

DERMOCHLORELLA D - DERMOCLORELLA DP

Skin restructuring

CODIF
Recherche & Nature

The ageing process starts from the age of 20.

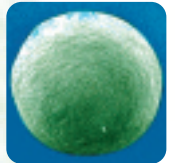
Our cells start from that age to produce less collagen, elastin, sebum and then the skin dries out, becomes thinner and loses its elasticity. Wrinkles and stretch marks are the result of this lack of skin elasticity.

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...

CODIF Recherche & Nature has an active ingredient that acts on all these elements of the dermal structure: **DERMOCHLORELLA D** and **DERMOCHLORELLA DP** (different preservative system).

DERMOCHLORELLA D / DP is an extract of a green microalgae *Chlorella vulgaris*, rich in peptides and amino acids.



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 synthesised 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 (Tissu Inhibitor of Metalloproteinase).

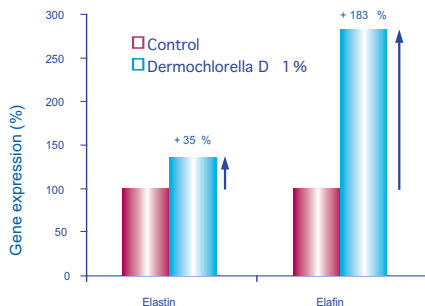
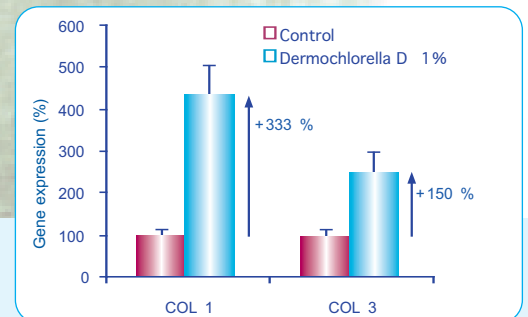
A new approach was tested here by molecular biology (RNA) according to the DNA mini-chips method. It allowed studying the effect of **DERMOCHLORELLA D / DP** on human dermis fibroblast gene expression and thus study its effect on the gene expression of the different extracellular matrix components.

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.

• **DERMOCHLORELLA D / DP** tested at 1%, increases Collagen I (COL1) expression by **+333%** and Collagen III (COL3) expression by **+150%** in fibroblasts.

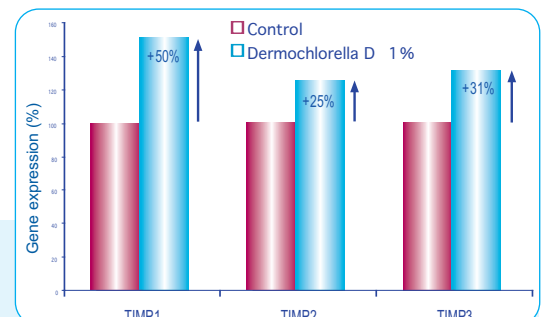


In vitro test

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.

• **DERMOCHLORELLA D / DP** at 1% increases Elastin expression in fibroblasts by **+35%** and Elafin expression in keratinocytes by **+183%**.



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.

• **DERMOCHLORELLA D / DP** at 1% increases TIMP-1 (**+50%**), TIMP-2 (**+25%**) and TIMP-3 (**+31%**) in dermal cells.

DERMOCHLORELLA D - DERMOCHLORELLA DP

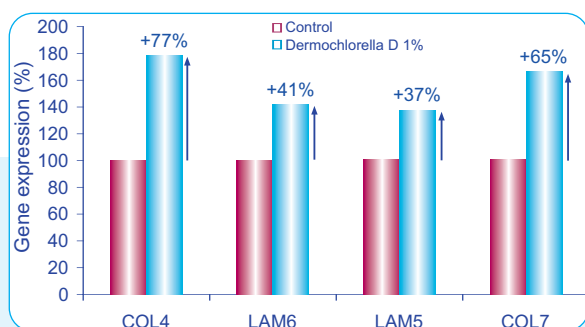
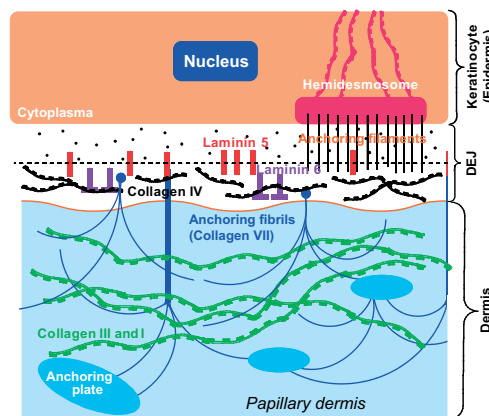
Skin restructuring

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 non-collagenic 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

- In fibroblasts, **DERMOCHLORELLA D / DP** increases Collagen IV (COL4) expression by **+77%** and Laminin 6 (LAM6) expression by **+41%**.
- In keratinocytes, **DERMOCHLORELLA D / DP** increases Laminin 5 (LAM5) expression by **+37%** and Collagen VII (COL7) expression by **+65%**.

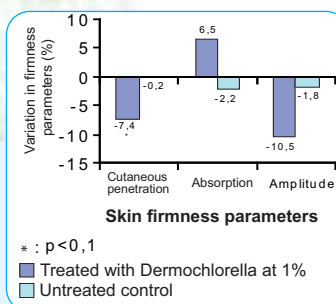
Clinical test

Effect on skin firmness and tone

The analysis of a bead propelled onto the skin (ballistometry) allowed the measurement of cutaneous firmness and tone. The results obtained with **DERMOCHLORELLA D / DP** were compared to an untreated control.

3 parameters were studied:

- cutaneous penetration: **-7.4%** on average and up to **-26%** after 84 days of use. 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%** on average and up to **+66%** after 84 days of use. An increase in this parameter indicates that the bounces stop sooner => the skin tone increased,
- amplitude of bounce: **-10.5%** on average and up to **-46%** after 84 days of use. A decrease in this parameter indicates that the bead bounces less intensely => the firmness and tone of the skin increased.

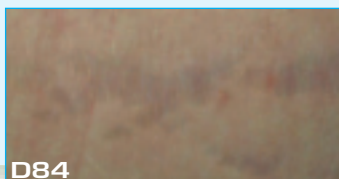
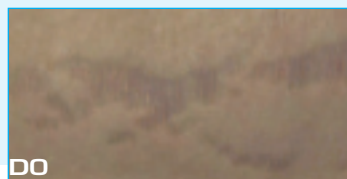


Clinical test

Anti-stretch marks effect

11 women applied twice daily for 84 days a cream containing **DERMOCHLORELLA D / DP** at 1%. The results of the study were compared to an untreated zone.

- **DERMOCHLORELLA D / DP** at 1% significantly decreases the colour of stretch marks (chromametry analysis): **-10.4%** on average and up to **-32%** after 84 days of use.
- **DERMOCHLORELLA D / DP** at 1% decreases the morphology of stretch marks (analysis from photographs): **-2.9%** on average and up to **-7.9%** after 84 days of use.



INCIUSA	INCI EUROPE	N° CAS	N° EINECS
Water (and) Chlorella vulgaris extract	Aqua Chlorella vulgaris	7732-18-5 91079-57-1	231-791-2 293-445-7

+ Preservatives: Propylene glycol / Phenoxyethanol / Chlorphenesin / Methylparaben (2.12 - 2.87%) for **DERMOCHLORELLA D (ALG057)**
Phenoxyethanol (~1%) for **DERMOCHLORELLA DP (ALG058)**

Corresponding technical files: D.Tech.05-038GB, D.Tech. 06-027GB, D.Tech. 06-038GB

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DERMOCHLORELLA D / DP is a restructuring active ingredient that allows the skin to find its tone and firmness again.

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