

# Deliner®: Anti-ageing Resulting of Scientific Studies Focused on the Modifications Undergone by Cutaneous Tissue During the Ageing Process.

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## Abstract

During cellular ageing, the dermis is subjected to deep modifications both from a molecular aspect and on an ultra-structural level. Thus, fibroblasts present in this tissue become increasingly rare, synthesis abilities of these cells diminish and the macromolecules responsible for sustaining the mechanical properties of the skin degenerate. Faced with this situation, research in cosmetology is increasingly developing new concepts and products, intended to fight against the degradation of the macromolecules in the extracellular matrix, such as collagens and elastin. These structure proteins constitute the main targets in the anti-ageing strategies proposed today. However, they are not the only ones to play an important role in maintaining the ultrastructure of the dermis and certain proteins could act as a particularly powerful lever on the mechanisms involved in skin ageing.

Fibronectin is one of these molecules. As a veritable organizer of the connections between the different macromolecules of the extracellular matrix, as well as between these macromolecules and the fibroblasts, it acts as a cohesive scaffold and heavily contributes to maintaining the ultrastructure of dermal tissue. Moreover, fibronectin is particularly involved in the migration of fibroblasts to the wounded area during wound-healing phenomena. On the reasoning that, like the phenomena observed during wound-healing, fibronectin could constitute the primary basis for fibroblast re-colonization of the areas in which they were rarefied, we sought to stimulate the synthesis of this glycoprotein. Interestingly, such an activity was also likely to result in the reactivation of fibroblastic neosynthesis of the macromolecules in the extra-cellular matrix of the ageing dermis.

However, the status of fibronectin during skin ageing remained controversial. The number of scientific publications reporting an increase or reduction of dermal fibronectin levels according to age is more or less equivalent. Faced with this controversial ambiguity, we decided to study first the status of fibronectin during ageing and demonstrated a clear diminution of the

fibronectin expression and content while ageing using in vitro skin engineering culture models.

Deliner®, the corn extract then selected stimulates protein synthesis and particularly fibronectin synthesis, cell proliferation and migration and offers an innovative avenue of investigation in the “anti-ageing” fight. Its importance in terms of cutaneous physiology is perfectly highlighted by the “anti-wrinkle” and redensifying effects which Deliner® provides.

## Introduction

### The fibronectin network during ageing: a missing cell connectivity

The connective tissue of the skin has been extensively studied but there is still important information missing. The main scaffolds, namely the collagen and the elastic networks, are now more or less understood as far as their three-dimensional organization and functions are concerned. For instance, collagen molecules can be assembled into collagen fibrils and then fibres that are responsible for mechanical properties of the skin. On the other hand, the complex elastic fibre network is also tremendously important for the plasticity of the skin and plays a pivotal role in the intrinsic and UV-related ageing phenomena. A third network has been poorly studied until now but is also essential to the connective tissue organization, as well as the cell-cell and cell-matrix interactions: the fibronectin network.

Fibronectin designates a family of glycoproteins (about twenty members) synthesized by alternative splicing. Produced in insoluble form by the connective tissue's fibroblasts, it is found within cells at the cell surface and on extra-cellular levels. Fibronectin is capable of contracting lesions, not only with most of the other connective tissue molecules, but also with numerous cellular types through the integrins present on their surface. It also combines with the components of the cytoskeleton such as actin, through surface proteoglycans to promote cellular adhesion (Ruoslahti, 1989).