeceutical Ingredient*

Phytopeptides
*from BIO-FD&C revolutionizes anti-aging
and skin cell rejuvenating!*

***BIO-FD&C Co., Ltd.,
We are your innovative partner for
your most valuable cosmetics!***

Phytopeptides are the latest innovations from BIO-FD&C skin research. Phytopeptides are bio-active ingredients obtained cutting-edge technologies improving efficacy, solubility, and stability of functional peptides by conjugating with various plant-originated phytochemicals possessing high anti-oxidant and anti-inflammation activities.



BIO-FD&C
(주)바이오에프디앤씨

In Jellanamdo Biopharmaceutical Research Center [JBRC], 121 Naepyeong-Ri,
Hwasun-Eup, Hwasun-Gun, Jellanamdo, S. Korea
BIO-FD&C Co., Ltd. Medicinal Nano-material Research Institute
Tel: 82-61-373-8381 Fax: 82-61-373-8382 e-mail: sjkim@biofdnc.com
Main office: 451-7 Nonhyun-Dong, Namdong-Gu, Incheon, Korea
<http://www.cosmo-bio.com> <http://www.biofdnc.com>