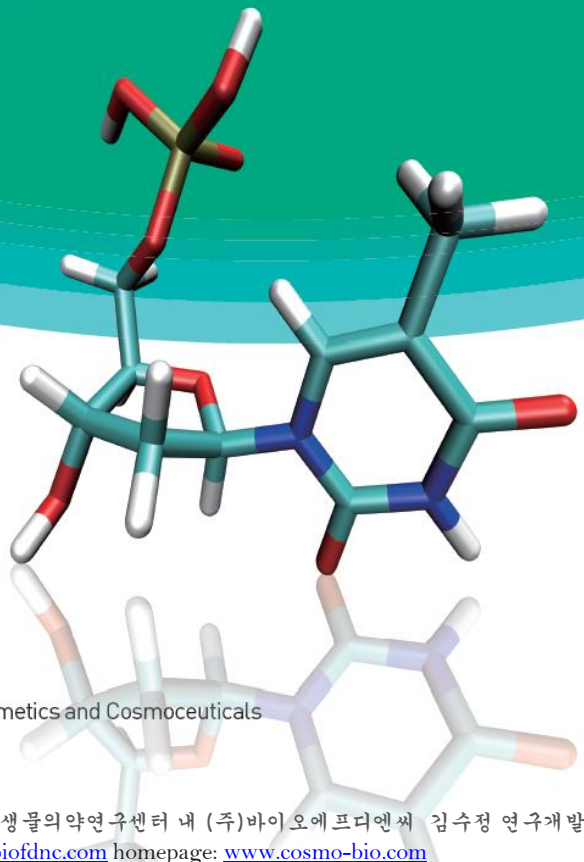




  
**BIO-FD&C**  
*Innovative Leader*  
*in Cosmeceutical Ingredient*

# Peptides as Cosmetic Ingredient



Provides Functional Cosmetic Ingredients for High Value Cosmetics and Cosmeceuticals

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

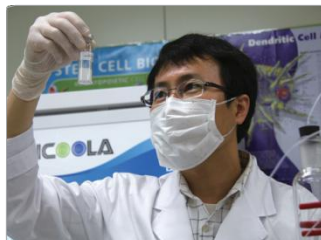
<http://www.biofdnc.com>

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Tel: 82-61-373-8381 Fax: 82-61-373-8382 e-mail: [sjkim@biofdnc.com](mailto:sjkim@biofdnc.com) homepage: [www.cosmo-bio.com](http://www.cosmo-bio.com)

# BIO-FD&C Peptides List

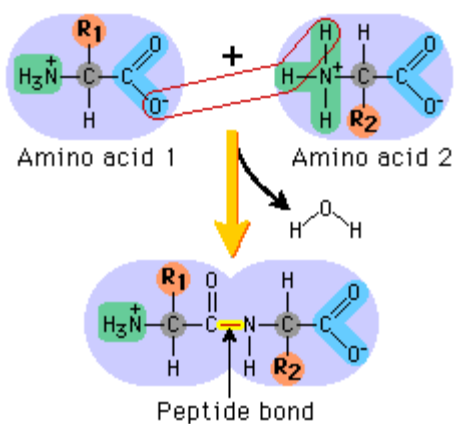
Anti-aging Peptide	Anti-wrinkle peptide	Whitening peptide	Anti-hair loss & hair growing peptide
BF-Dynorphin	Elastin essential peptide	Cyclitol	Anagen
BF-Enkephalin	Elastin anti-wrinkle peptide	ElaX-MV	Elanoren
Epiderm-X	Healix	Gallovax	Elastin scalp peptide
Heal-VB7	Keratin essential peptide	Melabet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

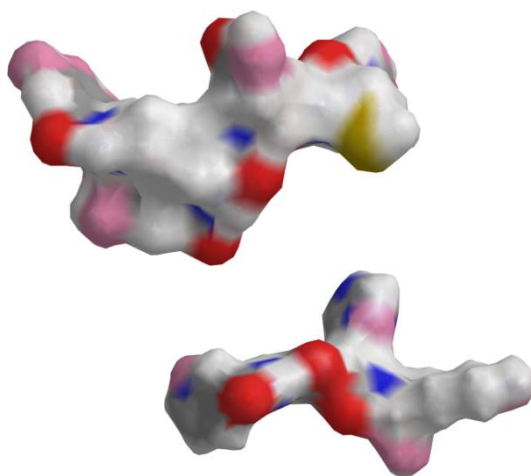


# What is Peptides ?

*Peptides are short polymer formed from the linking, in a defined order, of  $\alpha$ -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	<b>HAIREN™</b>
INCI Name	Azelaoyl Tripeptide-1
Molecular Characteristics	Bioactive conjugation of <b>azelaic acid</b> with biomimetic tripeptide, <b>GHK</b>
Product Type	Pure Peptide Powder or Nanosome Treated
Cosmetic Function	Antimicrobial activity, Anti-Acne, Anti-Atopic Dermatitis, Anti-inflammation, Improve skin health
Biological Function	Cell and Skin defense by antimicrobial activity Improvement of microbial related skin disease
Recommended Dosage	~ 20 – 200 ppm



## ● What is **HAIREN™** ?

- *Highly Active & Inhibitory Reagent for Every Needs!*



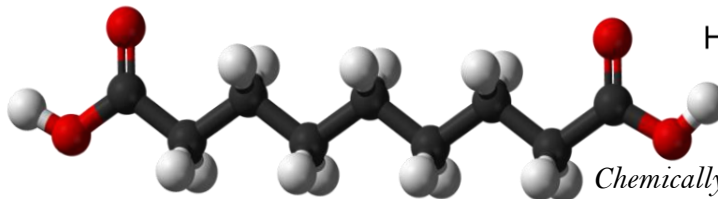
Acne



Whitening



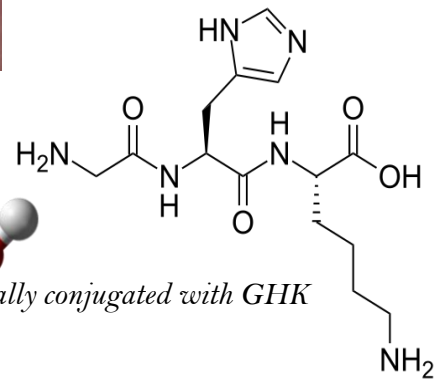
Rosacea



*Azelaic acid (well known agent for acne, whitening, rosacea, etc.) directly improve inflammatory signaling induced pathological skin conditions.*

*Azelaic acid show reasonable anti-microbial activity against all kinds of skin related microorganisms.*

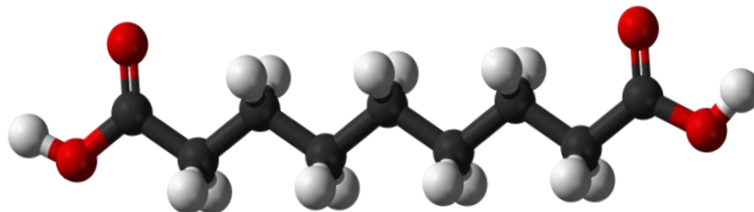
*Enhance anti-microbial activity of azelaic acid by reducing any possible side effects of azelaic acid on skin cell by tripeptide (or copper tripeptide) at pathological skin conditions*



Skin cell rejuvenating by Tripeptide, GHK

Anti-microbial activity on *P. acnes* and/or *S. aureus* From Acne, Atopic dermatitis, etc.

## ● So, what is Azelaic acid ?



Azelaic acid is industrially produced by the ozonolysis of oleic acid. The side product is nonanoic acid. It is produced naturally by *Malassezia furfur* (also known as *Pityrosporum ovale*), a yeast that lives on normal skin. The bacterial degradation of nonanoic acid gives **azelaic acid**.

### Uses in hair and skin treatments

#### Acne treatment

Azelaic acid is used to treat mild to moderate acne; i.e. both comedonal acne and inflammatory acne. It works in part by stopping the growth of skin bacteria that cause acne, and by keeping skin pores clear.

#### Rosacea treatment

Azelaic acid is also used as a topical gel treatment for rosacea, due to its ability to reduce inflammation. In some cases, females have reported hair growth on face and neck.

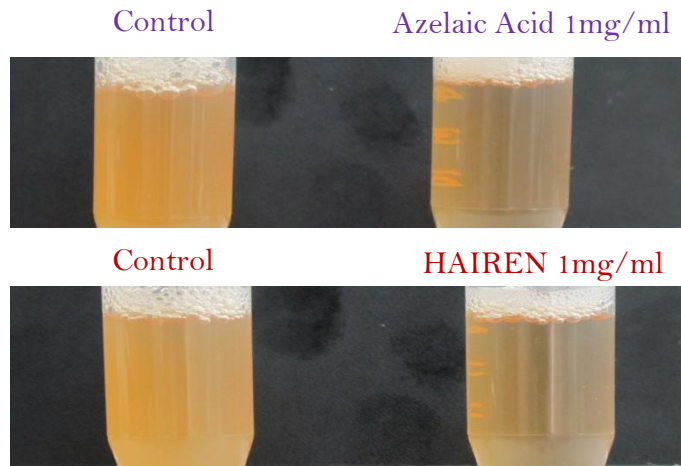
#### Pigmentation treatment

Azelaic acid has been used for treatment of skin pigmentation including melasma and post-inflammatory hyperpigmentation, particularly in those with darker skin types. It has been recommended as an alternative to hydroquinone (HQ), the current gold standard for skin lightening, as countries such as Japan and the EU have questioned the safety of HQ. It is a Tyrosinase inhibitor. This reduces synthesis of melanin.

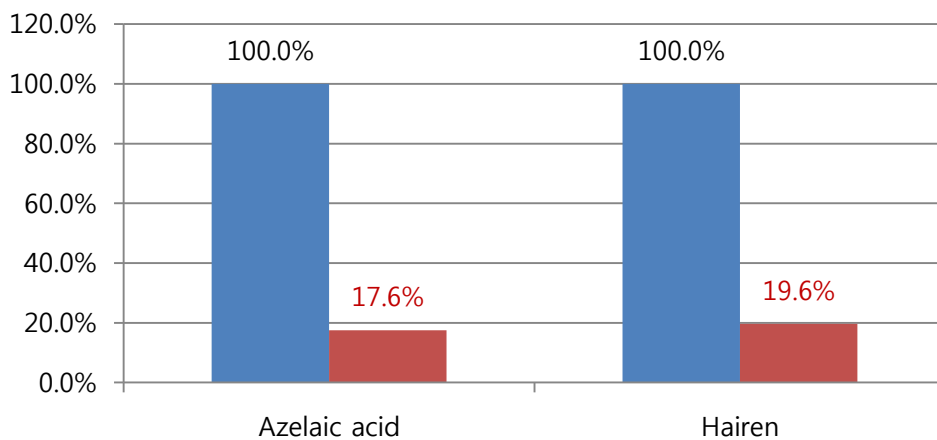
#### Hair loss

Azelaic acid may be useful as a hair growth stimulant. A research report by Stamatiadis in 1988 suggested that azelaic acid (and combinations of it, with zinc ion and vitamin B6) was a strong type I 5-alpha reductase (5-AR) inhibitor. The enzyme, 5-AR (both Types I and II) convert testosterone to dihydrotestosterone (DHT). DHT has been shown to contribute to prostate enlargement (benign prostatic hyperplasia, BPH) and to damage hair follicles. However, no clinical studies have confirmed its efficacy in helping with hair loss.

● Strong Anti-microbial Activity & Higher Skin Cell Compatibility



Against P. acnes

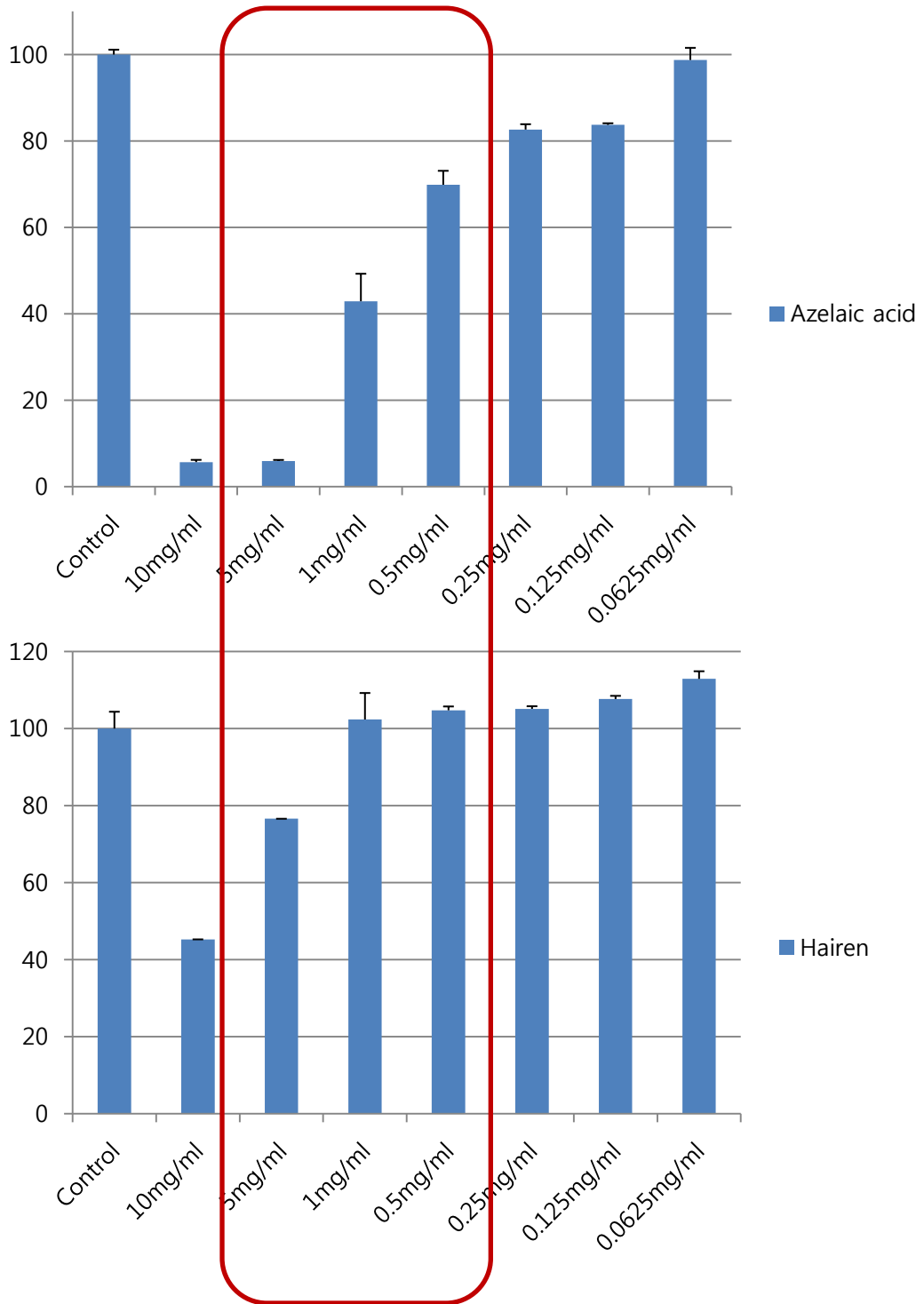


***Azelaic acid*** is famous as an antibacterial that helps reduce and kill most of the bacteria that cause various skin problems. It is effective in destroying all the free radicals in your skin, at reducing any inflammation and pigmentation that arises from acne or rosacea attacks, and for treating facial scars. It is because of all these beneficial properties of this acid that it is today an important ingredient in cleansing and beauty products.

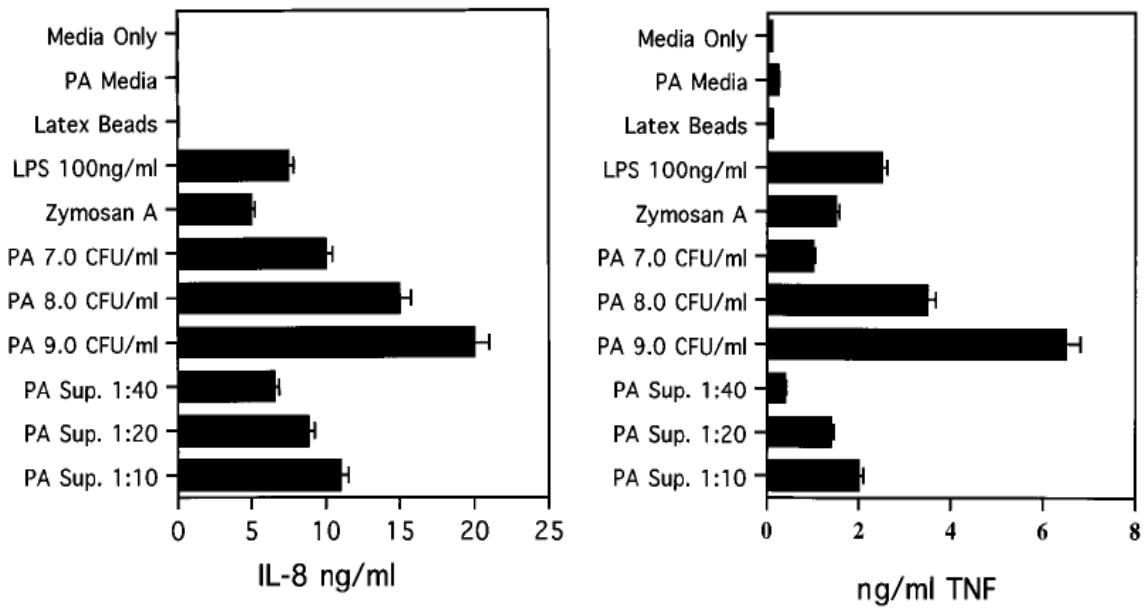
***HAIREN is Biologically Improved and Safely Enhanced Bio-Mimetic Azelaic Acid !!!***

● Strong Anti-microbial Activity & Higher Skin Cell Compatibility

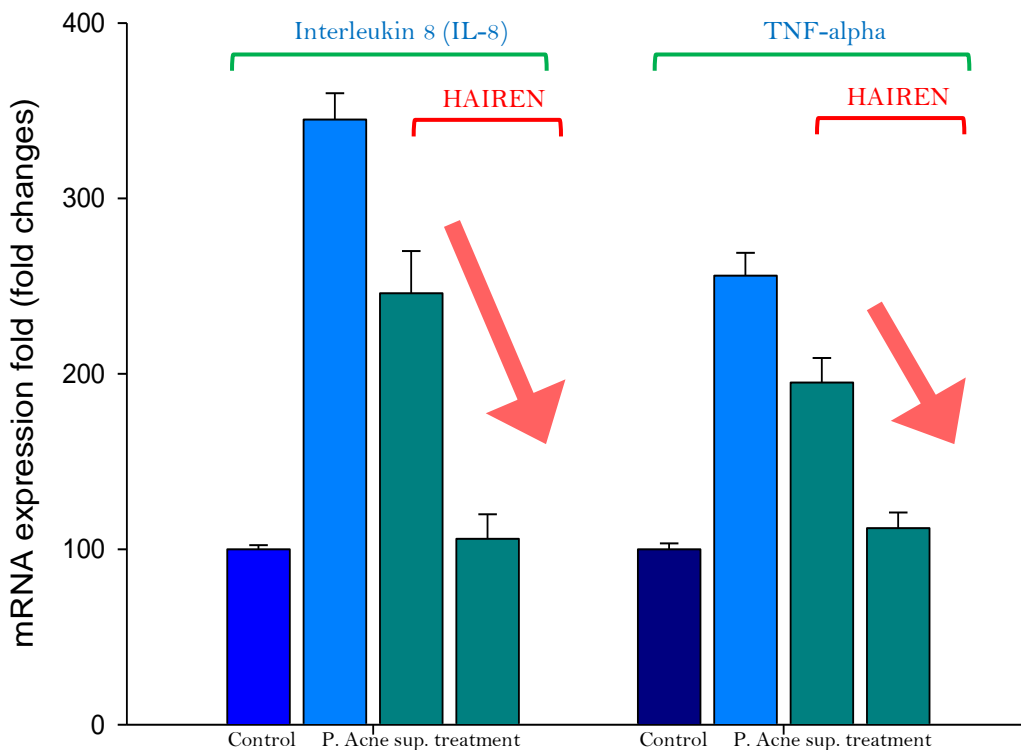
*HAIREN shows highly enhanced safety on skin fibroblast cells by MTT assay.*



● Important Inflammatory Cytokines (IL-8 & TNF-alpha) in acne



*IL-8 and TNF-alpha is inflammatory key molecule in acne by P. acne*  
 Reference) *INFECTION AND IMMUNITY*, Aug. 1995, p. 3158-3165



Relative expression of acne-related inflammatory cytokines from keratinocyte.

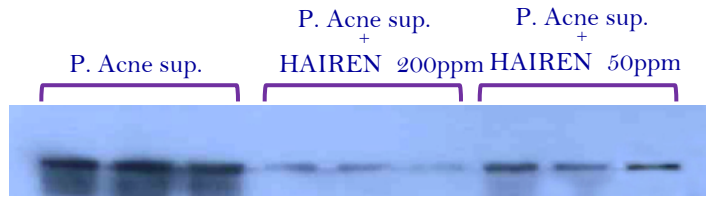
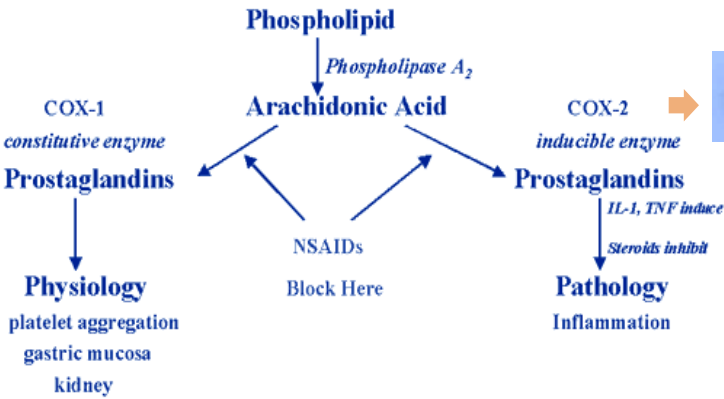
Treatment various concentration (50ppm & 200ppm) of HAIREN significantly reduced proinflammatory cytokines, IL-8 and TNF-a from keratinocyte by real-time PCR.



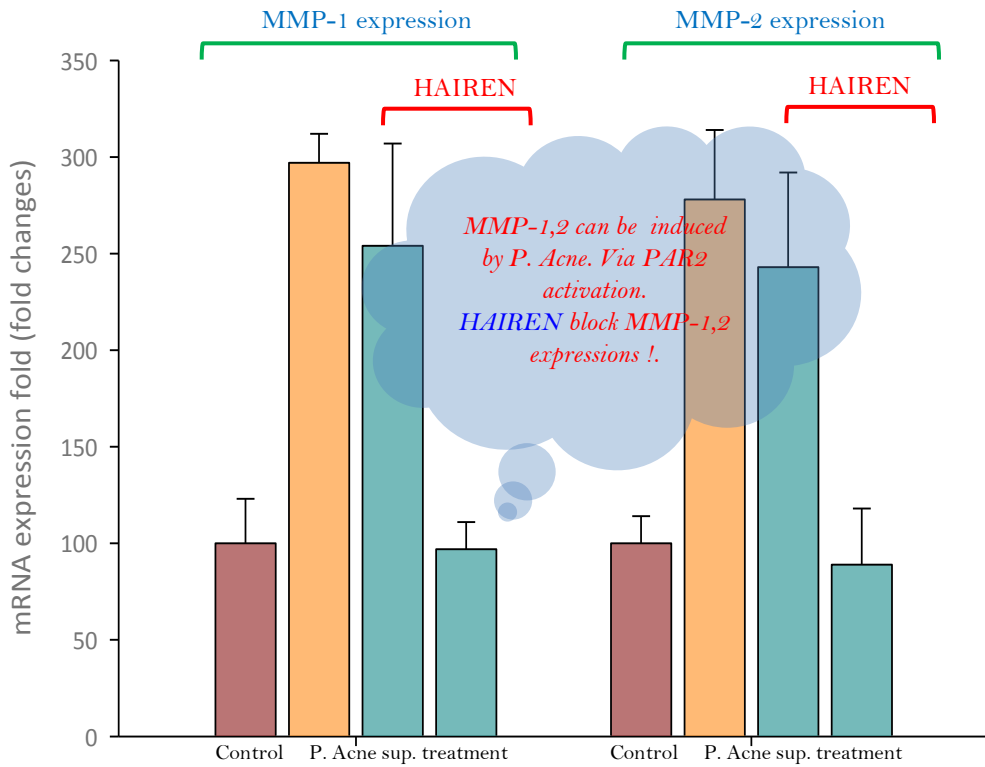
● Experimental Data

### Prostaglandin Biosynthesis

Two Cox Enzymes



Treatment 50 & 200ppm HAIREN significantly reduced expression of COX-2 from P. Acne supernatant-simulated expression.



# 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	★		★★★						

# 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
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)바이오프디엔씨

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