

PRODUCT, DESCRIPTION AND EVIDENCE

REFERENCE: FS1-54

PUBLISH DATE: 06/04/2023

QUENCH

Quench 4D replenishing serum, is an ultra-low molecular weight Hyaluronic Acid complex that will work immediately, providing 72-hour hydration and an improved cumulative effect with long term use.

KEY BENEFITS

- Provides deep and long-lasting moisturization up to 72 hours.
- Reduces signs of dry skin by 20%.
- Ultra-low molecular weight hyaluronic acid to provide moisturization to deeper layers of the skin.
- Skin appears more elastic and nourished.
- Improves the appearance of rough texture and smoothes fine lines.

DIRECTIONS FOR USE

Apply 1-2 drops to the face, neck, décolletage and back of the hands and massage until absorbed. Apply as required. Avoid contact with the eyes.

WARNINGS

For external use only. Avoid contact with eyes. If this occurs wash affected area thoroughly with water. If irritation occurs, discontinue use. Store this product below 40°C.

INGREDIENTS

Aqua, Glycerin, Hyaluronic Acid, Saccharide Isomerate, Glycogen, PPG-26-Buteth-26, PEG-40 Hydrogenated Castor Oil, Sodium Benzoate, Cellulose Gum, Potassium Sorbate, Parfum, Inulin, Xanthan Gum, Didecyldimonium Chloride, Cellulose, Fructose, Glucose, Linalool, Citric Acid, Sodium Citrate, Limonene.

ACTIVE INGREDIENTS

Ultra-low molecular weight Hyaluronic Acid 0.25%

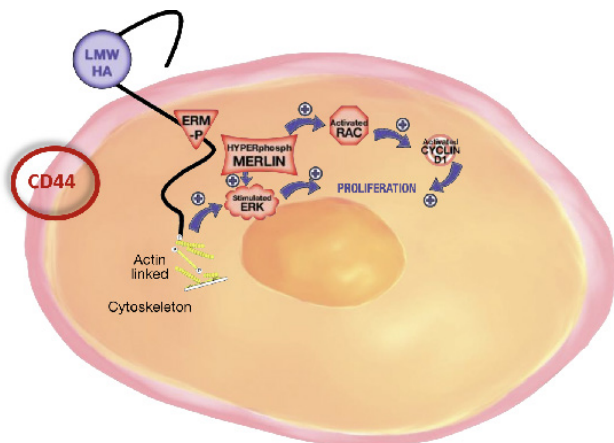
Saccharide Isomerate 1%

Glycogen 0.1%

Glycerin 3%

ULTRA-LOW MOLECULAR WEIGHT HYALURONIC ACID

This formulation contains a hyaluronic acid complex, with an ultra-low molecular weight of 2-10kDa. This is 60 times more soluble than standard hyaluronic acid and provides quicker penetration through the layers of the skin for faster moisturisation.



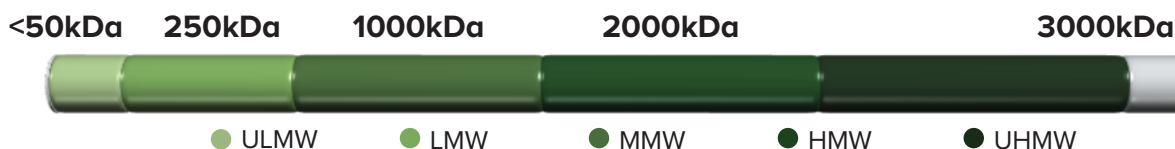
The ultra-low molecular weight of this hyaluronic acid provides quicker penetration through the layers of the skin and faster moisturisation in comparison to any sodium hyaluronate, even those of very low molecular weight.

The molecular size of this hyaluronic acid is optimized to reversibly bind to the CD44 cell membrane receptors, inducing an internal reaction, activating cell proliferation and metabolism.

This particular hyaluronic acid is not a salt, but directly the acid form of the hyaluronan. A hyaluronan is a hyaluronic acid molecule with a molecular weight of less than 250kDa, this molecule is so small that this form is very solid and stable. It provides quick percutaneous permeation and improvement of moisturisation. Alongside this, it stimulates fibroblast proliferation and increases skin elasticity.

This Formulation

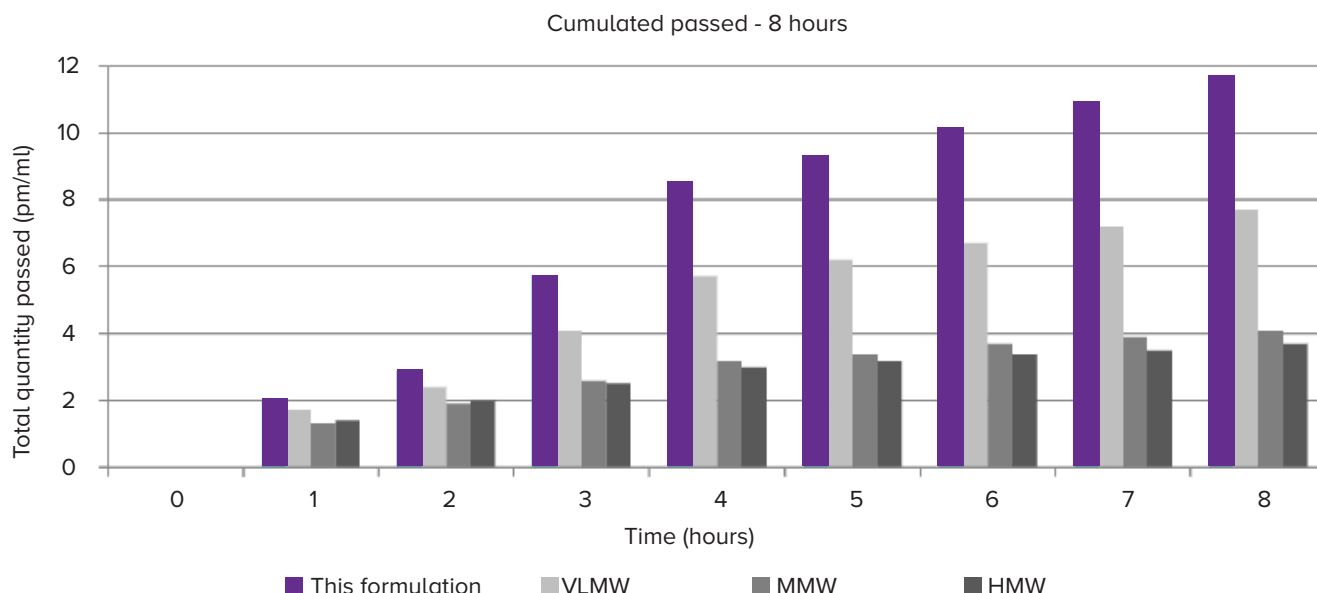
Standard HA



Under 2kDa hyaluronans are considered too small to bind to the CD44 receptor.

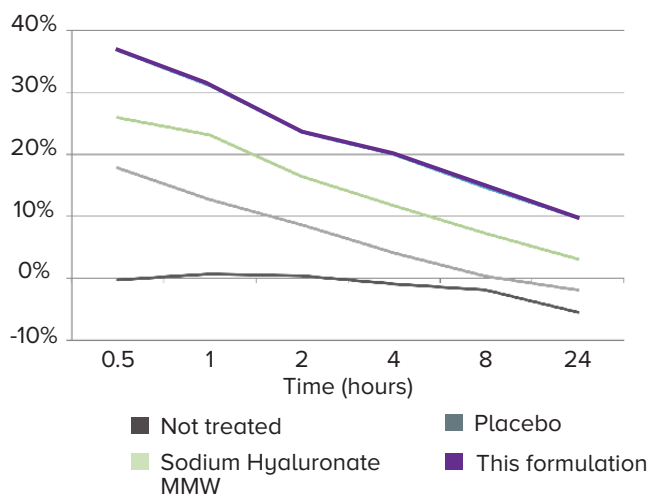
From 2 – 10kDa, the bound is considered reversible, allowing for multiple stimulations.

Above 30kDa, the bound is considered as irreversible, allowing only for a single stimulation.

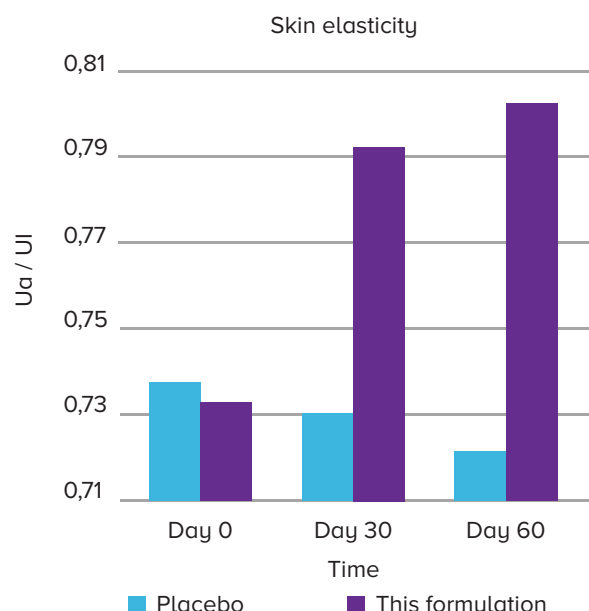


Compared to regular hyaluronic acid (60 to 2000kDa), this formulation permeates the layers of the skin more than twice after just 24 hours. This fast improvement is maintained over time, as shown in the graph above; after only 1-hour permeation has doubled in comparison to medium molecular weight Hyaluronic Acid.

Even very low molecular weight (VLMW) displays lower performance to this formulation in identical conditions.



In an in-vivo clinical study designed to measure skin moisturisation, Hyaluronic Acid Complex induced a constant improvement of moisturisation in comparison to medium molecular weight sodium hyaluronate: with an increased moisturisation of 10.9% after just 30 minutes.



In a second in-vivo study, this formulation was applied twice daily and displayed a 10% increase in skin elasticity after 60 days.

Compared to a control of 0.25% ULMW Hyaluronic Acid, this formulation:

- Stimulates elastin synthesis by 35% within 24 hours.
- Decreases elastase activity by 25% within 2 hours.
- Decreases collagenase activity by 32% within 2 hours.

Link: [Data on file](#)

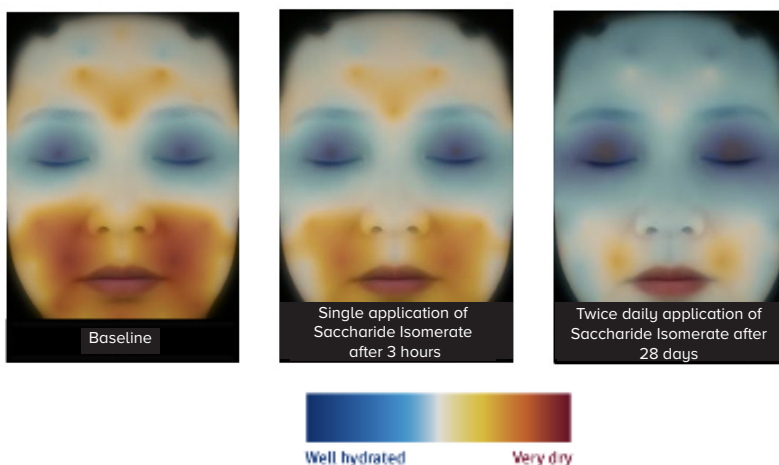
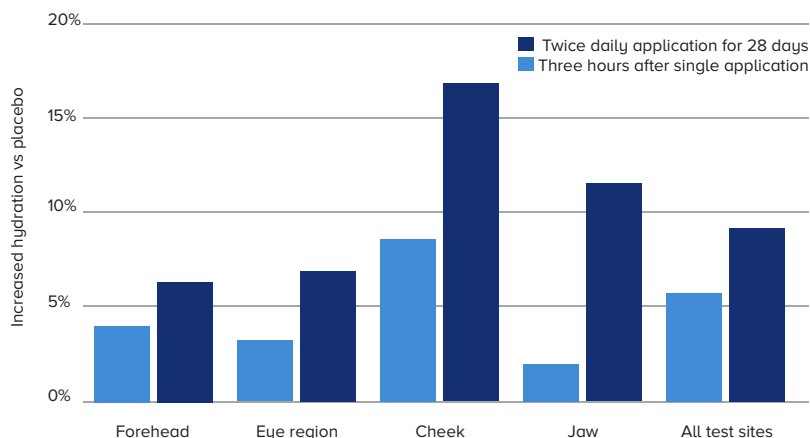
SACCHARIDE ISOMERATE

Saccharide Isomerate Complex is a 100% plant-derived carbohydrate complex, similar to that found in human skin. The molecules bind to the skin, preventing epidermal water loss, delivering immediate & long-lasting hydration for up to 72 hours. As a vegan hyaluronic acid booster, Saccharide Isomerate complex contains no animal by-products, so you can be confident that this product is cruelty-free and highly efficacious.

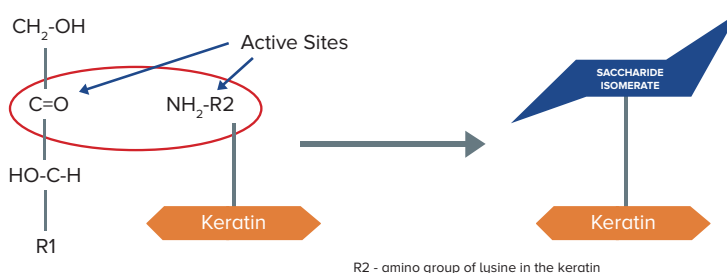
Saccharide Isomerate Complex is clinically proven to provide short and long-term hydration. The case study image below shows the increase in hydration to the stratum corneum after 3 hours and after 28 days, where Saccharide Isomerate Complex was applied twice per day.

Saccharide Isomerate vs. Placebo

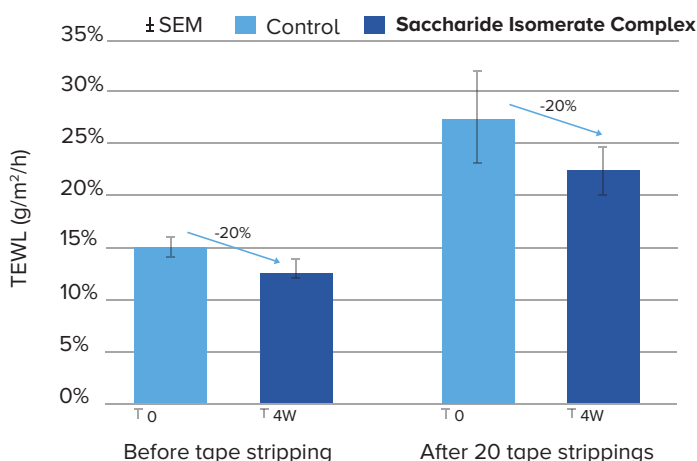
After twice daily application of Saccharide Isomerate Complex, there is a significant improvement in hydration across all facial areas. Just 3 hours after a single application, the excessively dry cheek area is significantly more hydrated.



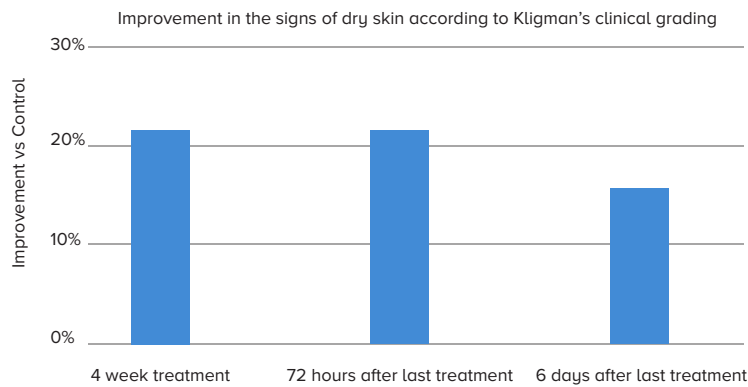
The in-vivo and in-vitro studies have proven the unique binding of this Saccharide Isomerate Complex to the free amino group of lysine in keratin. After 4 weeks of continuous use, Saccharide Isomerate improves the signs of dry skin by 20%, with effects lasting long after the final application 6 days later. This binding function allows the Saccharide Isomerate Complex to connect with the top layer of the skin, locking in moisture.



Saccharide Isomerate Complex in an aqueous solution improves and strengthens the skin barrier function as shown by the 20% reduction in trans-epidermal water loss before and after 20 successive tape strippings after a 28-day application.



After 4 weeks of continuous use, Saccharide Isomerate Complex improves the signs of dry skin by 20%, with effects lasting long after the final application 6 days later.



Link: [1. International Journal of Cosmetic Science, 2015, 37, 595-605](#)

Link: [2. International Journal of Cosmetic Science, 2016 38, 217-223](#)

Link: [3. Data on file.](#)

Link: [4. Data on file.](#)

Link: [5. G. Padberg, J. Soc. Cosmetic Chemists 23, 271-279, 1972](#)

GLYCOGEN

Glycogen has been shown to increase cellular metabolism and structural dermis proteins; glycosaminoglycans & fibroblasts. It is hypoallergenic, biocompatible with clinically proven benefits on the skin; smoothing wrinkles and fine lines, restoring radiance and correcting hyperpigmentation. A single molecule of glycogen in this formulation has a diameter of $70\text{nm} \pm 5\%$, with a molecular weight of 15MDa.

+23% Skin Barrier

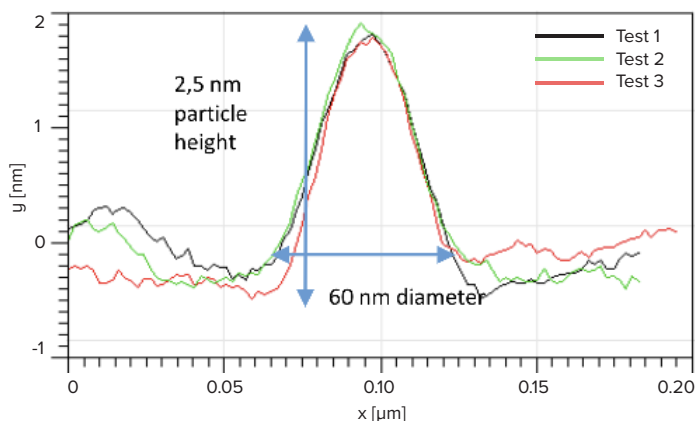
An in-vivo clinical study on 20 women showed a 23% increase in skin barrier function after 14 days, with 2 applications of this formulation per day vs. baseline.

-38% Skin Sensitivity

An in-vivo clinical study on 20 women showed a 38% reduction in skin sensitivity after 4 weeks with 2 applications of this formulation per day vs. baseline.

+130% Skin Hydration

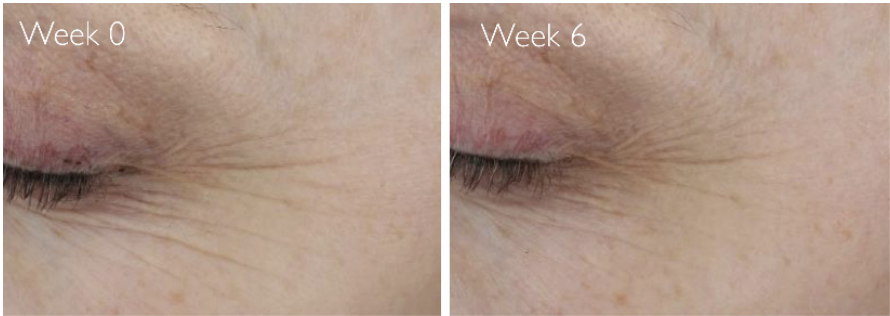
An in-vivo clinical study on 13 volunteers showed a 130% increase in skin hydration 7 hours after 1 application of this formulation vs. baseline.



This formulation contains 'shape-shifting' glycogen. These glycogen molecules can alter their diameter and flatten to pass through the layers of the skin, allowing for deeper penetration into the dermis, resulting in a 130% increase in skin hydration.

The pore size between skin cells is known to be approximately 40nm. In the graph to the left, you can see how the glycogen particles height and diameter flatten to allow for deeper penetration into the dermis.

Glycogen is clinically proven to reduce wrinkles. An in vivo clinical study was conducted on 30 women, results are shown after 6 weeks with 2 applications per day vs. placebo.



Crow's feet reduction - 11% reduction in wrinkle area and 5% reduction in wrinkle depth.

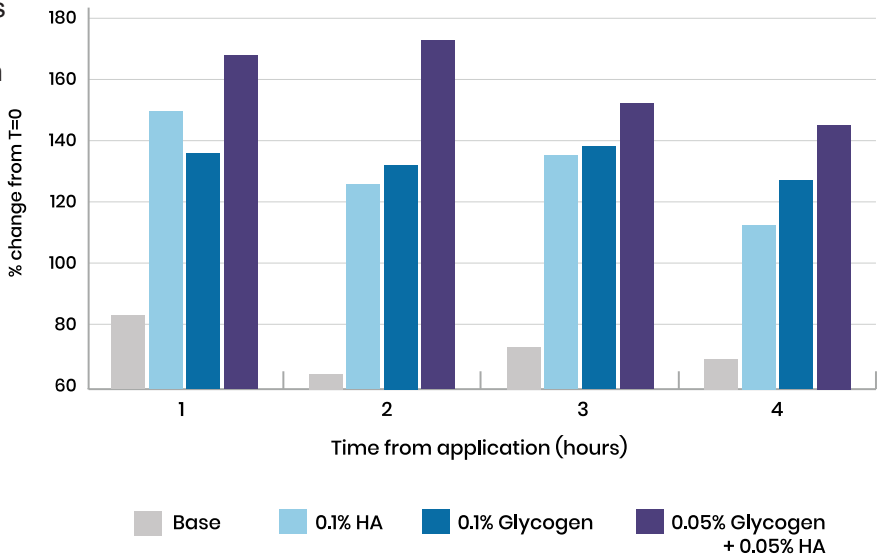


Line erasing - 75% reduction in wrinkle area and 20% reduction in wrinkle depth.

Barrier Function

Glycogen tightly holds water for long periods of time and boosts hydration performance when used on its own or in combination with HA (Hyaluronic Acid).

Great Hydration Performance⁴



- Glycogen at 0.1% improves skin hydration by 60% after 7 hours vs placebo.
- Glycogen boosts HA moisturising performance instantly and after 7 hours up to 40%.
- Glycogen was found to perform as well as HA, with the combination of these materials outperforming both materials individually, indicating some type of synergistic effect.

- +23% skin barrier function reinforced.
- -38% in skin sensitivity
- +130% in skin hydration

Radiance



Week 0

Week 6

Dark Spot Fighter



Week 0

Week 6

Radiance

Recovery of skin luminosity at 0.1% Glycogen
Up to:

- -15% redness
- +7% skin radiance
- +7% skin homogeneity

Dark Spot Fighter

Skin tone enhancement at 0.3% Glycogen
Up to:

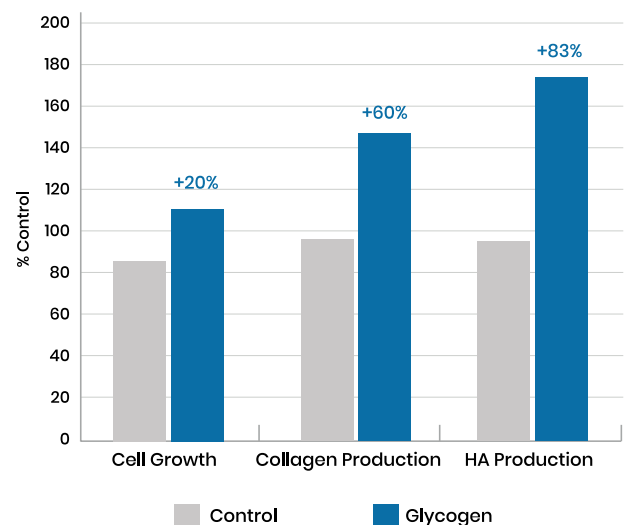
- -59% in pigmentation area
- Resulting in:
- +12% skin homogeneity

Cellular response of human fibroblast cells after 36 hours with and without Glycogen

- -12% Dullness
- +56% Even skin tone
- -85% Hyperpigmentation intensity

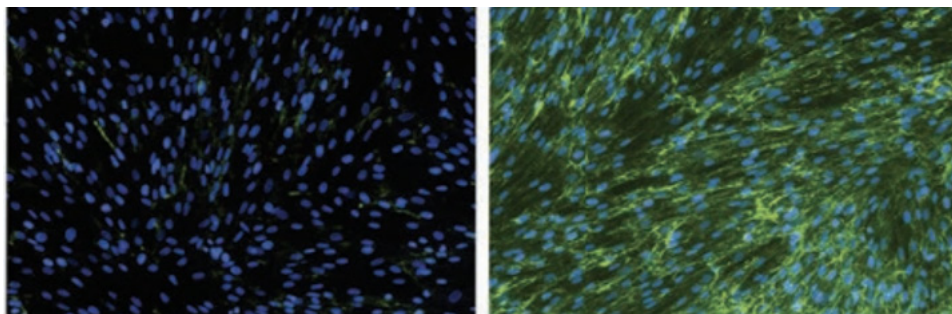
A booster in cellular response

Glycogen increases the metabolic activity of fibroblasts. In vitro studies conducted on human fibroblast cells exposed to 0.05% after 36 hours revealed Glycogen increases cellular growth rate, Type 1 collagen production, and HA production.



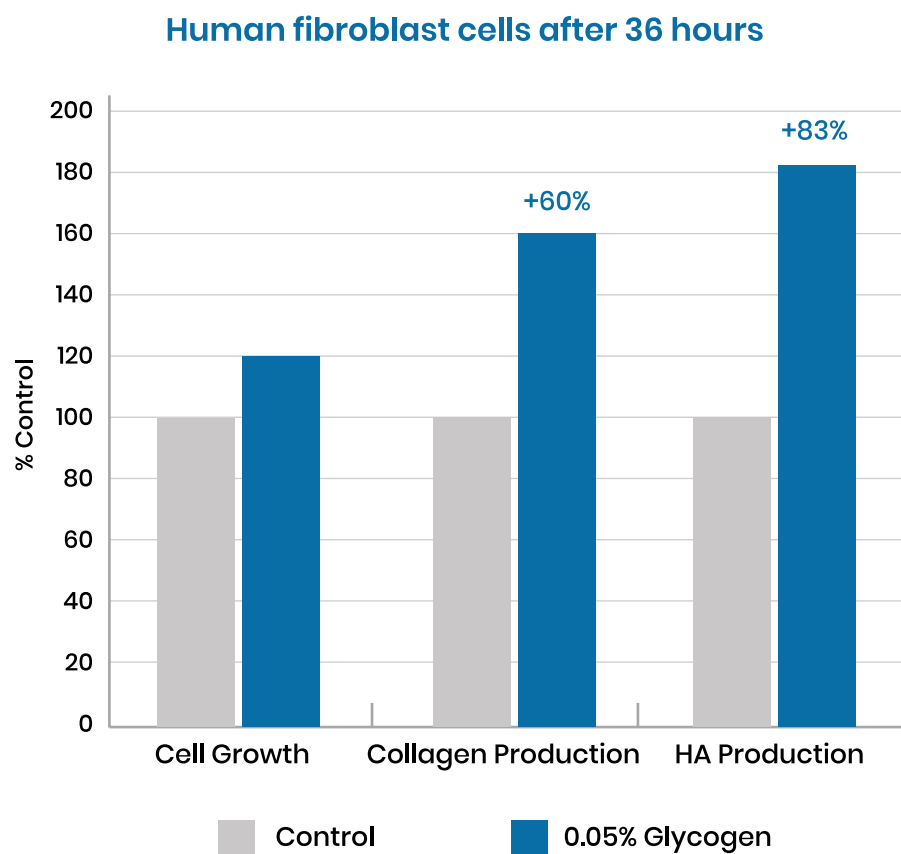
Without Glycogen

With Glycogen



Microscopic image of cells (blue) producing Type 1 collagen (green) with and without Glycogen.

Glycogen increases the metabolic activity of skin fibroblast cells.

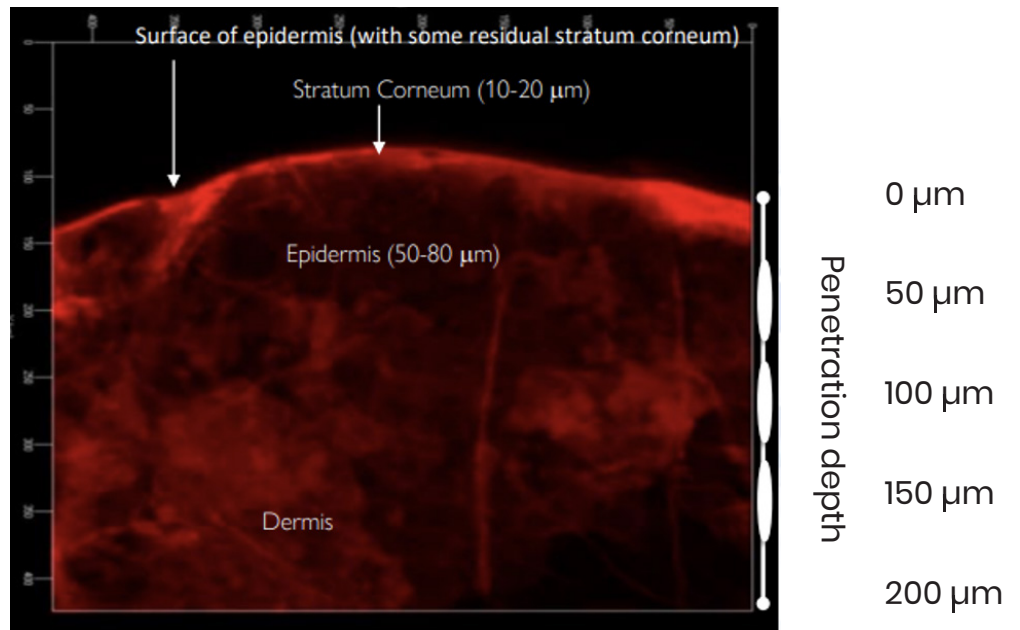


In vitro studies conducted on human fibroblast cells exposed to 0.05% after 36 hours revealed Glycogen increases cellular growth rate, collagen production, and hyaluronic acid production.

Penetration through human skin.

Confocal microscopy on cross-section of human skin incubated with rhodamine-labelled PHX

We have demonstrated that fluorescently labelled Glycogen penetrates human skin to depths corresponding to the dermal layer, suggesting that Glycogen formulated in a cream can reach live skin cells to enhance metabolism and promote the endogenous production of biopolymers essential for healthy skin.



Even Skin Tone

Radiance

Recovery of skin luminosity at 0.1% Glycogen
Up to:

- -15% redness
- +7% skin radiance
- +7% skin homogeneity

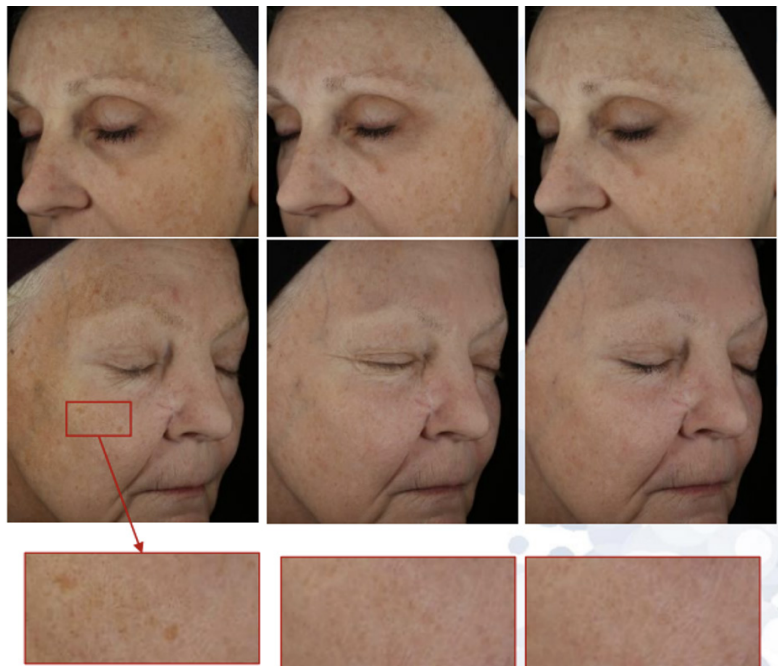
Dark spot fighter

Skin tone enhancement at 0.3% Glycogen
Up to:

- -59% in pigmentation area

Resulting in:

- +12% skin homogeneity



In vivo, clinical study on 30 womens results after 6 weeks with 2 applications/day vs placebo

Link: [Data on file.](#)

GLYCERIN

Glycerin is a humectant which is present in all-natural lipids. Derived from natural substances by hydrolysis of fats and by fermentation of sugars₁. Our palm-free vegetable glycerin is a skin-friendly humectant which draws water to the skin. It has wonderful emollient and water-retaining properties. Use it in your creams, lotions, and serums₂. Known for its fantastic emollient and hydrating abilities, glycerin is one of the most versatile and widely used skin care cosmetic ingredients on the market. It is a natural humectant and lubricant, making it an ideal cosmetic ingredient for skin and hair care products₃. Our palm-free glycerin is a non-irritating, soothing moisturiser that not only boosts skin elasticity, but it contains anti-bacterial and softening properties making it an ideal candidate for sensitive skin care; treating dry, cracked skin, eczema, acne or burns and rashes₄.

Link: [1: International Journal of Cosmetic Science, August 2016, ePublication](#)

Link: [2: British Journal of Dermatology, July 2008, pages 23-34](#)

Link: [3: Journal of Cosmetic Dermatology, June 2007, pages 75-82](#)

Link: [4: Proceeding of the National Academy of Sciences, June 2003, pages 7,360-7,365](#)

