

SEADERMIUM™

NOURISHING PREMIUM FILLER





Marine bio-research, more than water

- **Ocean**, lifeblood of Earth, has an untapped potential, with **only a 5% explored**
- **Unique species** from the ocean's depths and sea breeze, to the marine cnidarians and onshore halophyte plants
- In collaboration with **research institutes**, we have **proprietary collections** of microorganisms for an **unlimited source** of **new active ingredients**

Over 22,000 microorganisms at our disposal



Malaspina
Expedition



Mediterranean
Expedition



Marine cnidarian



Halophyte
Plants*



Extreme aquatic
environments

...and more **True** novel active ingredients yet to be unveiled



Malaspina expedition, inspired by history

Inspired in the first expedition in **1789**, a **oceanographic research** vessel set sail in a journey around the world

- **≥ 42,000 nautical miles** of international waters navigated
- Over **350 marine water samples** collected
- Over **120 unknown bacterial strains** isolated
- Different **depths, temperatures, salinities** and **oxygen** levels

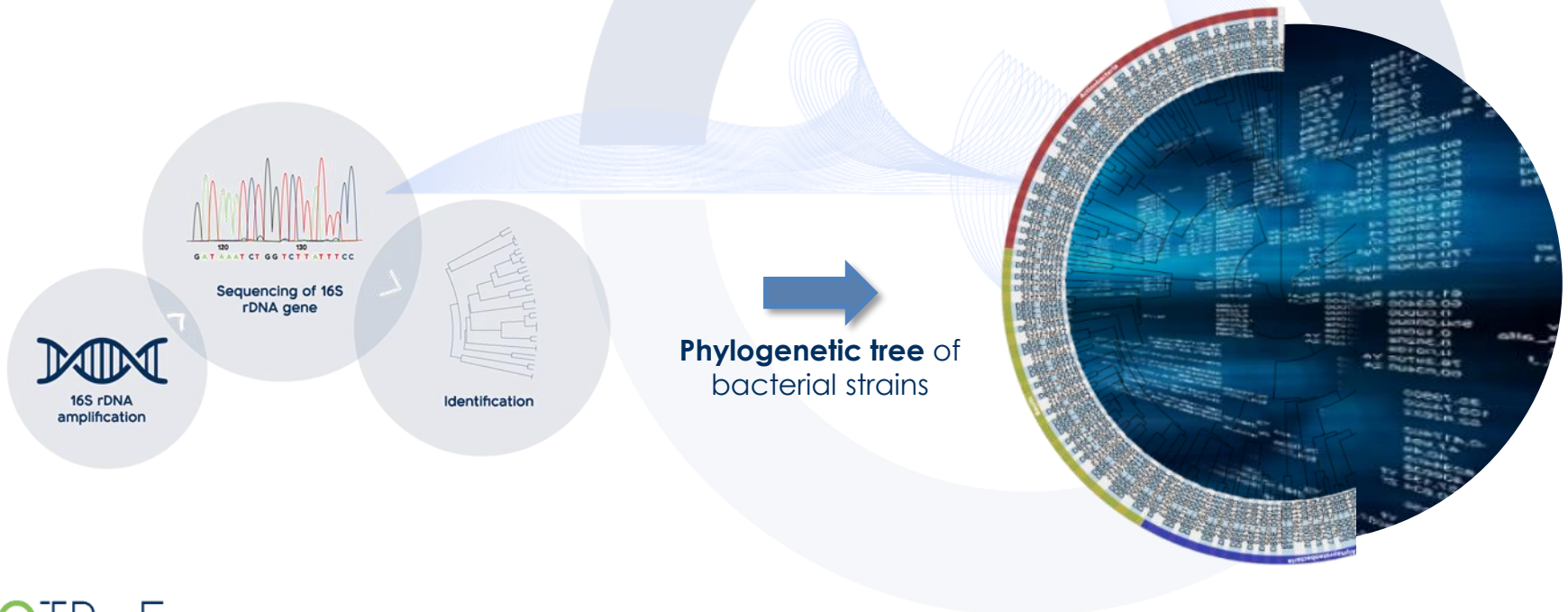


Courtesy of CSIC: Malaspina expedition, 2010



Strain classification and identification

- Classification and identification of isolated microorganisms by **MALDI-TOF MS** in a HTS analysis and **16S ribosomal RNA** sequencing
- **Cultured** (only 1% of the population) and **new uncultured species**
- **Evaluation** and **characterization** of derived extracts through metabolomics





Transforming it into Smart Data

- **Derived extracts efficacies** are analyzed through **transcriptomics** generating a great amount of data
- **Smart data** for the development of new active ingredients with **outstanding efficacies**
- Two strategies:
 - Identify the **mechanism of action** of an active ingredient
 - Define the **best active ingredient** for a **specific** mechanism of action





Seadermium™, where fire meets the ocean

Seadermium™, is an active ingredient from a microorganism discovered during the **Malaspina** expedition, near **Reunion Island** (east coast of Madagascar)

- **Young active volcanic** island where burning rivers flow down the hillsides **redefining** the island's **coastlines**
- Nearby ocean currents flow, **nourishing** the 20 km length coral reef, **filling** and **sustaining** the rich biodiversity



The microorganism was collected at:

Depth: 3 m

Temperature: 25 °C

Oxygen level: 3.5 µmol/L

Seadermium™, nourishing premium filler

Refine your lines with Seadermium™ to help you to bring out your *true beauty*, restoring skin integrity and plumping deep wrinkles

- **Plumps deep wrinkles** (-10% volume in 14 days, *in vivo*)
- **Restores and strengthens skin integrity** (*in vitro*, on human skin explants and *in vivo*)
- **Moisturizes and smoothes mature skin** (*in vitro*, on human skin explants and *in vivo* -12% wrinkles in 28 days)





Your skin says all of you

- Book that explains **what** & **how** you have lived
- As we age, **nourishment** and **hydration** of cutaneous cells is **impaired**
 - **Thinning** of the skin and appearance of **wrinkles**
 - Reduction of **hydration** and **fullness**
- Skin needs nutrients to maintain its **best complexion** and appearance



Skin appearance reflects on your inside

Improving **nourishment** and **hydration** will **bring out the best of you**



DEJ structural integrity and cohesion

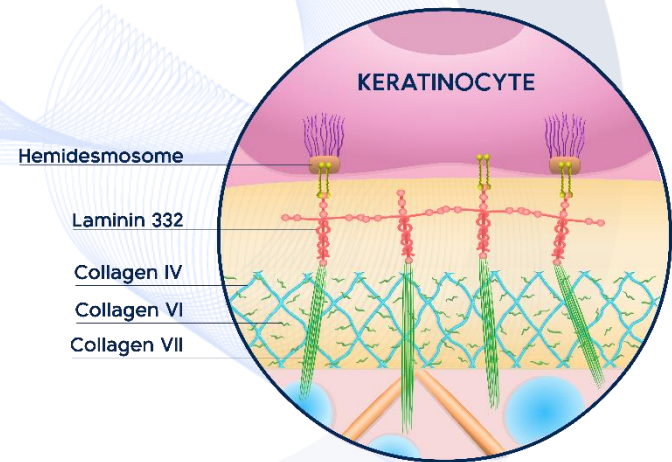
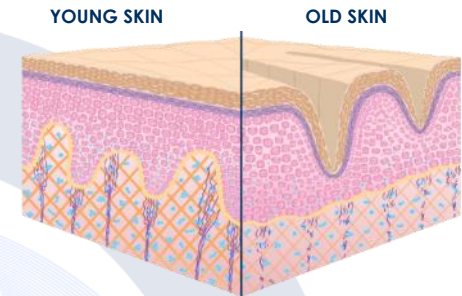
Dermis and epidermis are connected by the **dermo-epidermal junction (DEJ)**, composed of the **lamina lucida** and **lamina densa** layers

- **Collagen IV**, forms the **3D network** of the *lamina densa*
- **Collagen IV** interacts with **laminin 332** (laminin 5) and its **hemidesmosomal integrin** receptor



Anchoring the *lamina densa* to the deepest layer of the epidermis

- **Laminin 332** has a **key role** in dermo-epidermal **anchoring** and **cohesion**
- **Collagen VI** is involved in **dermal ECM** → **Collagen I** and **III**



- ✓ In **aged skin**, there is a **degradation** of DEJ components, leading to a structural integrity impairment and resulting in **wrinkles** and **saggingness**

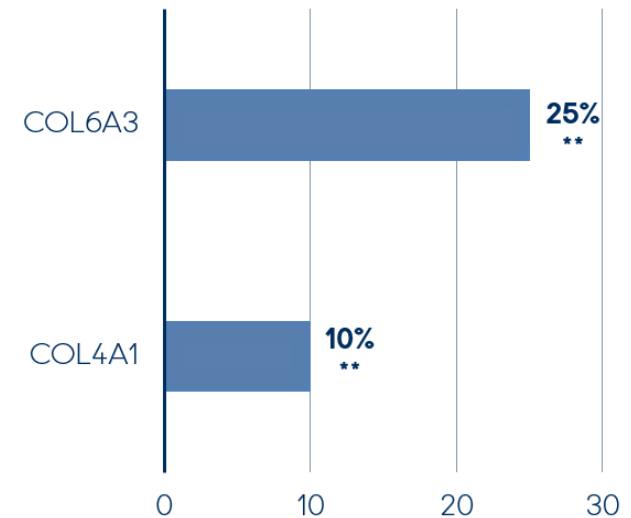
In vitro efficacy: transcriptomics by Dermoarray (fluorescence)

- Primary human epidermal keratinocytes
- 0.05 mg/mL **Seadermium™ active ingredient***
- 24 h incubation
- 600 genes expressed in skin cells

✓ **Collagen IV and VI genes expression** increased by 10% and 25%, respectively

✓ **Up-regulation of genes involved in the dermo-epidermal structure**

GENE EXPRESSION INCREASE VS
BASAL (%)



**p<0.01

➤ Microarrays can be used to study the extent to which certain genes are turned on or off in cells and tissues



In vitro efficacy: strengthening skin integrity (ELISA)

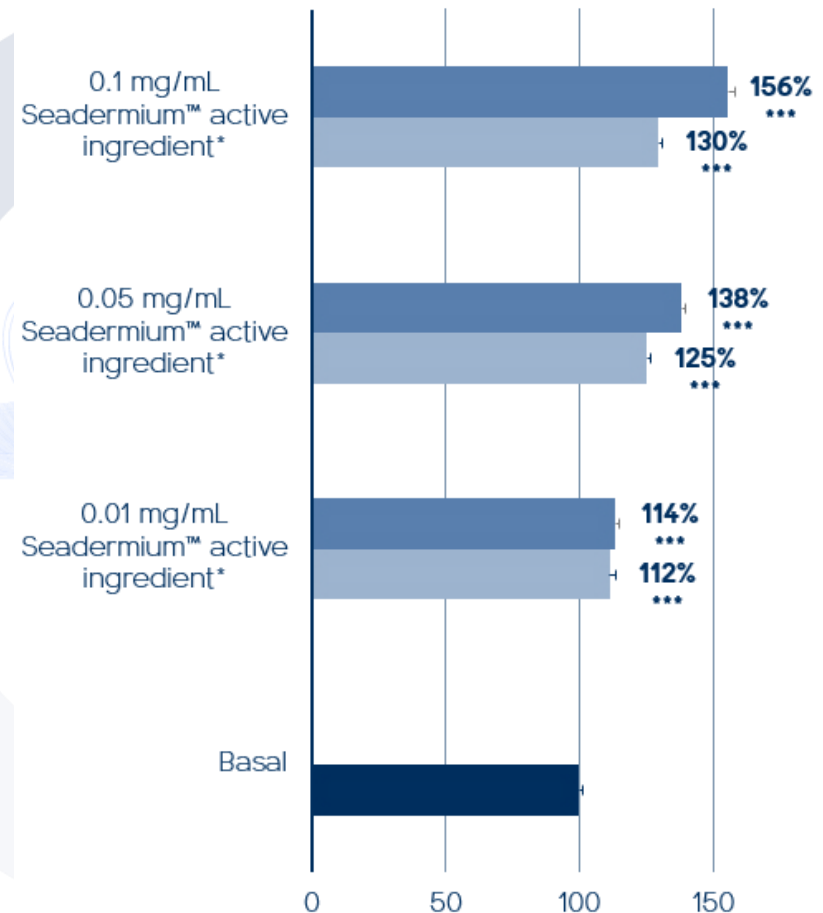
- Primary human epidermal keratinocytes
- 24 and 48 h incubation
- Absorbance (450 nm)

✓ **30% and 56% collagen IV increase after 24 h and 48 h with 0.1 mg/mL vs basal, recovering DEJ structural integrity**

✓ **Higher collagen IV boosting efficacy with time and dose**

COLLAGEN IV PROTEIN INCREASE (%)

■ 48 h ■ 24 h



***p<0.001



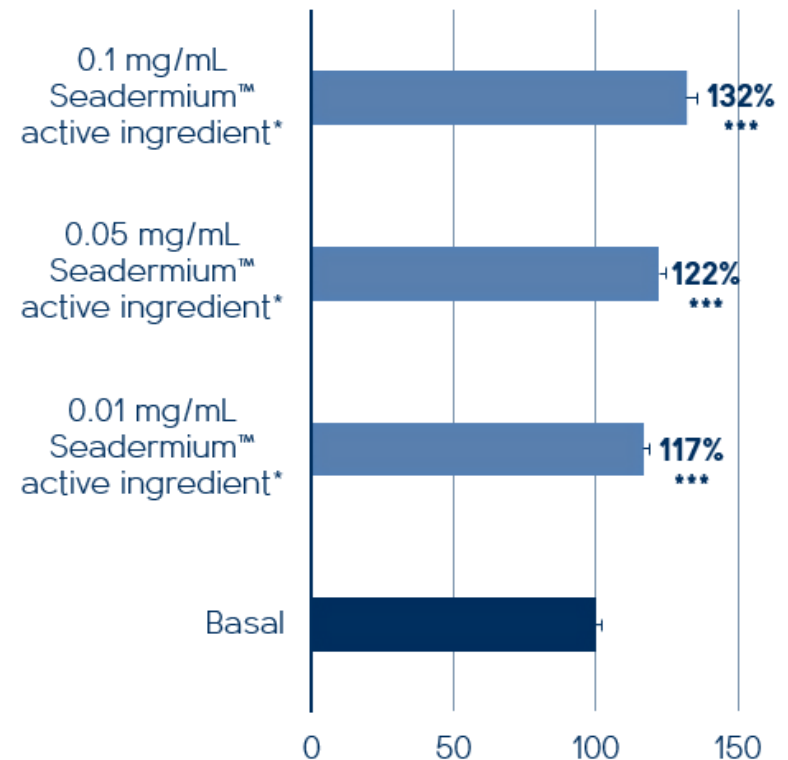
In vitro efficacy: strengthening skin integrity (ELISA)

- Primary human epidermal keratinocytes
- 48 h incubation
- Absorbance (450 nm)

✓ **32% laminin 332 increase** with
0.1 mg/mL Seadermium™ vs
basal, helping to **strengthen skin
cohesion**

✓ **Dose-dependent efficacy**

LAMININ 332 LEVELS INCREASE (%)

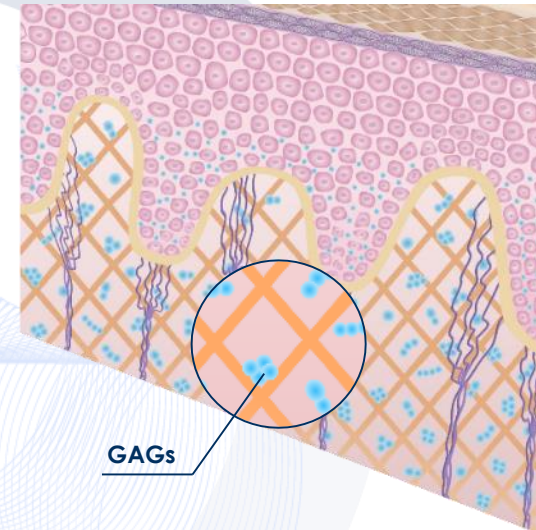


***p<0.001



Pumping dermal water

- **GAGs protect** skin **against excessive tissue compression** and maintains its suppleness
 - GAG major dermal ECM component responsible for:
 - **Water-holding** capacity
 - **Nutrient exchange**
 - **Repair** and **protection** processes
 - **GAGs hydrating power** → helping to skin fullness
- **GAGs** levels **decline** with age. GAGs loss is key in the decrease of skin hydration leading to **wrinkling** and **skin aging hallmarks**



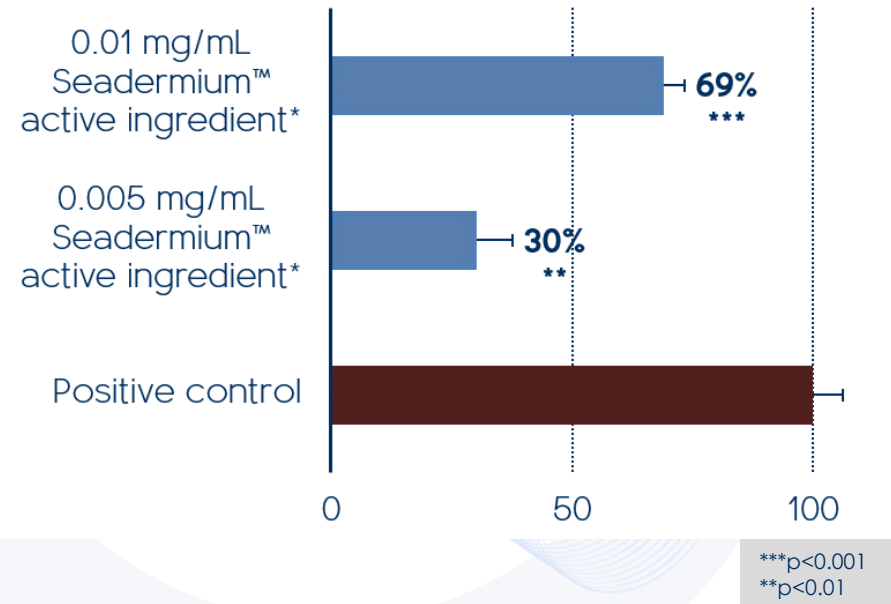


In vitro efficacy: hyaluronan protection (enzymatic)

- Positive control
- Absorbance (570 nm)

- ✓ **69% hyaluronidase activity inhibition** with 0.01 mg/mL Seadermium™
- ✓ **Protection from hyaluronan degradation** helping to **prevent volume loss**

HYALURONIDASE ACTIVITY INHIBITION (%)

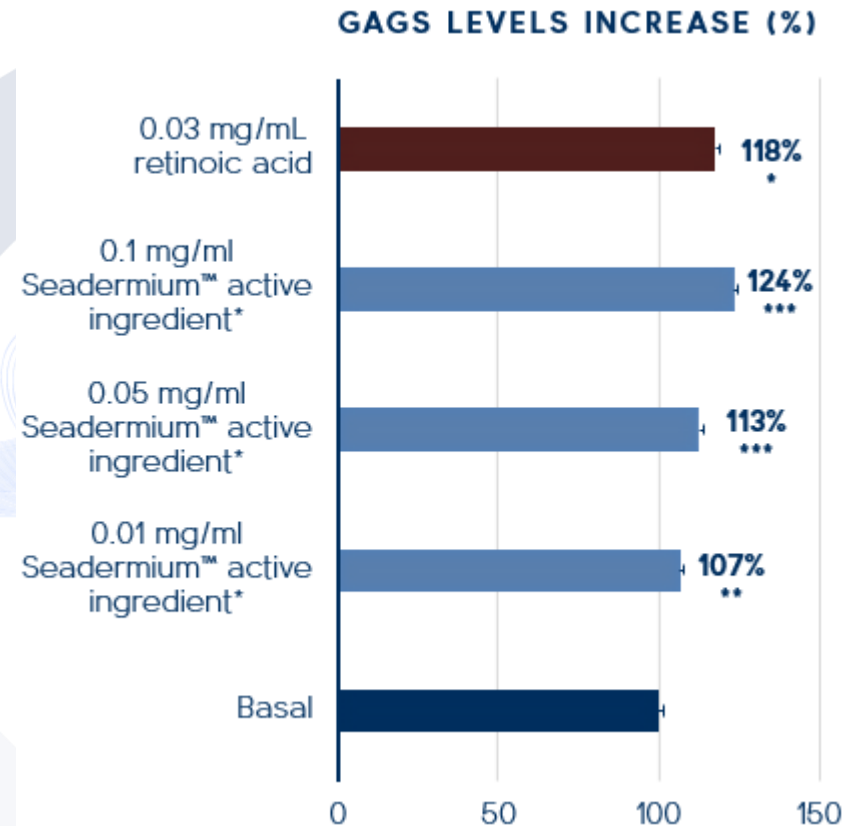




In vitro efficacy: hydrating volume enhancement (ELISA)

- Human dermal fibroblasts
- 48 h incubation
- Positive control: 0.03 mg/mL retinoic acid
- Absorbance (450 nm)

- ✓ **24% GAGs levels increase with 0.1 mg/mL, resulting in a plumping effect**
- ✓ **GAGs synthesis stimulation is dose-dependent**



***p<0.001
**p<0.01
*p<0.05



Dermo-epidermal junction, key of nourishment

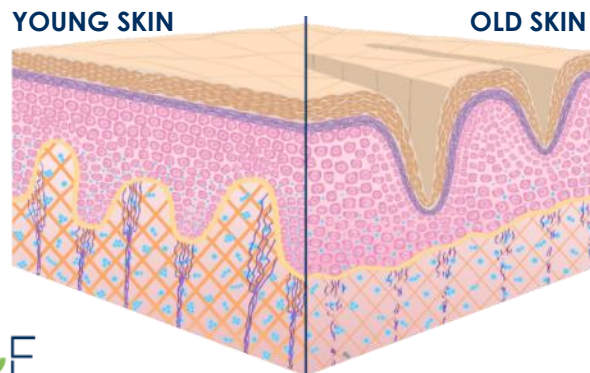
- Downward **epidermal ridges** interdigitate with upward projections of the dermis, **dermal papillae**

↳ **Capillaries** in the papillae provide **nourishment to the epidermis**

- In **aged skin** the **number** and **size** of the dermal papillae **decrease**

➤ **Thinner** and **flattened** DEJ → **↑** DEJ separation → **wrinkle formation**

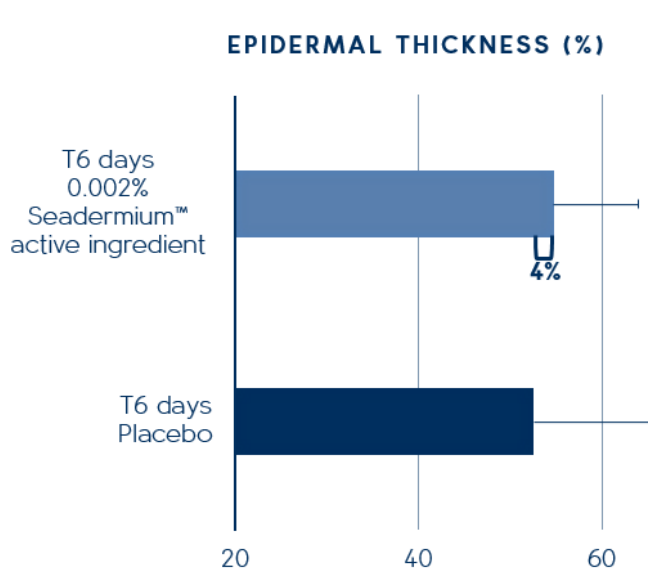
↳ {
 ↓ dermo-epidermal **exchange surface**
 ↓ **nourishment** to the **epidermis**



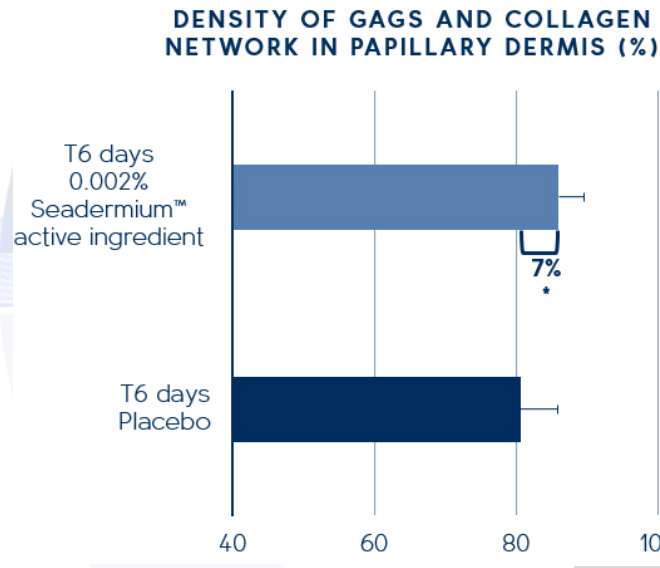
50% reduction in interdigitations per unit area of the skin between 30 and 90 years old

Human skin explants efficacy: skin replenishment and thickening (Masson's trichrome staining)

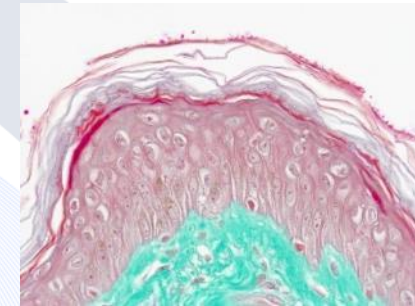
- Human skin explants (50-year old woman donor)
- 6 days
- 0.002% Seadermium™ active ingredient



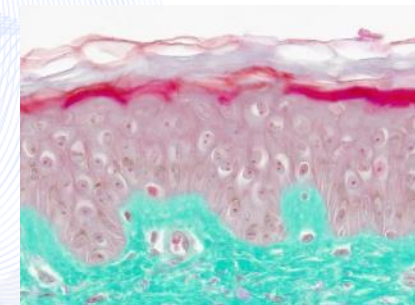
✓ **4% thicker** epidermis vs placebo



✓ **7% more GAGs and collagen network density** vs placebo in papillary dermis



Placebo

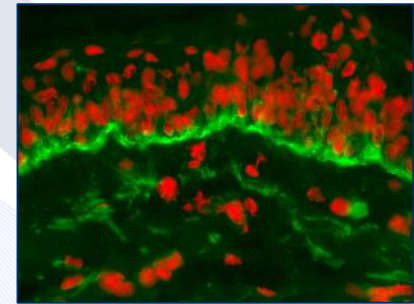
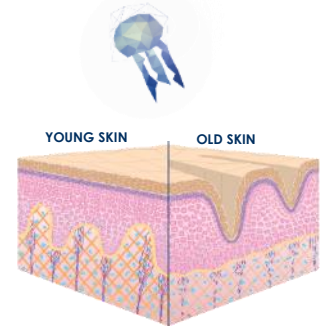


0.002% Seadermium™ active ingredient

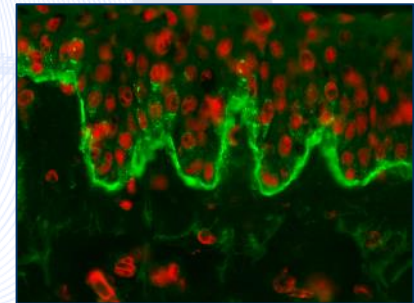
*p<0.05

Human skin explants efficacy: cohesion reinforcement (immunofluorescence)

- Human skin explants (50-year old woman donor)
- 6 days
- 0.002% Seadermium™ active ingredient

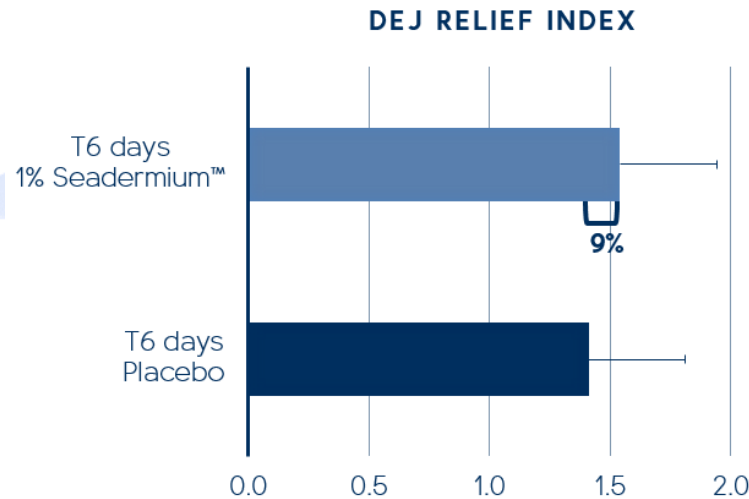


Placebo



0.002% Seadermium™
active ingredient

- ✓ **9% higher DEJ relief index** vs placebo in **6 days** (DEJ relief less flat)
- ✓ **Noticeable laminin 332 increase**



- DEJ relief index equals to the ratio of the length of the DEJ by the length of the epidermis.
- The flatter the relief, the closer to 1 is the DEJ relief index.

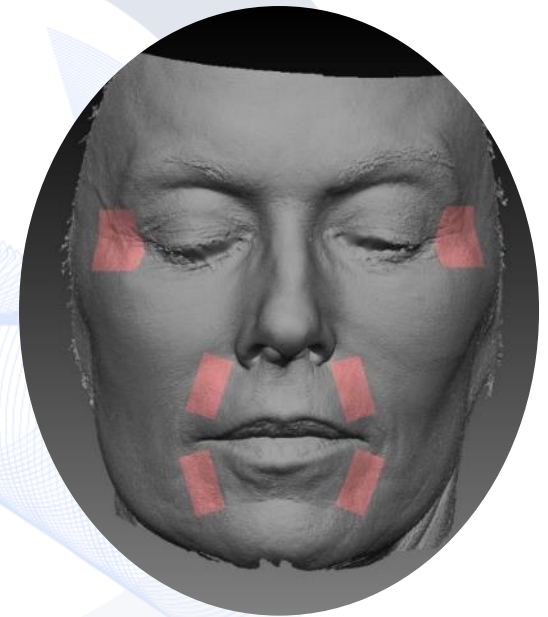


In vivo efficacy: wrinkle plumping & smoothness efficacy

20 Caucasian women (50-70 years old) applied a cream with **4% Seadermium™** on half face, twice daily for 28 days. A placebo was applied on the other half of the face

Evaluation of:

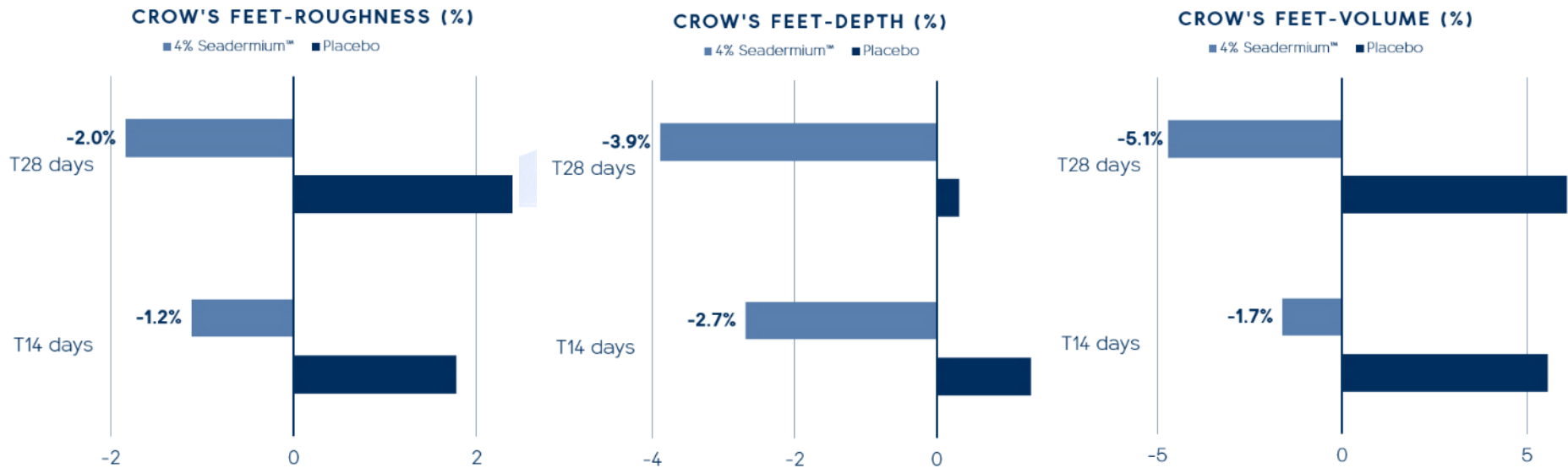
- Type of wrinkles: Crow's feet, nasolabial fold, marionette lines (**fringe projection**)
- Wrinkles & smoothness (**Visia®**)
- Hydration (**Corneometer®**)





In vivo efficacy: wrinkle plumping & smoothness efficacy

- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 50-70



- ✓ 4% and 5% less depth and volume in only one month
- ✓ Excellent wrinkle plumping and smoothing efficacies



In vivo efficacy: wrinkle plumping & smoothness efficacy-Golden volunteers

- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 60-70

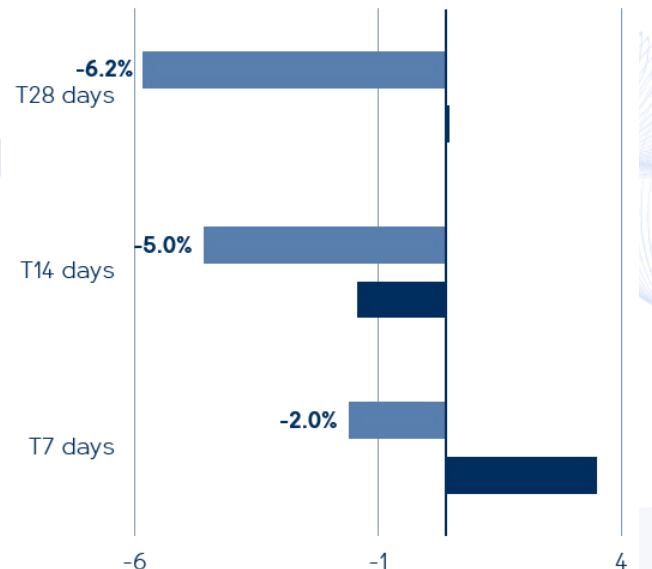


✓ 6% and 16%
roughness and
volume reduction at
28 days

✓ Wrinkle
replenishment in
golden volunteers

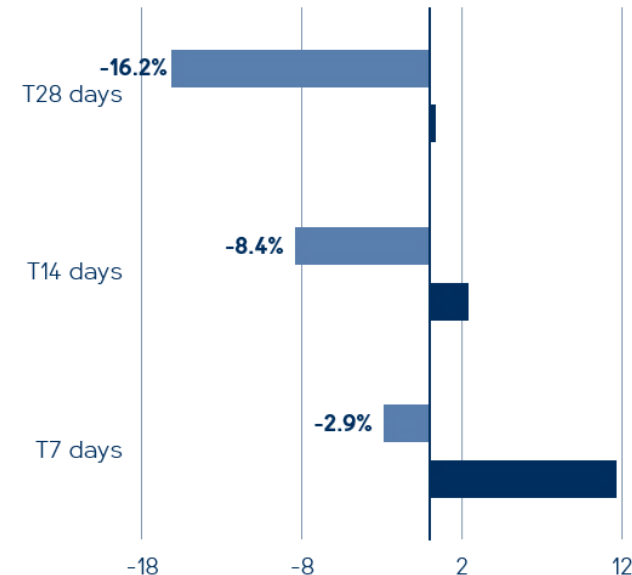
CROW'S FEET-ROUGHNESS
(GOLDEN VOLUNTEERS, %)

■ 4% Seadermium™ ■ Placebo



CROW'S FEET-VOLUME
(GOLDEN VOLUNTEERS, %)

■ 4% Seadermium™ ■ Placebo



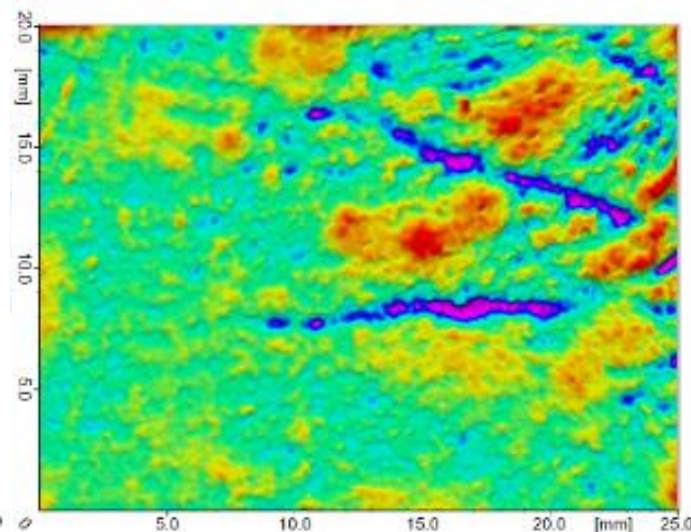
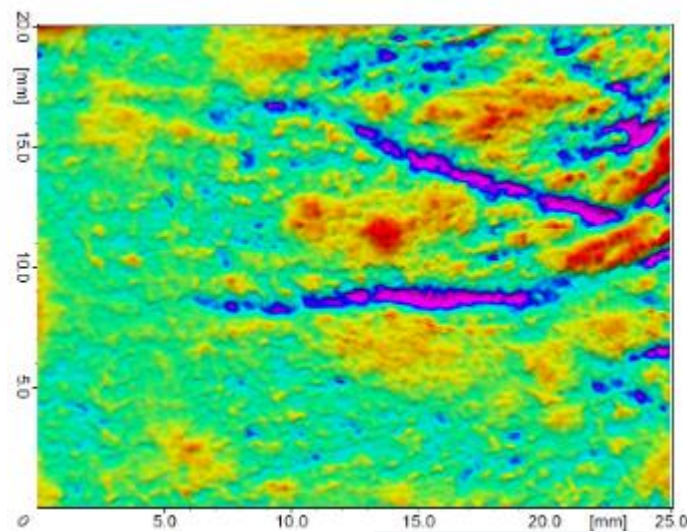
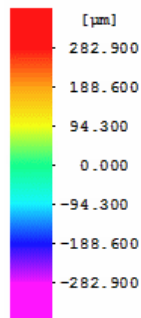
In vivo efficacy: wrinkle plumping & smoothness efficacy

- Wrinkles and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 65 (volunteer 3)



T0 days

T7 days



✓ Up to 47% wrinkle
volume decrease
in just one week

Crow's feet roughness: ↓17%
Crow's feet volume: ↓47%

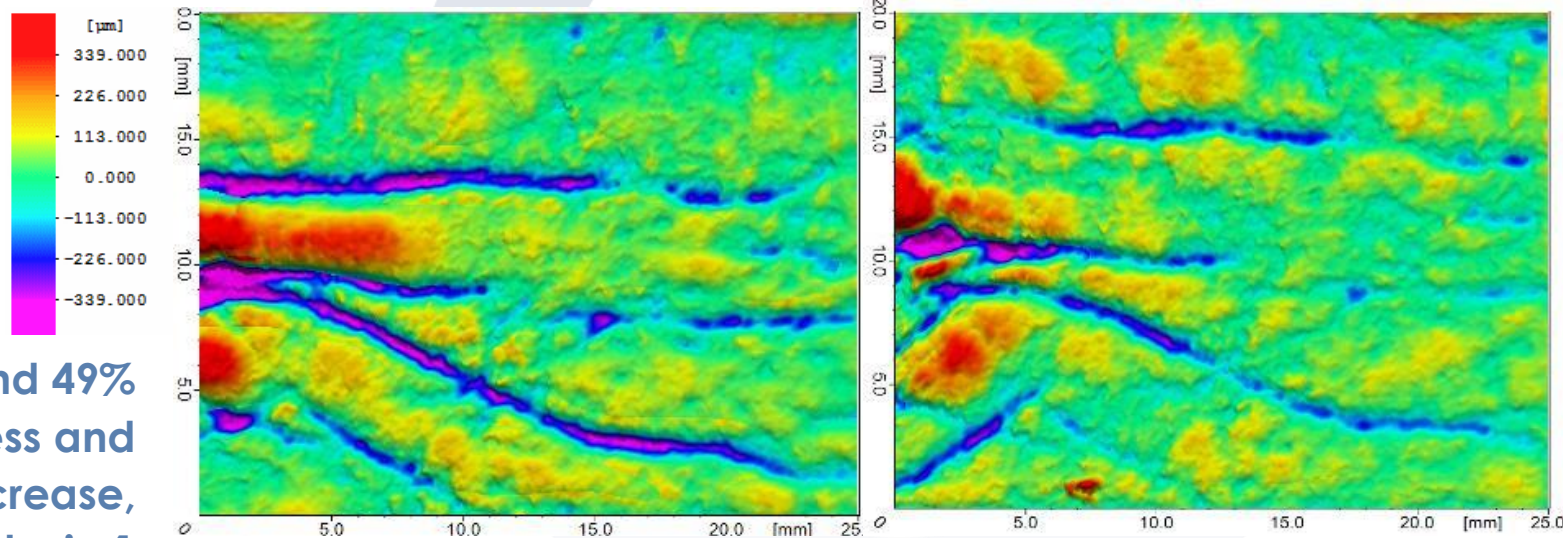
In vivo efficacy: wrinkle plumping & smoothness efficacy

- Wrinkles and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 67 (volunteer 20)



T0 days

T28 days



✓ Up to 24% and 49%
roughness and
volume decrease,
respectively, in 1
month

Crow's feet roughness: ↓24%
Crow's feet depth: ↓20%
Crow's feet volume: ↓49%



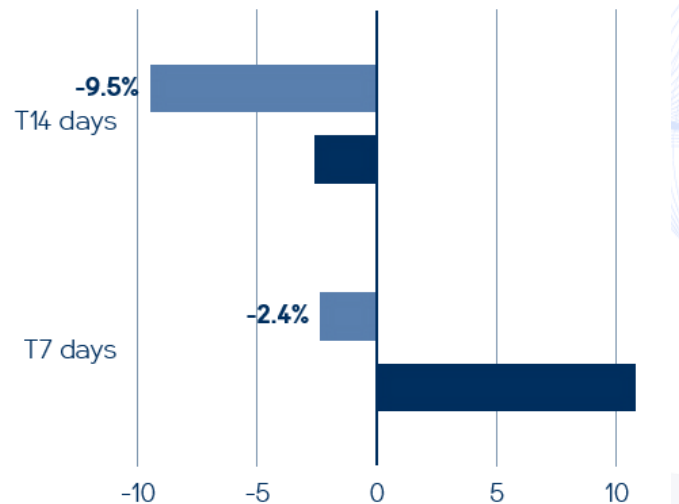
In vivo efficacy: wrinkle plumping & smoothness efficacy

- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 50-70



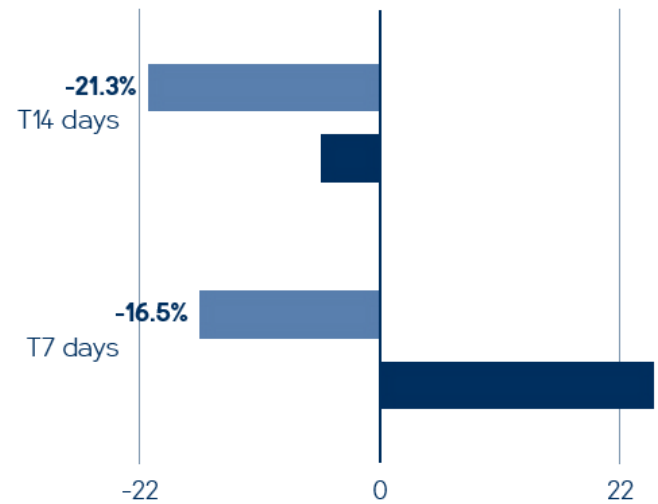
NASALFOLD-VOLUME (%)

■ 4% Seadermium™ ■ Placebo



NASALFOLD-VOLUME (GOLDEN VOLUNTEERS, %)

■ 4% Seadermium™ ■ Placebo



✓ 9% wrinkle
plumping after 14
days

✓ 21% wrinkle filler in
only two weeks in
golden volunteers



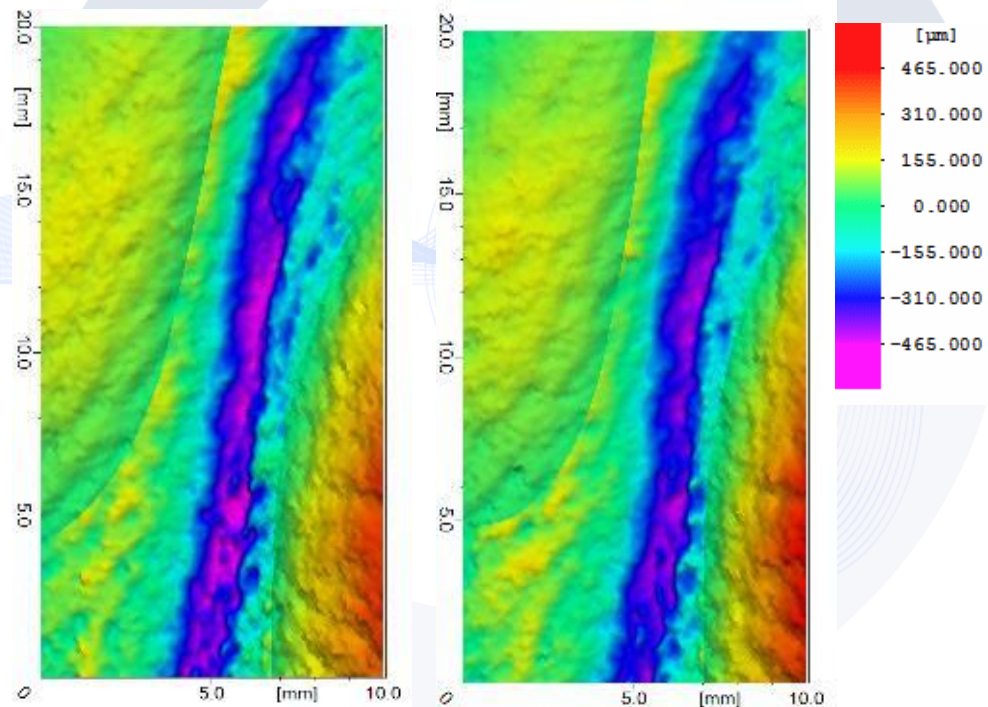
In vivo efficacy: wrinkle plumping & smoothness efficacy

- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 61 (volunteer 14)



T0 days

T14 days



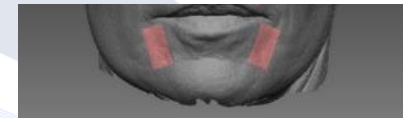
✓ Up to 74% wrinkle volume decrease in 14 days

Nasolabial fold Volume: ↓74%



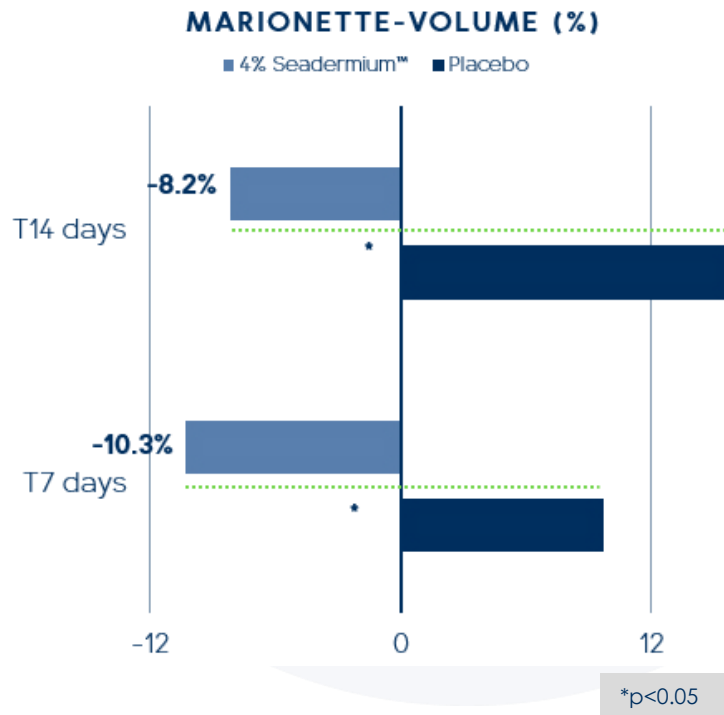
In vivo efficacy: wrinkle plumping & smoothness efficacy

- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 50-70



✓ Average 10% replenishment
after only 7 days

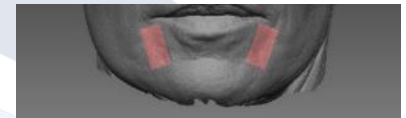
✓ Up to 58% wrinkle volume
decrease in marionette lines
in 28 days



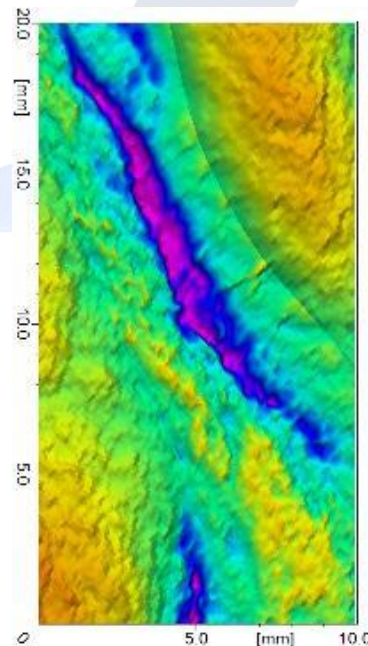


In vivo efficacy: wrinkle plumping & smoothness efficacy

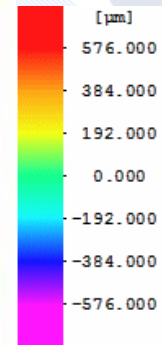
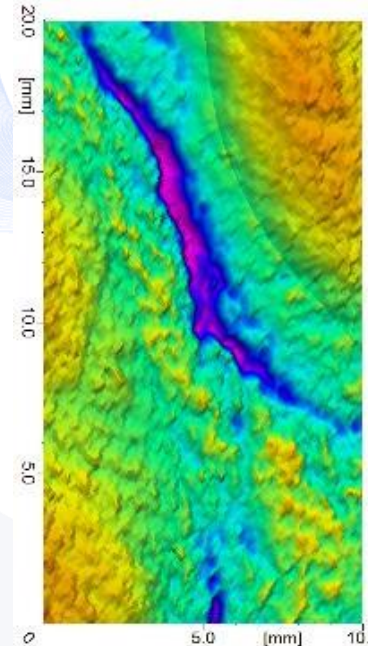
- Plumping and smoothness (fringe projection)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 61 (volunteer 5)



T0 days



T28 days



Marionette lines Volume: ↓30%

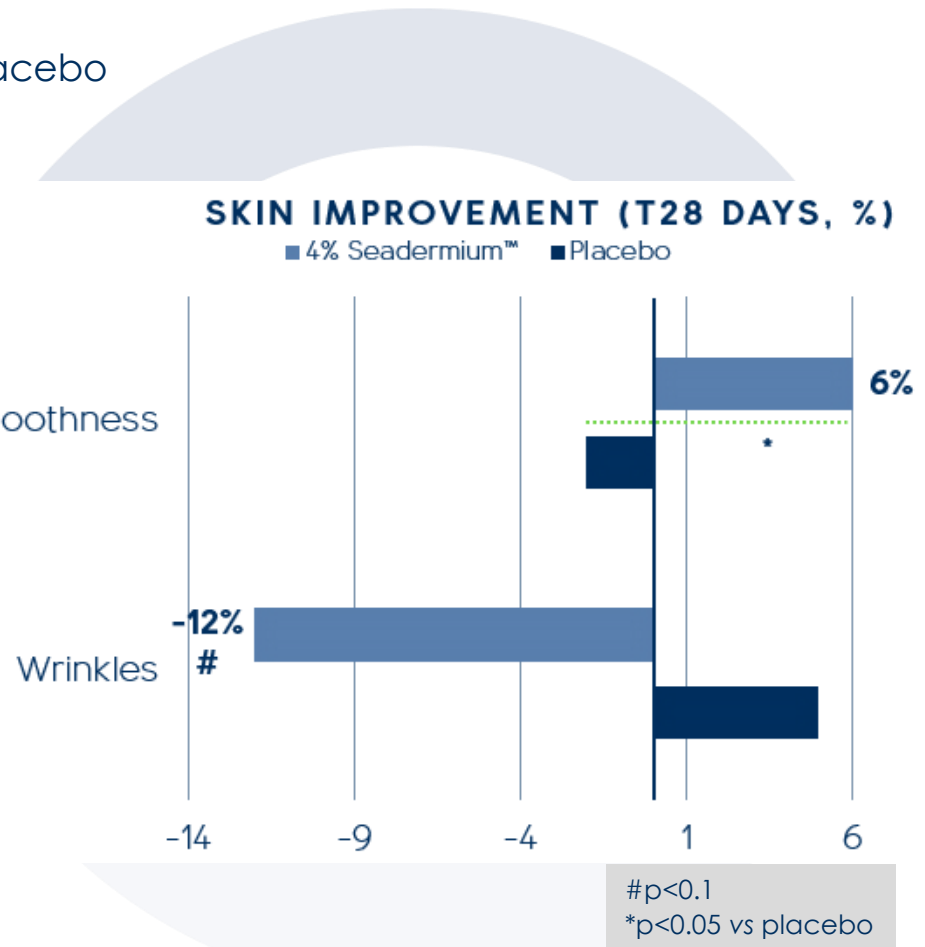


In vivo efficacy: wrinkle plumping & smoothness efficacy

- Plumping and smoothness (Visia®)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 50-70

✓ 12% wrinkles decrease in 28 days

✓ 6% smoothness improvement in 4 weeks





In vivo efficacy: wrinkle plumping & smoothness **efficacy**

- Plumping and smoothness (Visia®)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 51 (volunteer 9)

T0 days

T28 days



✓ Up to 45% wrinkle
reduction in 4
weeks

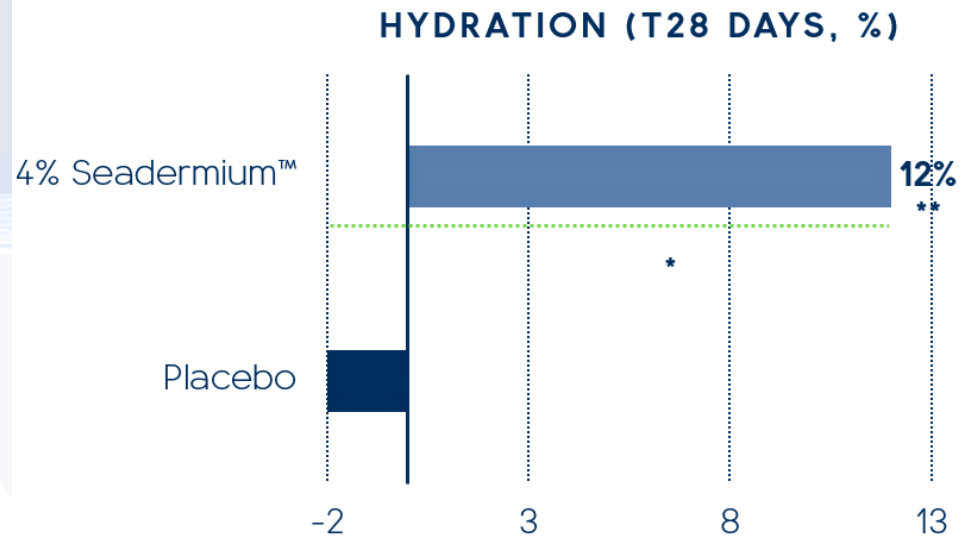
Undereye wrinkles: ↓45%



In vivo efficacy: wrinkle plumping & smoothness efficacy

- Hydration (Corneometer®)
- Cream with 4% Seadermium™ vs placebo
- Half face, 28 days, twice daily
- Age: 50-70

✓ 12% moisture increase in one month

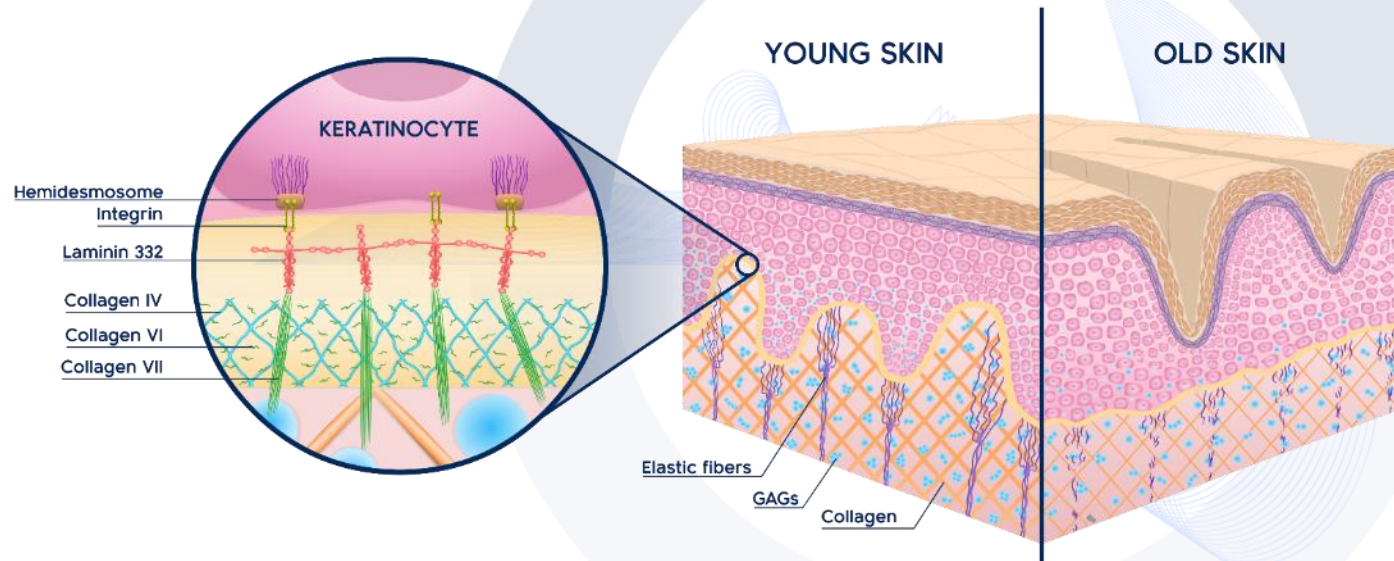


**p<0.01
*p<0.05 vs placebo




Nourishing premium filler

- **Plumps** deep wrinkles
- **Restores** and **strengthens** skin integrity
- **Moisturizes** and **smoothes** mature skin





Technical information

- **Product Name:** Seadermium™
- **Marine** active biotechnological ingredient
- **Recommended dose:** 4%
- **INCI name:** Bacillus Ferment 
- **Appearance:** Solution
- **Preservatives:** None
- **Solubility:** Water soluble



Applications

Cosmetic formulations

- Global action in crows feet, nasolabial fold, marionettes lines
- Targeted efficacy in golden volunteers, when you need it most
- Premium treatment for premium people
- Fill your skin with youth
- Complete approach for mature beauty



SEADERMIUM™
NOURISHING PREMIUM FILLER

