

# DENSIFY

your most beautiful age is now

P

**MIDSS**  
DESIGNERS  
OF  
**TIMELESS**  
**REGENERATION**

*presents*

**salmostim**  
by **Pluryal**

—————  
—————  
—————  
DENSIFY  
SILK  
HAIR DENSITY

**MD** SKIN SOLUTIONS  
LABORATORIES  
*at a glance*

SINCE **2009**

**29**  
PRODUCTS

**75**  
COUNTRIES

**5**  
TECHNOLOGIES

**>25M**  
TREATMENTS

**DENSIFY**  
*restorative treatment*

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# 1. *about* MD SKIN SOLUTIONS

With over a decade and a half of expertise in the aesthetics industry and a remarkable track record of outstanding results, **MD Skin Solutions** is a trusted company representing a holistic aesthetic approach focused on providing professionals around the world with innovative solutions enabling their patients to achieve healthy, radiant skin without surgical interventions.

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**MD Skin Solutions** is home to two main brands: **Pluryal**, a trusted provider of medical aesthetic products available in over 75 countries worldwide, and as newest addition, **meso'me**, a range of at-home cosmeceutical therapies inspired by professional mesotherapy, which allows to continue treatments any place, any time.

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Currently, **MD Skin Solutions'** portfolio includes 29 products in 5 ranges at the forefront of science and technology. From dermal fillers to collagen biostimulators and densifiers, mesotherapy treatments, as well as complementary home-use microneedling, **MD Skin Solutions** is dedicated to bring the world exceptional aesthetic solutions that address patients' unique skin concerns.

## 2. *why* SALMOSTIM?

Today's skincare landscape is shifting from traditional dermal fillers to treatments that promote overall well-being and skin health.

Patients are increasingly seeking:

- **Well-aging** and **natural-looking** results.
- Solutions for **skin texture concerns** and **flawless appearance**.
- **A fresh, radiant look** that reflects skin vitality.

Moreover, younger patients are adopting **preventive approaches** using gentle, biologically active solutions.

Among biostimulators, **polynucleotides (PNs)** are gaining prominence for their high safety profile, excellent tolerance, and natural origin—unlike synthetic alternatives.

## 3. *what are* POLYNUCLEOTIDES (PNs)?

Polynucleotides are purified DNA fragments composed of repeating units of nucleotides, each consisting of a phosphate group, sugar, and nitrogenous base.

At Pluryal, these biopolymers are extracted from **salmon DNA**, known for its biocompatibility with human tissues. They are:

- **Ultra-purified, protein-free, and non-allergenic.**
- **Fully absorbable and immunologically inert.**

Upon injection, PNs bind to **toll-like receptors (TLRs)**, triggering a cascade of tissue repair and regeneration<sup>[1,2]</sup> through the activation of **growth factors** and **cytokines**.



# 4. *what is* SALMOSTIM® TECHNOLOGY?

**SALMOSTIM® is an advanced extraction and purification technology** for injectable-grade polynucleotides, developed to ensure maximum safety, purity, and regenerative performance.

Why Farmed Salmon Matters?

Pluryal uses **controlled, certified farmed salmon milt** as its source of DNA.

This ensures:

- **Full traceability and safety oversight:**  
Controlled aquaculture standards reduce biological variability and minimize the risk of contaminants often associated with wild-caught sources.
- **Consistent quality across batches:**  
Standardized feeding, environment, and reproductive cycles deliver stable nucleic-acid profiles ideal for medical-grade purification.
- **Reduced allergenic potential:**  
Farmed salmon allows strict pre-processing controls to ensure the DNA is free of proteins, lipids, and immunogenic residues.
- **Higher sustainability and ethical sourcing:**  
Controlled farming avoids ecological disruption and enables more responsible large-scale production.

## SALMOSTIM® Purification Advantages

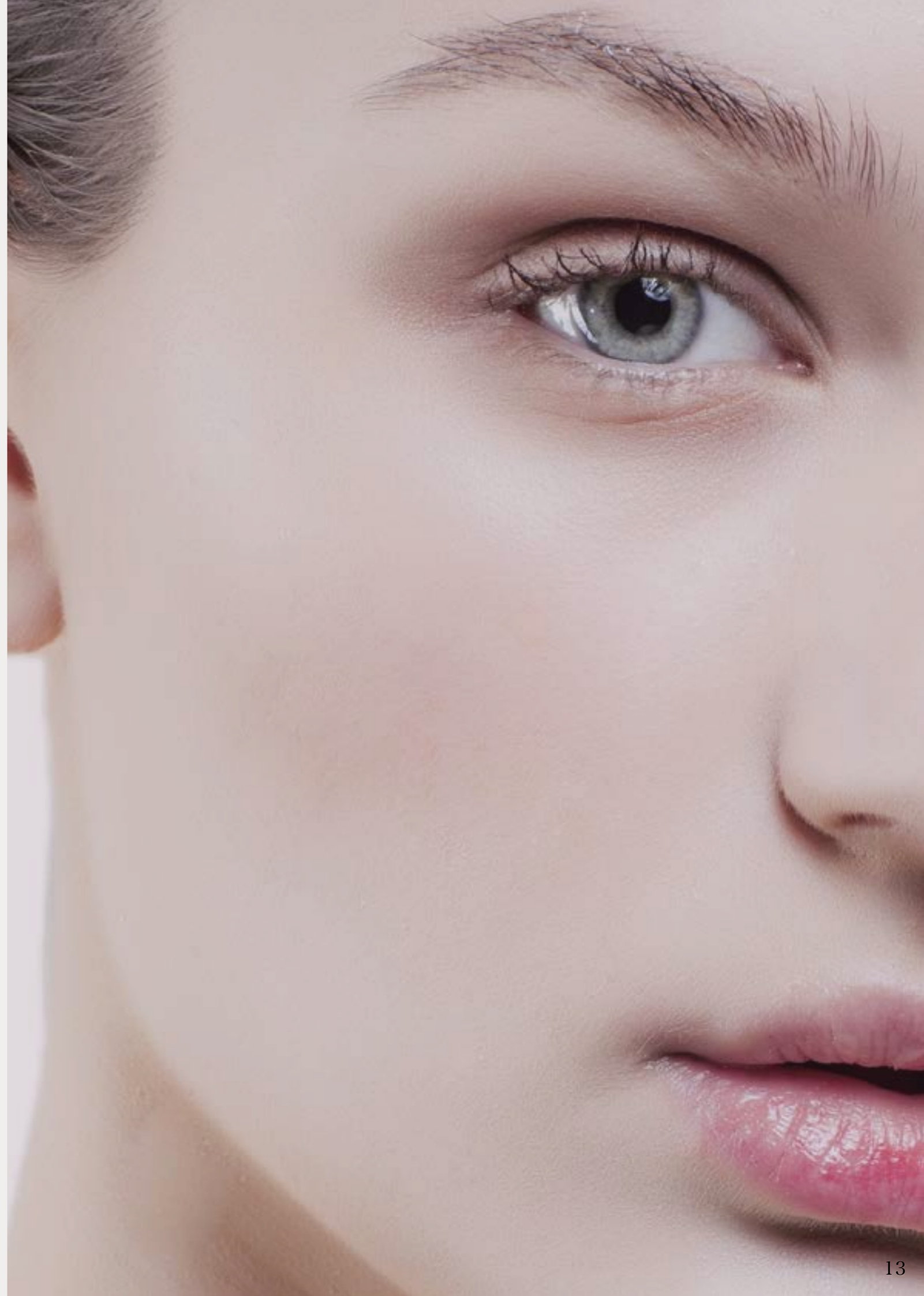
Through multi-stage refinement, SALMOSTIM® technology provides:

- **High Purity:**  
Advanced filtration eliminates proteins, lipids, and impurities for ultra-clean, injectable-grade PN.
- **Biological Safety:**  
Protein-free, non-allergenic, fully absorbable.
- **Certified Quality:**  
Manufactured under ISO 13485 standard and Medical Device CE certification.
- **Molecular Integrity:**  
Maintains the long-chain structure of polynucleotides required for hydration, ECM remodeling, and fibroblast stimulation.
- **Batch-to-Batch Consistency:**  
Guaranteed performance and reproducibility, essential for clinical reliability.

# 5. *how do* POLYNUCLEOTIDES REGENERATE THE SKIN?

Polynucleotides support skin renewal through a multifaceted approach:

- **Deep Hydration:** Attract water due to their polyanionic structure<sup>[3]</sup>.
- **Collagen Stimulation:** Activate fibroblasts for collagen and elastin synthesis<sup>[4, 5, 6]</sup>.
- **Angiogenesis:** Promote new capillaries to improve oxygenation and circulation<sup>[7]</sup>.
- **Antioxidant Defense:** Neutralize reactive oxygen species (ROS) and protect DNA<sup>[8, 9, 10]</sup>.
- **Anti-Inflammatory Action:** Reduce inflammatory cytokines and boost IL-10.
- **DNA Repair:** Provide raw material for DNA synthesis and cellular recovery<sup>[11]</sup>.



# 6. PLURYAL® DENSIFY - *fact sheet*

Composition (per 2 ml syringe):

Ingredient	Concentration
Polynucleotides (PN)	20 mg (10 mg/ml)
Hyaluronic Acid (HA)	20 mg (10 mg/ml)
Mannitol	80 mg (40 mg/ml)

Each component contributes synergistically<sup>[12]</sup> to:

- **Hydration.**
- **Resilience.**
- **Skin Regeneration.**

Mannitol:

- **Stabilizes HA.**
- **Reduces inflammation.**

THE  
ESSENCE  
OF  
DENSITY

## Presentation:

- Sterile prefilled 2 ml syringe.
- Includes two 30G needles.
- CE marked,  
for professional use only.

## Indications:

- Dehydrated or environmentally stressed skin.
- Dull, fatigued skin lacking tone and glow.
- Skin preparation before other aesthetic treatments.
- Acne scars and post-inflammatory scarring.

## Treatment Areas:

- Face (excluding the periorbital area).
- Neck and décolleté.
- Body (striae – stretch marks).

# 7. PLURYAL® DENSIFY - *unique composition*

A synergistic formula combining:

## 1. Hyaluronic Acid (HA)

- **Deep Hydration:** Retains moisture for plumper skin.
- **Skin Firmness:** Supports collagen and elasticity.
- **Biocompatibility:** Naturally present and well-tolerated.

## 2. Mannitol<sup>[14, 15]</sup>

- **HA Stabilization:** Prevents hyaluronic acid degradation.
- **Antioxidant Protection:** Scavenges free radicals.
- **Osmotic Balance:** Maintains hydration.

## 3. Polynucleotides (PNs)

- **Tissue Regeneration:** Trigger cellular repair.
- **Anti-inflammatory Effects:** Modulate immune response.
- **Collagen Synthesis:** Stimulate fibroblast activity.

### Why It Works:

Together, PN + HA + Mannitol achieve superior hydration, structural support, and long-term rejuvenation<sup>[13]</sup>.

# 8. *proven efficacy of* PLURYAL® DENSIFY

## 1. In Vitro Study – Synergistic Effect

The combination of PN + HA led to significantly higher skin cell activation than either component alone.

In a trial comparing 3 formulations<sup>[16]</sup>:

- One with pure hyaluronic acid [100%].
- A second one with pure polynucleotides [100%].
- A third one with hyaluronic acid [50%] and polynucleotides [50%].

(Same total concentration for the 3 formulations)

### Synergistic effect of HA + PN association on human fibroblast cultures

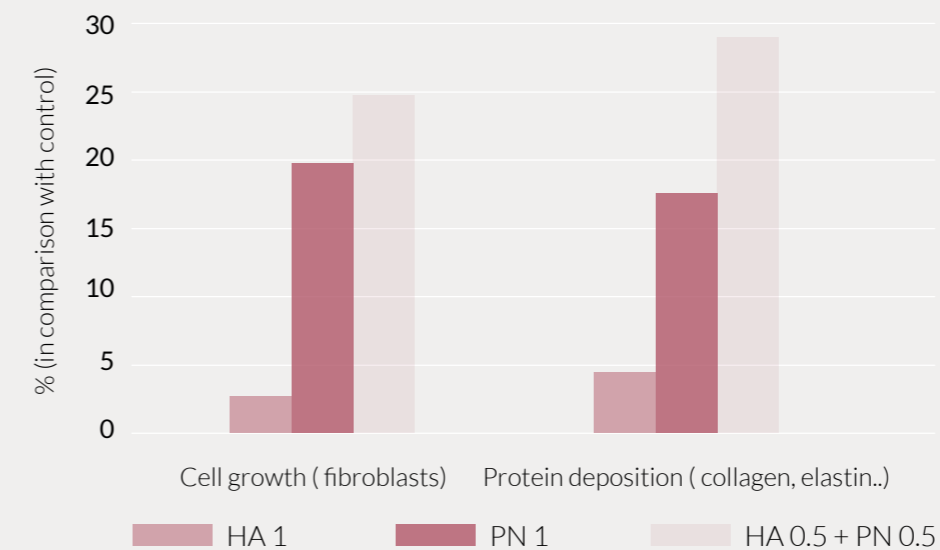


Fig. 1: Effect of PN, HA and synergetic association of PN+HA on fibroblasts number and protein deposition

By combining HA and PN in a 50/50 ratio, **a synergistic effect** in cell regeneration and the deposition of protein matrix is obtained, the combination is **more efficient**, the **stimulating action on fibroblasts is higher** than other formulations (100% pure HA or PN). That's why the ratio of 50 % HA / 50 % PN was specially selected in Pluryal® DENSIFY (10mg/mL HA + 10mg/mL PN).

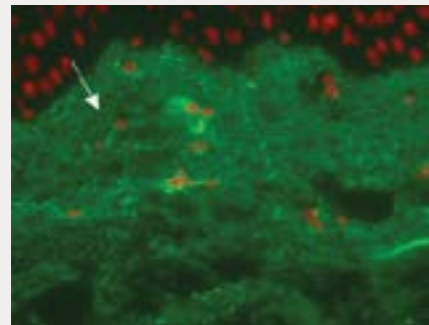
**Conclusion:** With the addition of HA stabilized with mannitol, **our product is one of the most complete and efficient.**

## 2. Ex Vivo Study – Fibronectin Stimulation

Independent lab results showed increased **fibronectin levels**, improving cell adhesion and matrix remodeling.

In an ex-vivo study<sup>[17]</sup> conducted by an independent laboratory in France, Pluryal® DENSIFY has proven to increase fibronectin in the papillary and upper reticular dermis. (fig.2)

Control on Day 9



Pluryal® Densify (P1) on Day 9

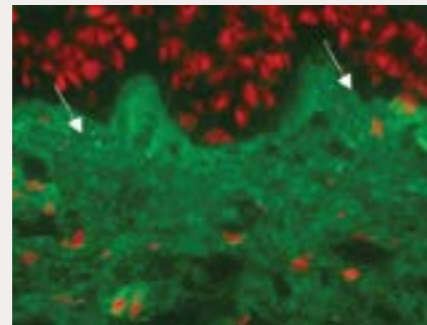


Fig.2 : Fluorescence immunolabeling of fibronectin with and without Pluryal® DENSIFY after 9 days on skin explants

## Fibronectin: A Key Structural Protein in the Extracellular Matrix

### 1. Role and Functions:

Fibronectin is a structural protein and one of the ligands of integrins.

It plays multiple biological roles in the skin, including:

- Acting as a growth factor.
- Functioning as an adhesion molecule and a chemotactic agent for fibroblasts<sup>[18]</sup>.
- Participating in the deposition and assembly of collagen fibrils.
- Controlling keratinocyte migration during the healing process<sup>[19]</sup>.

### 2. Impact on Skin:

- Fibronectin stimulates fibroblasts and contributes to restructuring collagen levels in the extracellular matrix.

**Conclusion:** Pluryal® DENSIFY increases the fibronectin in the papillary and upper reticular dermis.

## 3. Ex Vivo Comparative Study

Compared with a 25 mg/ml polymerized PN product, Pluryal® DENSIFY:

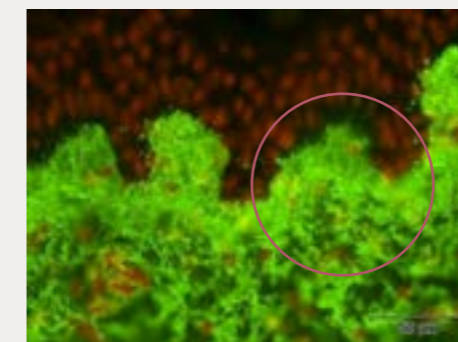
- Stimulated **Collagen I, Collagen III, and Elastin.**
- Induced HA production.
- Outperformed competitor in dermal remodeling.

## COLLAGEN I

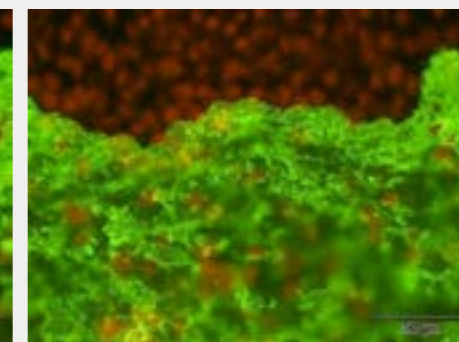
### Results / Pictures

Labelling with Collagen I antibody and revealed in AlexaFluor 488: **green staining.**

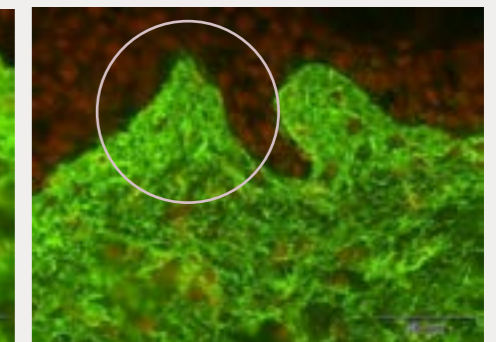
*Nuclei were counterstained with propidium iodide.*



P1 : Pluryal Densify (Day 7)  
Papillary dermis: **+38%**



Control  
Day 7



P2 : Polymerized PN 25mg/ml  
(Day 7)  
Papillary dermis: **+24%**

We observe that the intensity of the green coloration is more important for P1 than for P2 (compared to the control).

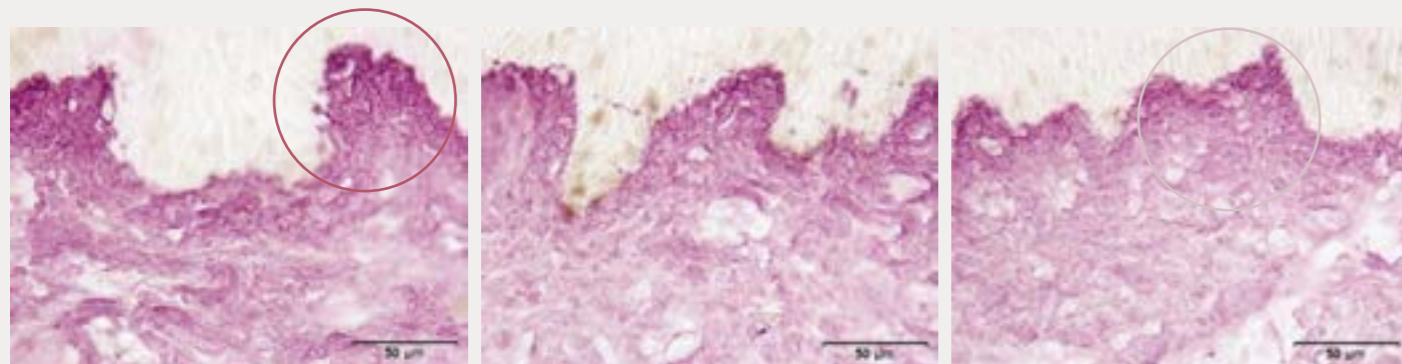
**Conclusion:** At Day 7, Pluryal® DENSIFY stimulates more the expression of **Collagen I** than Polymerized PN 25mg/ml.



## COLLAGEN III

### Results / Pictures

Labelling with Collagen III antibody, amplified with biotinylated / streptavidin secondary antibody and revealed in VIP, giving a **purple color** once oxidized.



P1 : Pluryal Densify (Day 7)  
Papillary dermis: **+ 24%**

Control  
Day 7

P2 : Polymerized PN 25mg/ml  
(Day 7)  
Papillary dermis: **-3%**

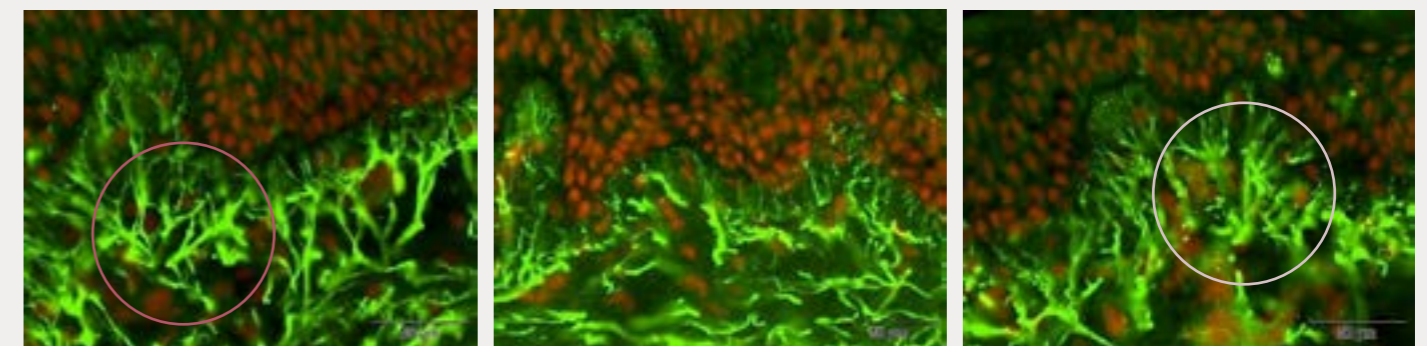
We observe that the intensity of the purple coloration is more important for P1 and less important for P2 (compared to the control).

**Conclusion:** At Day 7, **Pluryal® DENSIFY stimulates the expression of Collagen III**, whereas Polymerized PN 25mg/ml does not.

## ELASTIN

### Results / Pictures

Labelling with Collagen I antibody and revealed in AlexaFluor 488 : **green staining**.  
*Nuclei were counterstained with propidium iodide.*



P1 : Pluryal Densify (Day 7)  
Papillary dermis: **+ 25%**

Control  
Day 7

P2 : Polymerized PN 25mg/ml  
(Day 7)  
Papillary dermis: **+18%**

We observe that the intensity of the green coloration is more important for P1 than for P2 (compared to control).

**Conclusion:** At Day 7, **Pluryal® DENSIFY stimulates more the expression of Elastin** than Polymerized PN 25mg/ml.

## 4. In Vivo VISIA Study – 10 Patients

Led by Prof. Alexander Turkevych (Ukraine), VISIA imaging revealed an **average rejuvenation of 7 years** after just two treatments.

The skin was analyzed before treatment and after 2 procedures using Pluryal® DENSIFY with the VISIA software machine.

The VISIA software assesses the skin age (“TruSkin Age”) before and then after the treatment, according to various parameters:

**Pigmentation | Wrinkles depth | Skin texture | Pores | UV spots | Brown spots | Vessels | Porphyrin**

### Visia-facial skin analysis report

- Case 1:**

Before



Pigmentation (25,398)    Wrinkles (35,434)    Skin texture (13,569)    Pores (16,410)

**YOUR REAL AGE**  
**53**

**YOUR “TRUSKIN AGE”®**  
**59**

After 2 procedures



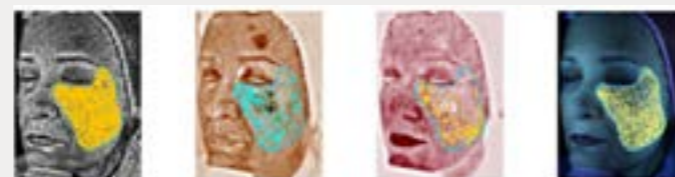
Pigmentation (30,886)    Wrinkles (21,199)    Skin texture (9,030)    Pores (12,928)

**YOUR REAL AGE**  
**53**

**YOUR “TRUSKIN AGE”®**  
**44**



UV spots (32,493)    Brown spots (60,771)    Vessels (49,184)    Porphyrins (22,628)



UV spots (34,956)    Brown spots (57,340)    Vessels (30,619)    Porphyrins (20,403)

Patient real age: **53**

VISIA assesses her age as 59: according to the analyzed parameters, she looks older than she really is.

**Conclusion:** After only two treatments, the age of the patient’s skin (measured by VISIA) drops from **59** to **44**: gain of **15** years.

Pluryal® DENSIFY is a synergetic mix of 3 active ingredients. It significantly **improves the global appearance and quality of the skin.**

### Visia-facial skin analysis report

- Case 2:**

Before



Pigmentation (33,159)    Wrinkles (42,195)    Skin texture (4,129)    Pores (6,216)

**YOUR REAL AGE**  
**38**

**YOUR “TRUSKIN AGE”®**  
**41**

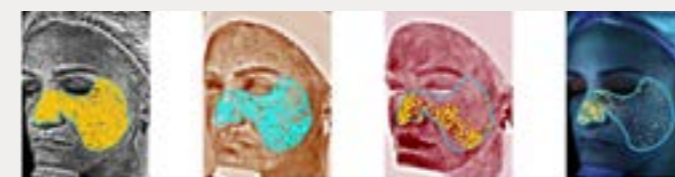
After 2 procedures



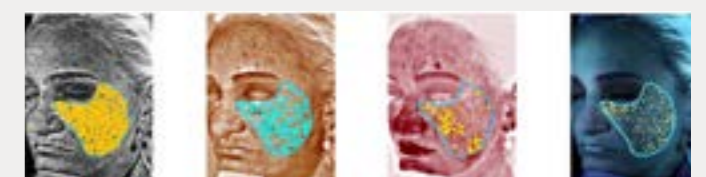
Pigmentation (30,674)    Wrinkles (20,179)    Skin texture (3,323)    Pores (6,100)

**YOUR REAL AGE**  
**38**

**YOUR “TRUSKIN AGE”®**  
**29**



UV spots (30,485)    Brown spots (64,891)    Vessels (44,920)    Porphyrins (4,030)



UV spots (32,082)    Brown spots (62,059)    Vessels (37,435)    Porphyrins (4,597)

Patient real age: **38**

VISIA assesses her age as 41: according to the analyzed parameters, she looks older than she really is.

**Conclusion:** After only two treatments, the age of the patient’s skin (measured by VISIA) drops from **41** to **29**: gain of **12** years.

# 9. *injection* TECHNIQUES & PROTOCOL

**Injection Level:** Intradermal.

**Techniques:** Multi-Puncture, Micro-Droplet, or Point-by-Point.

**Protocol:**

- One injection every 21 days, for a total of 3 sessions.
- Repeat the course every 6 months.

**Recommended Areas:**

- Face (excluding under-eye area; use Pluryal® SILK instead).
- Neck and décolleté.
- Body (e.g., stretch marks).



# 10. CASE *studies*

## Case 1:

Full face rejuvenation.  
Using Pluryal Densify\*.

### Courtesy of:

Prof. Bob Khanna  
Global Facial Aesthetic Expert (UK)



Before

After

\* Combined with Pluryal Silk

## Case 2:

Skin density and texture.  
Using Pluryal Densify\*.

### Courtesy of:

Prof. Bob Khanna  
Global Facial Aesthetic Expert (UK)



Before

After

\* Combined with Pluryal Silk

## Case 3:

NuFace Protocol.  
Using Pluryal Densify\*.

### Courtesy of:

Prof. Bob Khanna  
Global Facial Aesthetic Expert (UK)



Before

After

\* Combined with Pluryal Dermal Fillers

## Case 4:

Lift + NuFace Protocol.  
Using Pluryal Densify\*.

### Courtesy of:

Prof. Bob Khanna  
Global Facial Aesthetic Expert (UK)



Before

After

\* Combined with Pluryal Dermal Fillers

*Beauty, precisely tailored, ...*

**Pluryal® DENSIFY** is a class III medical device which must only be used by doctors who have received specific training on the intradermal injection techniques. Read the instructions before use. Inform the patients about possible side effects.

**Sources:**

- <sup>1</sup>Veronesi et al. Polydeoxyribonucleotides (PDRNs) From Skin to Musculoskeletal Tissue Regeneration via Adenosine A<sub>2A</sub> Receptor Involvement. *J. Cell. Physiol.* 232: 2299–2307. (2017).
- <sup>2</sup>Park et al. Long-chain polynucleotide filler for skin rejuvenation: efficacy and complications in five patients. *Dermatologic Ther.* (Jan-Feb 2016). 29(1):37-40.
- <sup>3</sup>Rubegni, P., De Aloe, G., Mazzatenta, C., Cattarini, L. & Fimiani, M. Clinical evaluation of the trophic effect of polydeoxyribonucleotide (PDRN) in patients undergoing skin explants. A Pilot Study. *Curr Med Res Opin* 17, 128–131. (2001).
- <sup>4</sup>Thellung et al. Polydeoxyribonucleotides enhance the proliferation of human skin fibroblasts: involvement of a purinergic receptor subtypes. *Life Sci.* (1999). 64(18):1661-64.
- <sup>5</sup>Sini et al. Effect of Polydeoxyribonucleotides on Human Fibroblasts in Primary Culture. *Cell Biochem.Funct.* 17, 107-14. (1999).
- <sup>6</sup>Muratore, O. et al. A human placental polydeoxyribonucleotide (PDRN) may promote the growth of human corneal fibroblasts and iris pigment epithelial cells in primary culture. *New Microbiol* 26, 13-26. (2003).
- <sup>7</sup>Polito et al. Polydeoxyribonucleotide restores blood flow in an experimental model of ischemic skin flaps. *J Vasc Surg.* (2012 Feb). 55(2):479-88.
- <sup>8</sup>Bitto et al. Polydeoxyribonucleotide reduces cytokine production and the severity of collagen-induced arthritis by stimulation of adenosine A<sub>2A</sub> receptor. *Arthritis Rheum.* (2011 Nov). 63(11):3364-71.
- <sup>9</sup>Bitto et al. Adenosine receptor stimulation by polynucleotides (PDRN) reduces inflammation in experimental periodontitis. *J Clin Periodontol.* (2013 Jan). 40(1):26-32.
- <sup>10</sup>Castellini et al. Anti-Inflammatory Property of PDRN—An in Vitro Study on Cultured Macrophages. *Advances in Bioscience and Biotechnology.* (2017 Jan). 8,13-26.
- <sup>11</sup>Squadrito et al. Pharmacological Activity and Clinical Use of PDRN. *Front Pharmacol.* (2017 Apr). 26:8:224.
- <sup>12</sup>Pallio et al. Combined Treatment with Polynucleotides and Hyaluronic Acid Improves Tissue Repair in Experimental Colitis. *Biomedicines.* (2020 Oct). 20;8(10):438.
- <sup>13</sup>Colangelo et al. A Biomimetic Polynucleotides- Hyaluronic Acid Hydrogel Promotes Wound Healing in a Primary Gingival Fibroblast Model. *Applied Sciences.* (2021). 11(10), 4405.
- <sup>14</sup>André et al. Free radical scavenging properties of mannitol and its role as a constituent of hyaluronic acid fillers: a literature review. *Int J Cosmet Sci.* (2017 Aug). 39(4):355-360.
- <sup>15</sup>Taieb et al. Hyaluronic acid plus mannitol treatment for improved skin hydration and elasticity. *J Cosmet Dermatol.* (2012 Jun). 11(2):87-92.
- <sup>16</sup>Kim et al. Comparative Evaluation of the Effectiveness of Novel Hyaluronic Acid-Polynucleotide Complex Dermal Filler. *Sci Rep.* (2020 Mar). 20;10(1):5127.
- <sup>17</sup>Evaluation ex-vivo of the effect of different injectable products (Pluryal DENSIFY, Pluryal BIOSCULPTURE, Pluryal SILK and Pluryal HAIR DENSITY) on skin human explants (Study 19E4548, conducted by the BIO-EC laboratory).
- <sup>18</sup>Akiyama et al., *The journal of Cell Biology.* (1989). 109: 863-875; Bitterman et al., (1983). *The Journal of Cell Biology.* 97: 1925-1932; Postlethwaite et al., (1981) *The journal of experimental medicine.* 153: 494-499.3.
- <sup>19</sup>Larjava et al., (2002). *Cell invasion.* 3: 42-64.

... defined by Pluryal Densify.

A microscopic view of skin cells, showing various cell shapes and structures. The image is overlaid with several large, overlapping circles. Water droplets are scattered across the surface, particularly concentrated in the central circle. The overall color palette is light and neutral, with a focus on the natural textures and colors of the skin cells.

*densify*

EMPOWER  
YOUR  
SKIN  
TO  
REGENERATE

**MD** SKIN SOLUTIONS  
LABORATORIES

48, rue de Bragance  
L-1255 Luxembourg

+352 26 20 04 06  
[info@mdskin-solutions.com](mailto:info@mdskin-solutions.com)



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