

PEPHA[®]-TIGHT CB

*The power of algae for
superior skin tightening*



June 2025

Biotech | Nature, enhanced by science

dsm-firmenich 

Algae are becoming a major skincare ingredient...



A story of natural resilience

ALGAE

More than 70% of the earth is covered by water. It provides many unique environments and rich resources.

Oldest plant surviving geological ordeals

Very stable, resistant and resilient organisms

For thousands of years, microalgae has been able to survive under the stress of different environments

Rich in nutrients, like Vitamins & Minerals

Source of effective Bioactives

for pharmaceuticals, nutraceuticals and skincare

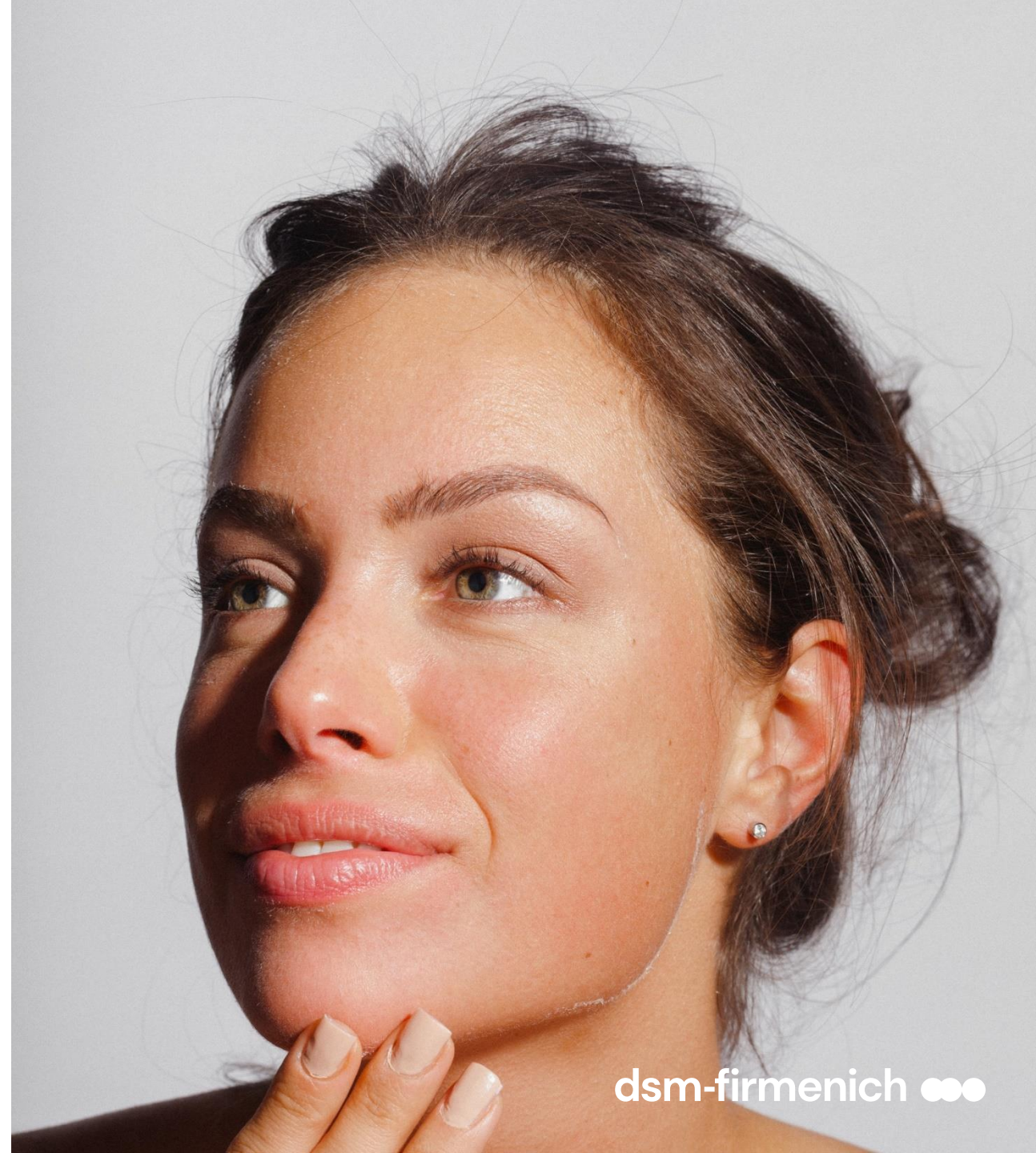
A major ally for the skin!

The skincare benefits of algae are well-known

Algae are superfood for healthy looking skin!

An abundant source of amino acids, vitamins, minerals, antioxidants and essential fatty acids.

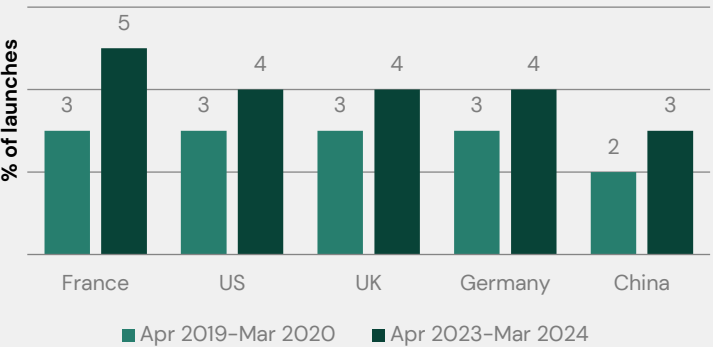
They are known and proven to provide a wide range of highly sought-after skincare benefits, including skin firming, restoration and boosting of Collagen synthesis, skin radiance and protection from blue light which causes skin hyperpigmentation and redness.



Algae keeps buzzing in latest skincare innovation

A dynamic and attractive solution for brands & consumers

Penetration of launches with marine ingredients in Beauty & Care, 2019–24

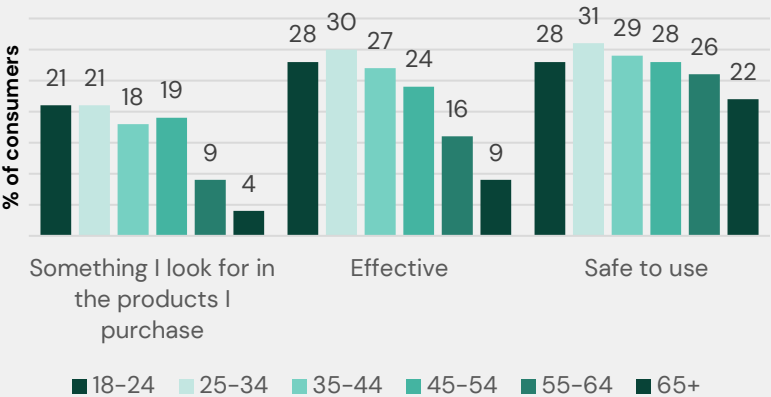


Uncover the potential of emerging marine beauty

Despite ongoing consumer interest, the use of marine ingredients remains relatively small.

However, the segment has grown in key beauty markets such as France, the US and the UK in recent years, indicating promising expectations for expansion.

US consumer perception of marine ingredients by age (2023)

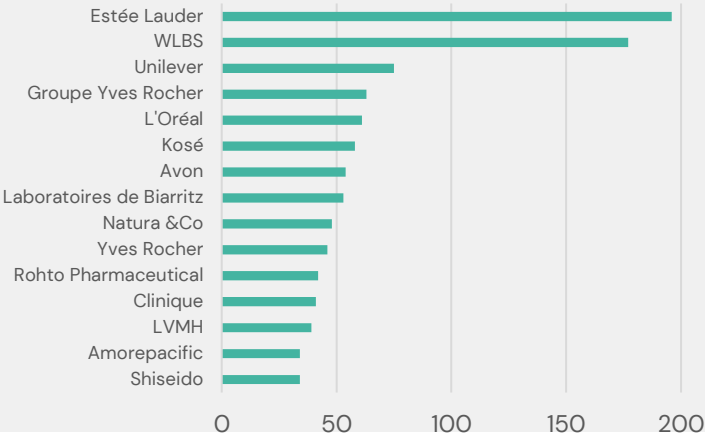


Younger consumers' positive perception

Marine ingredients have been gaining more attention in beauty products.

This is especially so among younger consumers, more of whom perceive these ingredients positively (30% of US consumers aged 25–34 find them effective compared to only 9% of those aged 65+).

Most active companies in skincare with algae (Launches 2020–2024)



Key industry players feature & claim “algae” in latest innovations

Algae remain a popular ingredient claimed by brands across the globe from key industry players. Mainly claimed by botanical & marine brands.

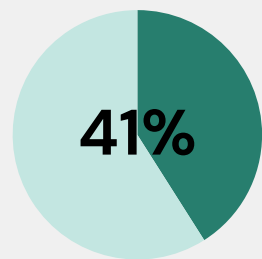
Social media data indicates that global consumers primarily associate marine ingredients with keywords such as health, natural, vitamins and hydration.

Sources: Mintel GNPD (algae/kelp/seaweed; total), April 2019–March 2024
Kantar Profiles/Mintel, November 2023 / US: 1,970 internet users aged 18+ who have used BPC products in the past 12 months
Mintel GNPD Face/Neck Innovations featuring & claiming “algae” in the last 5 yrs / Infegy Atlas/Mintel, April 2021–March 2024

Ticking the box of naturality and sustainability

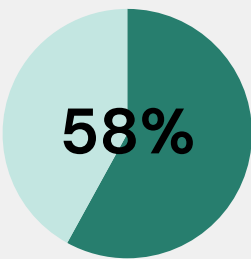
Consumers are seeking natural and ethical ingredients

In the US



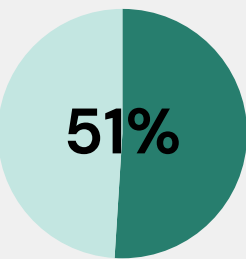
of facial skincare users say it is important for their products to contain natural ingredients

In the UK



of Gen Z beauty users always look for products that are environmentally friendly

In Spain



of adults would be willing to buy BPC made exclusively with lab-grown ingredients if they are better for the planet

Lab-grown is the **next-natural** in sustainability

Algae can be lab-grown, the key to true sustainability as we reassess our relationship with oceans and planet.

Consumers will be accepting of lab-grown alternatives, perceived as natural and sustainable.

Source: Lightspeed/Mintel

PEPHA®-TIGHT CB

ID Card

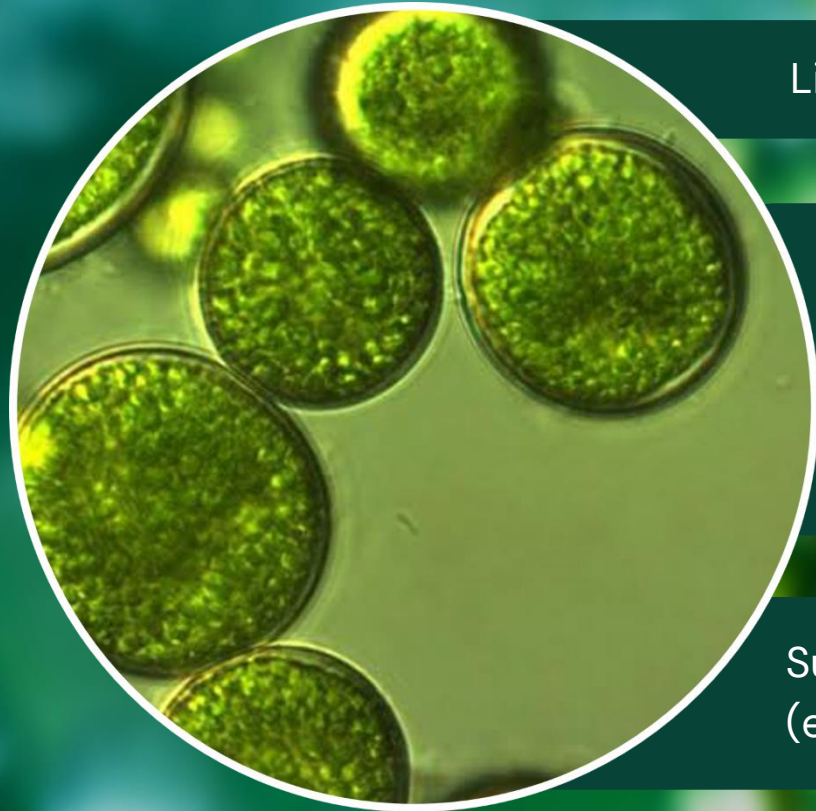
INCI NAME:	Nannochloropsis Oculata Extract, Pullulan, Pentylene Glycol, Citric Acid, Aqua		
TECHNOLOGY:	Sustainably farmed in photo-bioreactors, guaranteeing maximum quality (no risk of contamination, reproducibility of process, fully traceable) Derived from Nannochloropsis oculata microalgae and high performing polysaccharide Polysaccharides obtained from natural fermentation of tapioca starch 100% naturally-derived origin (ISO 16128)		
TECHNICAL:	Form: Transparent to turbid yellow to amber highly viscous liquid Use level: 1–5%	pH of use: 3.5 – 7.5 Preservative: Free	Solubility: Soluble in water
BENEFITS:	• Stimulates fibroblasts’ proliferation and Collagen I* • Protects the skin against oxidative stress and urban dust* • Short-term: Flawless skin after 1 application. Long-lasting lifting result up to 12hrs, already with 2 applications***. • Long-term: With regular usage wrinkles reduction by over -20%		
REGISTRATION CERTIFICATION	 Raw material verified by ECOCERT GREENLIFE, conform to the COSMOS Standard 		

¹ Based on dsm-firmenich clinical study where improvements in skin smoothness and texture homogeneity were detected already within 15min from 1st product application

* in vitro ** ex vivo *** in vivo

The algae

Nannochloropsis Oculata



Lives in both MARINE and FRESHWATER LAKES

Used for several decades to PRODUCE NUTRACEUTICALS and FEED SUPPLEMENTS

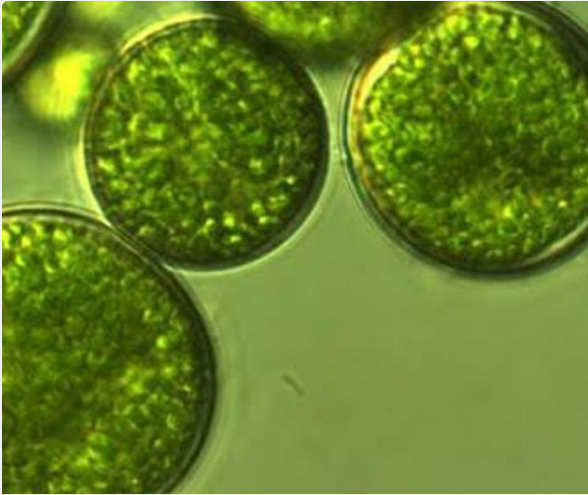
A STRONG COCCOID CELL WALL that protects its bioactives

Supplies the skin with ESSENTIAL AMINO ACIDS, PRECIOUS VITAMINS (especially vitamins C and B12) and POWERFUL ANTIOXIDANTS

Unique combination for efficacy & sustainability

A concentrated mixture of powerful functional ingredients produced by biotechnologies, fully naturally derived & renewable

A transparent concentrated mixture with 3 powerful functional ingredients



Microalgae

Produced in photobioreactor as a more sustainable solution compared to open ponds cultivation

- Safer and better quality
- More respectful of terrestrial biodiversity
- Use of renewable energy



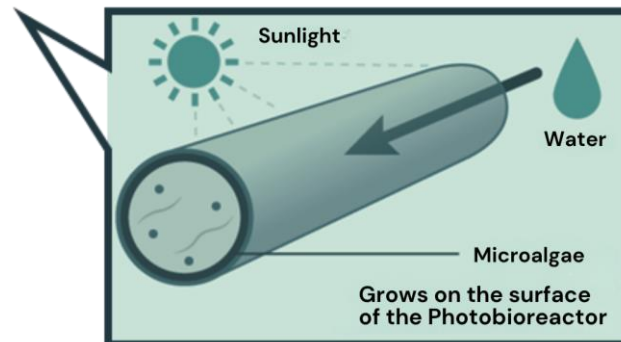
Pullulan

Fermentation of tapioca starch



Pentylene Glycol

Produced from valorised and naturally-derived material

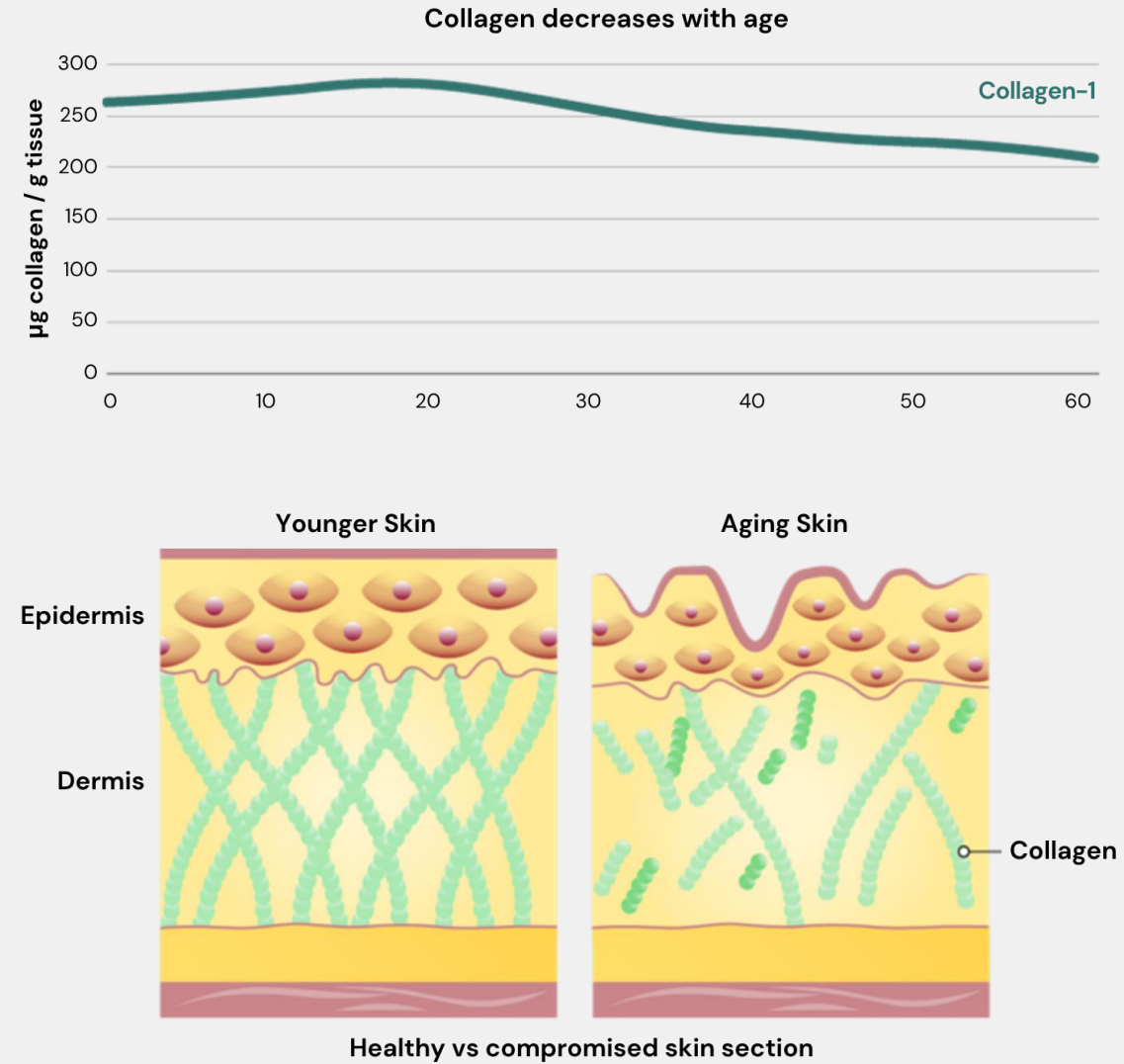


Over time skin works less efficiently

Reference: Asserin et al. (2015) J Cosmet Dermatol, 14, 291–301

Profound changes occur in the structure of the dermis and epidermis, through processes of intrinsic and extrinsic aging, leading to the appearance of wrinkles and the loss of tone

- With age, the Collagen density in the Dermis decreases and its network becomes increasingly fragmented, presenting shorter and less organized fibres.
- An increase in Matrix Metalloproteinase (MMP) expression accelerates the Collagen degradation. In parallel, the synthesis of new extracellular matrix components by dermal fibroblasts slows down, failing to adequately replace the degraded matrix.



How does it work?

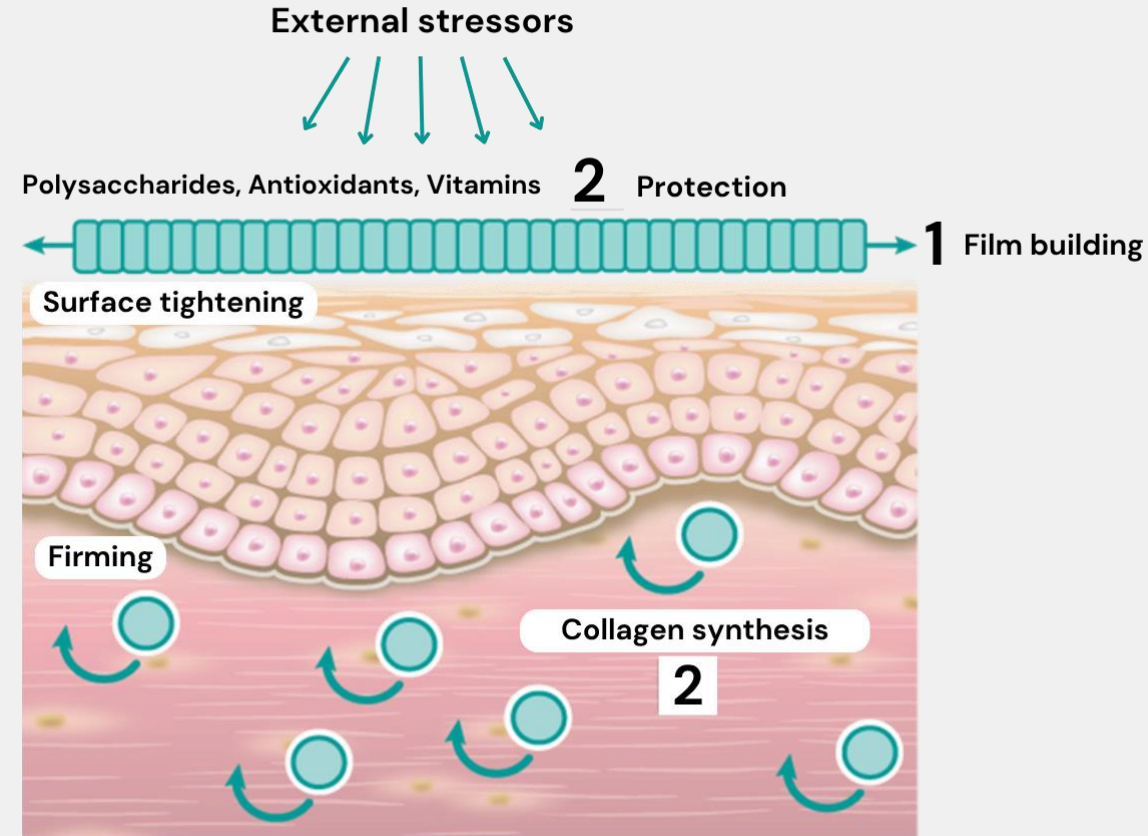
PEPHA®-TIGHT CB combines short- and long-term efficacy

1. Short-term, with 1 application:

PEPHA®-TIGHT CB forms a thin film on the skin, exerting an **instant and long-lasting perceptible skin smoothing & lifting effect**.

2. Long-term, with regular applications:

PEPHA®-TIGHT CB acts as a **protective shield** against oxidative stress, helps to **stimulate the formation of Collagen I**, an essential part of the skin's connective tissue, **helping reducing wrinkles & improving skin elasticity**.



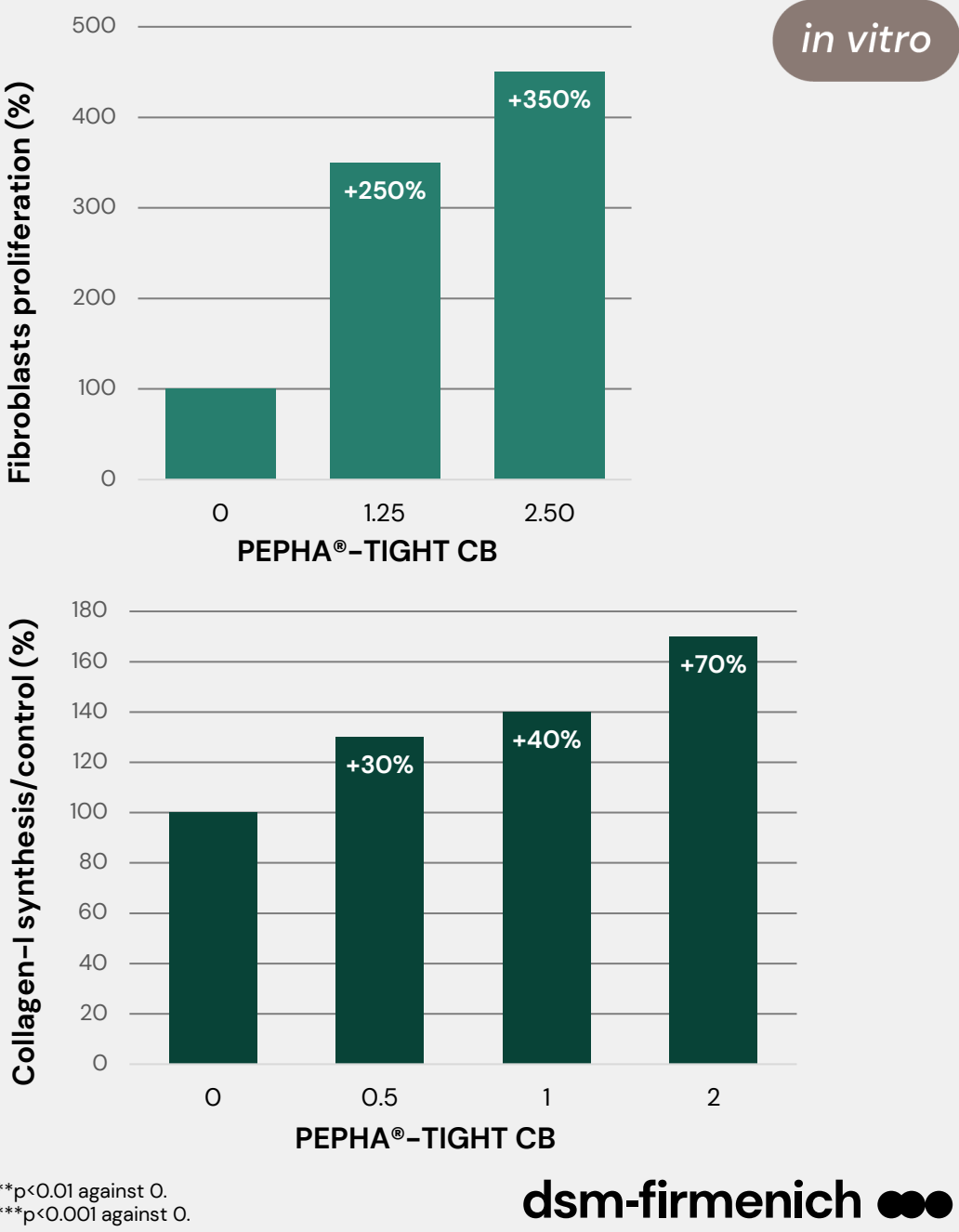
Highly increases fibroblasts proliferation and Collagen-I synthesis

Stimulation of fibroblasts proliferation by 350% and Collagen-I by 70%

Aged skin is characterized by a decline of cell number and proliferative cells. Therefore, less ECM is produced, leading to a lack of structural components, such as collagen fibers. The skin gets thinner, less resilient and less firm.

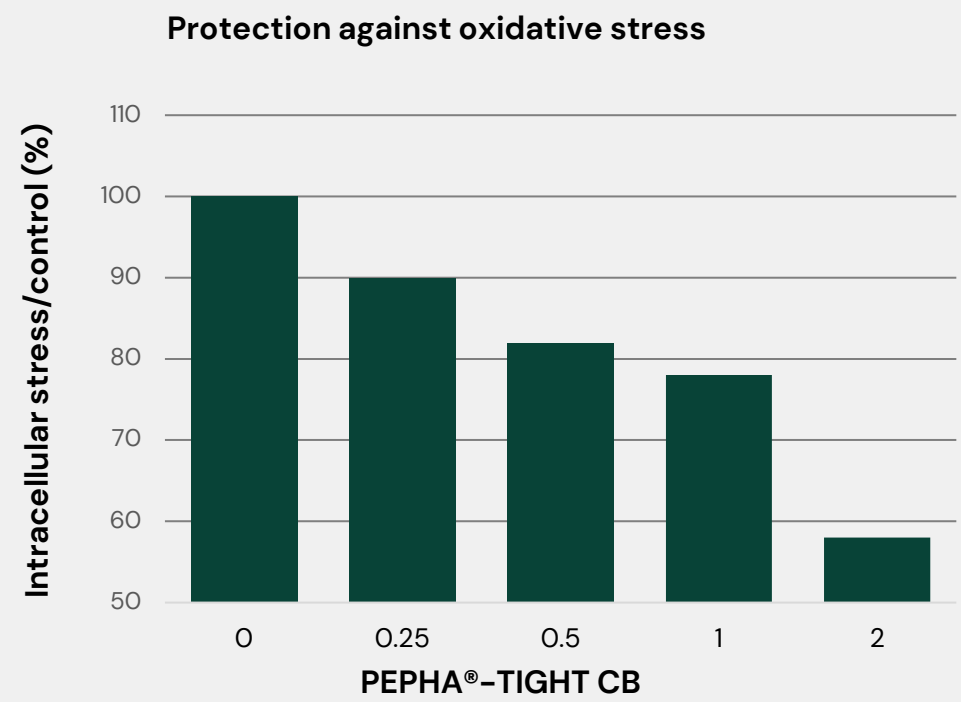
Results:

- Increase in cell proliferation of human fibroblasts, and consequently support for collagen production increase.
- Stimulation of Collagen-I synthesis in human fibroblasts, improving the structure of the connective tissue



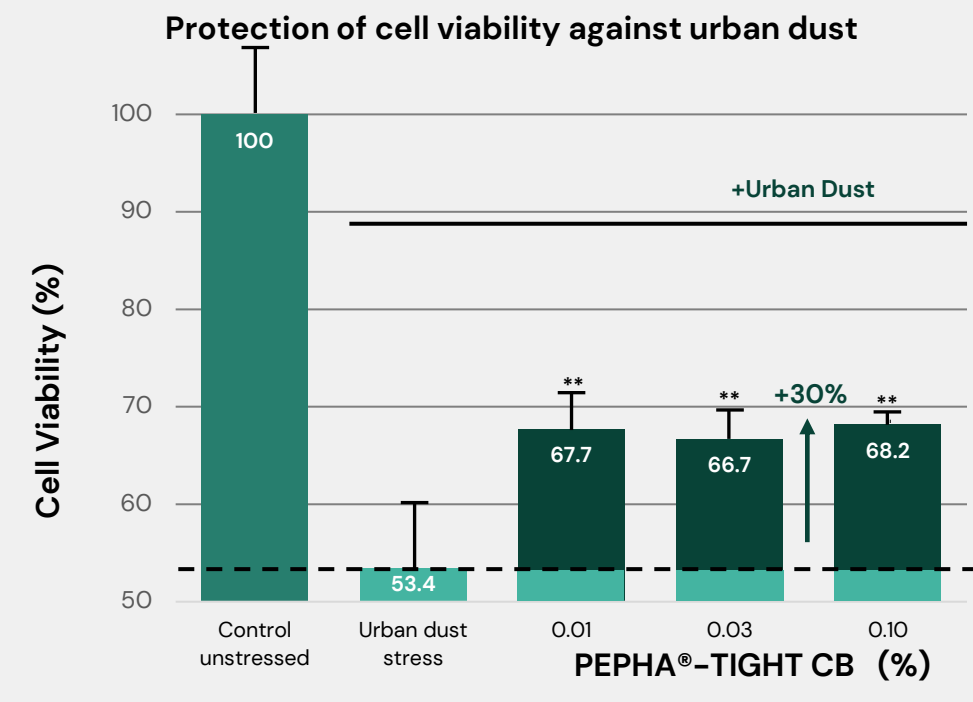
Protects the skin against stressors

in vitro



Reactive Oxygen Species (ROS) are known to accelerate the aging process. In addition, aged cells are less able to protect themselves against oxidative stress. This leads to an accelerated collagen breakdown and cross-linking of proteins. The skin gets thinner and less resilient. In vitro protection was measured by the ROS assay: Human fibroblasts were exposed to hydrogen peroxide (H₂O₂) to induce an intracellular oxidative stress. The release of ROS was quantified by fluorescence staining.

Results:
Dose dependent protection of human fibroblasts from oxidative stress, and consequently, protection of the collagen fiber network from damaging processes.



Used in the dsm-firmenich assay and research Standard Reference Material® (SRM) 1649b “urban dust” is an authentic surrogate for urban air pollution of the National Institute of Standards and Technology (Gaithersburg, MD, USA).

Results:
With PEPHA®-TIGHT CB, cell viability improves up to +30% vs stressed cells

Urban dust: SRM16495 extract, Mean ± SD, It=3, Student t-test, ** p 0.01 vs. urban dust stressed cells

Short-term *in vivo* Study

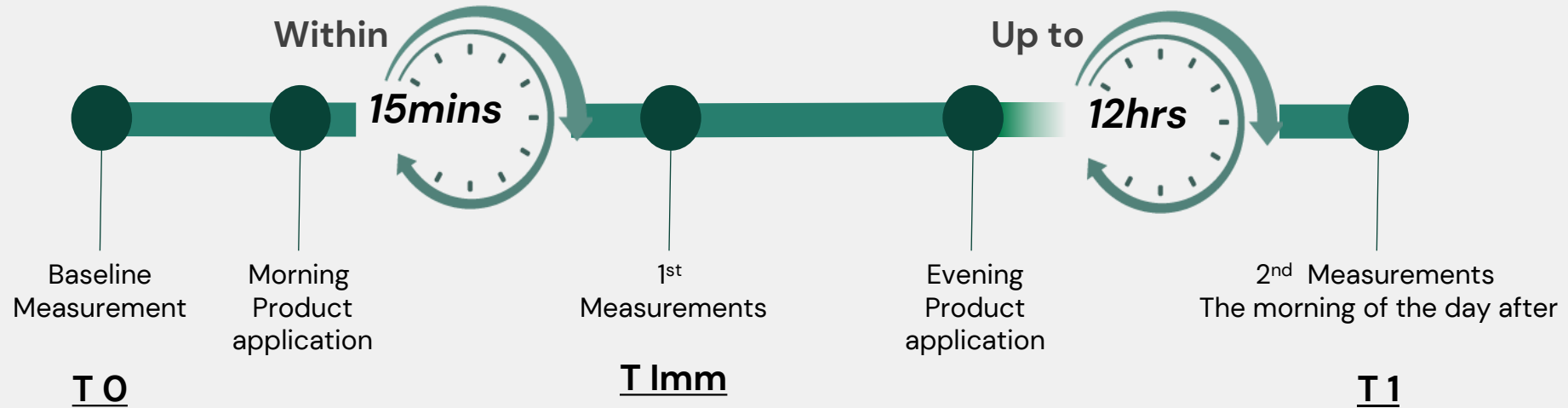
Study design, Spring 2022 (Lyon, France)

in vivo

Randomized double-blind, mono-center study. Caucasian female volunteers.

Two groups:

- Placebo & 3% PEPHA®-TIGHT CB
 - 27 volunteers by group, 40-65 years (mean 55 years)
- Twice daily product application



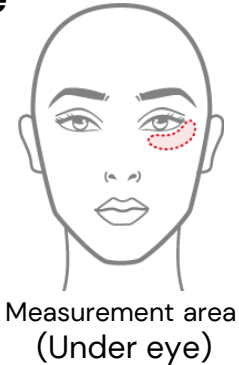
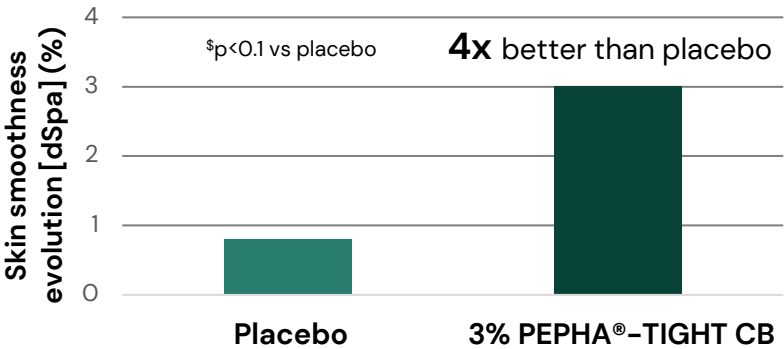
Flawless skin in minutes with PEPHA®-TIGHT CB

SkinCam measurement

in vivo



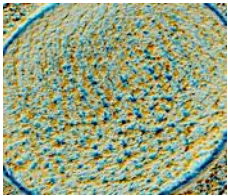
Skin Smoothness Improvement below eye



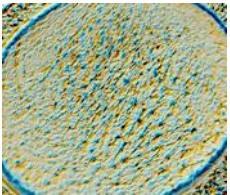
Measurement area (Under eye)

Immediately after 1 application

Volunteer 19

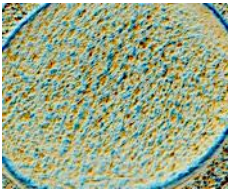
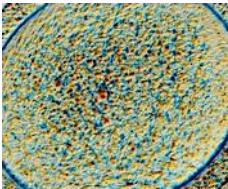


Baseline

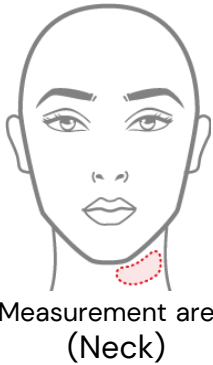
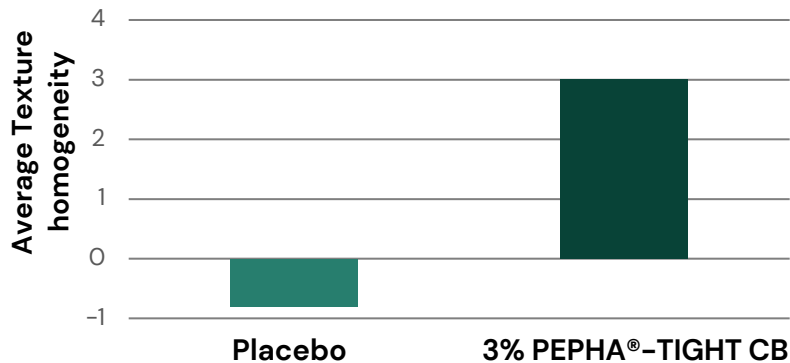


Immediately after 1 application

Volunteer 36



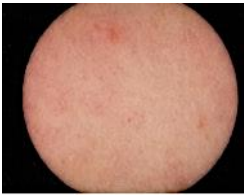
Skin Texture Improvement on Neck Area



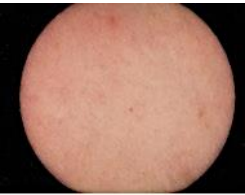
Measurement area (Neck)

Immediately after 1 application

Volunteer 09

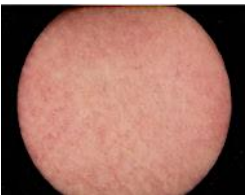


Baseline



Immediately after 1 application

Volunteer 58



SkinCam takes an image of the skin surface and shows how the irregularities of the skin texture evolve.

After PEPHA®-TIGHT CB application, skin surface appears smoother and texture more homogeneous

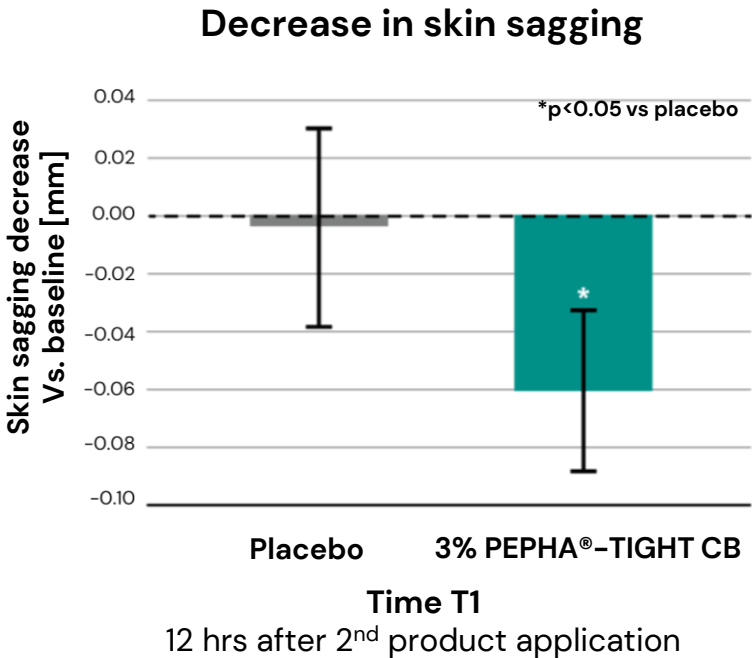
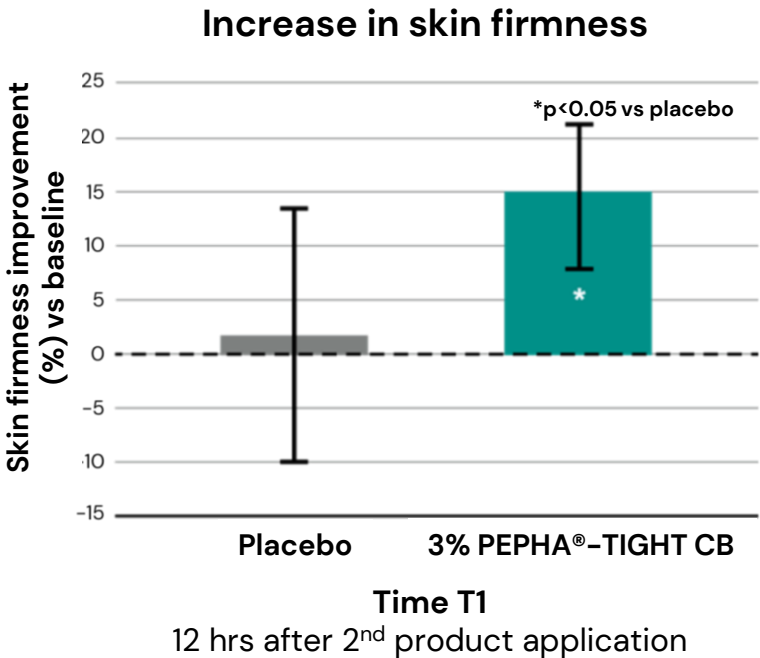
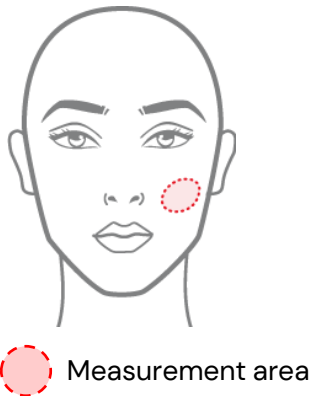
Significant long-lasting lifting effect with PEPHA®-TIGHT CB

SkinFlex measurement

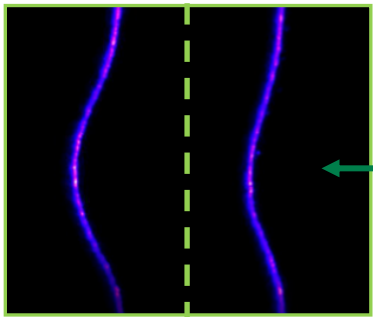
in vivo



PEPHA-TIGHT CB is 13X better than placebo



Volunteer 39
Skin deformation upon strain

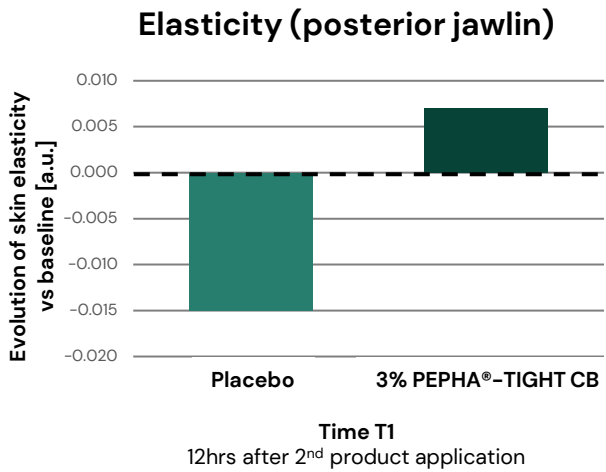
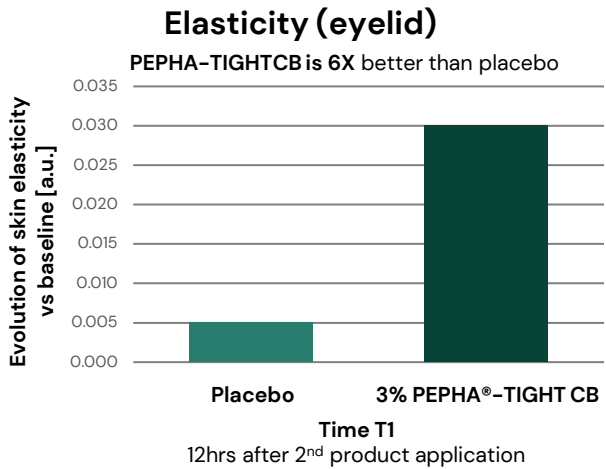
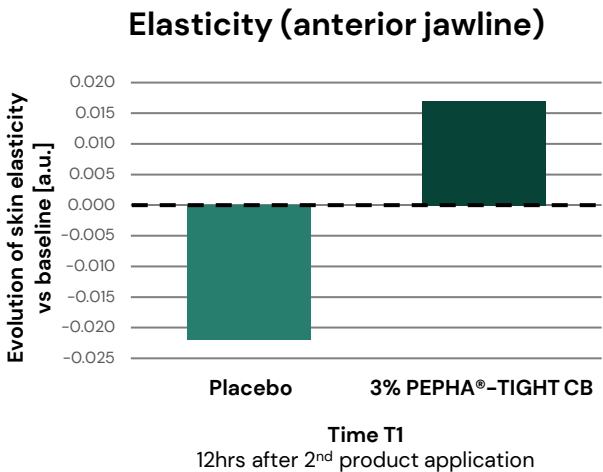
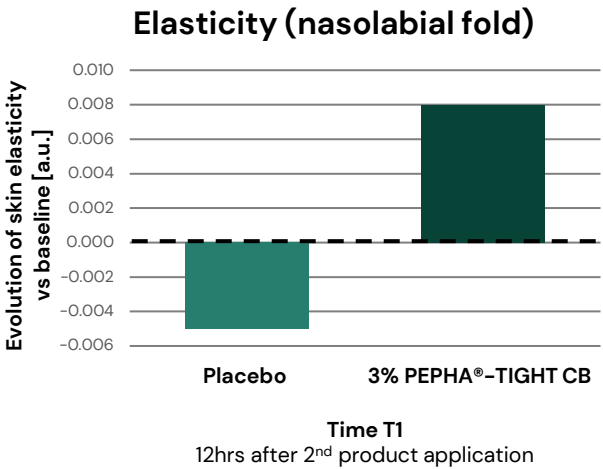


An airstream is blown perpendicularly to the cheek: it pushes the skin inwards forming a kind of “hole” in the cheek. The firmer & more lifted is the skin, the more it’s able to resist the airstream, as shown for Volunteer 39 in the pic

Skin gains elasticity in critical facial areas with PEPHA®-TIGHT CB

Cutometer measurement

The Cutometer applies a vacuum to the skin, pulls on the skin and then lets it go. The time, velocity and return to the original position are measured, from this the elasticity is calculated. Elastic skin can bounce back to its original position fully and fast. with PEPHA®-TIGHT CB, we see an improvement of this skin behavior.



in vivo



Measurement area

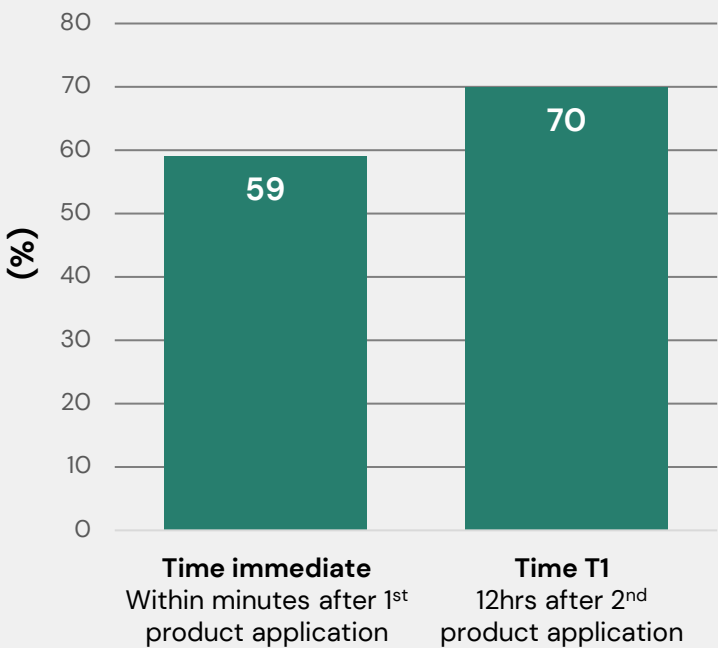
Consumers perceive the improvement

Qualitative questionnaire, for immediate & long-lasting perception

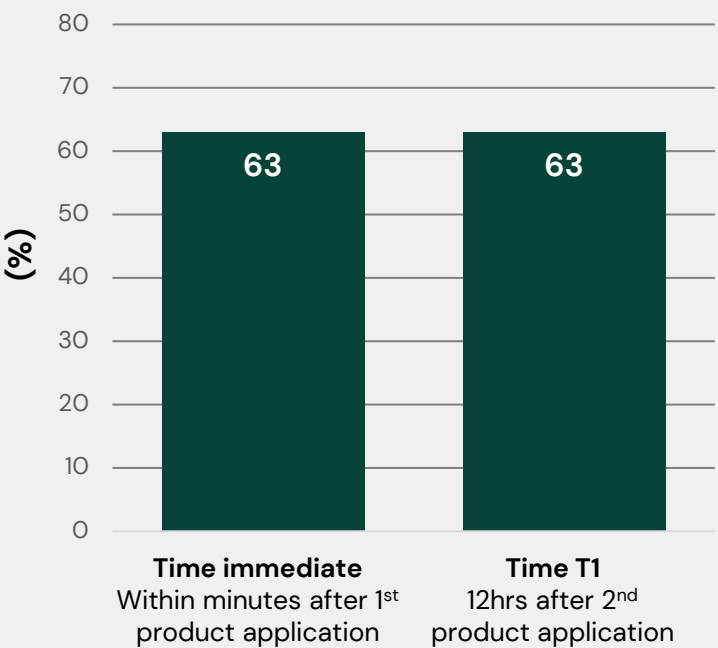
in vivo

% of affirmative answers to «My skin looks & feels firmer with PEPHA®-TIGHT CB»

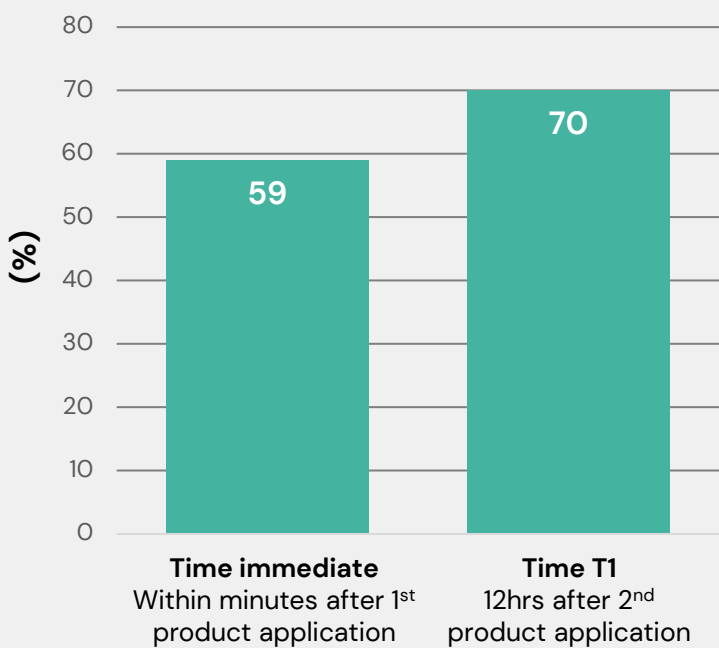
Overall facial skin



Skin around the eyes



Neck & neckline

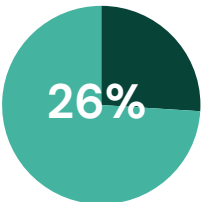


Long-term well-aging result with regular usage of PEPHA®-TIGHT CB

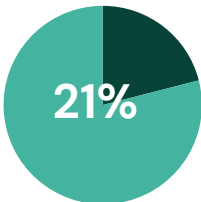
in vivo

Profilometer and Cutometer measurement

Wrinkle reduction (profilometry):

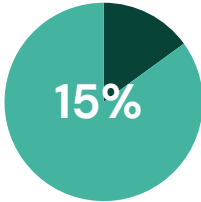


reduction of wrinkle surface

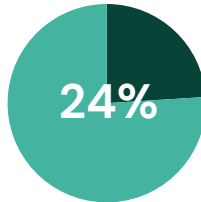


reduction of wrinkle length

Skin firming (cutometry):



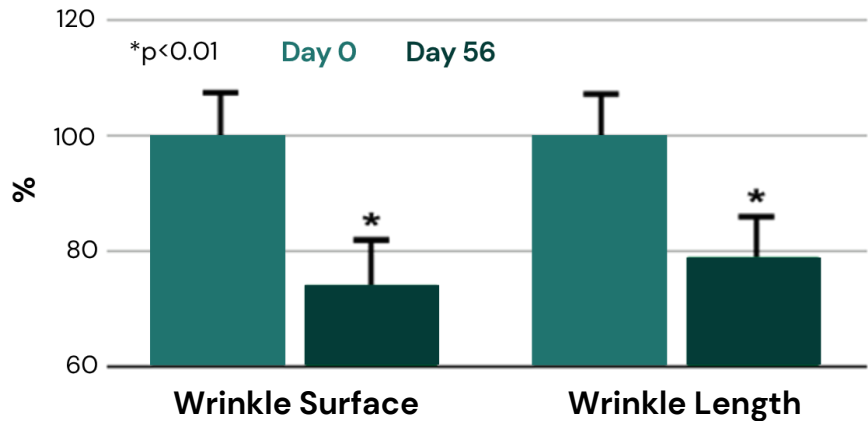
improvement of elasticity



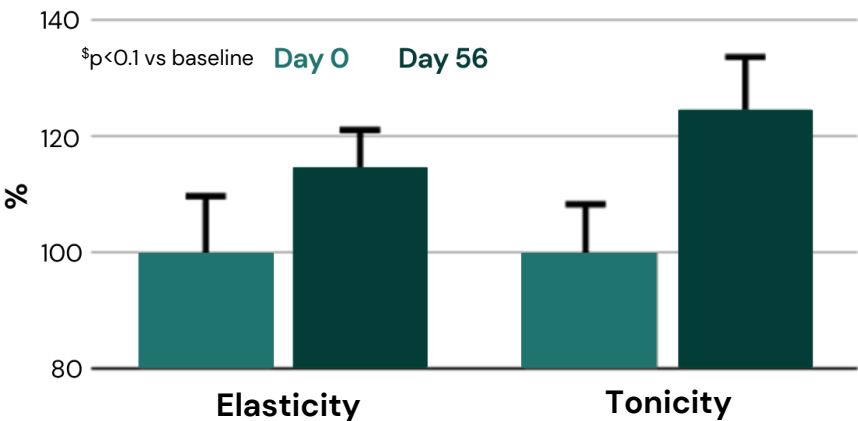
improvement of tonicity

Cream with 3% PEPHA®-TIGHT CB applied on the face twice daily over 2 months. 13 female volunteers 30-55y.o., mean 40yrs.

Visible wrinkle reduction after 2 months



Long-term skin firming results after 2 months!



Formulation Guidelines

PEPHA®-TIGHT CB

INCI name (active):

Nannochloropsis oculata Extract, Pullulan

- Viscous, yellowish to amber solution
- Stable at pH ranges from 3.5 to 7.5
- Should be processed below 50°C
- Suggested concentration: 1–5%

Cosmetic application

- Facial skin tightening products
- Protective care for long-term firmer skin
- Firming and lifting Neck & Décolleté formulations
- Added value for anti-wrinkle products



PEPHA®-TIGHT CB

Supported marketing claims

- Flawless skin within minutes¹
- With just 1 application, skin surface appears smoother and texture more homogeneous
- Long-lasting lifting effect, up to 12hrs from last application
- Skin gains elasticity in critical facial areas
- After multiple applications, long-term well-aging effect with wrinkles reduction by over -20%

¹Based on dsm-firmenich clinical study where improvements in skin smoothness and texture homogeneity were detected already within 15min from 1st product application



PEPHA®-TIGHT CB B2C potential

This ingredient serves different market trends & products' narratives

Fast Beauty

Looking for rapid & perceivable skin improvements

- **Consumers want** instant gratification and fast visible results. Consumption can also be occasion driven (e.g. a special meeting, a night out, the wedding day...and consumers want to look at their best).
- **We offer:** PEPHA-TIGHT® provides smoother skin texture & flawless skin within minutes from 1st application. Long-lasting lifting effect, proven to last up to 12hrs

Good Beauty

Looking for transparency and solutions that can make a positive impact

- **Consumers want:** compromised-free solutions, good for the skin & for the planet.
- **We offer:** PEPHA-TIGHT® combines efficacy and sustainability.
 - Rapid and long-lasting visible results, already with 1 application.
 - Derived from microalgae and high performing polysaccharides, produced by biotechnologies, fully naturally-derived & renewable. Vegan-friendly, COSMOS approved

Healthy Beauty

Beautiful skin starts with healthy skin

- **Consumers want:** solutions that goes beyond the superficial, as they know that beautiful skin starts with healthy skin
- **We offer:** PEPHA-TIGHT® microalgae, superfood for more resilient and healthy-looking skin. It delivers smoother & lifter skin already after few applications. Additionally, with a more regular consumption, it can act as a protective shield against oxidative stress and pollution, for long-term well-aging effects. This 2 in 1 proposition, might also serve the "minimal beauty" positioning

dsm-firmenich solution: PEPHA®-TIGHT CB

The fast lane to superior skin tightening

in vitro PEPHA®-TIGHT CB:

- Stimulates Fibroblasts' proliferation by +350% and Collagen-I by +70%
- Protects the skin against oxidative stress and urban dust

in vivo PEPHA®-TIGHT CB:

- **Within minutes from 1st application:**
 - Visibly smoothens skin texture for an immediate¹ flawless effect
- **Up to 12hrs long-lasting effect:**
 - Skin looks and feels firmer, more lifted and more elastic already after 2 applications
- **Long-term result, after 2 months treatment:**
 - Reduces the wrinkles' surface by -26% and length by -21%
 - Improves skin elasticity by 15% and tonicity by 24%

¹Based on dsm-firmenich clinical study where improvements in skin smoothness and texture homogeneity were detected already within 15min from 1st product application



DEEP BEAUTY

Discover the hidden secret of nature for a healthy-looking skin!

Powered by **blue biotechnology** ingredients, the deep beauty skincare range nourishes skin, protects against external aggressors and helps minimize the appearance of fine lines and wrinkles with an immediate and long-lasting lifting effect. For skin that looks firmer, more vibrant healthier.

Is this not the ultimate deep beauty?!

For internal use only. Illustrated products are for experimental use and are not for sale. dsm-firmenich is not responsible for final products claims



DEEP BEAUTY



For internal use only. Illustrated products are for experimental use and are not for sale. dsm-firmenich is not responsible for final products claims



DEEP BEAUTY

2IN1 MILKY LOTION
ON-THE-GO

With **PEPHA®-TIGHT CB**, **PEPHA®-CTIVE CB**, **ARGAN OIL**, **Mixed Tocopherols 95**, **SYN®-COLL CB** and **D-Panthenol 75 L**

Your skin ally for an on-the-go extra boost of nourishment! Packed with Marine Biotech Complex, rich in amino acids, vitamins, minerals, antioxidants and essential fatty acids for immediate and long-lasting healthy-looking skin. This lightweight milky texture is designed for dual application:

- roll it over targeted zones for precision tightening
- spray it in a fine facial mist for instant hydration that smoothens and re-energizes your skin

99.39% natural origin content according to ISO 16128

SK-E-102022-36

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DEEP BEAUTY

REVITALIZING SERUM

With **PEPHA[®]-CTIVE CB, PEPHA[®]-TIGHT CB**

A concentrated shot of the most powerful marine ingredients for strong anti-aging benefits. Skin looks firmer and plumper, evener and re-energized.

100% natural origin content according to ISO 16128

SK-E-102087-5

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DEEP BEAUTY

INSTANT TIGHTENING ULTRA-PRECISION STICK

With **PEPHA®-TIGHT CB**, **ALPAFLOR® EDELWEISS CB**

A concentrated solid serum stick for targeted application. Enriched with powerful Active Algae, it helps minimize the appearance of fine lines and wrinkles with an immediate tightening effect and, when applied regularly, it acts as a protective shield against oxidative stress for healthier and firmer looking skin.

100% natural origin content according to ISO 16128

SK-E-101904-15

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We bring progress to life

Unique combination for efficacy & sustainability

A concentrated mixture of powerful functional ingredients produced by biotechnologies, fully naturally derived & renewable

The **Microalgae**, is produced in photobioreactors and grows in water on sunlight, carbon dioxide from the air, and some nutrients. It is natural up to the solvent used for the extraction of the algae, as only water is used. By using biotechnology to produce the microalgae, we are making a more sustainable choice compared to open ponds culture:

- A safer choice because photobioreactors are less susceptible to contamination
- A lower impact on terrestrial diversity, as the construction of the open ponds is usually associated with a destruction of local fauna habitat
- The energy used for the photobioreactors is mostly renewable

The **Pullulan** is produced by fermentation of tapioca starch.

Those are preserved in Pentylene Glycol, produced from corn cobs, therefore valorizing a residual stream after the extraction of the more valuable materials from the crop.

PEPHA®-TIGHT CB is a very powerful combination of anti-ageing effects, based on biological sources, processed with biotechnology and fitting in a net zero climate change policy. All production processes are operated under mild conditions without hazardous chemical substances and generate only small amounts of non-hazardous waste.