

# DERMOCHLORELLA

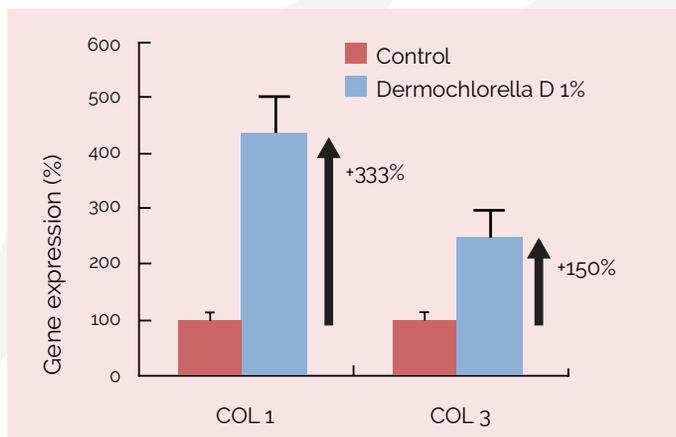
## SKIN RESTRUCTURING

From the age of 20, our cells start to produce less collagen, elastin, sebum and then the skin dries out, becomes thinner and loses its elasticity. Wrinkles and stretch marks are the result of this lack of skin elasticity. Stretch marks appear when the elastic fibres of the dermis tear. Frequently they are located on the thighs, hips, breasts and buttocks due to a rapid weight gain or loss, pregnancy, puberty... Dermochlorella is an extract of a green microalgae *Chlorella vulgaris*, rich in peptides and amino acids, acts on all these elements of the dermal structure.

*The space surrounding the cells contains macromolecules, polysaccharides or glycosaminoglycans, fibrous protein, salts and water which as a whole are designated as the extracellular matrix, responsible for tissue cohesion. The main structure proteins are collagen and elastin. The extracellular matrix components are synthesized and secreted by cells such as the fibroblasts and degraded by enzymes called MMP (Matrix MetalloProteinase) whose activity is inhibited by endogenous antagonists called TIMP (Tissue Inhibitor of Metalloproteinase).*

### IN VITRO TEST: EFFECT ON COLLAGENS 1 AND 3

Collagen is the main fibre protein of the body which gives tissues their elasticity. Its role may be compared to that of a frame. It is composed of different types depending on their location and it is essential for the healing process.

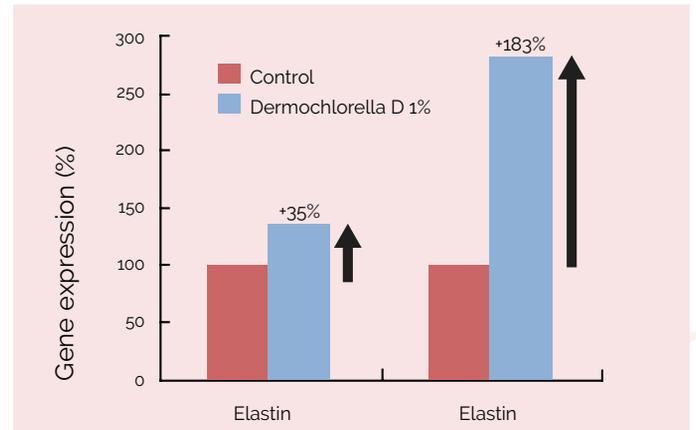


Results: Dermochlorella increases collagen in fibroblasts:

- Collagen I by +333%
- Collagen III by +150%

### IN VITRO TEST: EFFECT ON ELASTIN AND ELAFIN

Elastin is a glycoprotein secreted by dermis cells which has elastic properties. Its synthesis decreases with age resulting in the appearance of stretch marks under the action of mechanical constraints. Elafin is a specific inhibitor of elastase, an enzyme responsible for elastin fibre degradation.

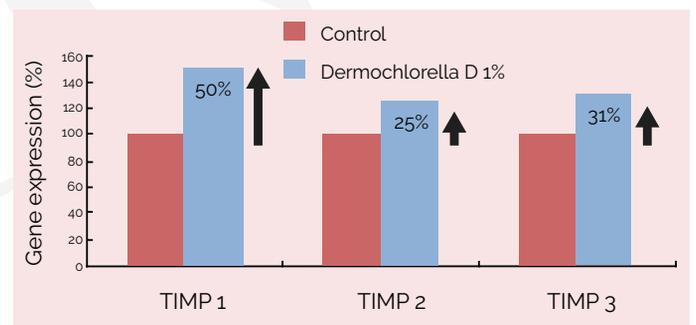


Results: Dermochlorella increases:

- Elastin by +35% in fibroblasts
- Elafin by +183 in keratinocytes

### IN VITRO TEST: EFFECTS ON TIMPS EXPRESSION

TIMPs are capable of inhibiting all MMPs. Therefore, they play a key role in maintaining a balance between extracellular matrix formation and degradation in various physiological processes.



Results: Dermochlorella increases TIMPs in dermal cells:

- TIMP-1: +50%
- TIMP-2: +25%
- TIMP-3: +31%

### THE DERMIS-EPIDERMIS JUNCTION: ATTACHMENT POINT BETWEEN THE EPIDERMIS AND THE DERMIS

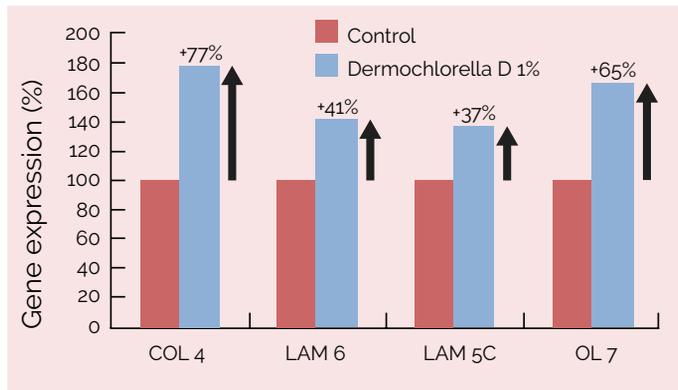
The skin contains the Dermis-Epidermis Junction (DEJ) or basal membrane which ensures an optimum cohesion between the dermis and the epidermis. Initially it is sinusoid in shape, and becomes flatter with age: the dermis is less well attached to the epidermis. It contains specific molecular components:

- collagen glycoproteins, the main components in the extracellular matrix: type IV collagen provides the mechanical stability of the basal membrane and type VII collagen is the major component of anchoring fibrils

- several types of laminins. They represent the major non-collagenic components. The isomers present are laminin 5 and 6. They have a major structural role with the formation of a network to which other collagenic or noncollagenic proteins bind

The degradation of the DEJ results in a reduction in the exchange surface between the epidermis and the dermis which can even result in the detachment of the epidermis with rubbing.

### IN VITRO TEST: EFFECT ON THE EXPRESSION OF PROTEINS PRESENT IN THE DEJ



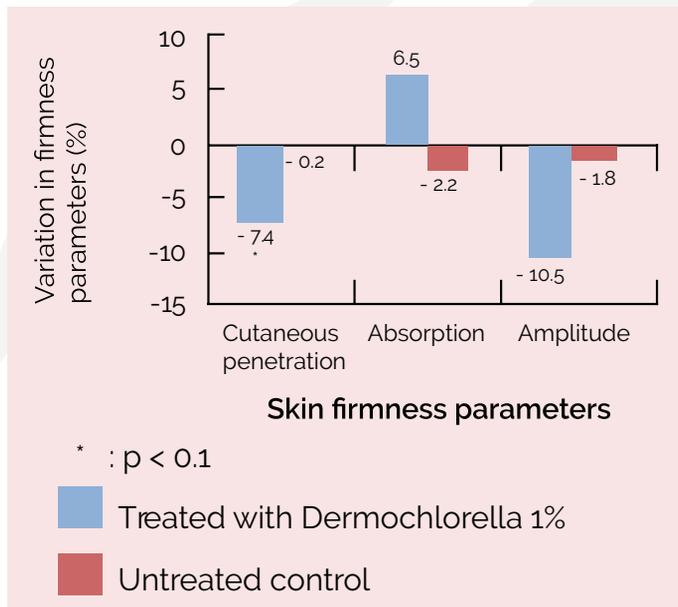
Results: In fibroblasts Dermochlorella increases:

- Collagen IV by +77%
- Laminin 6 by +41%

Results: In keratinocytes Dermochlorella increases:

- Laminin 5 by +37%
- Collagen VII by +65%

### CLINICAL TEST: EFFECT ON SKIN FIRMNESS AND TONE



Results after 84 days of use:

- Cutaneous penetration: -7.4% and up to -26%

*A decrease in this parameter indicates that the bead creates only a slight depression on the skin => the skin is firmer*

- Absorption of bounces by skin: +6.5% and up to +66%

*An increase in this parameter indicates that the bounces stop sooner => the skin tone increased*

- Amplitude of bounce: -10.5% and up to -46%

*A decrease in this parameter indicates that the bead bounces less intensely => the firmness and tone of the skin increased.*

### CLINICAL TEST: ANTI-STRETCH MARKS EFFECT



Results after 84 days of use:

- Significantly decreases the color of stretch marks: -10.4% and up to -32%
- Decreases morphology of stretch marks: -2.9% and up to -7.9%

*Dermochlorella is a restructuring active ingredient that allows the skin to find its tone and firmness again.*