Advanced delivery systems



Synerga
SKIN EVOLUTION

Enhancing the performance of active ingredients through smart delivery

INGREDIENT LIMITATION

Active ingredients can present limitations due to their physicochemical properties.

Some raw materials can be **too hydrophilic**, which makes it difficult for them to penetrate the lipophilic stratum corneum, resulting in low absorption, or **poorly bioavailable** in skin layers.

EVEN THE MOST EFFECTIVE INGREDIENTS DO NOT WORK WITHOUT PROPER SKIN ABSORPTION.

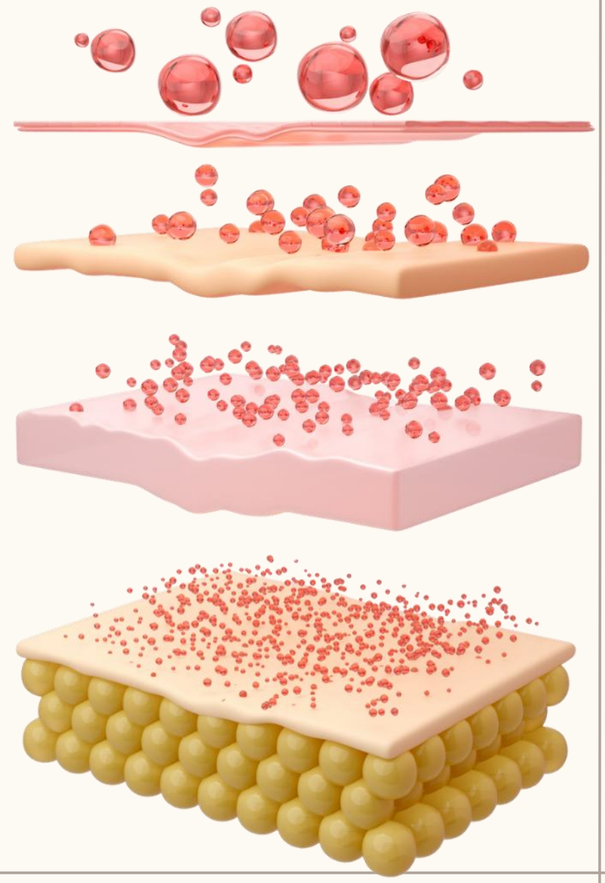




VEHICULATION

To overcome this limitation, active ingredients can be **vehiculated** using delivery **systems with skin-like structures**, which facilitate their interaction with the skin barrier.

These systems help **enhance absorption**, improve stability, and increase the **bioavailability** of the active compounds within the skin in a usable form for skin cells.



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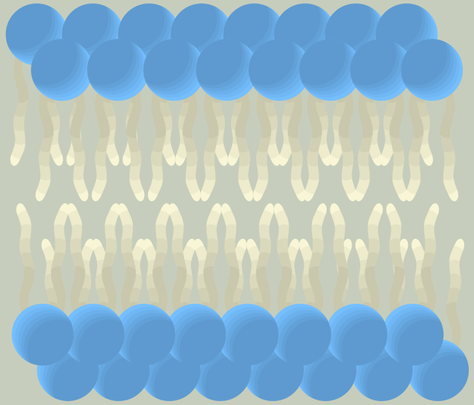
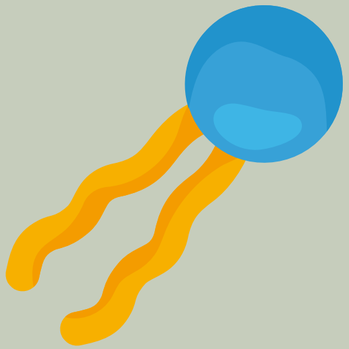
TYPES OF VEHICULATION

ACTIGPC



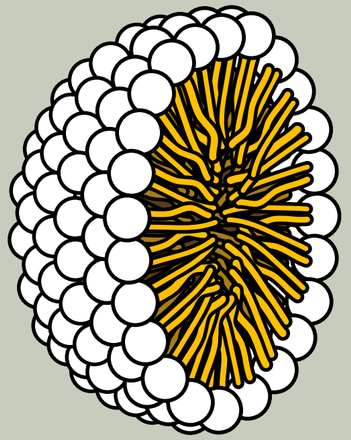
GPC
(GlyceroPhosphoCholine) acts as a **biomimetic carrier** whose structure is related to phospholipids that make up skin cell membranes.

LIPO.AMI.ACI



Based on the creation of an **amphiphilic carrier** that has high affinity with skin lipids and binds well with actives, increasing the bioavailability with its fatty acids tail.

ENCAPSULATION



It does not rely on molecular association like the previous, but on **physical containment** inside a carrier structure made of vescicles.

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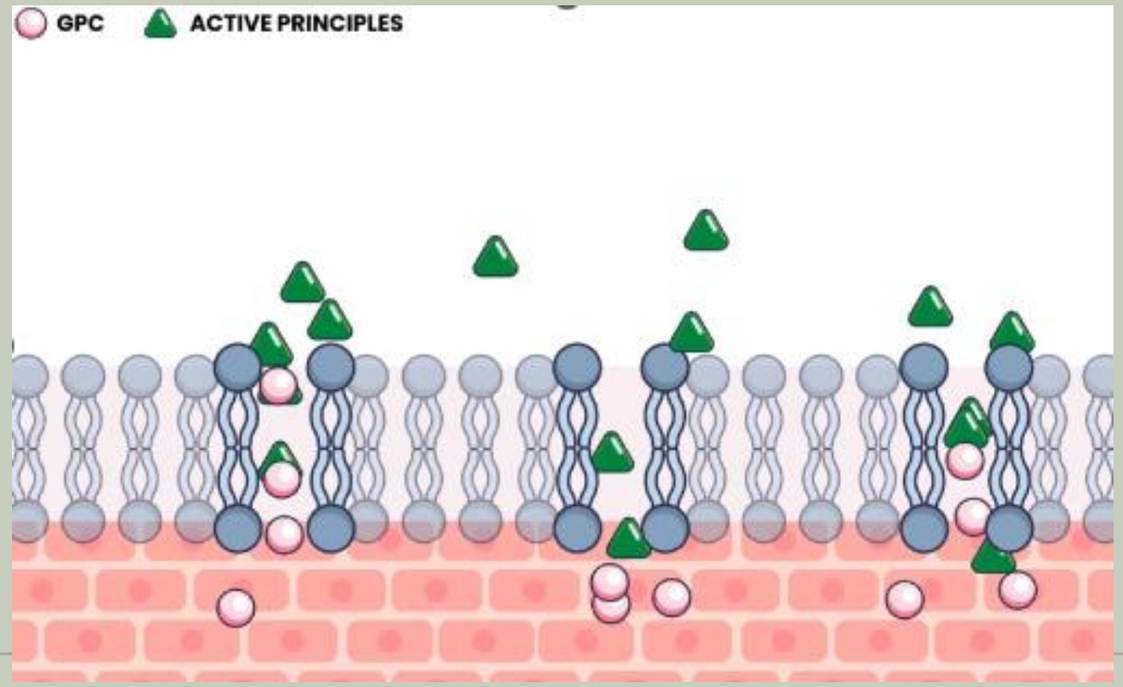
ACTIGPC

GPC (Glycerylphosphocholine) is a naturally occurring phospholipid-related molecule. It’s:

- **Biocompatible** (well tolerated by skin)
- **Small,** hydrophilic **phospholipid derivative**
- Structurally made with a polar head, **that binds well with the polar head of membrane channel**

Because of its low molecular weight, it works well as a delivery enhancer for active ingredients, helping them **move through the lipid matrix** of the stratum corneum by slightly disrupting lipid layers.

The high polarity of GPC can form hydrogen bonds with polar groups in the skin, as well as slightly disrupt lipid layers in the stratum corneum. This can increase lipid fluidity and create microchannels for other molecules like Chitosan (Chitorepair^{GPC}) or Lisine / Valine (Acticolina LV) to pass.



Watch more about the GPC delivery enhancement!

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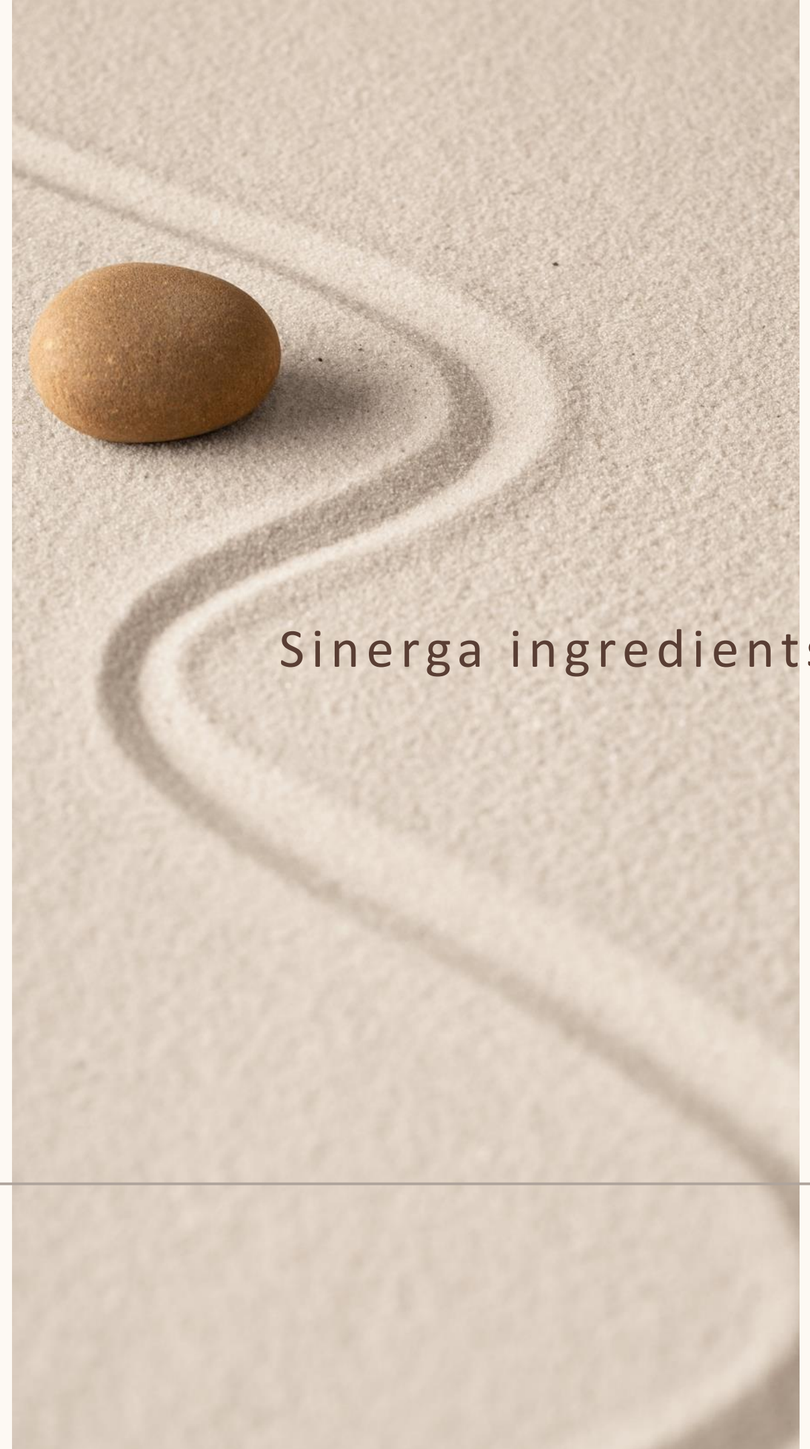
- **Biomimetic enhancer** to facilitate the bioavailability
- **Increased stability** (phospholipidic-related molecule)
- **Low molecular weight**
- High **tolerability**



Sinerga ingredients vehiculated in GPC:

- Acticolina LV
- Chitorepair^{GPC}

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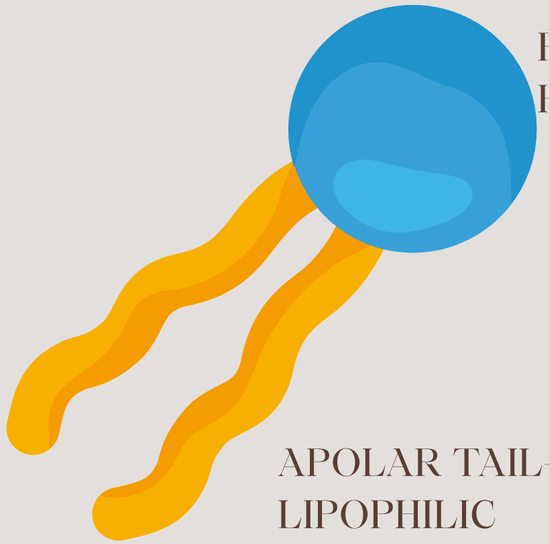
LIPO.AMI.ACI

A lipo–amino-acid structure used as a **vector to enhance the absorption**; it has an **amphiphilic** nature, conjugating:

- **Hydrophilic** amino acid or protein hydrolysates head
- **Lipophilic** fatty acid chain (tail)

The fatty acid portion **improves affinity with skin lipids**, enhancing the penetration and bioavailability of the ingredient, while the amino acid/protein portion binds to the hydrophilic active, stabilizes and avoids excessive membrane disruption.

The amphphilic nature of LIPO.AMI.ACI structure allows to solve the permeability of too hydrophilic actives, like Picea Abies (for Tricho-Solve) and Hydroxyproline (for Hydroxypro-Lift)



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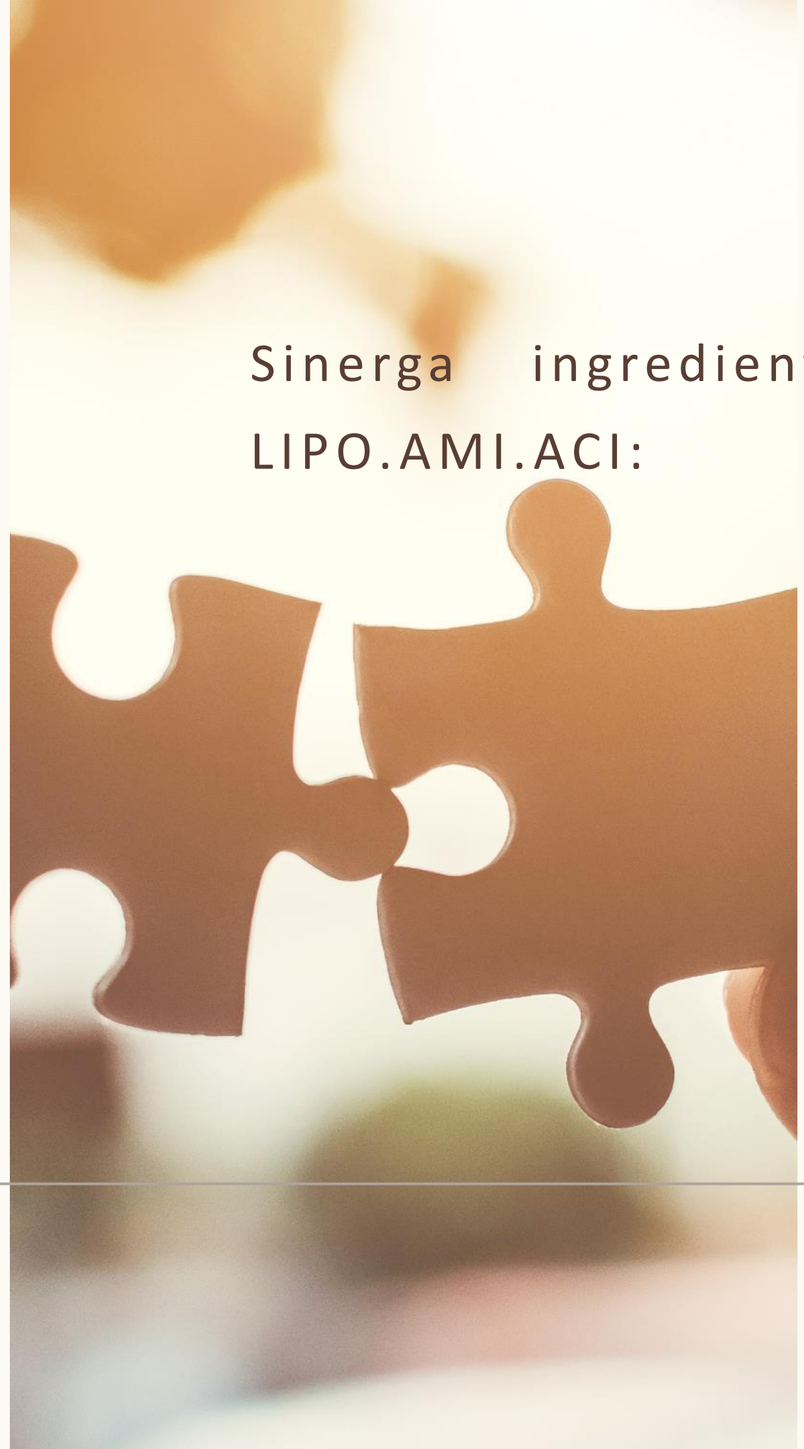
LIPO.AMI.ACI

- Forms a amphiphilic structure that is more **skin-like**
- Creates a **highly tolerable & stable structure**
- Allows to **enhance the absorption** of highly **hydrophilic** active ingredients



Sinerga ingredients vehiculated with LIPO.AMI.ACI:

- Hydroxypro-lift
- Tricho-Solve

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ENCAPSULATION

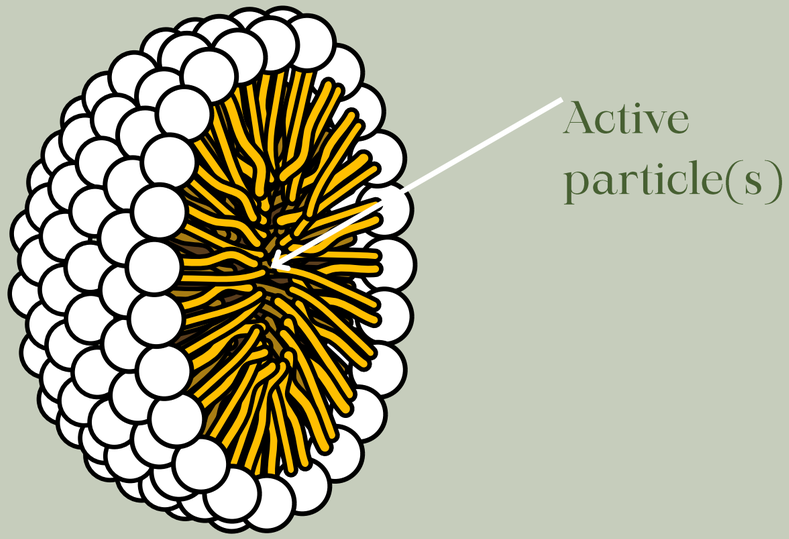
When talking about encapsulation as a vehiculation system, it means using a **physical carrier particle** that contains active particle(s).

This system allows also to **protect its contained active matter**, which is separated from the surrounding formula until its release, while the carrier is made to enhance its delivery into skin layers.

It also most often allow a controlled release, improving the **efficacy and duration** of the active principles.

The physical carrier, whether it is a liposome or a micelle, allows to create a structure that protects the contained active from degradation.

Micelle



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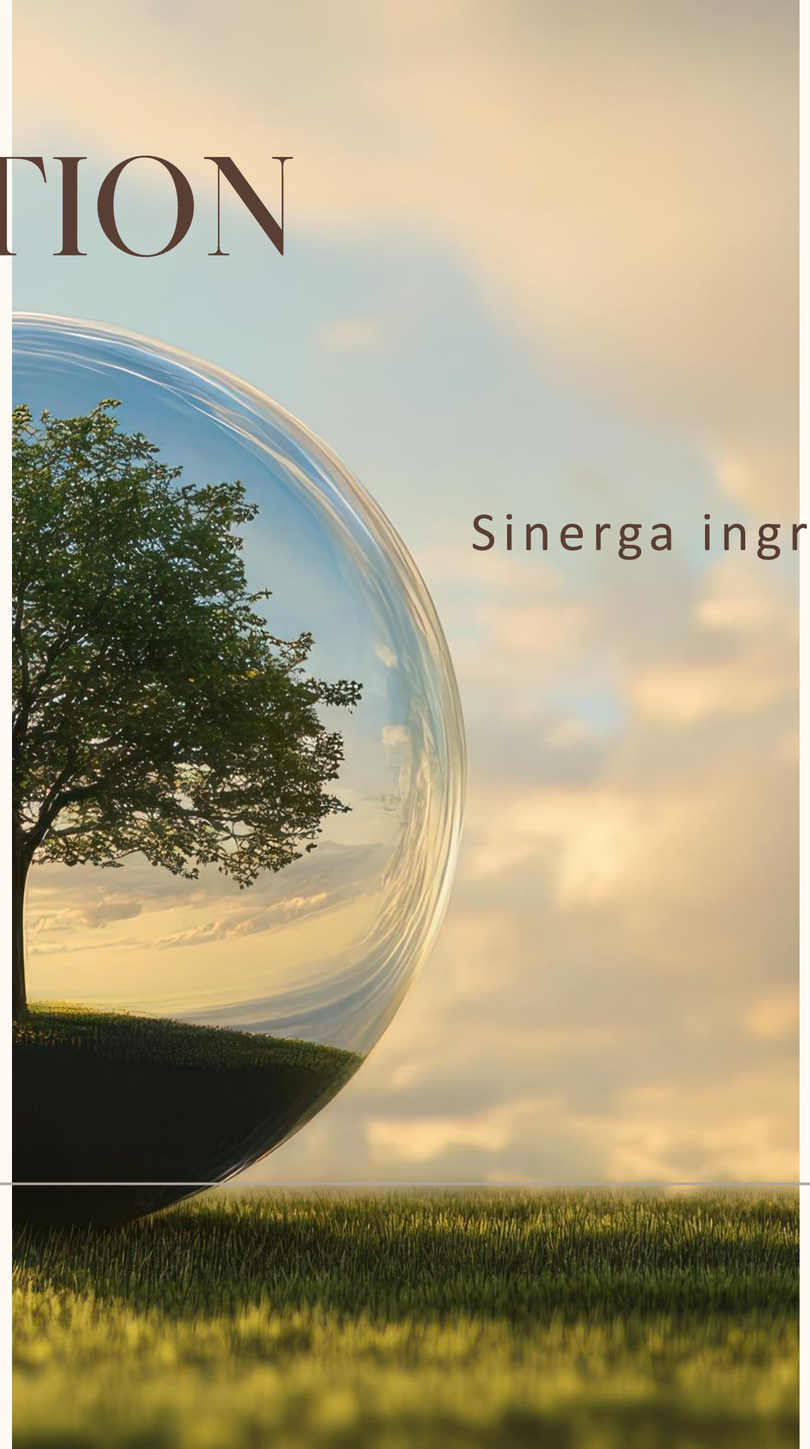
ENCAPSULATION

Using encapsulation provides:

- **Protection** of active ingredients from degradation (oxidation, hydrolysis,)
- **Controlled** and enhanced **release**
- **Improved delivery**
- Improved tolerability



Sinerga ingredients encapsulated:

- Tri-Solve P
- X-Solve
- Eyedren

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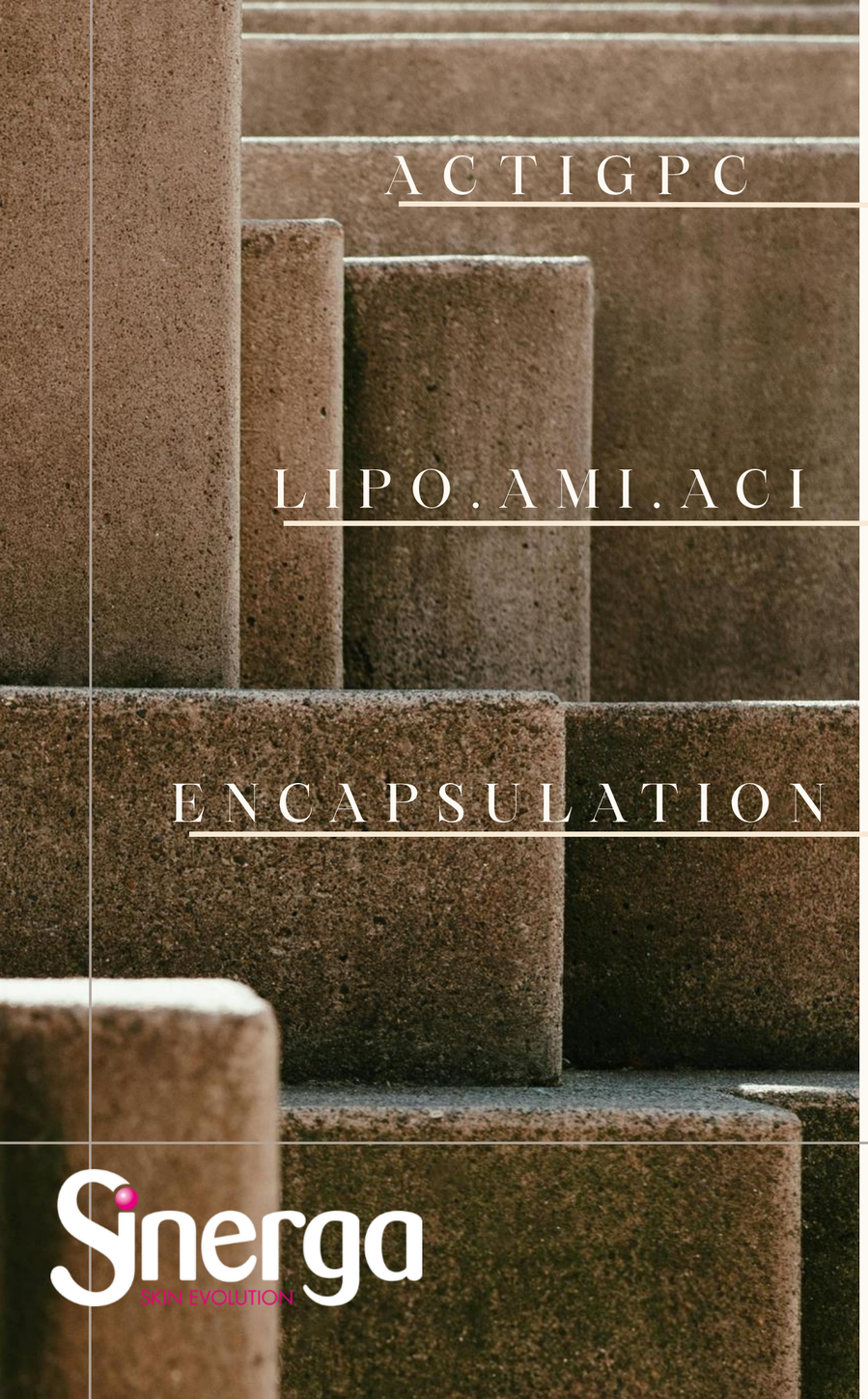

ACTIGPC

- **Chitorepair^{GPC}**
  Carboxymethyl chitosan, Glycerophosphocholine, Glycerin, Aqua

LIPO.AMI.ACI

- **Hydroxypro-lift**
  Dipalmitoyl Hydroxyproline, Helianthus annuus seed oil

ENCAPSULATION

- **X-Solve**
  Ethyl Ximenynate, Lecithin, Caprylic/Capric triglyceride, Glycerin

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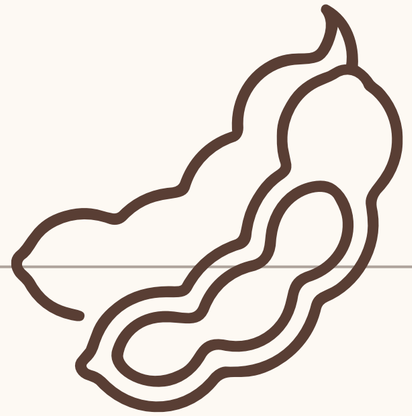
CHITOREPAIR^{GPC}

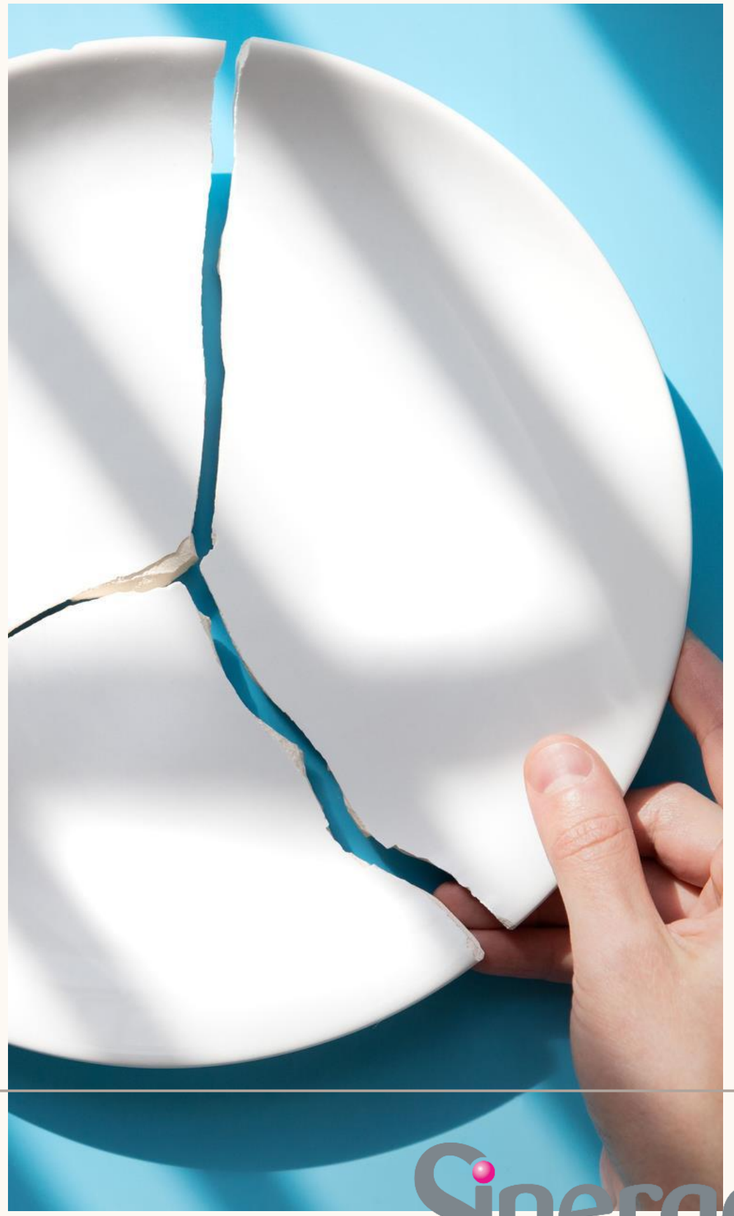
Carboxymethyl Chitosan, Glycerophosphocholine, Glycerin, Aqua

A film-forming **vegan** biopolymer obtained from fungi and then **delivered in GPC** to improve its bioavailability.
It has **re-epithelializing properties**, fostering the acceleration of wound healing and regeneration of skin tissues.
Suitable for skin and hair to provide a **protective** film, it has as well a specific **bacteriostatic** activity on microorganisms of the oral cavity, thus it is also suitable for oral care.



GPC is a natural component obtained from **soy lecithin**.

- **HIGHER BIOAVAILABILITY**: due to its high polarity and low molecular weight, GPC acts as a facilitator for the delivery
- **INCREASED STABILITY**: helps maintain the integrity of the other actives
- **BIOCOMPATIBLE**: serves as a source of choline, which cells can use to support and maintain membrane integrity



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CHITOREPAIR GPC

Carboxymethyl Chitosan, Glycerophosphocholine, Glycerin, Aqua

+64% wound healing after 24 hours

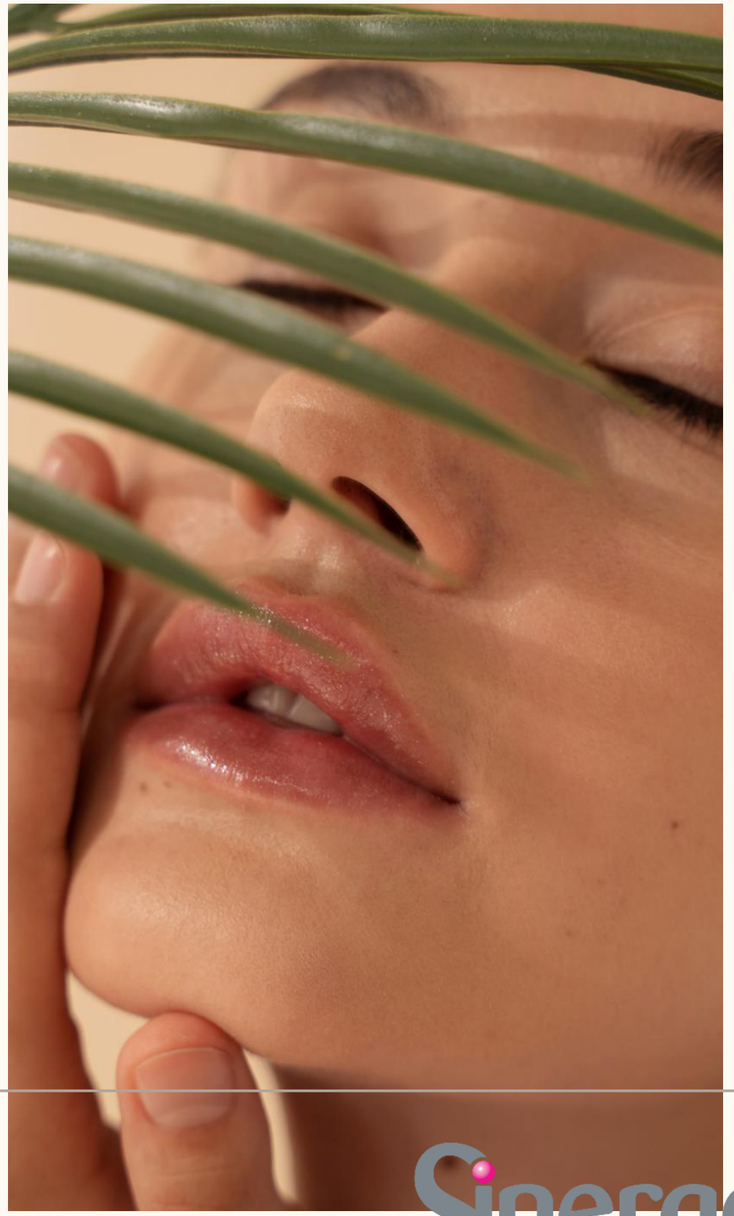
+31% wound healing vs negative control

+89% bio-adhesive properties

+79% bio-adhesive properties vs negative control

CERTIFIED SUSTAINABLE PALM OIL
RSPO
MIXED
9-4656-22-100-00

0.99
NATURAL ORIGIN INDEX



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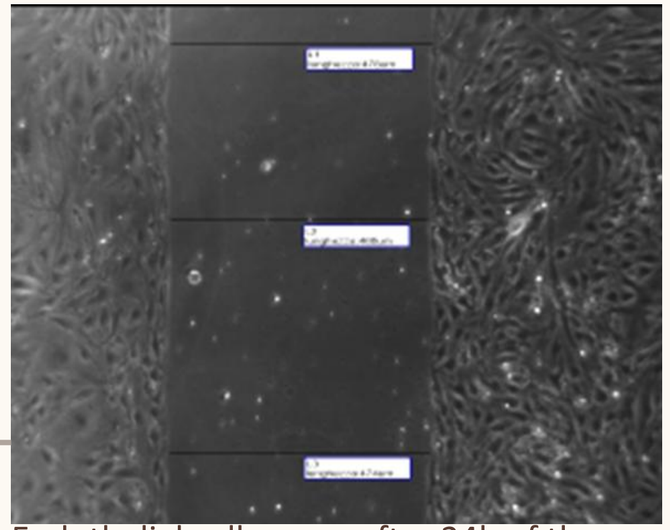
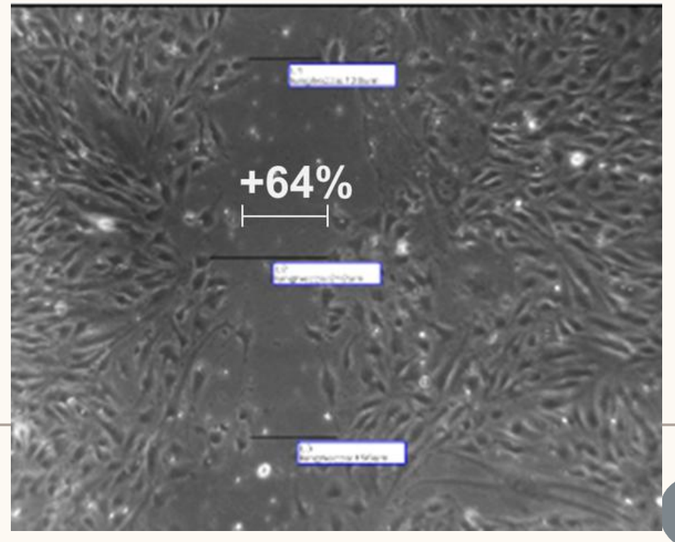
Endothelial cells soon after a wound is opened



Endothelial cells soon after 24h of the application of Chitorepair



Chitorepair is able to enhance wound healing by 64% (+31% compared to negative control), **measured through the width of the wound after 24hours,** compared to T0.

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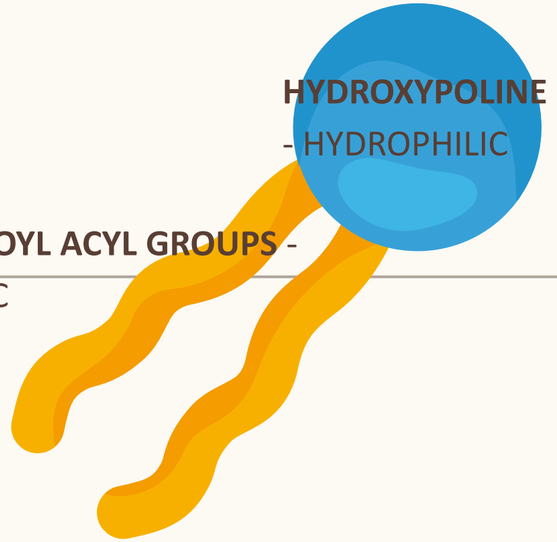
HYDROXYPRO-LIFT

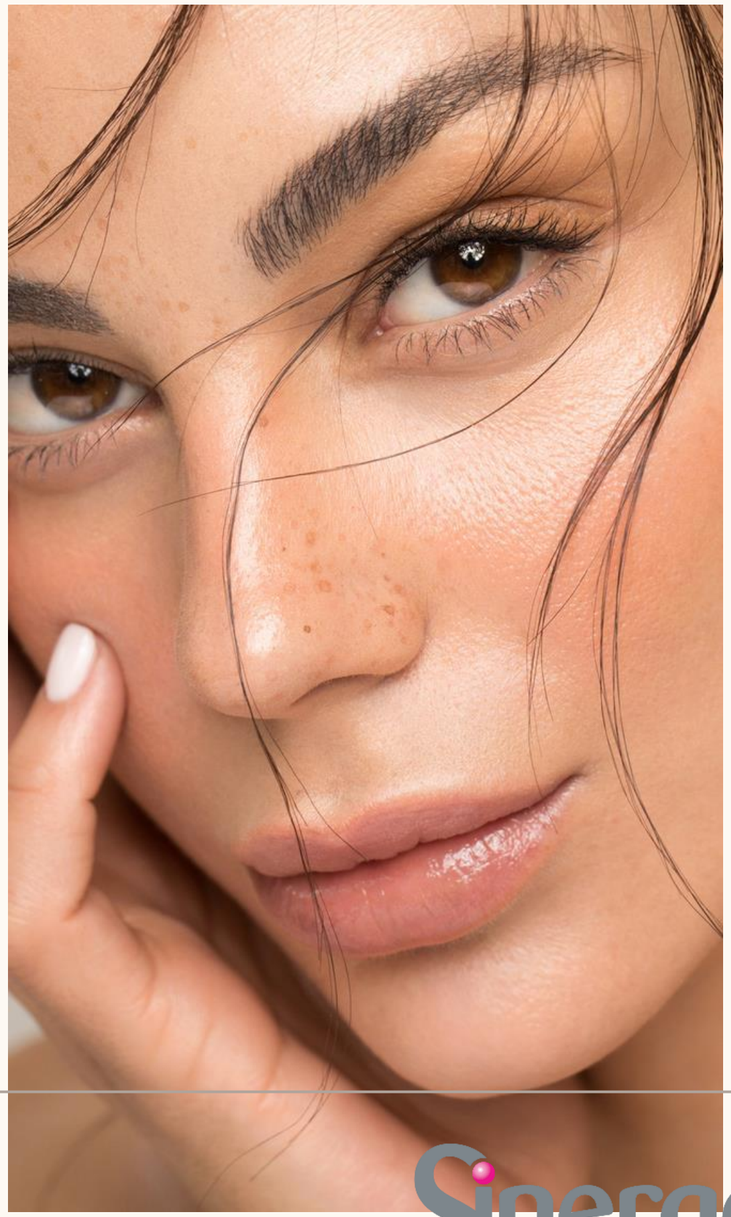
Dipalmitoyl Hydroxyproline, Helianthus Annuus Seed Oil

Lipophilic hydroxyproline derivative designed to preserve dermal structure and enhance the appearance of eyes and lips.

- It is able to **boost collagen** and inhibit its degradation, preventing age-related signs.
- On eyes, it **revitalizes the gaze** and reduces fatigue signs, creating a **blepharo-like, lifting effect** on the upper eyelid.
- It improves **lips hydration**, leaving them soft and smooth to enhance their overall appearance.



The dipalmitoyl acyl groups **confer amphiphilic character,** improving skin affinity and bioavailability thanks to its lipo-amino-acid (LIPO.AMI.ACI) structure, which allows to solve the permeability of too hydrophilic actives, like Hydroxyproline.



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HYDROXYPRO-LIFT

Dipalmitoyl Hydroxyproline, Helianthus Annuus Seed Oil

+3% lip hydration

+17% collagen expression in 24 hours

-37% MMP-2 expression in 48 hours

+6% eye collagen index

+9% pre-tarsal distance (*blepharo-like*)

-31% eye skin fatigue (R9)

PRESERVATIVE FREE

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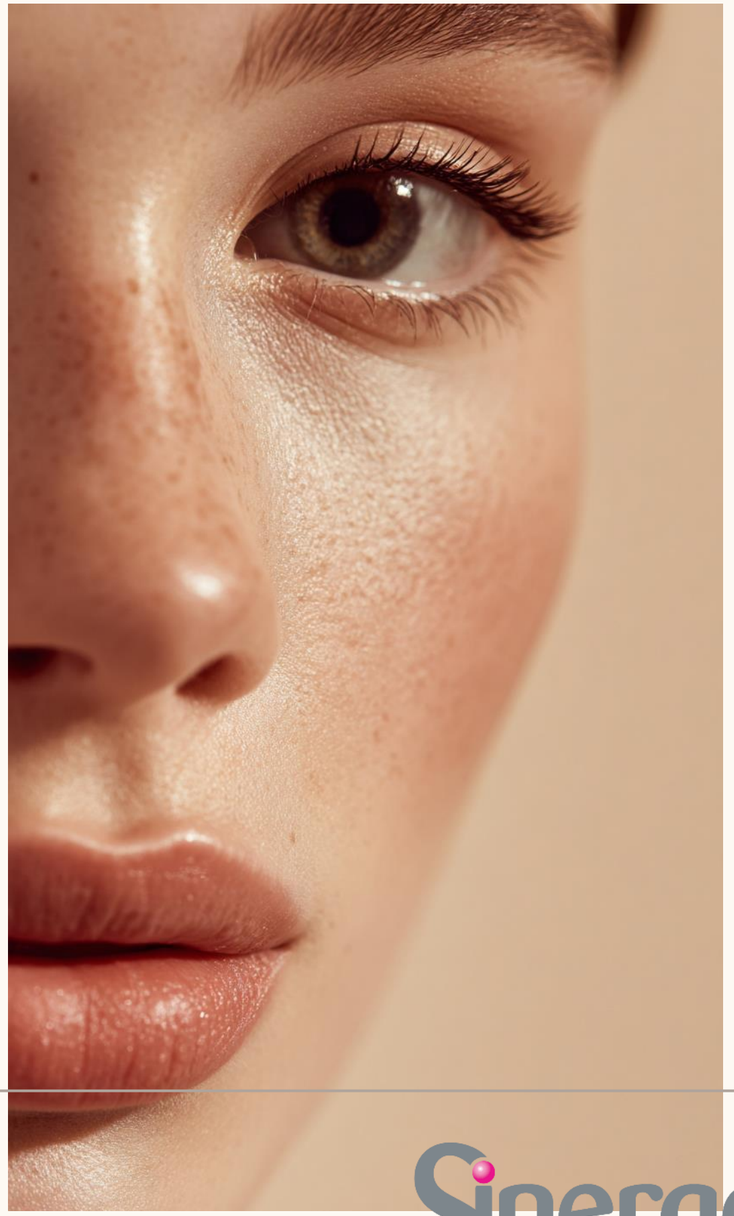
1 NATURAL ORIGIN INDEX



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Pictures of volunteers treated with 0.5% HydroxyPro-Lift, at T0 and after 30 days.





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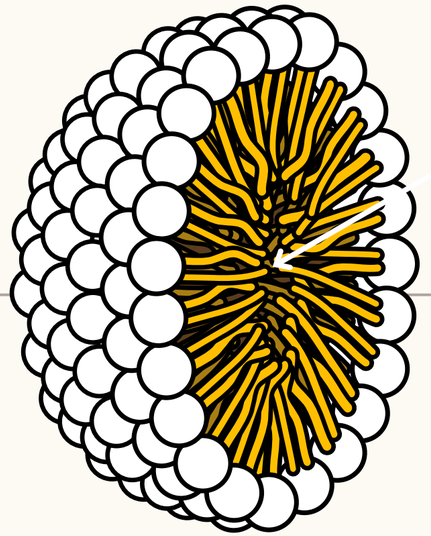
X-SOLVE

Ethyl Ximenynate, Lecithin, Caprylic/Capric triglyceride, Glycerin

High-performance microcirculation modulator for skin, scalp and lips, obtained by encapsulation technology to enhance its bioavailability and efficacy.
It **boosts lip volume and natural color**, while on the scalp it promotes oxygen and nutrient supply to follicles, supporting stronger, healthier hair. For body care, it provides a slimming and draining effect on the legs, reducing thigh circumference, and counteracts skin relaxation.



Micelle



The **physical carrier**, a micelle created by lecithin, allows to create a structure that **protects** the contained active from degradation.

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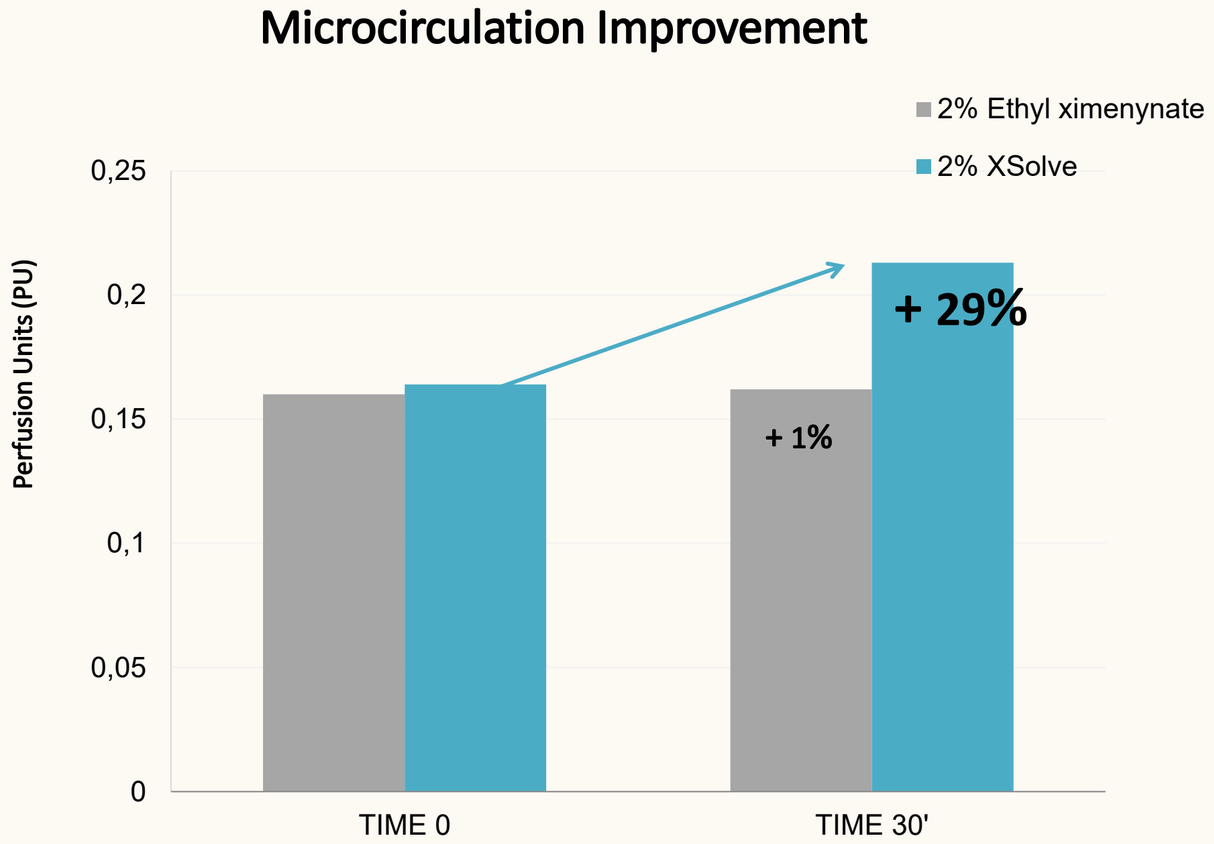
X-SOLVE

Ethyl Ximenynate, Lecithin, Caprylic/Capric triglyceride, Glycerin

In a clinical test on 10 women comparing the efficacy of Ethyl Xymenynate and the encapsulated version (X-Solve).

X-Solve proved to be able to **improve the capillary flow on thigh (+29%)** in comparison to the non–encapsulated form, already after 30 minutes.

This finding highlights the ability of encapsulation in delivering the active ingredient and achieving a **higher efficacy.**



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X-SOLVE

Ethyl Ximenynate, Lecithin, Caprylic/Capric triglyceride, Glycerin

+37% nitric oxide release

+40% actin expression

+10% lip dimension (*filler-like*)

+9% lip color (redness)

+29%* capillary flow on thigh after 30'

+5% hemoglobin on body (oxygenation)

-0.7cm thigh circumference

70% volunteers with cellulite improvement

+3.5% hemoglobin on scalp (oxygenation)

PRESERVATIVE FREE

1
NATURAL ORIGIN INDEX



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X-SOLVE

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Pictures of the lips of 1 volunteer at T0 and at T2w



Pictures of 1 volunteer at T0 and at after 3 weeks

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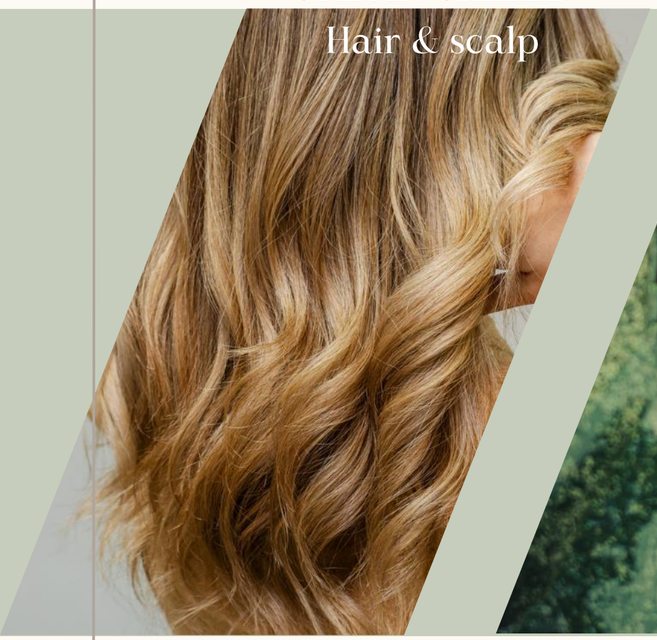
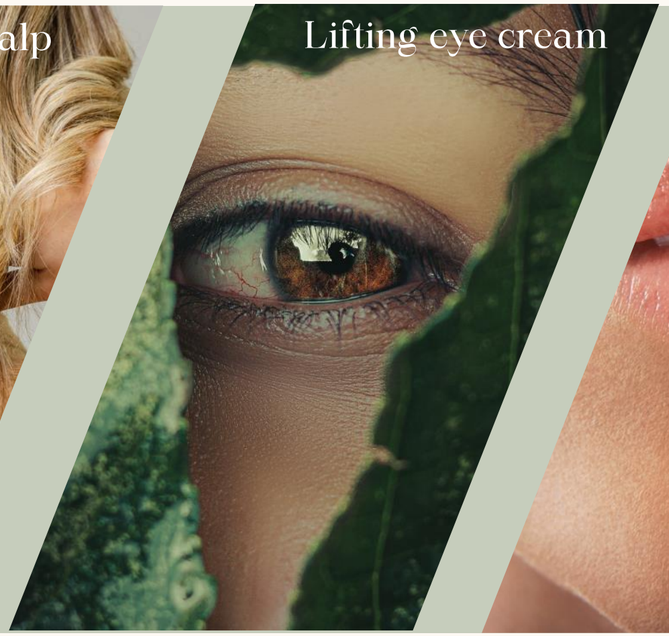
FORMULATION GUIDELINES

URBAN SHIELD
Hair & scalp



- X-Solve
- Chitorepair^{GPC}
- Carobsoothe
- Up-Citrus Extract

EYE REVIVE BOOST
Lifting eye cream



- HydroxyPro-Lift
- Eyedren

LIP FILLER BOOST
Volumizing lip balm



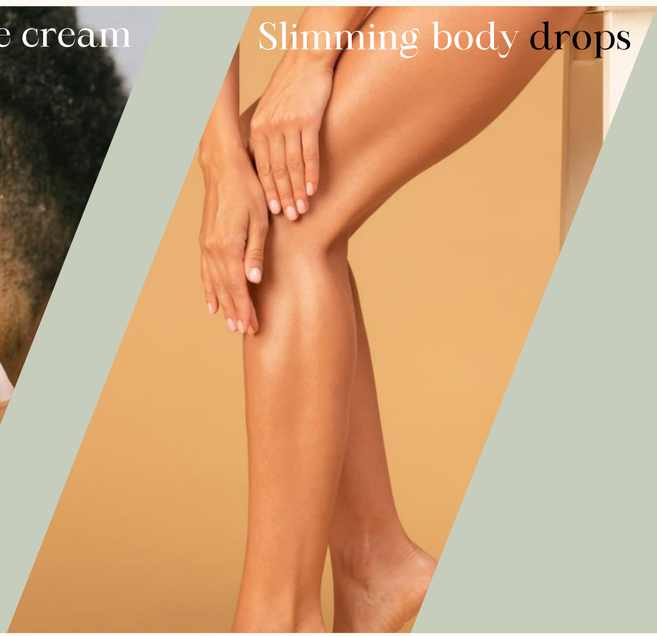
- HydroxyPro-Lift
- X-Solve

SOS FRAGILE SKIN
Hands & face cream



- Tri-Solve P
- Chitorepair^{GPC}
- Leniphenol

SILHOUETTE ELIXIR
Slimming body drops



- Acticolina LV
- X-Solve

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Advanced delivery systems



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