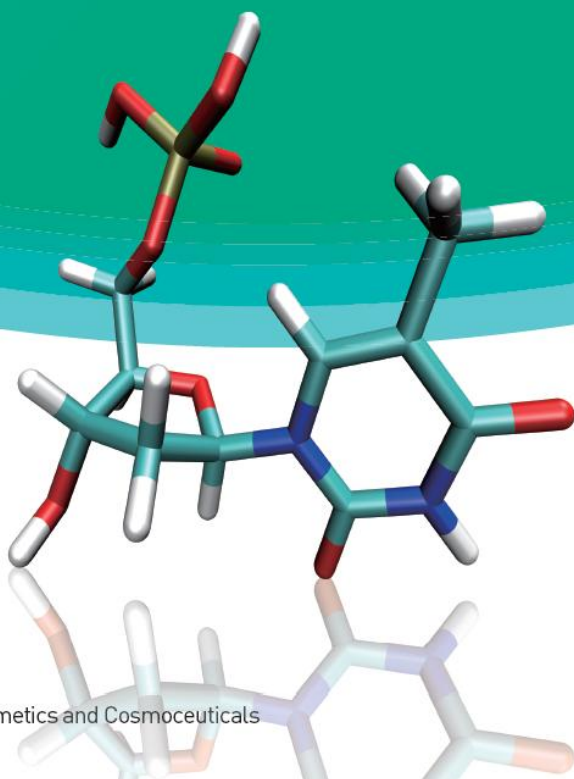


Peptides **as** **Cosmetic Ingredient**



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

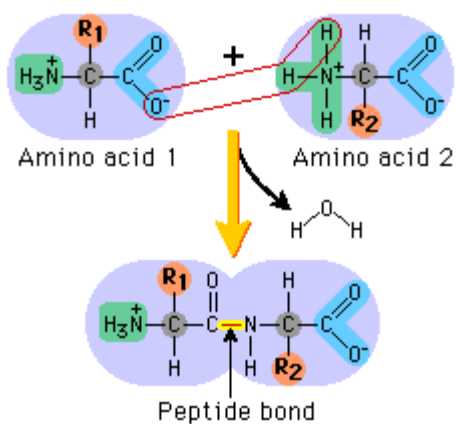
Anti-aging Peptide	Anti-wrinkle peptide	Whitening peptide	Anti-hair loss & hair growing peptide
BF-Dynorphin	Elastin essential peptide	Cyclitol	Anagen
BF-Enkephalin	Elastin anti-wrinkle peptide	ElaX-MV	Elanoren
Epiderm-X	Healix	Gallovac	Elastin scalp peptide
Heal-VB7	Keratin essential peptide	Melabet	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			

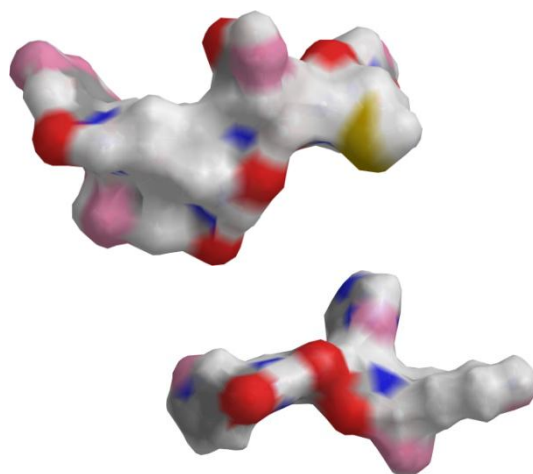


What is Peptides ?

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 ?

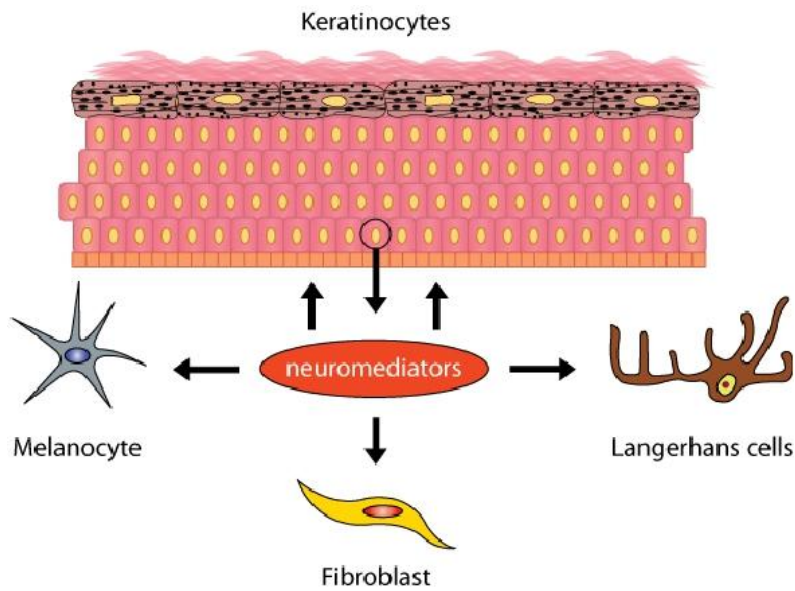
- *highly active biological materials can bind cellular receptors*
- *physically stable in cosmetic chemical conditions*
- *very small to effectively penetrate skin barrier and transdermal layers*
- *highly safe based on amino acid composition*

● General Information

Trade Name	Neoendorphin
INCI Name	sh-Decapeptide-9
Molecular Characteristics	Neuropeptide, chemically synthesized human pepetide
Product Type	Pure Peptide Powder or Liposome Encapsulated Solution
Cosmetic Function	Strong anti-aging and anti-wrinkle effect, Rejuvenating on aged hair tissue and follicles
Biological Function	reactivation of aged skin tissue and nerve system by supporting neuropeptides
Recommended Dosage	~ 20 ppm



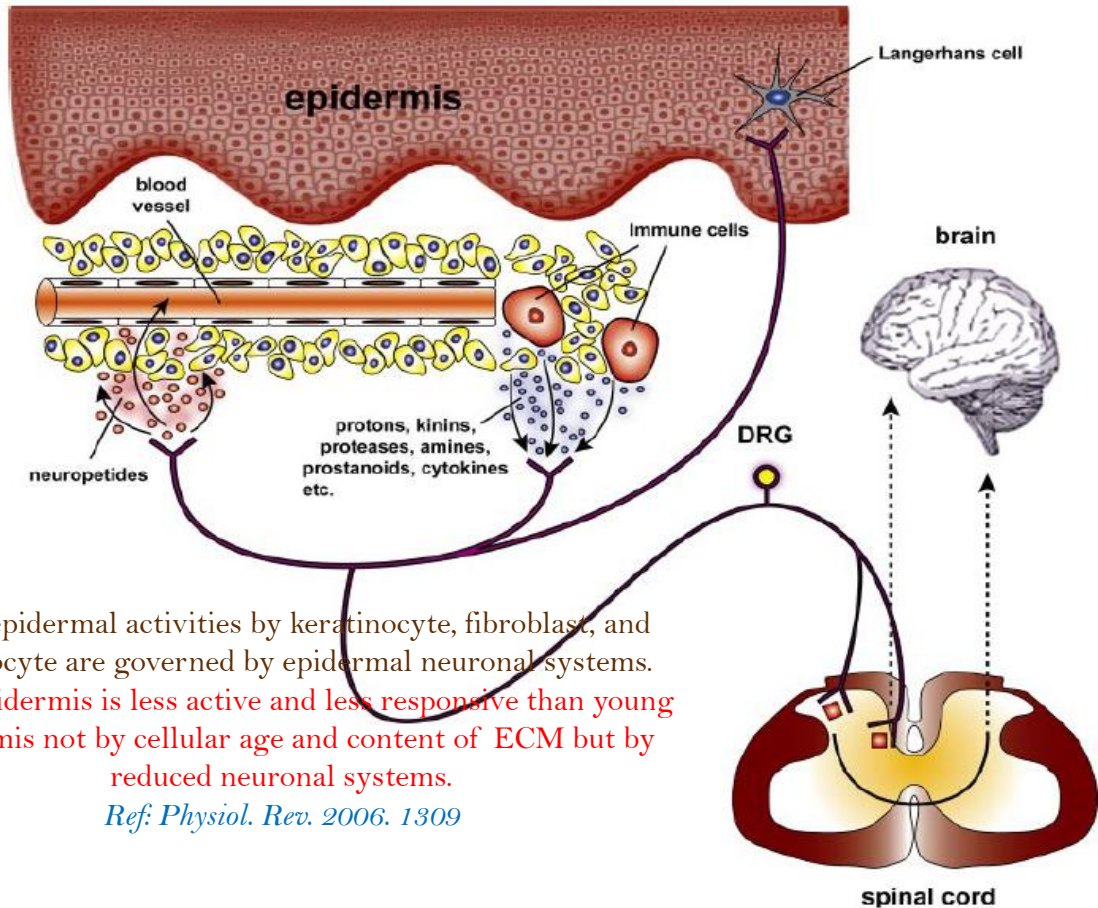
● Biological Mechanism of Neoendorphin



Communication with skin cells by neuromediators such as neoendorphin

Neurons are highly specialized for the processing and transmission of cellular signals. The axon terminal contains synapses, specialized structures where neurotransmitter chemicals (such as *neuropeptides*) are released to communicate with target neurons.

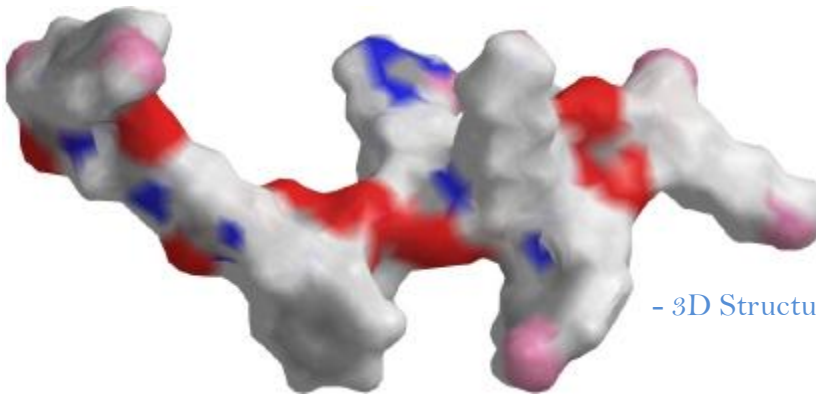
Neurons and Neuropeptides



Most epidermal activities by keratinocyte, fibroblast, and melanocyte are governed by epidermal neuronal systems. Aged epidermis is less active and less responsive than young epidermis not by cellular age and content of ECM but by reduced neuronal systems.

Ref: Physiol. Rev. 2006. 1309

Most Qualified Biomimetic Peptide for 20 Years



- 3D Structure of Neoendorphin -

Neoendorphin can directly bind to the kappa opioid receptor(KOR) on the plasma membrane of skin cells such as keratinocyte and fibroblast. And then it induce a variety of biological events such as wound healing and skin retexturizing.

R&D Background of Neoendorphin

Neuropeptides

Leu-Enkephalin
Met-Enkephalin } → Delta Opioid Receptor (**DOR**)

α -Neoendorphin
 β -Neoendorphin
Dynorphin A } → Kappa Opioid Receptor (**KOR**)

α -Endorphin
 β -Endorphin
 γ -Endorphin } → Mu Opioid Receptor (**MOR**)

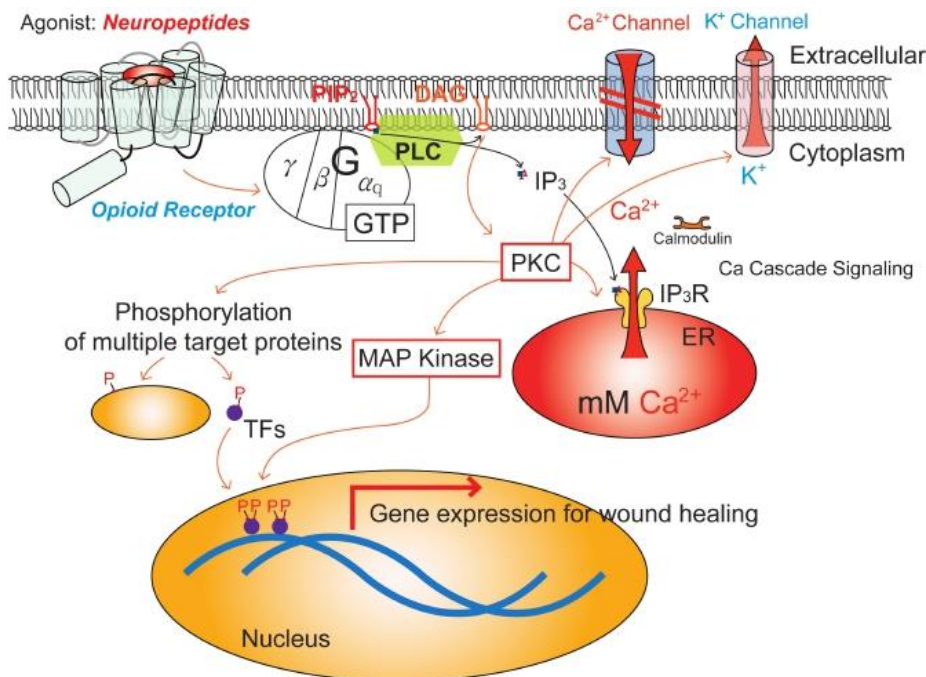
Opioid Receptor

The opioid receptors are G-protein coupled receptors (GPCRs) that inhibit neurotransmitter release by reducing Ca^{2+} ion currents and increasing K^{+} ion conductance.

Opioid receptors modulate a range of brain functions, including instinctive behavior and emotions and skin functions including wound healing and senescence.

How does neuropeptide activate skin cell physiology ?

Ref) Cellular physiology April 2004

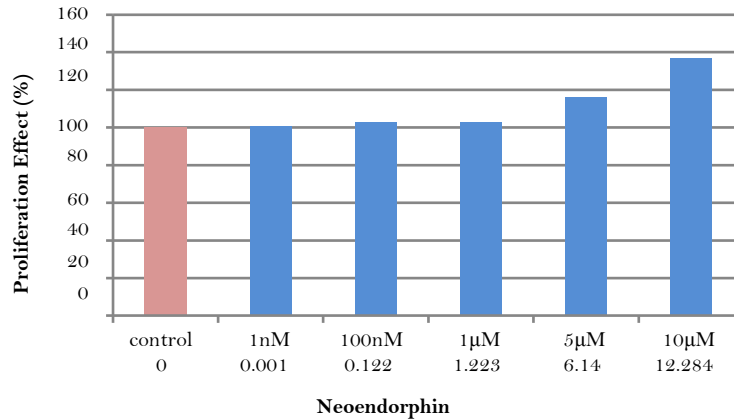


Neuropeptide Cascade Signaling

BIO-FD&C Co., Ltd

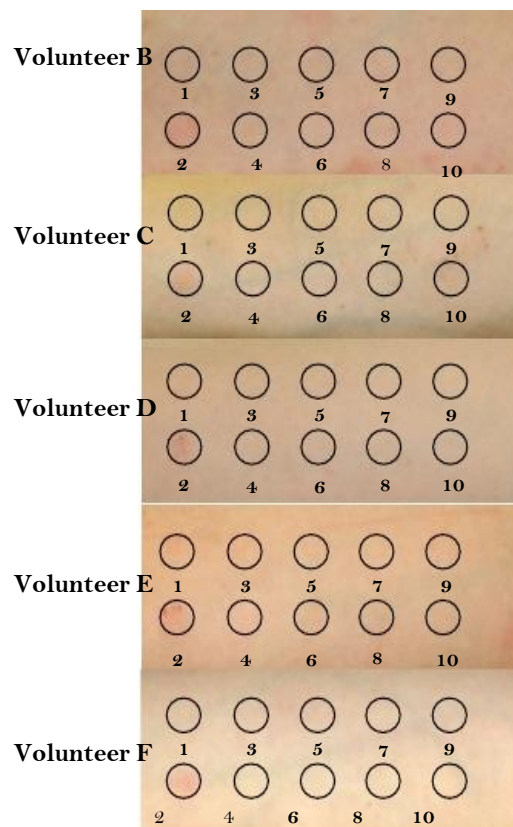
● Experimental Data

In vitro Safety on keratinocyte cells Cell (HaCaT)
after Neoendorphin Treatment for 48 hrs



Safety Data of Neoendorphin

Skin Irritation Test



(Treated Samples to Volunteers after 48hrs)

● Experimental Data



Clinical Test for Anti-wrinkle Effect of Neoendorphin

In this test, statistical analysis of test product for anti-wrinkle efficacy is based on 「Clinical Trials Statistical Guidelines (KFDA, 2000)」 & 「Guidelines for the validation of functional cosmetics(II)(KFDA, 2009)」



Clinical Data of Neoendorphin

The clinical result of the neoendorphin Contained cosmetic formula shown to reduced wrinkles dramatically after 8 weeks.



Conclusion

A comprehensive look at the results of this test, in part used test product applied to, an anti-wrinkle efficacy parameters to say wrinkle degree – has all decreased at eight week after use. It has significantly decreased statistically. It proved to be effective by expert's visual assessment and subjective survey to all the subjects in wrinkle improvement and no specific allergy reaction has not detected. In the end, this test product has an effectiveness in wrinkle improvement without skin irritation.



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
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