Technical Information

TEGO® Pep UP

Intended use

Active for skin care

Benefits at a Glance

- Up lifting of facial contours
- Wrinkle reduction
- Boosting of Collagen, Elastin and Fibronectin
- strong anti-ageing properties

INCI (PCPC name)

Tetrapeptide-4; Glycerin

Chemical and physical properties (not part of specifications)

Appearance	colorless to slightly yellow liquid
Active matter	> 1900 ppm

PROPERTIES

The normal loss of skin resistance with increasing biological age, accompanied by reduced skin elasticity and skin tension, occurs globally and independent of gender. The turnover of collagen, fibronectin and elastin, which is balanced under average conditions, is continuously shifted in the direction of increased degradation of the above-mentioned structures and visible consequences such as increased wrinkling, loss of skin elasticity and sagging of connective tissue gradually occur. Various influencing factors like increased UV radiation, stress, environmental influences, etc. play a decisive role in the increased and premature degradation of ECM components.

The prevention of early-onset loss of ECM components and skin's loss of resilience is essential and of global interest. The biomimetic amino acid sequence of the tetrapeptide shows convincing performance with regard to the increase of collagen and improvement of skin resilience. The nature of the amino acid sequence triggers skin's own production of new ECM components thus shifting the turnover back to normal and delaying visible signs of skin aging.

In vivo efficacy

Boosting of Collagen1A1, Elastin and Fibronectin

In order to test whether Tetrapeptide-4 increases gene expression of the ECM markers Collagen1A1, Elastin and Finronectin 1 ppm of the peptide was applied on normal human dermal fibroblasts (NHDF) for the duration of 24 hours. After this qRT-PCR was conducted to determine the expression of these genes.

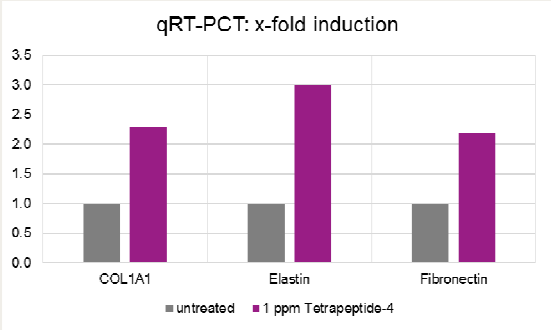

Figure 1: gene expression of COL1A1, Elastin and Fibronectin after treatment of NHDF with 1 ppm tetrapeptide-4

On the mRNA level all three tested marker genes COL1A1, Fibronectin and Elastin were induced by Tetrapeptide-4.

Elisa: Pro-Collagen I

Normal human dermal fibroblasts were treated with 5 ppm Tetrapeptide-4. After 48 hours the protein content of Collagen1A1 was measured using Elisa technique.

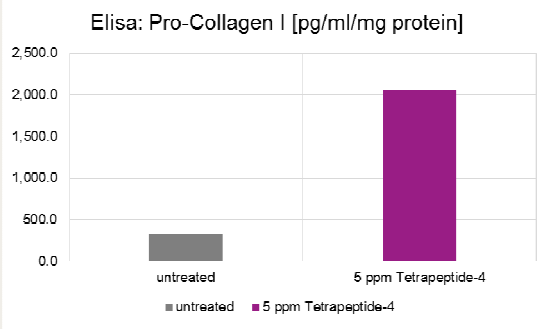

Figure 2: determination of Pro-Collagen I after treatment of NHDF with 5 ppm Tetrapeptide-4 using Elisa technique

Tetrapeptide-4 significantly induced collagen protein synthesis.

In vivo efficacy

The *in vivo* study was performed to determine the efficacy of TEGO® Pep UP on wrinkle reduction and skin sagging.

For the in vivo study 28 women aged between 44 and 66 years were recruited. They applied either an O/W face cream without active (vehicle) or the O/W face cream with 60 ppm Tetrapeptide-4 (equal to 3 % TEGO® Pep UP) in one half of their face (half side test) twice daily for 8 weeks. The pure Tetrapeptide-4 was used to show that the efficacy of TEGO® Pep UP originate from the tetrapeptide and not from the strong moisturizing properties of Glycerin, the solvent for Tetrapeptide-4 in TEGO® Pep UP.

Before the application started (baseline) and after 4 and 8 weeks wrinkle depth was measured using Primos Pico. In addition digital images of the face were taken by means of VISIA CR. On the basis of these images facial contouring properties of TEGO® Pep UP were determined.

Test formulation for in vivo study (MAC 868)

Phase A		
TEGO® Care 450 (Polyglyceryl-3 Methylglucose Distearate)	3.00%	3.00%
TEGIN® M Pellets (Glyceryl Stearate)	2.00%	2.00%
Stearyl Alcohol	1.00%	1.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	9.50%	9.50%
TEGOSOFT® TN (C12-15 Alkyl Benzoate)	9.50%	9.50%
Phase B		
Water	70.90%	70.80%
TEGO® Pep UP		3.00%
Glycerin	2.90%	
Phase Z		
Euxyl PE 9010 (Phenoxyethanol; Ethylhexylglycerin)	1.00%	1.00%
Perfume	0.20%	0.20%

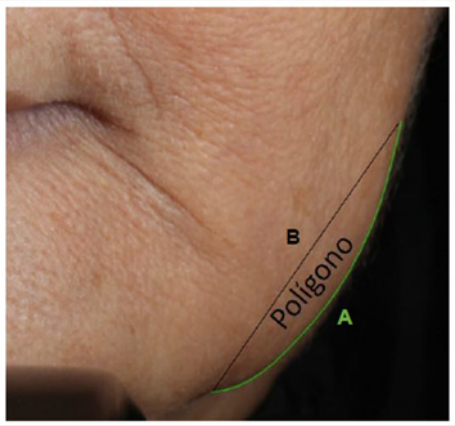

Figure 3: example of the quantification of the facial contours:
A: line which defines the facial contour
B: line used to form a polygon

From pictures taken with the VISIA CR the parameters area of the polygon and sinuosity were calculated. The area of the poygon was determined by counting the number of pixels inside. For the determination of the sinuosity the ratio of A/B was calculated: the closer the ratio is to 1 the more contoured the face will be. For an improvement of the facial contours the area and the sinuosity should decrease.

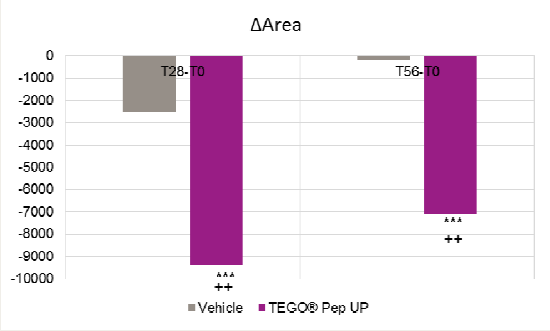

Figure 4: Decrease of the area of the polygon after 4 and 8 weeks treatment with TEGO® Pep UP
(*/+ p<0.05, **/++ p<0.01, ***/+++ p<0.001,
* compared to T0, + compared to vehicle)

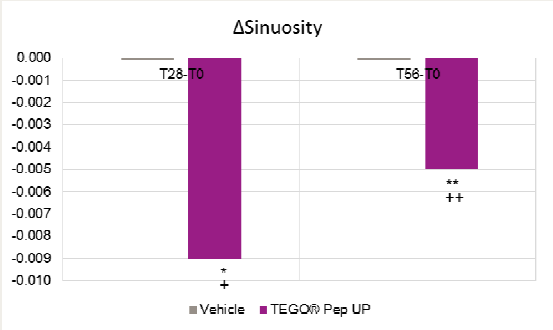

Figure 5: Decrease of the Sinuosity after 4 and 8 weeks treatment with TEGO® Pep UP
(*/+ p<0.05, **/++ p<0.01, ***/+++ p<0.001, * compared to T0, + compared to vehicle)

The area of the polygon as well as the sinuosity decreased significantly compared to the vehicle already after 4 weeks treatment with the face cream containing TEGO® Pep UP.

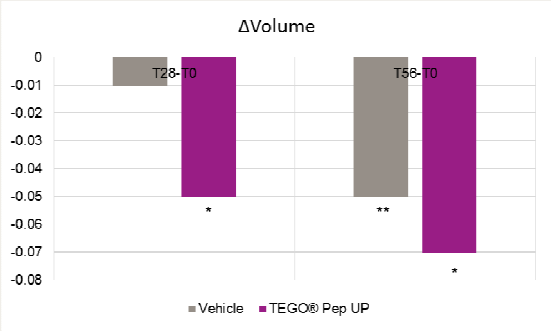

Figure 6: Decrease of skin volume after 4 and 8 weeks treatment with TEGO® Pep UP
(*/+ p<0.05, **/++ p<0.01, ***/+++ p<0.001,
* compared to T0, + compared to vehicle)

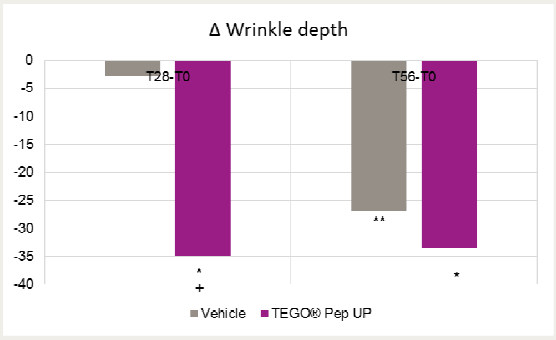

Figure 7: Decrease of wrinkle depth after 4 and 8 weeks treatment with TEGO® Pep UP
(*/+ p<0.05, **/++ p<0.01, ***/+++ p<0.001,
* compared to T0, + compared to vehicle)

Besides the significant improvement of the facial contours also the wrinkle depth and wrinkle volume measured in the crow feet area were significantly reduced after application of TEGO® Pep UP. This strong positive effect was already achieved after 4 weeks treatment.

The *in vitro* as well the *in vivo* tests proved the strong anti-ageing properties of TEGO® Pep UP. Tetrapeptide-4 supports the collagen production in the skin and thus helps to improve the facial contours and to reduce wrinkles.

Preparation

TEGO® Pep UP is water soluble, cold processable and heat resistant. Therefore it can be added to the water phase of the emulsion and the emulsion (O/W or W/O) is prepared as usual.

TEGO® Pep UP does not have a negative influence on the stability of emulsions.

Recommended usage concentration

3 % (clinically tested)

Applications

- Anti aging face care
- Skin contouring and lifting formulations
- Night care

Packaging

1 kg

Hazardous goods classification

Information concerning

- classification and labelling according to regulations for transport of chemicals
- protective measures for storage and handling
- measures in case of accidents and fire
- toxicological and ecotoxicological effects

is given in our safety data sheets.

Beispiel:

E 04/18

Guideline formulations

Lift Effect Face Care (MAC 892/3/2)

Phase A	
TEGO® Care PBS 6 (Polyglyceryl-6 Stearate (and) Polyglyceryl-6 Behenate)	3.00%
TEGIN® M Pellets (Glyceryl Stearate)	1.00%
TEGO® Alkanol 1618 (Cetearyl Alcohol)	1.00%
TEGOSOFT® DEC (Diethylhexyl Carbonate)	9.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	9.00%
TEGOSOFT OER (Oleyl Erucate)	2.00%
Phase B	
TEGO® Pep UP	3.00%
HyaCare® 50 (Hydrolyzed Hyaluronic Acid)	0.10%
Glycerin	2.00%
Water	
Phase Z	
Preservative, Perfume	q.s.

Preparation:

1. Heat phase A to 70 °C and phase B to approx. 30 °C.
2. Add phase B to phase A without stirring.
3. Homogenize.
4. Cool slowly while stirring

Anti-gravity Face Care Mousse (FU 07/18-1)

Phase A	
ABIL® Care XL 80 (Bis-PEG/PPG-20/5 PEG/PPG-20/5 Dimethicone; Methoxy PEG/PPG-25/4 Dimethicone; Caprylic/Capric Triglyceride)	2.50%
Wacker Belsil DM 5	5.00%
TEGOSOFT® DEC (Diethylhexyl Carbonte)	4.00%
TEGOSOFT® CT (Caprylic/Capric Triglyceride)	3.00%
TEGOSOFT® CR (Cetyl Ricinoleate)	1.00%
Phase B	
TEGO® Pep UP	4.00%
SK-INFLUX® V (Ceramide NP; Ceramide EOP; Phytosphingosine; Cholesterol; Sodium Lauroyl Lactylate; Carbomer; Xanthan Gum)	1.00%
TEGO® Cosmo C 100 (Creatine)	0.50%
Panthenol	0.50%
Allantoin	0.20%
Water	75.30%
Phase C	
TEGOSOFT® OS (Ethylhexyl Stearate)	1.60%
TEGO® Carbomer 141 (Carbomer)	0.15%
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Keltrol CG-SFT (Xanthan Gum)	0.10%
Phase D	
Sodium Hydroxide (10% in water)	q.s.
Phase E	
TEGO® Betain 810 (Capryl/Capramidopropyl Betaine)	1.00%

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