StimulHyal: Help to Rejuvenate the Skin with a 100% Natural Pure Molecule

Authors: Celina Rocquet, Romain Reynaud, Soliance, Paris, France

Introduction

High molecular weight Hylauronic Acid (HA) plays a key role in essential biological pathways of the skin and, more specifically, in the extracellular matrix of the dermis. It helps to support the matrix by forming a viscous network of polymers through collagen fibres, and maintains hydration thanks to its hygroscopic properties. Hyaluronic acid is important in skin physiology for cell renewal and cell migration. It maintains the biomechanical properties of the skin.

Our company has worked in biotechnology processes for more than 15 years. Thanks to our unique technical expertise, we have developed a new anti-ageing active ingredient specifically targeted to improve skin suppleness and elasticity.

StimulHyal is a pure molecule. Its structure is directly responsible for its activity. StimulHyal acts in the dermis where many biological activities take place. It improves the skin biomechanical properties, especially skin elasticity. Molecules like HA and elastin are essential for ensuring cutaneous suppleness and are the main targets of StimulHyal.

Its efficacy is proven by *in vitro*, *ex vivo* and *in vivo* tests.

Ecodesign is the driving force of Soliance product development. Our production process has been optimised to obtain StimulHyal, a product approved by Ecocert.

Cutaneous Ageing: Dermis Matters

The Extracellular Matrix of the Dermis (ECM)

The ECM of the dermis is made of a complex of molecules, which give the skin its biomechanical properties. Among these components, collagen is responsible for skin firmness, while hyaluronic acid and elastin are key components of skin elasticity.

Hyaluronic acid

The Hyaluronic acid molecule was isolated in 1934 by Meyer and Palmer. It is an essential component of numerous tissues and physiological fluids. It is a linear biopolymer, the main component of the glycosaminoglycan family (GAGs).

HA is a natural biopolymer formed of repeated disaccharidic units. These are D-glucuronic acidic and D-acetylglucosamine, linked together by glycosidic bonds β (1-3) and β (1-4). The formula is $(C_{14}H_{20}NNaO_{11})n$ with $200<n<700$.

The skin contains more than 50% of the total HA amount present in the body. It is mainly synthesised by fibroblasts in the dermis, but also by keratinocytes in the epidermis. Enzymes catalyse the length of the HA chains by adding alternatively a glucuronic acidic and a N-acetylglucosamine. The extension of the de novo synthesised polymer occurs in the cytoplasm. Almost 75% of the HA is immediately exuded in the cell.

Elastin

Elastin is another essential component of the dermal ECM. It is a 64 to 66 kDa protein, mainly constituted of glycine, valine, alanine and proline. It gives the skin its elasticity and suppleness, thus enabling it to recover its normal state after deformation.

During the ageing process, elastin and HA synthesis tends to decrease, while certain enzymes increase their degradation. Consequently, the skin loses elasticity and suppleness.

We have developed a new active ingredient that aims to fight skin ageing signs.

StimulHyal

Product's Nature and Characteristics

StimulHyal is the trade name of calcium 2-cetogluconate. This molecule is a highly purified white powder (>97%). This calcium salt is readily soluble in water until 10 g/L.

This molecule is traditionally used in the food industry, as an intermediate to synthesise the erythorbic acid antioxidant.

StimulHyal is a natural molecule of a lactic bacteria metabolism.

- White powder
- Odourless
- Preservative free
- Very high purity