



PerfectionPeptide P3

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**A biomimetic peeling
for skin rejuvenation**



PerfectionPeptide P3 is a liposomal preparation of a tripeptide which activates the regeneration of the skin.

PerfectionPeptide P3 stimulates the natural desquamation process of the skin leading to gentle peeling. Consequently a brighter, smoother and more evenly toned skin complexion is created. The skin is rejuvenated and looks younger.

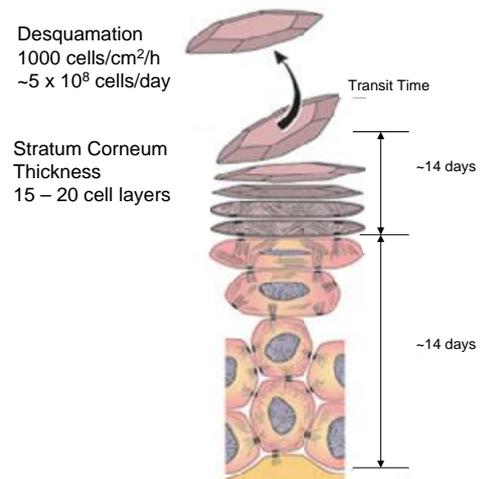
PerfectionPeptide P3

- Improves smoothness, clarity and radiance
- Reduces fine lines and uneven pigmentation
- Activates skin cell regeneration
- Rejuvenates the skin through biomimetic peeling

PerfectionPeptide P3 - a novel biomimetic skin care ingredient - assures your market share in peptide cosmetics.

Desquamation

Desquamation is the natural exfoliation procedure of our skin and an important step in the skin regeneration cycle. New keratinocytes are constantly formed in the basal layer of the epidermis. From there, cells migrate to form the outermost layer of the epidermis, the stratum corneum. In order to keep the thickness of the epidermis constant, dead cells are shed continuously from the surface of the stratum corneum.



Cycle of skin regeneration. Dead cells peel off during desquamation.

In the skin tissue, cells are connected by a number of specific proteins that form adhesion organelles, called desmosomes. Connection of adjacent cells is made by two transmembrane proteins, called desmocollin and desmoglein. These proteins are anchored inside the cell to the cytoskeleton. Specific amino acid sequences in the extracellular domains of these two proteins are responsible for the heterophilic binding. During desquamation the protein bridges between desmocollin and desmoglein are degraded by proteinases.

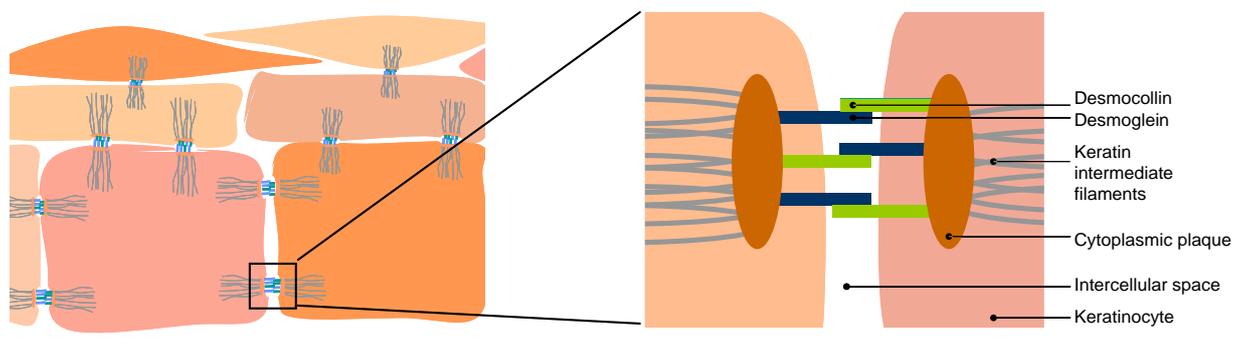


Diagram of skin cells and intercellular connections (desmosomes).

Design of a desmosome. Connection is made in the extracellular domains of desmocollins and desmogleins.

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PerfectionPeptide P3 Rejuvenates the Skin

With advancing age, desquamation becomes slow and irregular. In older people the turnover time of the epidermis increases. The skin gets dry, rough, patchy and scaly and more and more uneven and its color turns dull and greyish. Younger skin desquamates more quickly and homogeneously. This results in a smooth, evenly colored and soft skin without any scaling. PerfectionPeptide P3 stimulates desquamation. It re-establishes youthful conditions in older skin resulting in fast, regular and homogeneous exfoliation.

Molecular Structure of PerfectionPeptide P3

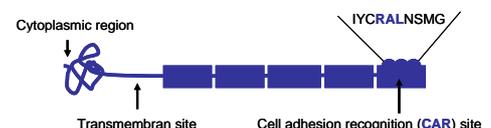
PerfectionPeptide P3 consists of three active amino acids present in desmoglein. The amino-terminal arginine is linked to hexanoic acid which increases the lipophilicity of the molecule in order to improve the penetration into the stratum corneum. For the same reason the peptide is encapsulated in liposomes. To increase the resistance to proteolysis, leucine is replaced by the unnatural amino acid norleucine.



The active compound in PerfectionPeptide P3: The tripeptide Arg-Ala-Nle.

Mode of Action and Effect of PerfectionPeptide P3

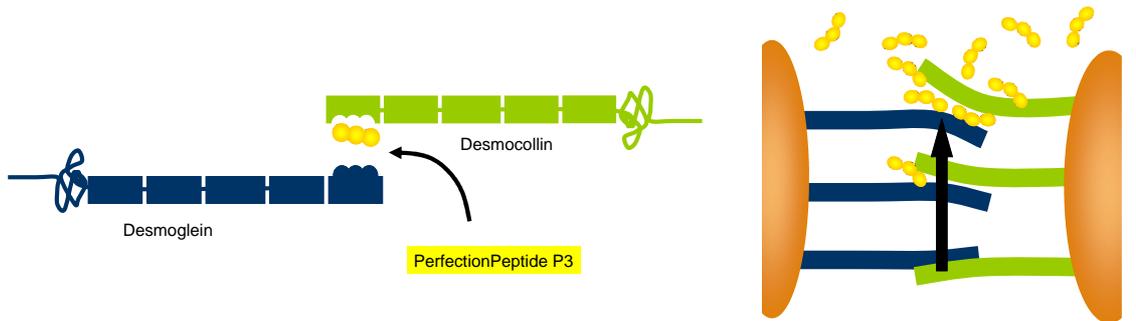
PerfectionPeptide P3 represents the amino acid sequence of desmoglein that is recognized by desmocollin as a binding site, the so called cell adhesion recognition site.



Desmoglein: the binding site to desmocollin is located on the last extracellular domain.

PerfectionPeptide P3

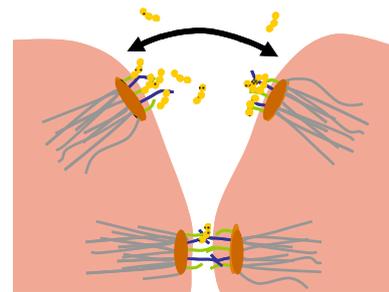
The principal mechanism of PerfectionPeptide P3 as a desquamation enhancer is that it competes with the desmogleins to bind to the desmocollins; once PerfectionPeptide P3 is applied it destroys the bonds between desmoglein and desmocollin.



Mode of action of PerfectionPeptide P3: the tripeptide competes for binding to desmocollin.

PerfectionPeptide P3 splits the bonds between desmocollins and desmogleins.

As a consequence, the connection between the cells get weaker. Cells in the stratum corneum lose contact with neighbouring cells and start to peel off.



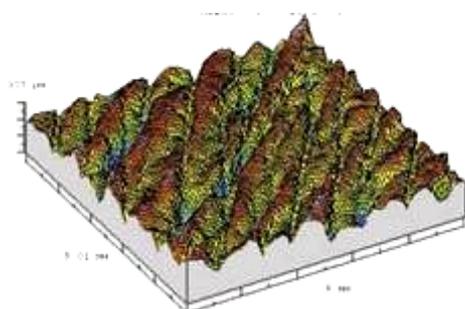
Effect of PerfectionPeptide P3: cell to cell adhesion weakens; cells can peel off in a regulated manner.

PerfectionPeptide P3 acts in the outermost layers of the stratum corneum. PerfectionPeptide P3 leads to a controlled loosening of the cell to cell connections. Hence, PerfectionPeptide P3 mimics the desquamation process as it occurs in young skin. It also reduces the turnover time of the epidermis. The skin becomes smooth and radiant.

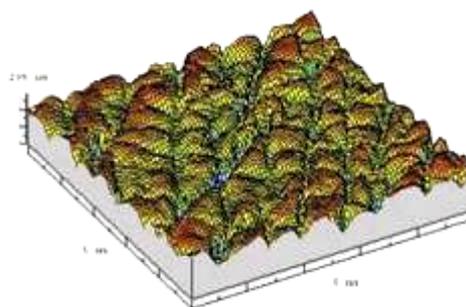
PerfectionPeptide P3

Study Results

To assess the efficacy of PerfectionPeptide P3, the skin micro-structure and the cellular cohesion were investigated. A cream containing 1% PerfectionPeptide was applied twice daily for 17 days to the inner side of the forearm. The skin micro-structure was analyzed from silicone prints using laser profilometry and the cellular cohesion by scanning electron microscopy.



d 0
1% PerfectionPeptide P3
complexity 13.2%

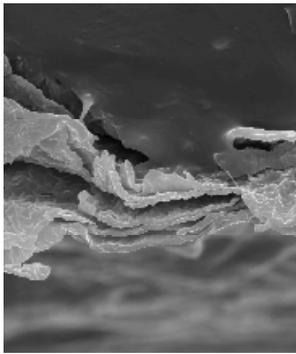


d 17
1% PerfectionPeptide P3
complexity 10.3%

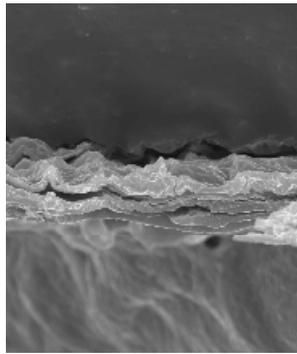
Laser profilometry analysis: treatment with 1% PerfectionPeptide P3

During the 17 days of application the median depth of wrinkles decreased from 53.9 μm at the beginning to 42.9 μm at the end of the study. The complexity value, representing the depth and number of wrinkles, decreased from 13.2% to 10.3%. In non-treated zones, the complexity did not change and the median depth even increased slightly.

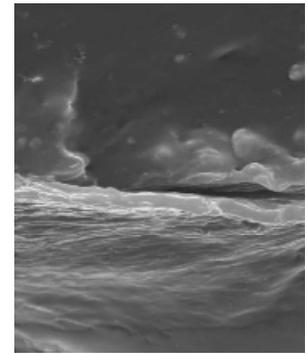
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not treated



placebo



PerfectionPeptide P3

Cellular adhesion scanned by electron microscopy

For scanning electron microscopy analysis, stratum corneum material was sampled by tape stripping. A rough skin surface is characterized by eruptive layers and a bigger distance between layers. At the end of the study the skin treated with PerfectionPeptide P3 clearly showed a smoother surface than that treated with placebo and untreated skin.

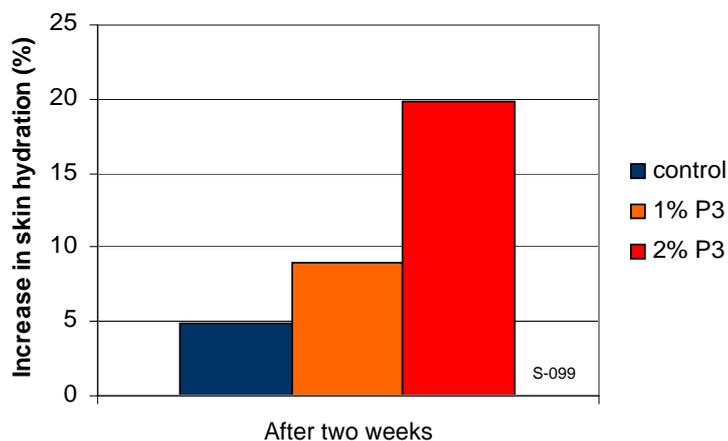
In Vivo Study on Skin Smoothness, Wrinkle Depth and Epidermal Turnover

In a second study the effect of PerfectionPeptide P3 on skin hydration, skin smoothness, wrinkle depth, and epidermal turnover was analyzed. The study was performed on 20 women aged between 41 and 58. Gels containing 1% and 2% of PerfectionPeptide P3 were applied twice daily for four weeks to the inner side of the forearm. The gel with 2% PerfectionPeptide P3 was also applied to the crow's feet area.

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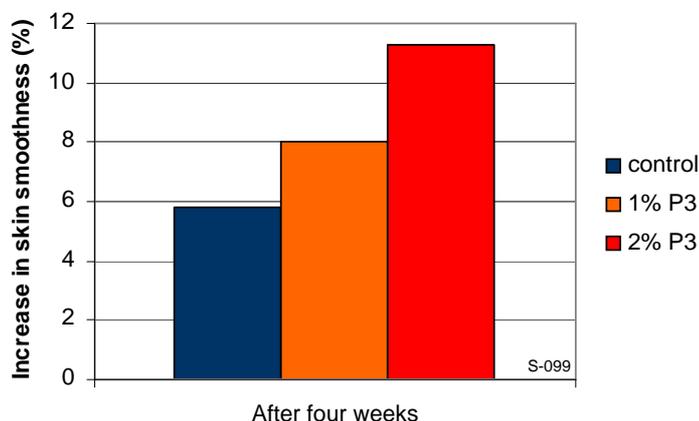
Hydration of the Skin

After two weeks of application, the tested creams with PerfectionPeptide P3 substantially increased the humidity of the skin. Hydration improved after two weeks by 20% with the 2% test product and by 10% with the 1% test product and stayed at the same level until the end of the study.



Smoothness of the Skin

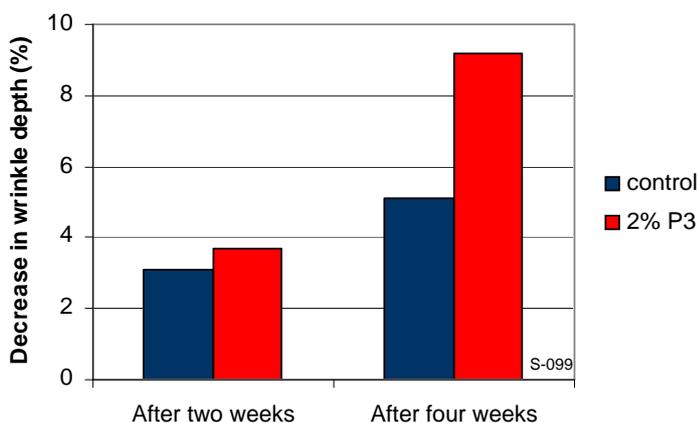
Four weeks of application of test creams containing PerfectionPeptide P3 led to smoother skin. Compared to untreated areas, the cream containing 1% of PerfectionPeptide P3 improved the smoothness of the skin by 8%. The improvement after application of the cream with 2% PerfectionPeptide P3 was even higher, namely 12%.



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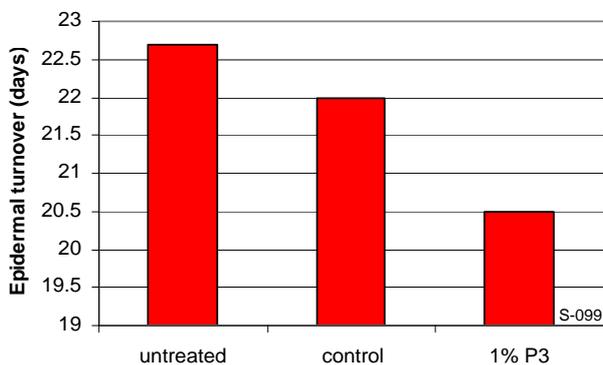
Wrinkle Depth

The wrinkle depth in the crow feet's area was clearly reduced after four weeks' application. The reduction was 9% compared to the beginning of the study.



Epidermal Turnover

Stimulation of desquamation should result in a decreased epidermal turnover time. A four week application of the control cream led to a 3% decrease of the epidermal turnover time compared to untreated skin. The cream with 1% PerfectionPeptide P3 decreased the epidermal turnover time during the four weeks by 7% compared to the control cream and by 10% compared to untreated skin.



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Claims with PerfectionPeptide P3

- Rejuvenates the skin
- Gentle biomimetic peeling
- Improves smoothness, clarity and radiance
- Reduces fine lines and uneven pigmentation
- Activates skin cell regeneration



Applications

- Anti-Aging Products
- Exfoliating Products
- Face Care Products
- Décolleté Products
- Body Care Products
- Hand Care Products

Dermatological Tolerance

The dermatological tolerance of PerfectionPeptide P3 has been carefully tested in healthy volunteers assessing irritating effects to the skin applying an occlusive patch test. No skin irritation was observed.

Formulating with PerfectionPeptide P3

The recommended concentration of PerfectionPeptide P3 is 0.5 - 3%. For the manufacture of products, PerfectionPeptide P3 can be used in emulsions (O/W, W/O) and gels. In emulsions PerfectionPeptide P3 should be dispersed in the aqueous phase. Homogenization and short temperature increases up to 60°C do not affect the stability of PerfectionPeptide P3.

INCI/CTFA-Declaration

Hexanoyl Dipeptide-3 Norleucine Acetate (and) Lecithin (and) Glycerin (and) Phenoxyethanol (and) Aqua/Water