



Proven efficacy

Anti-aging

Peptan[®]

Collagen peptides
for cosmetic applications

Improvement
by nature

www.peptan.com



Rousselot

Collagen and skin health

Collagen is one of the most abundant scleroprotein of the connective tissue occurring as fibres accounting for 70 to 80% of skin dry weight. It is the main structure element of the skin and, therefore, largely responsible for its characteristic properties.

Collagen, the frame supporting the skin

Collagen fibres are constructed within fibroblasts, from protein precursors that are assembled into rigid linear structures arranged in triple helices, which are then secreted by the fibroblasts. After proteolytic cleavage, the fragments assemble into long filaments, which then become grouped into fibrils, which are in turn grouped into bundles.

Collagen has a unique amino-acid composition, essential for its three-dimensional structure and its characteristic physical properties and renders the dermis resistant and tonic. The principal amino-acid components of collagen are glycine (20%), proline and hydroxyproline (25%). Hydroxyproline plays a particularly important role in stabilising the collagen triple helix, protecting against proteolytic digestion. Collagens type I and III are responsible for maintaining skin tonicity and solidity.

The deformation of these molecules allows the skin to stretch. These two types of collagen together account for 90% of the collagen present in the dermis (60 to 80% for collagen type I and 15 to 20% for collagen type III). This collection of fibres responsible for maintaining the structure

and resistance of tissues constitutes a dynamic network anchoring the skin in the deeper layers, thereby creating a support base for the skin. In addition to its architectural properties, collagen also regulates the activity of fibroblasts, playing a role in their migration, proliferation and differentiation, and in their adhesion to various elements of the extracellular matrix.



Science

Profound changes occur in the skin during aging, the dermis being the site of the most substantial histological and biological changes. The skin can synthesise collagen fibres, essential protein constituents of the dermis. However, the production of new collagen fibres declines over time. Collagen synthesis by fibroblasts decreases for two reasons: a decrease in the rate of fibroblast renewal with age and an associated decrease in the amount of collagen secreted by these cells. Collagen is also modified by the formation of bridges between fibrils, leading to the reticulation of fibres, rendering them more rigid.

Cross-links may be established between two collagen fibres or between the collagen fibre and glucose molecules (collagen glycation), rendering the network more rigid. Thus, the skin gradually loses its substance, through decreases in the amounts of its constituents, and becomes less supple, due to the loss of collagen fibre elasticity and to collagen dehydration. These changes in the extracellular matrix of the dermis lead to a loss of firmness, resulting in sagging of the skin and a loss of the harmonious volumes of the face. The tissues slide downwards and the face hollows out. This loosening

of the skin also leads to the formation of wrinkles, laughter lines and gravity-induced wrinkles. In parallel, the skin, like the rest of the body, is subject to numerous stresses that generate free radicals targeting cell membranes, proteins and DNA. The formation of these free radicals leads to changes in the skin over time, accelerating the cutaneous aging process.

Peptan® Cosmetic Peptides

Peptan® cosmetic peptide, a natural material offering a unique combination of functional and sensory benefits. Our collagen peptides can help you to create innovative solutions, high-end products adapted to your specific cosmetic needs.

Peptan® characteristics

- Pure type I collagen peptides
- Produced in our state-of-the-art plant in Angoulême, France
- Manufactured using a gentle enzymatic process to achieve the optimal molecular weight and to ensure the lowest possible odor, color and ash.
- Quality manufactured according to HACCP, ISO and GMP standards.

Rousselot's complementary nutritional & topical Peptan® range offer potential synergies to provide an extra boost to skin beauty and health. Our extensive offer of Peptan® products for nutricosmetic applications has proven benefits for moisturization & anti-aging in several clinical studies recently conducted in Japan and in France.



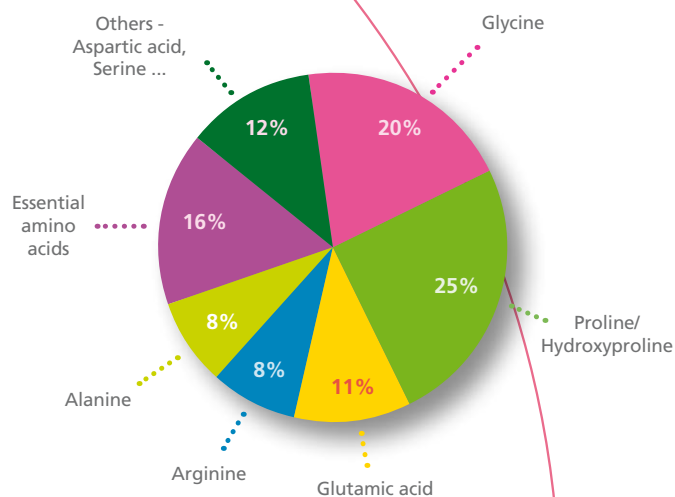
Peptan[®] Cosmetic Peptides

For years, Peptan[®] Collagen Peptides has been touted for its skin health properties for beauty from within. Now recent studies show Peptan[®] advanced benefits to cosmetic formulations. Peptan[®] Collagen Peptides are essential in the proliferation of fibroblast and collagen synthesis in the dermis and moisture retention in the skin.

What are Peptan[®] Cosmetic Peptides?

Peptan[®] Cosmetic Peptides are pure natural type I collagen peptides, preservative-free and easy to formulate in all your cosmetic applications.

The Peptan[®] Cosmetic Peptide is based on a sequence (GLY-PRO -X or GLY-HYPRO -X) which is naturally present in the dermis and contains 18 different amino acids, including glycine, proline and hydroxyproline in particular, these three molecules accounting for almost 50% of all the amino acids present.



Peptan[®] SR Marine

Peptan SR Marine is an active peptide is an active peptide originating from fish, providing the amino-acids required for the correct functioning of skin cells.

Properties

Peptan[®] SR marine boosts fibroblast proliferation and favors the synthesis of the major structural collagen molecule of the dermis, thus preserving its structural organization. It also can protect against free radicals, limiting their aging effects.

Cosmetic application

Peptan[®] SR marine is tailored for skin care where anti-aging action is desired.

Formulation

- **Versatility:** pure water soluble spray-dried powder.
- **pH Stability:** stable in the pH range of 3.0 to 7.0.
- **Thermostability:** temperature of up 60°C for a short time does not affect the stability and characteristics.
- **Incorporation:** For cold processes, dissolve Peptan[®] SR marine into the aqueous phase. For cold/hot processes, add during the cooling phase below 40°C.
- **Preservative-free**

Suggested dosage

1 - 3%

Product specifications

INCI/CTFA: Hydrolyzed Collagen

EINECS: 295 - 635 - 5

CAS: 92113 - 31 - 0

Product source: Fish skin

Molecular weight (average): 2000 Da

Form: Spray dried powder

pH: 5.0 - 6.5

Color: white to pale amber

Odor: none

Formulating with Peptan[®] SR Marine

Peptan[®] SR Marine has already been used in a number of successful cosmetic applications.

- **My Beauty-care mask** regenerates, smoothens and moisturizes skin.
- **Peptan SR anti-aging emulsion** boots fibroblasts proliferation and favors the synthesis of the major structural collagen molecule of the dermis.
- **My Beauty Serum** has been scientifically tested by French laboratories BIOEC in 2012. After an 8-day treatment with Peptan SR Marine serum, density in collagen in the dermis showed 8% improvement compared to placebo. Tolerance test showed no irritation.



Peptan® SR Marine: a proven solution

Efficacy tests

STIMULATION OF FIBROBLAST PROLIFERATION

XTT cell proliferation test

Cultured human skin fibroblasts were treated after 24 hours with Peptan® SR marine at a concentration of 0.1 mg/ml. After incubation for 24 h, XTT cell proliferation test was used to assess the viability and proliferation of the fibroblasts. The absorbance at 450 nm is determined by spectrophotometry and the results are expressed as a percentage of the value for untreated controls.

The incubation of 0.1 mg/ml Peptan® SR with cultured fibroblasts for 24 hours induced a significant increase in fibroblast proliferation to 18% higher than that of an untreated control (p=0.016).

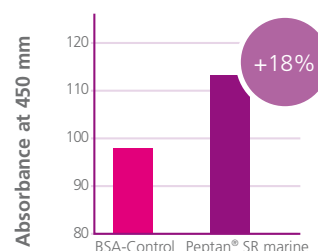


Figure 1: Stimulation of fibroblast proliferation by Peptan® SR marine at 0.1 mg/ml.

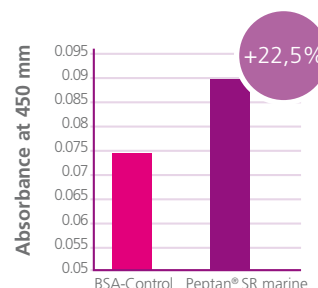
STIMULATION OF COLLAGEN SYNTHESIS

in vitro test vs BSA control

Human dermal fibroblasts were cultured and, 24 hours later, 0.01 mg/ml Peptan® SR marine was added to the culture medium. As a control, fibroblasts were incubated with 0.01 mg/ml BSA. Two days later, collagen I in fibroblasts was quantified by staining with Sirius Red by a fluorimetric method.

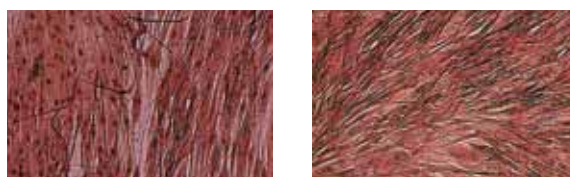
The treatment of fibroblasts with 0.01 mg/ml Peptan® SR for 2 days induced a significant increase in collagen synthesis to 22.5% higher than that of the BSA-treated control (p<0.05).

Figure 2: Stimulation of collagen synthesis by fibroblasts induced by Peptan® SR marine (0.01 mg/ml), as shown by comparison with Control at 2 days.



EFFECT OF PEPTAN® SR marine on the organization and density of fibroblasts

Figure 3: Fibroblasts incubated for 7 days with 0.01 mg/ml BSA (left) and 0.01 mg/ml Peptan® SR marine (right), after staining with Sirius Red.



PROTECTION AGAINST OXIDATIVE STRESS

ORAC test in vitro

Decoloration of beta carotene was assessed in the presence and absence of 5 mg/ml Peptan® SR marine. The positive control used was butylhydroxyanisol (BHA) at a concentration of 2.5 mg/ml.

Spectrofluorimetry was used and the results are expressed with respect to the protection against oxidation conferred by the reference antioxidant (BHA) per gram of product tested.

The antioxidant activity of Peptan® SR (5 mg/ml) was about 62% of that of BHA.

Results

	Peptan® SR marine (5 mg/ml)	BHA (2.5 mg/ml)
Antioxidant activity (% that of BHA)	62%	100%

Figure 4: Antioxidant activity of Peptan® SR marine (5 mg/ml) Results of the ORAC test after 60 minutes.

Peptan® SR marine activates collagen synthesis by fibroblasts. It can restore the threedimensional architecture of the dermis, increasing the volume of this tissue and providing it with cohesion and tonicity. Its effects on the extracellular matrix of the dermis thus counteract the loss of firmness that occurs over time and eventually leads to wrinkles. Peptan® SR marine also has an antioxidant effect providing protection against agents generating free radicals.