

# White paper SLOWING DOWN THE CLOCK WITH COLLAGEN PEPTIDES

Collagen is a key player in the 'beauty from within' trend. Here, **Patrícia Maia Campos** and **Ana Cristina Corrêa de Faria** discuss the positive effects that Rousselot's Peptan B product has been shown to have on skin and hair beauty

**T**hroughout history and across cultures all over the world, beauty has been understood in radically different ways. In ancient Greece, beauty was quantified by the 'golden ratio', basing beauty on symmetry. In medieval Japan, extremely long hair was prized, as well as pale skin. During the 16th century in England, flawless skin undamaged by the sun was the most sought-after attribute, as this was a sign of class and wealth.

Nowadays, beauty is associated with health and youthfulness. In the beauty market, this is reflected by the high demand for nutricosmetic products with associated skin and hair beauty benefits. For hair beauty the most demanded products are those addressing damage repair, hydration and moisture.

The most desired benefits in skin beauty products are their moisturising, hydrating and anti-ageing properties.

## INSIDE OUT

Your skin reflects the quality of your nutrition and lifestyle choices, such as smoking, drinking enough water or sleeping habits. Thus, beautiful skin on the outside must first have a healthy foundation on the inside.

Collagen, the human body's most abundant protein, has lately been getting a lot of attention. Collagen's popularity grew rapidly over the past decade, becoming the leading ingredient in nutricosmetics, and it is now featured in 25% of these products. Given its versatility and anti-ageing properties, it is estimated that collagen's use will only continue to grow. But why is collagen a key element in beautifying from within?



## LAYING THE FOUNDATIONS

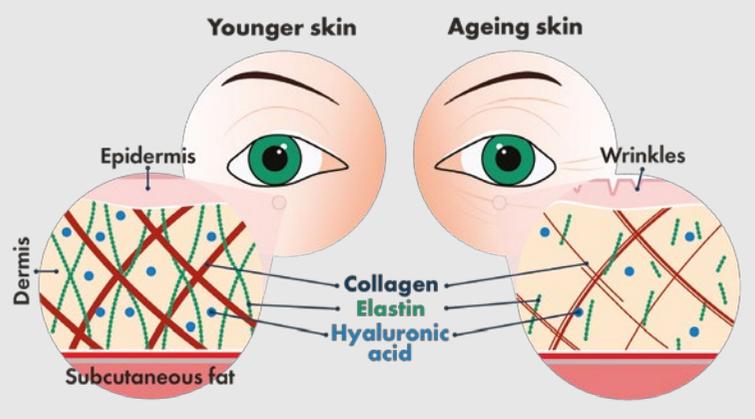
Skin is composed of different layers that are tightly connected to each other (figure 1). The outermost layer, the epidermis, wraps our bodies and protects us from UV radiation and serves as a shield against infections and chemicals.

Underneath we find the dermis, which cushions the body from stress and strain. The dermis is a thick layer of connective tissue, mostly made of collagen, which lays the structural foundation of the skin.

Collagen fibres, arranged in the shape of resilient sheets, provide structural and mechanical support. These fibres serve as the infrastructure for elastin, which maintains the skin's elasticity, and hyaluronic acid, which traps water. Collagen gives the dermis its strength and extensibility, and sustains the renewal of skin cells and replacement of damaged and dead cells.

**Figure 1**

Structure of young and ageing skin. In younger skin, collagen fibres serve as a good network support for elastin and hyaluronic acid. In ageing skin, this structure is lost and both elasticity and hydration decrease. As a result, skin wrinkles and desquamation increase





Collagen supplements can improve the signs of ageing for both skin and hair

Sadly, strong and supple skin does not last forever. Environmental factors such as diet, smoking or UV light can burn up the body's collagen supply. Moreover, as we age, our body generates less and lower quality collagen.

As a result, the collagen network in the dermis becomes thinner and more fragmented (figure 1), leading to reduced skin hydration, firmness and elasticity. Eventually, the degradation of collagen fibres leads to the visual signs of ageing, such as wrinkles and loss of firmness.

The reduction of collagen fibres can also affect hair since there is collagen in the hair follicle. The lack of follicle support could lead to weaker and thinner hair fibres that can easily break.

Ageing is inevitable, but collagen's beneficial properties for skin and hair appearance could help delay the visual effects. Its high demand and trending status on digital media stem from a growing body of scientific research.

### SCIENCE THAT BACKS THE HYPE

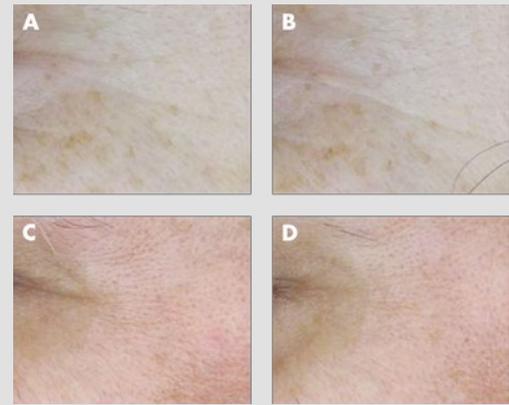
Rousselot has gone back to the basics of skin condition to find out how collagen peptides can enhance beauty from within. Peptan collagen peptides are produced by a targeted enzymatic hydrolysis, meaning that collagen is specifically cut into more easily digestible pieces (ie collagen peptides).

Clinical trials showed that collagen peptides are bioactive, inducing collagen as well as hyaluronic acid production in the skin (online access: doi: 10.1111/jocd.12174). As a consequence, skin hydration increased and the quality of the dermal collagen network improved.

Recently, collagen peptides supplementation for skin and hair improvement was clinically evaluated in a study with 60 healthy women. The study was conducted to evaluate both the

### Figure 3

High resolution images of the eye wrinkles of a placebo (A and B) and a collagen peptides (C and D) supplemented volunteer at the onset of the study (T0, A and C) and after 90 days (T90, B and D) of supplementation



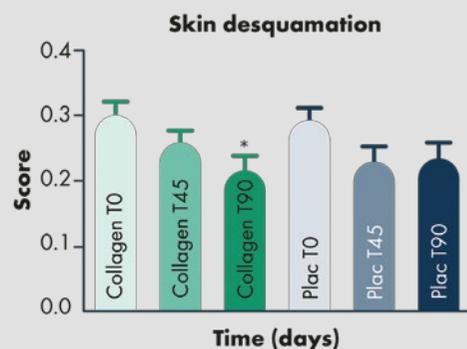
supplement performance as well as the consumer's response. The product used was Peptan B, a very pure, natural product containing (on a dry weight basis) more than 97% collagen peptides of bovine origin.

The 60 healthy female participants, aged 45-60 years old, were given 5g/day of either Peptan B or a placebo for 90 days (figure 2). After 45 and 90 days, the skin of the participants was evaluated using biophysical, high-definition imaging, and high-frequency ultrasound techniques to detect changes in hydration, cutaneous microrelief, wrinkles and thickness of the dermis.

The supplementation with collagen peptides over 90 days showed a reduction in skin desquamation (shedding of the epidermis layer)

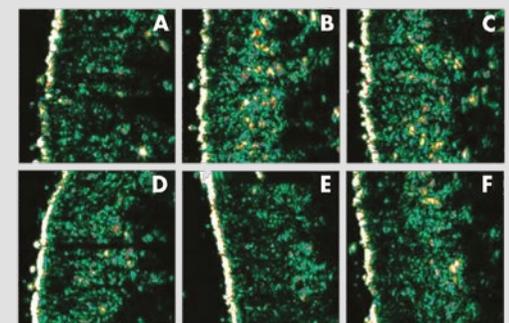
### Figure 2

Results of the clinical study with 60 healthy women, aged 45-60 years old, supplemented with collagen peptides or the placebo. Effects on skin desquamation are displayed as scores calculated at the onset of the study (T0), after 45 (T45) and 90 (T90) days of supplementation



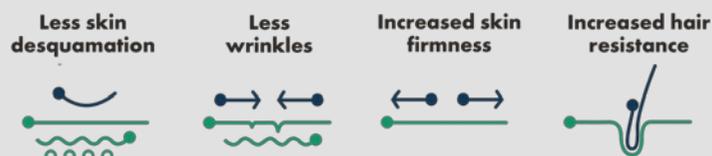
### Figure 4

Ultrasound images of the dermis of the participants supplemented with collagen peptides (A, B, C) or the placebo (D, E, F) at the onset of the study (T0, A and D) and after 45 (T45, B and E) and 90 (T90, C and F) days of supplementation. The higher the dermis density, the more light-coloured spots (white, yellow) are in the image



## Figure 5

Overall effects of collagen peptides supplementation on skin and hair



(figure 2), reflecting less damage and reduced loss of the upper layer of the skin.

High-definition imaging also showed a substantial decrease in face wrinkles for the group treated with collagen: a 13% reduction of the wrinkles around the eyes (figure 3), while those around the mouth were reduced by 10%.

The high-frequency ultrasound revealed an increase in acoustic reflectance in the collagen-supplemented group (figure 4), suggesting that the product improved the dermis density. An increased dermis density can be related to skin wrinkle reduction and firmness increase. The findings support previous studies on how a denser dermis, that is, an increased collagen layer and enhanced fibrillar network, improves the skin structure and integrity.

Ageing also affects the hair. Our hair receives the nutrients and proteins we ingest via the bulb region of the hair follicle, localised in the dermis. The loss of collagen can impact the quality of the hair follicle, causing hair fibres to become thinner and therefore less resistant to external impacts.

The use of collagen peptides as a dietary supplement or in cosmetics can help the restitution of the hair follicle and subsequently increase the strength of the formed hair.

The effect of Peptan B on hair fibres was evaluated through a break stress test. The results showed a significant 13% increase in break force for the collagen-supplemented group. These findings suggest that the oral intake of Peptan B promoted stronger hair, supporting collagen as a



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strategy for improving the conditions of the capillary fibre as we age.

Studies conducted for Peptan B thus showed important benefits for relevant skin visual parameters, dermis density and hair strength (figure 5). As such, oral supplementation with collagen peptides impacts skin and hair beauty.

### WHAT THE PARTICIPANTS SAID

The effectiveness of Peptan B was also surveyed among the participants of the study regarding their perception and thoughts on the product (figure 6). Overall, participants who received Peptan B noticed more hydrated skin compared with those in the placebo group. Those taking collagen also noticed a reduction in skin pore size: 85% of participants who took Peptan B reported fewer large pores.

Regarding wrinkles, while the placebo group didn't notice any changes, 75% of participants taking Peptan B reported fewer and less deep wrinkles.

### CONCLUSION

The current beauty trend for looking healthy promotes healthier habits and practices to improve our skin's appearance. These choices are strongly driven by a desire to slow ageing and reduce its signs.

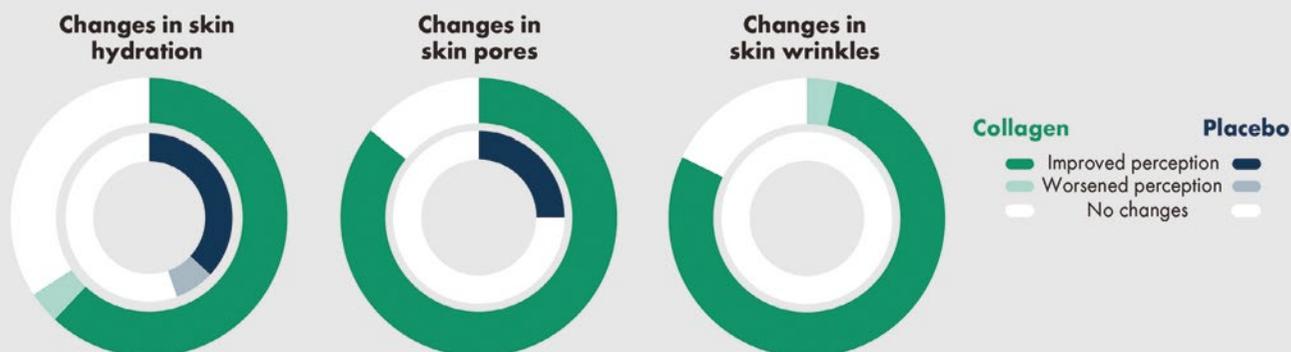
Dietary supplements are developed to support our health and nurture our skin by going to its foundations. In this regard, collagen is highly praised for its effects on skin and hair. Collagen supplements such as 5g/day of Peptan B offer a long term and sustainable approach to combating ageing and improving skin and hair properties.

Tackling beauty from within will have you glowing on the outside and on the inside.

Disclaimer: use of this information shall be at your own discretion and risk. Nothing herein relieves you from your obligation to comply with all applicable laws and regulations and to observe all third-party rights. Peptan B is not intended to diagnose, treat, cure or prevent any disease ●

## Figure 6

Participants' perceptions on the effects of collagen peptides or the placebo on skin hydration, pores and wrinkles





# Peptan

## COLLAGENS FOR BEAUTY FROM WITHIN

### NURTURING A NATURAL GLOW FROM THE INSIDE OUT

Rousselot Health & Nutrition's collagen solutions for the beauty from within market can help brands deliver on all consumer needs without compromise, from science-backed beauty benefits to clean labels, natural appeal and sustainability. Peptan is the world's leading collagen brand\*.

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A world of health benefits

\*Ref. *Nutraingredients - State of the Industry Survey 2020*



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Rousselot is a brand of Darling Ingredients