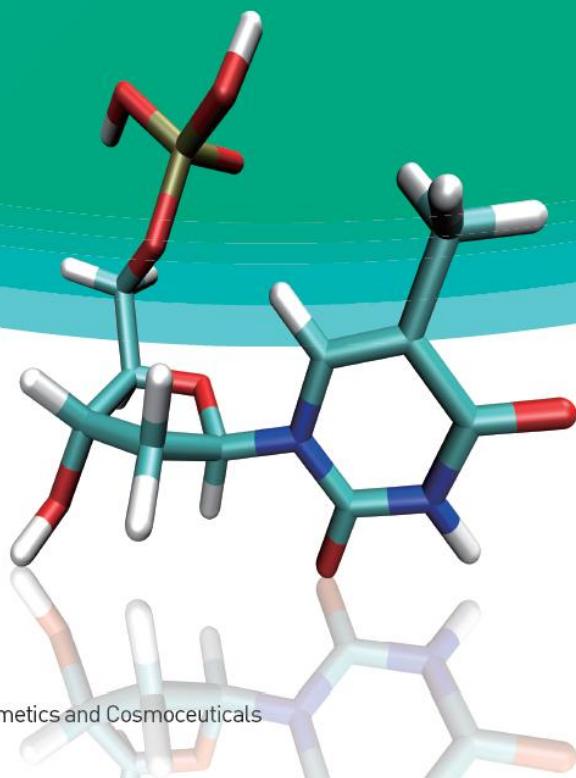


BIO-FD&C
Innovative Leader
in Cosmeceutical Ingredient

Peptides as Cosmetic Ingredient



Provides Functional Cosmetic Ingredients for High Value Cosmetics and Cosmeceuticals

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

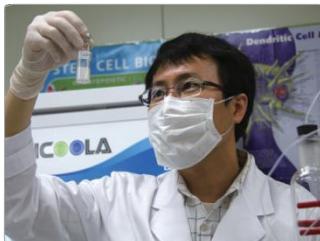
<http://www.biofdnc.com>

전남 화순군 화순읍 내평리 121번지(산단길 12-55번지) 전남생물의약연구센터 내 (주)바이오에프디엔씨 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

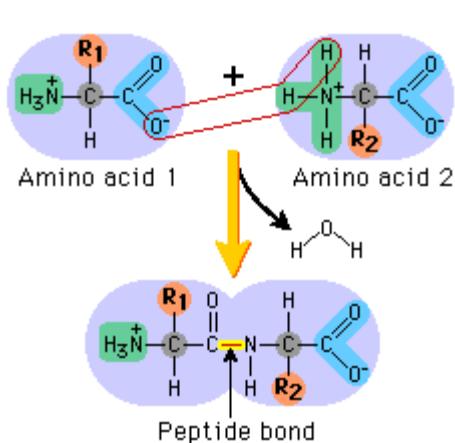
Anti-aging Peptide	Anti-wrinkle peptide	Whitening peptide	Anti-hair loss & hair growing peptide
BF-Dynorphin	Elastin essential peptide	Cyclitol	Anagen
BF-Enkephalin	Elastin anti-wrinkle peptide	ElaX-MV	Elanoren
Epiderm-X	Healix	Gallovax	Elastin scalp peptide
Heal-VB7	Keratin essential peptide	Melabet	Elastin hair peptide
Neuropeptide-1	Lipovax	Purosol	HG-Thymopentin
Neoendorphin	Prospin	Redovax	HG-Phyto-Thymopentin
Polyol	Skinup-US	Respep	Innogrowin
Rejucell-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			

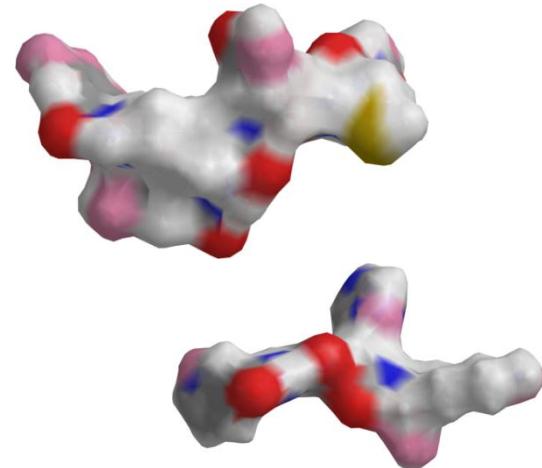


What is Peptides ?

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 ?

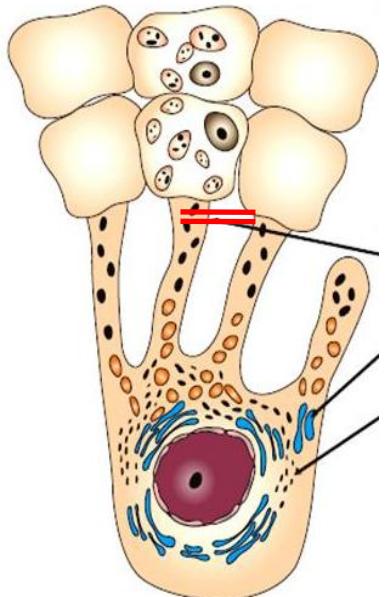
- *highly active biological materials can bind cellular receptors*
- *physically stable in cosmetic chemical conditions*
- *very small to effectively penetrate skin barrier and transdermal layers*
- *highly safe based on amino acid composition*

● General Information

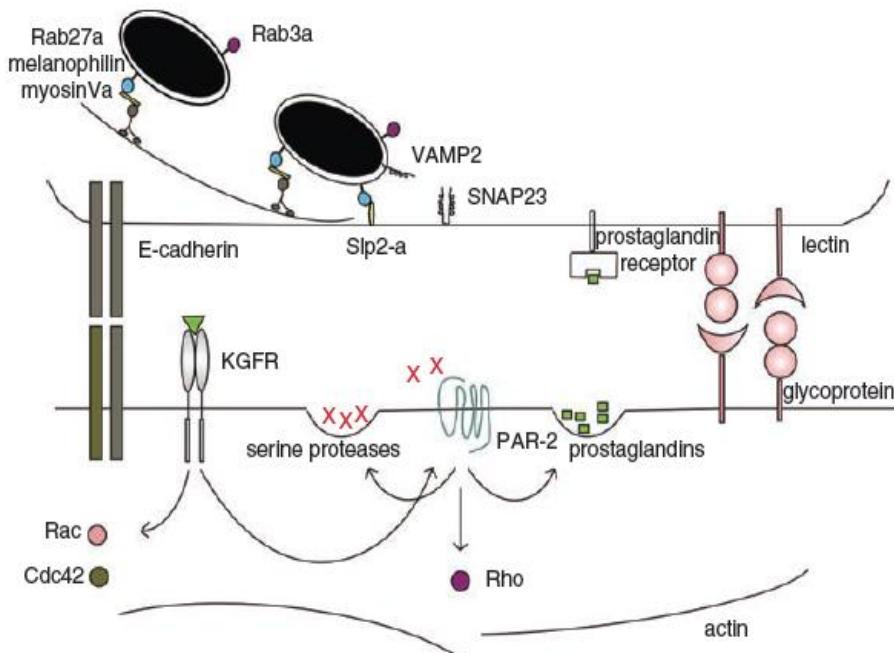
Trade Name	SONITIN™
INCI Name	Nicotinoyl Octapeptide-9
Molecular Characteristics	Nicotinic Acid (Vitamin B3, Niacin) + PAR2 Inhibitory Peptide
Product Type	Pure Peptide Powder or Nanosome Treated
Cosmetic Function	Whitening (& Anti-Wrinkle)
Biological Function	Melanin Transfer Inhibition
Recommended Dosage	~ 20 ppm



● Biological Mechanism



1. *Sonitin™* enhance whitening by inhibiting PRR-2 mediated melanin transfer from melanocyte to keratinocyte.
2. *Sonitin™* enhance whitening by strong anti-oxidant effect of nicotinic acid on tyrosinase.
3. *Sonitin™* reduce melanin content itself without any toxic effect on melanocyte and epidermal cells.



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Traffic 2006; 7: 769–778

Figure 3: The pigmentation synapse. A hypothetical model of the pigmentation synapse depicting molecules with an established role in transport or transfer: PAR-2 and its downstream effectors, the Rab27a-melanophilin-MyosinVa complex, Slp2-a and lectins; and molecules with a putative role in transfer: E-cadherin and SNAREs and Rabs mediating fusion of the melanosomal membrane with the plasma membrane.

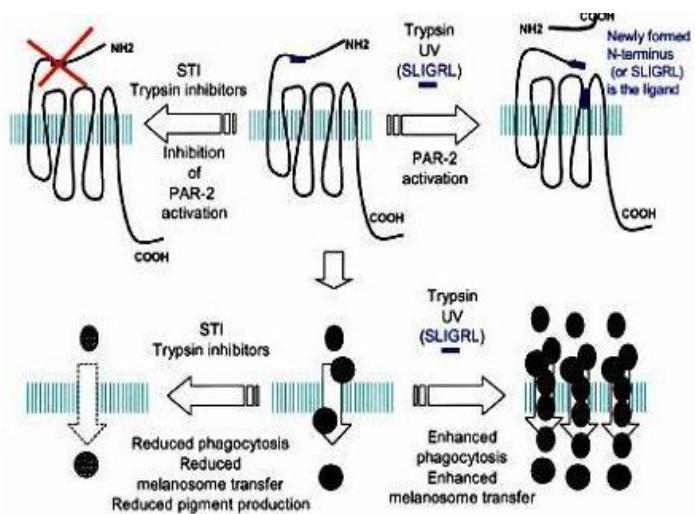
Revelations of the Pigmentation Synapse

Molecular Players in Melanin Transfer

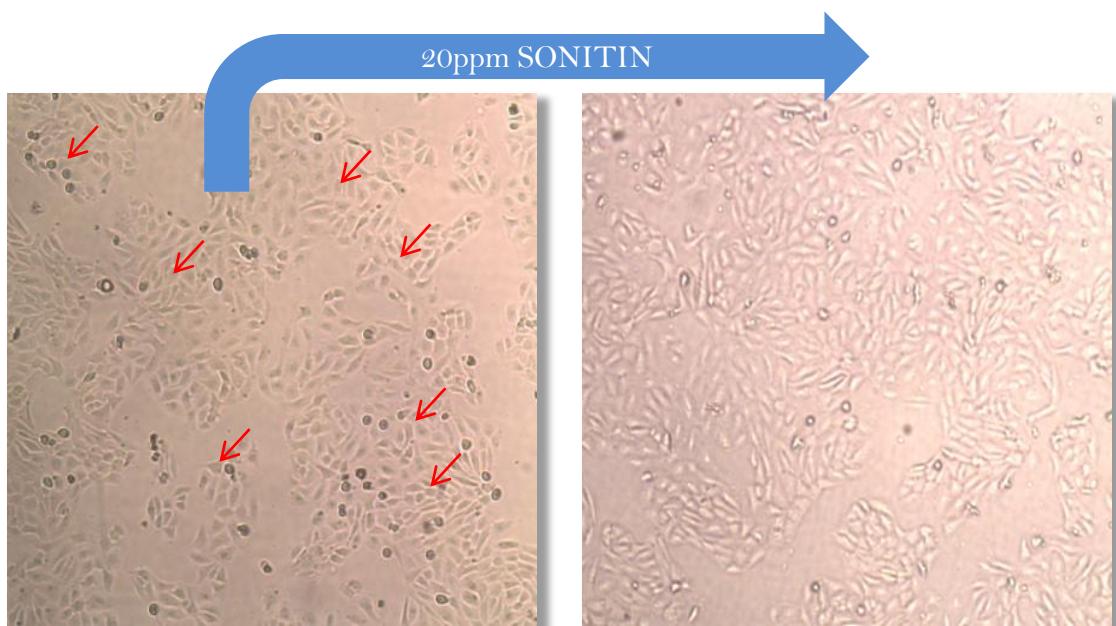
PAR-2

The family of protease-activated receptors (PAR-1-PAR-4) consists of G-protein-coupled transmembrane receptors that are activated by serine proteases that cleave the extracellular amino terminal domain. The newly formed amino termini are tethered ligands, they undergo a conformational change and bind the receptors leading to activation. In the past 5 years a role for PAR-2 in melanin transfer has been established (49). PAR-2 is expressed in keratinocytes (50), not in melanocytes (51). Stimulation of this receptor enhances the phagocytosis rate of keratinocytes and leads to increased melanin transfer, which has been proved *in vitro* as well as *in vivo* (51–54). Melanocyte–keratinocyte contact is a prerequisite for this function (51). Ultraviolet irradiation induces PAR-2, and, the other way round, blocking of the PAR-2 receptor inhibits UV-induced pigmentation. Further, PAR-2 expression and induction by UV seem to depend on skin type, with a higher expression and more pronounced induction in dark-skinned individuals (55,56). The putative tethered ligand that cleaves and activates PAR-2 *in vivo* has yet to be identified. It has been shown *in vitro* that activation of PAR-2 leads to serine protease secretion by keratinocytes, creating a positive feedback loop. UVB induces a similar effect (55). PAR-2 signals to Rho as Rho-GTP is upregulated upon PAR-2 stimulation and, conversely, inactivation of Rho or its downstream effector Rho kinase abolishes PAR-2-stimulated phagocytosis (57). Meanwhile, commitment in phagocytosis in other cell types has put forward PAR-2 as a genuine phagocytic receptor. A leading role for phagocytosis in melanin transfer is thereby practically guaranteed. But then again, transfer cannot be completely inhibited by treatment with serine protease inhibitors (53). Either phagocytosis by PAR-2 is not the only mechanism

50. Santulli RJ, Derian CK, Darrow AL, Tomko KA, Eckardt AJ, Seiberg M, Scarborough RM, Andrade-Gordon P. Evidence for the presence of a protease-activated receptor distinct from the thrombin receptor in human keratinocytes. *Proc Natl Acad Sci USA* 1995;92:9151–9155.
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52. Sharlow ER, Paine CS, Babiarz L, Eisinger M, Shapiro S, Seiberg M. The protease-activated receptor-2 upregulates keratinocyte phagocytosis. *J Cell Sci* 2000;113:3093–3101.
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55. Scott G, Deng A, Rodriguez-Burford C, Seiberg M, Han R, Babiarz L, Grizzle W, Bell W, Pentland A. Protease-activated receptor 2, a receptor involved in melanosome transfer, is upregulated in human skin by ultraviolet irradiation. *J Invest Dermatol* 2001;117:1412–1420.
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57. Scott G, Leopardi S, Parker L, Babiarz L, Seiberg M, Han R. The proteinase-activated receptor-2 mediates phagocytosis in a Rhodependent manner in human keratinocytes. *J Invest Dermatol* 2003;121:529–541.
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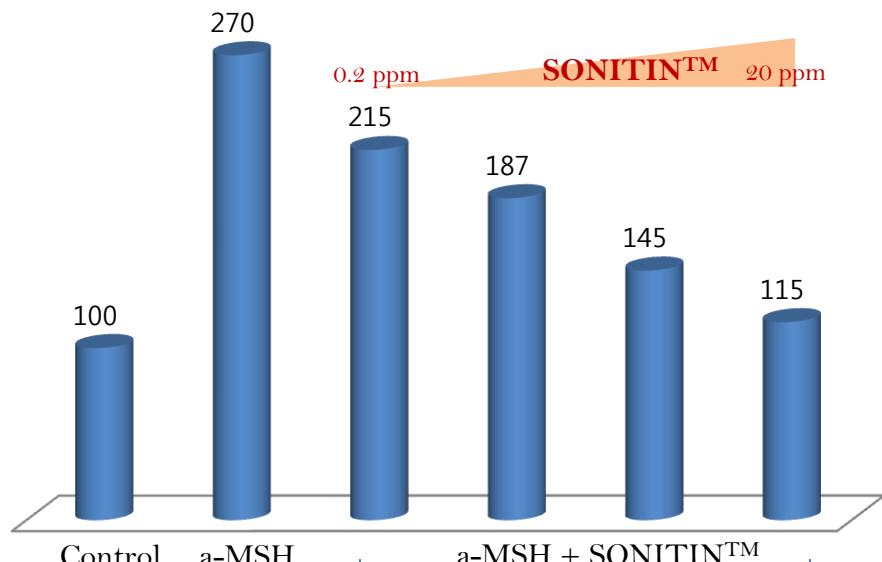
Main action of SONITIN significantly block melanin-transporting PAR2 receptor activation by inhibitory octapeptide resulting anti-pigmentation in keratinocytes!



Significant dark melanin transfer into keratinocyte was blocked by 20 ppm SONITIN !!!
Relative melanin content in cell was reduced up to 328% by colorimetric assay.

● Experimental Data

Relative melanin content (%) by SONITIN™



Treatment various concentration of SONITIN™ significantly reduced melanin content on melanocyte after 48hrs.

SONITIN™ Effect on UVB Pigmentation



Treatment 20ppm SONITIN™ significantly reduced UVB-induced pigmentation of melanocyte after 48hrs.

So, Why Niacin ?

Definition

Niacin is a type of B vitamin. It is water-soluble, which means it is not stored in the body. Water-soluble vitamins dissolve in water. Leftover amounts of the vitamin leave the body through the urine. That means you need a continuous supply of such vitamins in your diet.

Alternative Names

Nicotinic acid; Vitamin B3

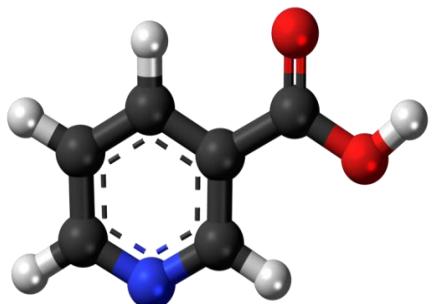
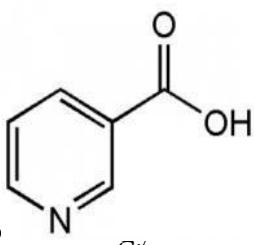
Function

Niacin helps the digestive system,

healthy skin, healthy hair,

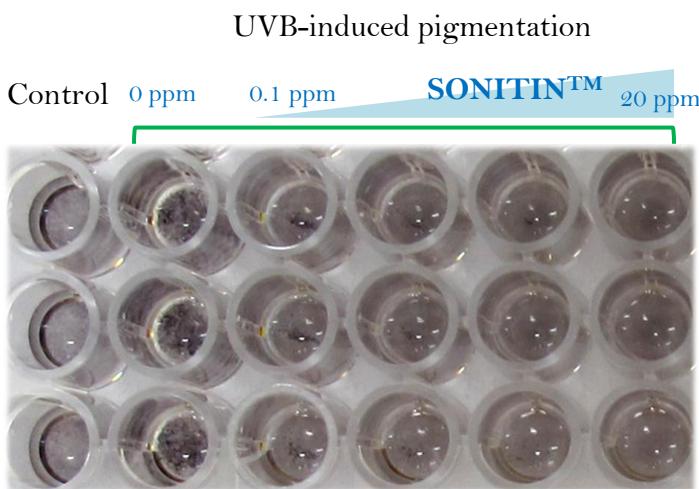
and nerves to function.

It is also important for converting foo



Food Sources

Niacin (also known as vitamin B3) is found in: Dairy products , Eggs , Enriched breads and cereals , Fish , Lean meats , Legumes , Nuts, Poultry



Treatment 20ppm SONITIN™ significantly reduced UVB-induced pigmentation of melanocyte after 48hrs.

So, From Your Cosmetics !!!

Now SONITIN™ supports biological active and epidermal safe bio-mimic NIACIN (Vitamin B3) !!!

Do you need more peptide ?

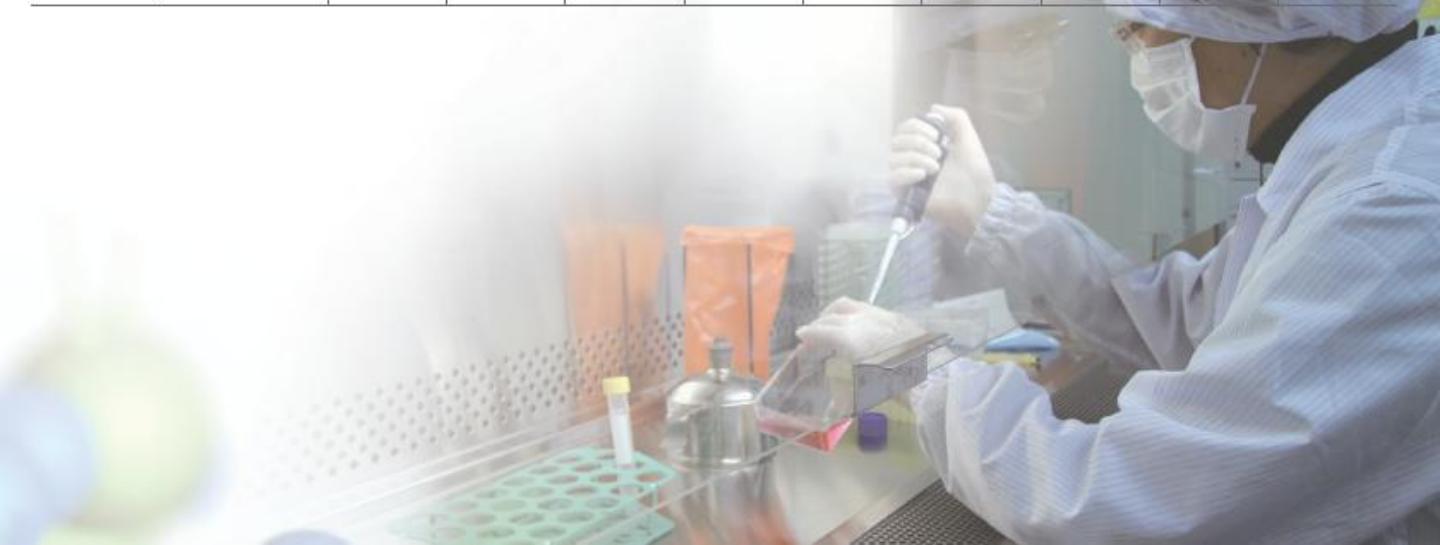
BIO-FD&C Peptides Selection Guide

Biomimetic Peptides	Anti-aging	Anti-wrinkle	Whitening	Anti-hair loss & hair growing	Anti-inflammation	Anti-oxidant	Anti-microbial	Anti-acne	Anti-atoxy
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		★	★★★		★			★	
Gallovax	★		★★★		★★	★★		★	★
Melabet	★★	★	★★★		★★				
Purosol		★	★★★	★	★	★			
Redovax		★	★★★	★	★★	★★		★	
Respe	★		★★★		★★	★			
Sonitin	★	★	★★★		★	★			
Symvastin		★	★★★		★★	★★		★	★
Whitening peptide	★		★★★						

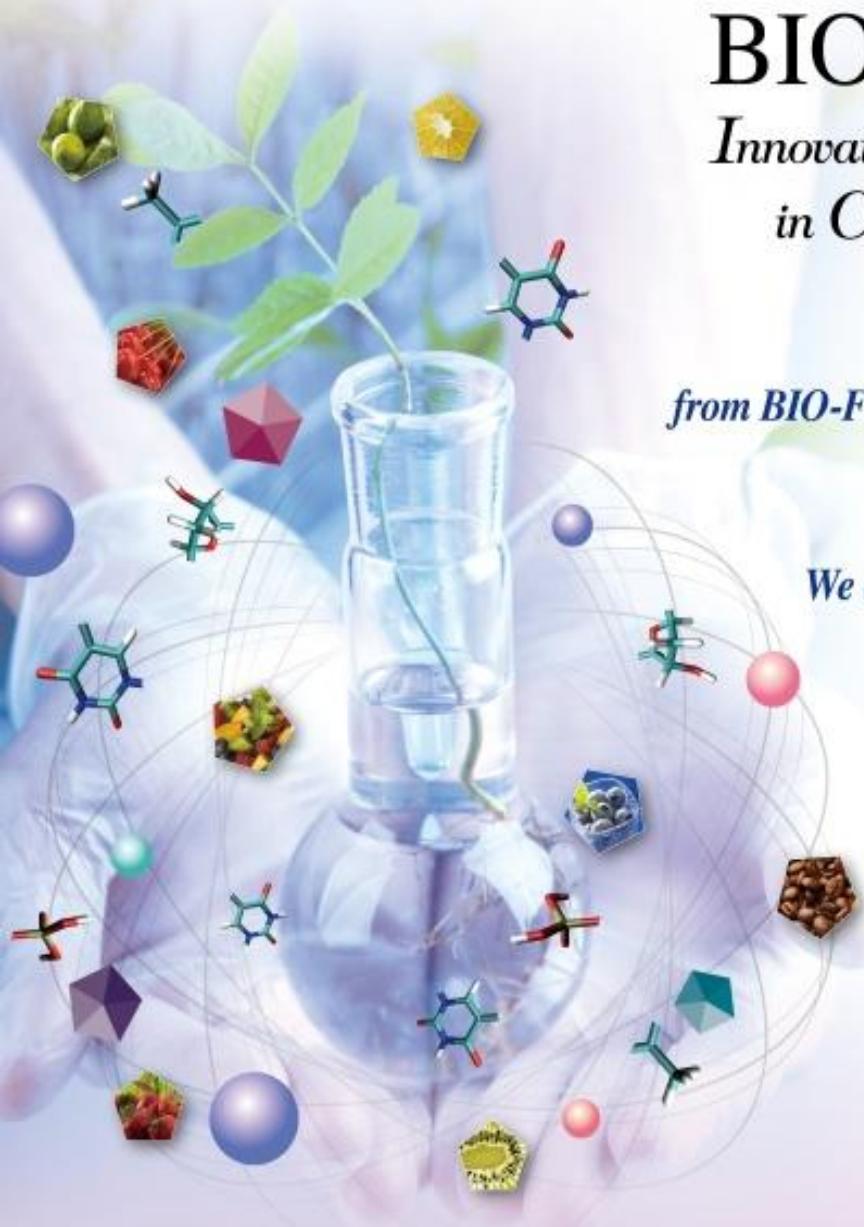
BIO-FD&C

Peptides Selection Guide

Biomimetic Peptides	Anti-aging	Anti-wrinkle	Whitening	Anti-hair loss & hair growing	Anti-inflammation	Anti-oxidant	Anti-microbial	Anti-acne	Anti-atoxy
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.



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