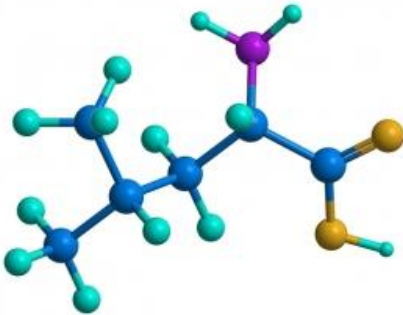


PALMITOYL TRIPEPTIDE-38 CLINICAL DATA

Palmitoyl Tripeptide-38 is a matrikine-mimetic peptide that stimulates the synthesis of matrix molecules and supports the skin's functional proteins. An efficacious alternative to topical hyaluronic acid which provided no dermal filling unless injected, palmitoyl tripeptide-38 is an anti-ageing active that has been shown to provide visible volumising and anti-wrinkle effects on the epidermis, dermal-epidermal junction and dermis when applied topically at 2%.



Palmitoyl Tripeptide-38 structure

Palmitoyl Tripeptide-38 has been shown to stimulate the synthesis of 6 major constituents of the skin matrix and dermal-epidermal junction *in vitro*:

1. collagen I
2. collagen III
3. collagen IV
4. fibronectin
5. hyaluronic acid
6. laminin 5

As a result of the above actions, palmitoyl tripeptide-38 has been found to provide a rejuvenating effect by significantly reducing wrinkle appearance *in vivo*.

Dermal macromolecules and ageing

The properties of dermal macromolecules that support the epidermis—such as collagen or hyaluronic acid—provide much of the mechanical and physiological properties of the skin. During the ageing process, the synthesis of filling/volumising macromolecules diminishes, and molecular associations become unbalanced. The dermal-epidermal junction, which is highly complex and rich in macromolecules, becomes less dense and therefore less able to adapt to stress. Among the most important molecules in the dermis are collagen I, collagen III, fibronectin, and hyaluronic acid (hyaluronan). Collagen IV and laminin-5 in the dermal-epidermal junction are equally as important to ensure the cohesive function and structure of skin (1).

Palmitoyl tripeptide-38 stimulatory effects

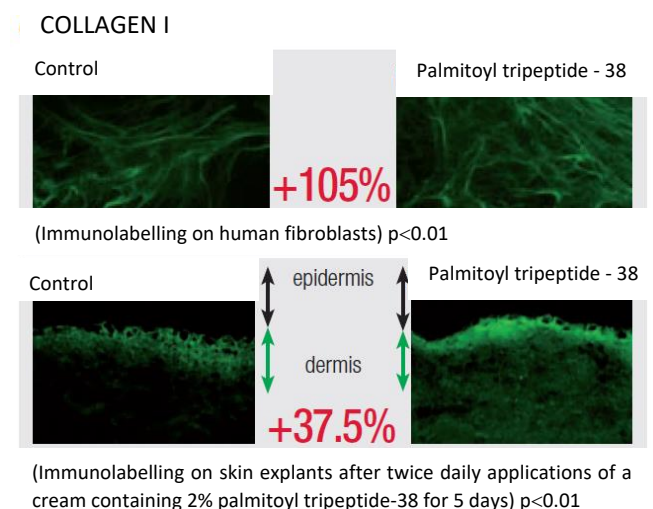
Signalling peptides are well documented for their ability to reduce fine lines and wrinkles, and aid in the regeneration of the skin matrix cells. In addition, the use of peptides has been shown to increase skin resilience and provide smoother more youthful skin (1).

Palmitoyl tripeptide-38 has a matrikine-like effect that stimulates the synthesis of 6 major constituents of the skin matrix and dermal-epidermal junction (collagen I, III, IV, fibronectin, hyaluronic acid, and laminin 5) *in vitro*. A study was conducted on human fibroblasts and keratinocytes with 2% palmitoyl tripeptide-38 twice a day over five days.

Results showed that palmitoyl tripeptide-38 strongly stimulated:

- The synthesis of matrix molecules (collagen I: +105%, collagen III: +104%, fibronectin: +59% and HSP 47: +123%),
- The synthesis of molecules of the dermal-epidermal junction (collagen IV: +42% and laminins: +75%)
- The synthesis of hyaluronic acid (+174%)

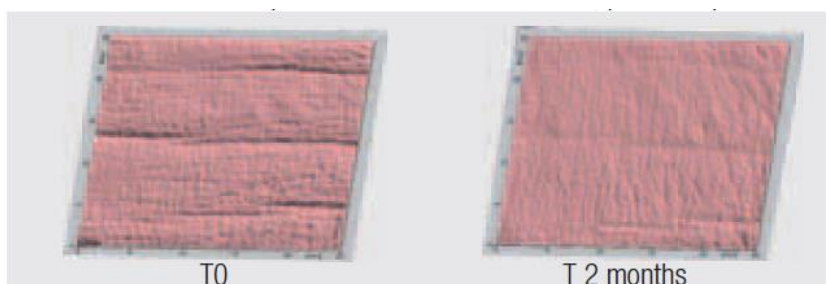
The results of *in vitro* tests demonstrated a mechanism of action that leads to facial wrinkle smoothing by promoting a restructuring of the cutaneous tissues.



SYNERGIE SKIN CLEAN SCIENCE

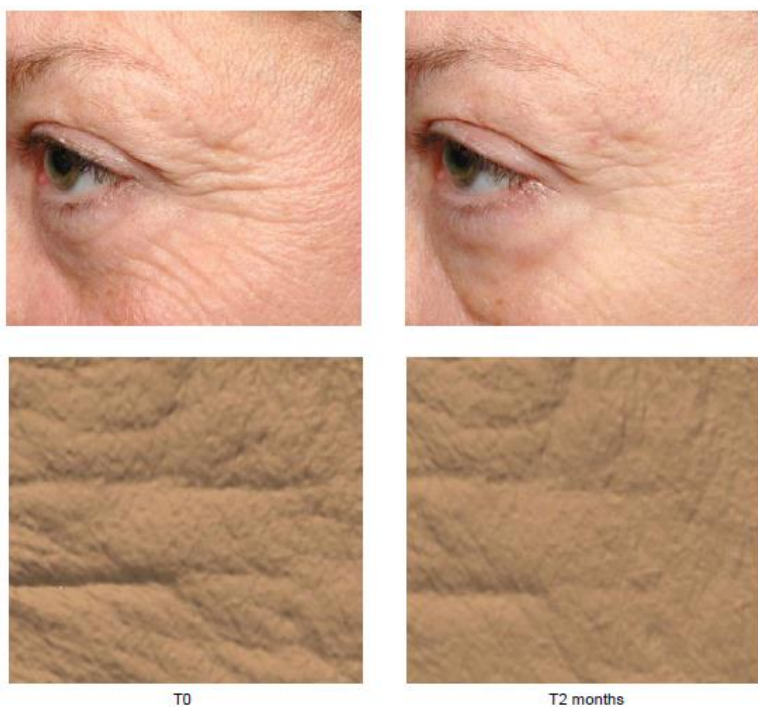
In vivo testing shows that palmitoyl tripeptide-38 provides a rejuvenating effect by significantly reducing wrinkle severity around the forehead and crow's feet. A clinical study was conducted on 25 female volunteers, who applied a 2% palmitoyl tripeptide-38 cream twice a day for 2 months vs placebo. The assessments specifically monitored the smoothing and filling effect on forehead lines and crow's feet.

Before and after 2 months use of palmitoyl tripeptide-38 on forehead



The anti-ageing effect of palmitoyl tripeptide-38 was proven using predominant techniques. On the forehead, measurement by fringe projection (also known as FOITS) demonstrated a visible, mean reduction in main wrinkle volume of 31%. This was complemented by a 28% reduction in cutaneous roughness, which can be associated with a lifting effect. Finally, the maximum depth of this main wrinkle decreased by a mean of 16.3%.

In vivo- Before and after use of palmitoyl tripeptide-38



In vivo study of crow's feet (see left). The anti-wrinkle effect was measured through a decrease in the surface occupied by deep wrinkles (-28.5%), a decrease in the volume of a major wrinkle (-21%), and a reduction in the mean depth (-15%). There was also a lifting effect since there was an approximate -13% reduction in cutaneous roughness. The wrinkle further opened by 8.4%, which reduced the shadow effect.

These results are directly related to the *in vitro* results obtained, which demonstrated an increase in the quantity of six major components of cutaneous tissue.

Resources

1. Pugliese, P. Behavior of Normal Skin. In: Physiology of the Skin II. Carol Stream, Illinois, Allured, 2006, p. 9-13.
2. Schagen, S.K. Topical Peptide Treatments with Effective Anti-Aging Results. *Cosmetics* 2017, 4, 16.
3. Gorouhi F, Maibach HI. Role of topical peptides in preventing or treating aged skin. *Int J Cosmet Sci.* 2009 Oct;31(5):327-45

Additional peptide resources:

KATAYAMA K., ARMENDARIZ-BORUNDA J., RAGHOW R., KANG A.H., SEYER J.M., "A pentapeptide from type I procollagen promotes extracellular matrix production", *J. Biol. Chem.*, 268, 1993, p. 9941-9944.
LINTNER K., PESCHARD O., "Biologically Active Peptides: from a lab bench curiosity to a functional skin care product", *Int. J. Cosm. Sci.*, 22, 2000, p. 207-218.

MATSUOKA Y., KUBOTA H., ADACHI E., NAGAI N., MARUTANI T., HOSOKAWA N., NAGATA K., "Insufficient folding of type IV collagen and formation of abnormal basement membrane-like structure in embryoid bodies derived from HSP47-null embryonic stem cells", *Molec. Biol. Cell.*, 15, 2004, p. 4467-4475.

NATSUME T., KOIDE T., YOKOTA S., HIRAYOSHI K., NAGATA K., "Interactions between collagen binding stress protein HSP47 and collagen. Analysis of kinetic parameters by surface plasmon resonance biosensor.", *J. Biol. Chem.*, 269, 1994, p. 31224-31228.