

# Neodermmyl®

The “needle-free” collagen and elastin filler

Upon aging, cells are no longer able to produce collagens and elastin effectively. By providing a new source of bio-energy this production is reactivated. Neodermmyl® boosts senescent fibroblasts to:

- 1) Increase collagens I and III (youth collagen) synthesis:
  - › Improvement of skin density and firmness.
- 2) Increase elastin production:
  - › Improvement of skin elasticity.

Visible reduction of wrinkles' depth and volume in only 15 days.

E=ECM<sup>2</sup>

Energy=ECM  
regeneration in  
2 weeks

# Focus on the product

## The essential role of collagens and elastin in a young skin

The extracellular matrix (ECM) is composed of essential polymers that provide the skin all of its properties: young skin is supple, firm and elastic. These polymers are different types of collagens (mainly collagens I and III) that maintain skin's structure and elastin to provide its viscoelasticity. Compared to hyaluronic acid (another major component of the ECM), collagens and elastin are quite sophisticated 3D proteins. Collagen I represents almost 90% of the total collagen, and the collagen III is the youth collagen.

## Aging > less collagens and elastin production > less energy

Enzymes (collagenases and peptidases) are degrading collagens and elastin along with aging. This is particularly true for collagen III, a.k.a. the youth collagen, which degrades even faster than collagen I and almost disappearing with aging.

Moreover, our senescent cells (fibroblasts) are no longer capable of keeping up the production pace of these polymers to cover the loss. This is due to the loss of energy required to drive this production. The main consequences are the formation of wrinkles, loss of firmness and loss of elasticity.

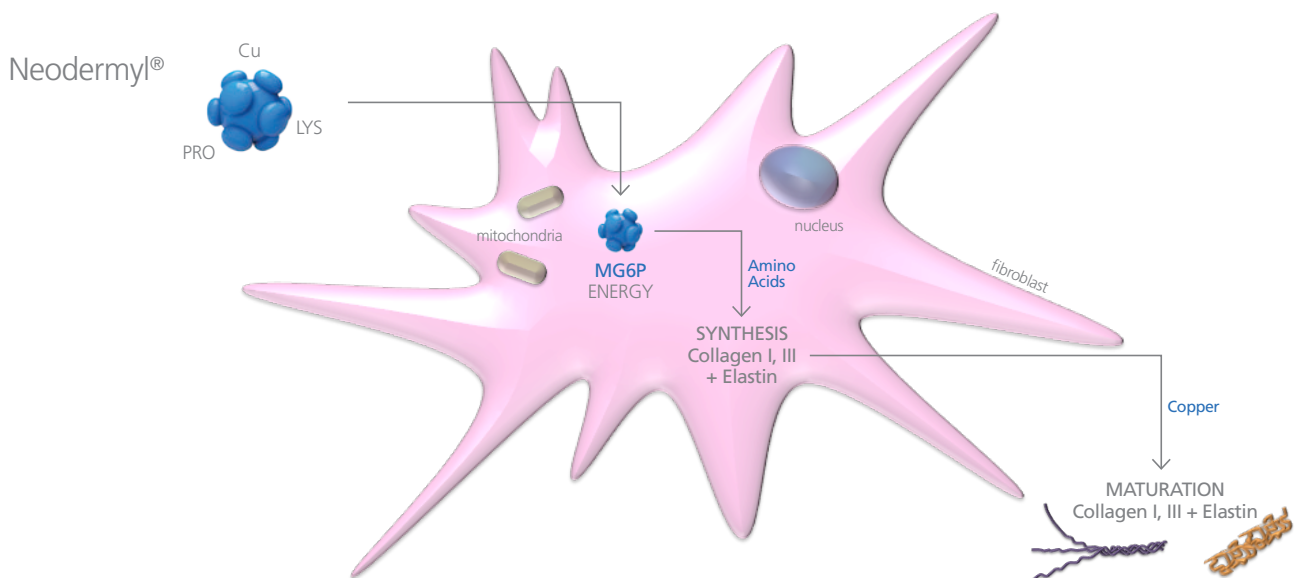
## Neodermyl®: a new source of bio-energy to recharge skin's beauty

Neodermyl® is a new active ingredient created by a leading edge patented green chemistry process. It contains a safe and pre-activated source of energy: MG6P (Methyl-Glucoside-6-Phosphate) to feed aging cells.

To reactivate collagens and elastin production, MG6P has been combined with:

- Essential amino acids: Proline and Lysine play a major role in the production of collagens and elastin that the body is not able to produce by itself.
- Copper to reactivate Lysyl oxydase, the enzyme which enables reticulation and maturation of collagens and elastin.

Neodermyl® is a pure source of bio-energy which can naturally diffuse into skin, re-energizing senescent fibroblasts and triggering essential elements to produce collagens and elastin. Neodermyl® shows high clinical efficacy within 15 days resulting in visible reduction of deep wrinkles and improvement of skin firmness.

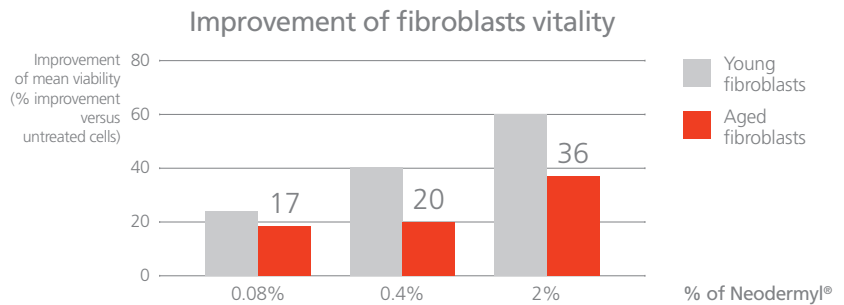


# Biological activity

## Dose dependent increase of fibroblasts vitality (*in vitro* tests)

Normal human dermal fibroblasts and aged dermal fibroblasts (Hayflick model) were incubated for 72 hours in a medium containing a low concentration of glucose (1g/l). The number of living cells and their metabolic activity were evaluated by a MTT reduction assay and morphological observations with microscope.

**Results:** Neodermyl® dramatically increases the vitality of young and aged fibroblasts. Aged fibroblasts are enabled to function properly again.

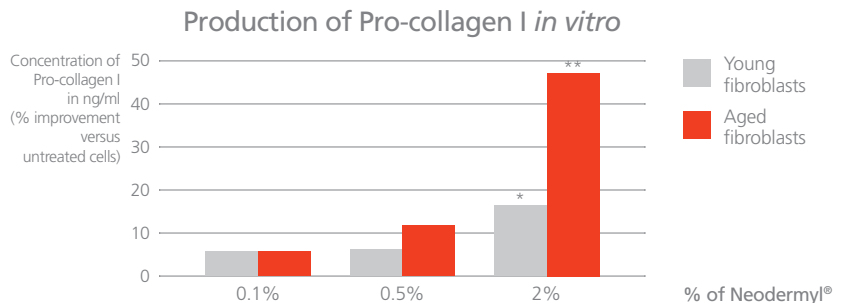


## Synthesis of the collagen precursor (*in vitro* tests)

Neodermyl® was evaluated to increase the production of Pro-collagen I, the precursor of collagen. Young and aged fibroblasts (Hayflick method) were incubated for 24 hours in a culture medium. The medium was then removed and replaced by a control medium with or without Neodermyl® at different concentrations for 72 hours. The quantification of Pro-collagen I synthesis was done using ELISA kit.

**Results:** Neodermyl® increases the synthesis of Pro-collagen I in a dose dependent way. Aged fibroblasts show even better ratio of production compared to young fibroblasts.

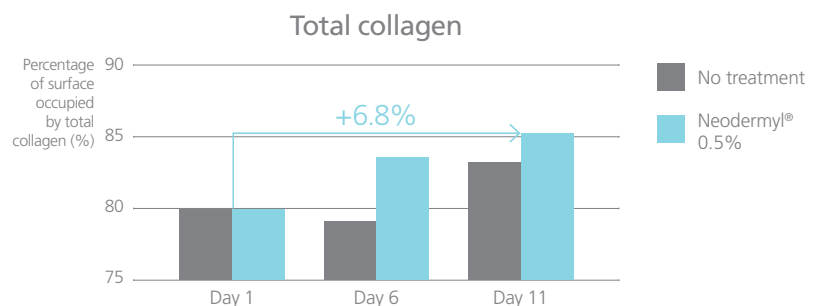
\*p<0.01 compared to untreated, Student t-test  
\*\*p<0.001 compared to untreated, Student t-test



## Production of total collagen, collagens I and III (*ex vivo* tests)

The action of Neodermyl® on total collagen production was evaluated on skin explants from a 74 years old donor. Skin explants were either untreated or treated with 0.5% of Neodermyl® at day 0, day 1, day 4, day 6 and day 8. Explants were then sampled and analyzed at day 0, day 6 and day 11. Total collagen was detected with staining assessed by microscopical observation and image analysis.

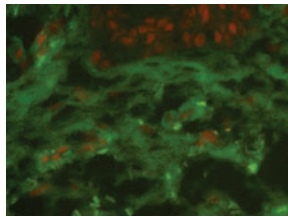
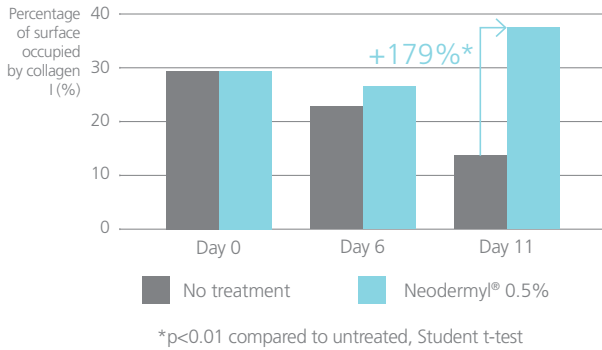
**Results:** Neodermyl® used at 0.5% increases the quantity of total collagen by 6.8% in 11 days.



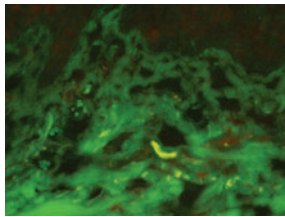
# Biological activity

After studying the total collagen, two different types of collagens were quantitatively evaluated by immunostaining: collagen I (in green fluorescent), and collagen III (in dark rose), also known as the youth collagen.

## Collagen type I

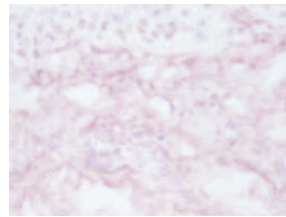
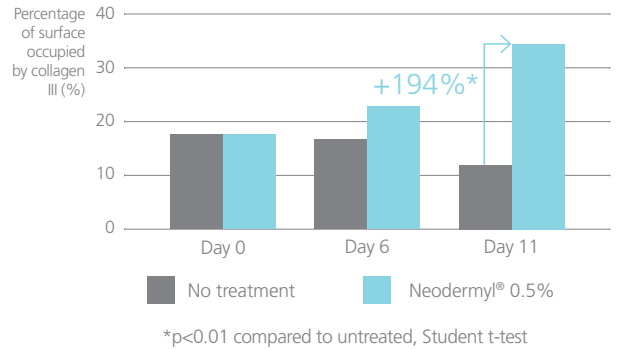


Untreated – Day 11

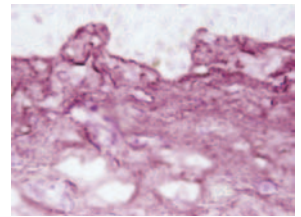


Neodermyl® 0.5% – Day 11

## Collagen type III (Youth Collagen)



Untreated – Day 11



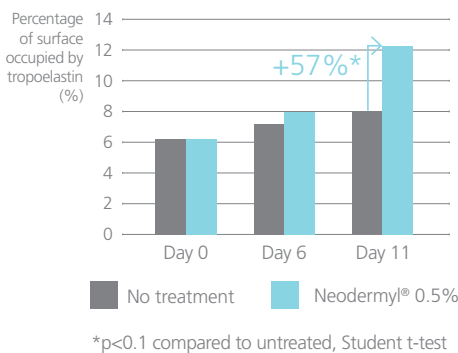
Neodermyl® 0.5% – Day 11

**Results:** Neodermyl® at 0.5% significantly increases collagen I and collagen III synthesis by +179% and +194% respectively after 11 days, versus untreated. Upon aging, the ratio of collagen I / collagen III is increased. With Neodermyl® at 0.5%, this ratio is decreased to the level of a younger skin: it moves from 0.82 to 0.55.

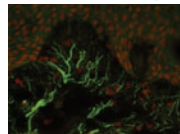
## Production of elastin (ex vivo tests)

The action of Neodermyl® on tropoelastin and elastin production was evaluated by following the same protocol as for collagen I and III. Tropoelastin (in green fluorescent) and elastin (in green fluorescent) were detected by immunostaining assessed by microscopical observation and image analysis.

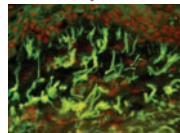
### Tropoelastin



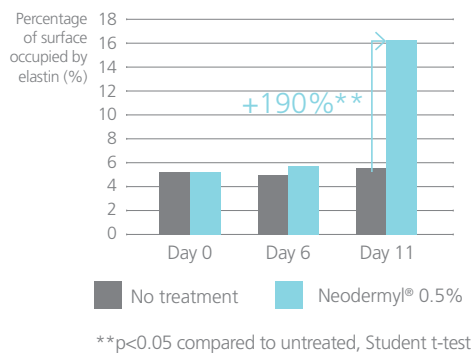
Untreated – Day 0



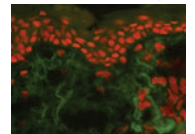
Neodermyl® 0.5% Day 11



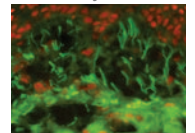
### Elastin



Untreated – Day 0



Neodermyl® 0.5% Day 11

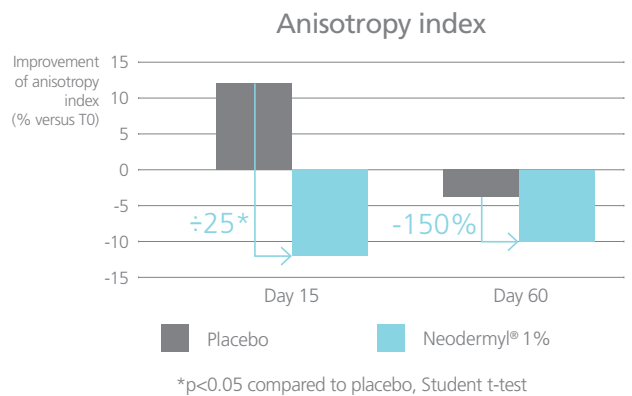
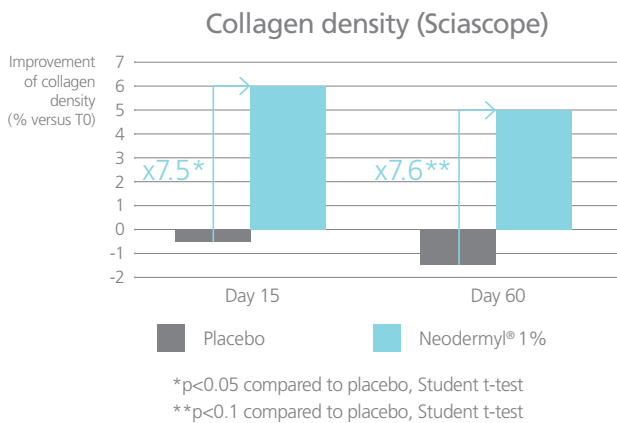


**Results:** Neodermyl® significantly increases tropoelastin and elastin production by +57% and +190% respectively after 11 days, versus untreated.

# Efficacy

## Significant improvement of collagen production and quality (clinical)

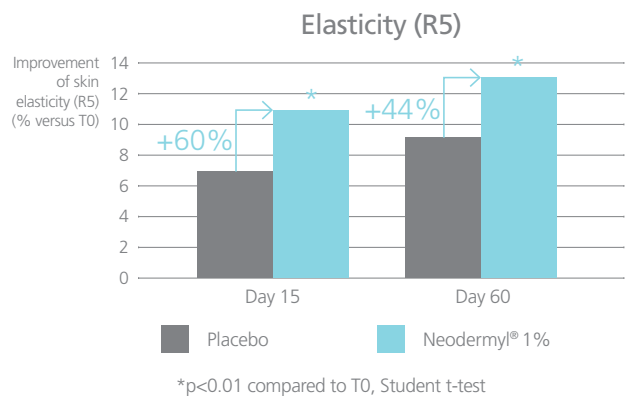
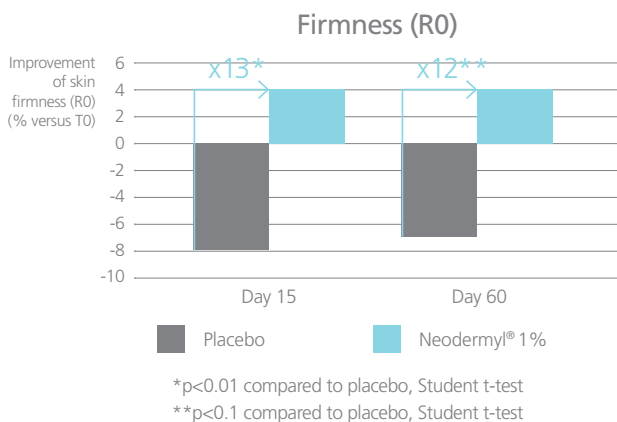
The efficiency of Neodermyl® at 1% was evaluated in a double-blind test versus a placebo under dermatological control. Twenty volunteers 61 +/- 7 years old participated in this study. The volunteers applied the placebo on one side of their face, and a cream containing Neodermyl® at 1% on the other side of the face twice per day. Collagen density and anisotropy index were measured by using SIAscopy and SkinEvidence™ visio image analysis respectively. Anisotropy index is a marker of the quality of the collagen network. It is related to the angle that forms the skin lines, and represents a good marker of the “biological age” of skin. When the skin is young lines are oriented in all directions and the anisotropy index is low. With aging lines become parallel and the anisotropy index is high.



**Results:** Using Neodermyl® at 1% significantly increases collagen density by 7.5 times and improves the anisotropy index by 25 times compared to placebo after only 15 days. The results are confirmed after 2 months of treatment.

## Fast improvement of firmness and elasticity (clinical)

The two parameters R0 and R5 were measured by Cutometry to evaluate the performance of Neodermyl® at 1% on firmness and elasticity.



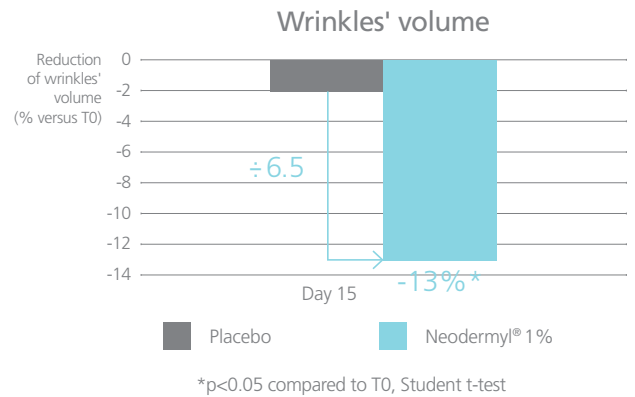
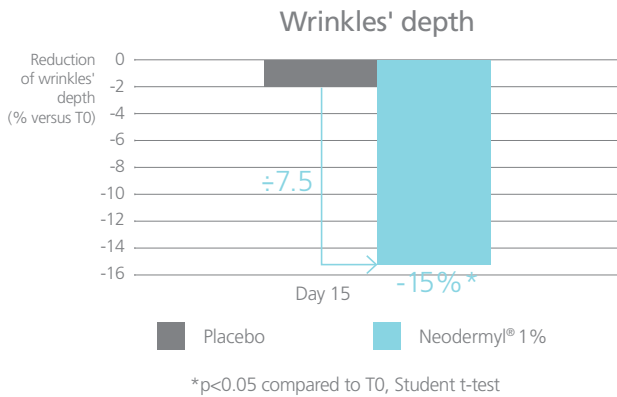
**Results:** Using Neodermyl® at 1% increases firmness by 13 times and elasticity by 1.6 times in only 15 days. These improvements of skin parameters are sustained after two months of treatment.

# Efficacy

## Fast visible reduction of wrinkles in 15 days (clinical)

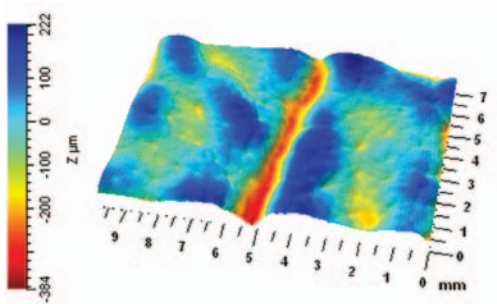
Neodermyl® use at 1% was evaluated to perform rapid and visible reduction of wrinkles' depth and volume.

Wrinkles' depth and volume are measured by silicone replica and calculated by using the Dermatop® system and Toposurf® software.

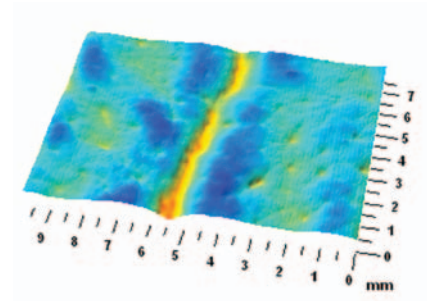


**Results:** Neodermyl® at 1% reduces wrinkles' depth by 15% and wrinkles' volume by 13% in only 15 days.

Wrinkles' profiles confirm the benefits of using Neodermyl® at 1%. After 15 days, the results are outstanding:



Wrinkle profile – Untreated – Day 0  
Volunteer number 13 - 67 years old - crow's feet area



Wrinkle profile – Neodermyl® 1% – Day 15

**Results:** The skin is smooth and wrinkles are visibly reduced after only 15 days of treatment with Neodermyl® use at 1%.

Neodermyl® delivers equivalent results to one injection of collagen filler in just 2 weeks: -15% of wrinkles reduction (source American Society of Plastic Surgeons – 2013).

# Summary

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## Technical information

Suggested INCI:	Water, Glycerin, Methyl glucoside phosphate proline lysine copper complex
Origin:	Biotechnology
Preservation:	Preservative free
Appearance:	Clear blue solution
Solubility:	Water soluble
Dosage:	0.1% to 2%
Storage:	Store at room temperature under 25°C.
Processing:	Can be added at the end of the formulation process under stirring or homogenizing. Formulate at pH 3.0 to 7.0 and temperature below 45°C.

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## Claims

Claims:	Anti-wrinkle, youth collagen booster, firms, re-densifies, energizes
Applications:	Anti-aging serums and creams, instant anti-wrinkles products, anti-aging products for the reduction of deep wrinkles, nasolabial anti-wrinkles products, lip contour products, anti-worry-lines products, anti-crow's feet products, skincare products targeting mature skin.

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