

HydraSourcing **AM+PS**

Natural skin hydration



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AM + PS

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BACKGROUND

Argemone mexicana + Polysaccharides

Naolys' objective in creating this unusual new cellular plant complex, consisting of a Mexican poppy cell and polysaccharides, is to provide a comprehensive solution to chronic and temporary dry skin. A unique synergy between the active molecules synthesized by the cell and the natural polysaccharides that it has absorbed results in a complete moisturizing action.

The Mexican poppy, originating from Mexico and the West Indies, has been naturalized in many arid tropical zones of the globe, where it is used as a medicinal plant. Polysaccharides derived from plants, consisting of long chains of simple carbohydrates, are recognized for their water retention capacity. Enriching a plant cell with polysaccharides thus increases the bioavailability of all the active molecules that it contains.

Key points

A biotechnological complex

A reinforced assimilation of active molecules.

Innovative design

A medicinal plant species combined with well-known active plant molecules.

Full moisturizing action

Relaunches short and long term hydration and improves the skin's flexibility.

Because dry skin involves a combination of numerous imbalances at several levels, such as the quantity of water and the quality of the intra and extra-cellular water barrier, it is necessary to correct these imbalances at their source. For softer, suppler, more efficient skin. For skin that looks younger for longer.



PRODUCT BENEFITS

Hydration

Moisturizes

Keeps water in the epidermis, stimulates NMF levels and the quality of the hydro lipid film in the corneous layer.

Protects

Strengthens the corneous layer, helps to restore the skin barrier.

Restores lipid levels

Helps to restore and maintain lipid levels in the epidermis.

Regenerates

Increases epidermal cell regeneration.

Anti-ageing

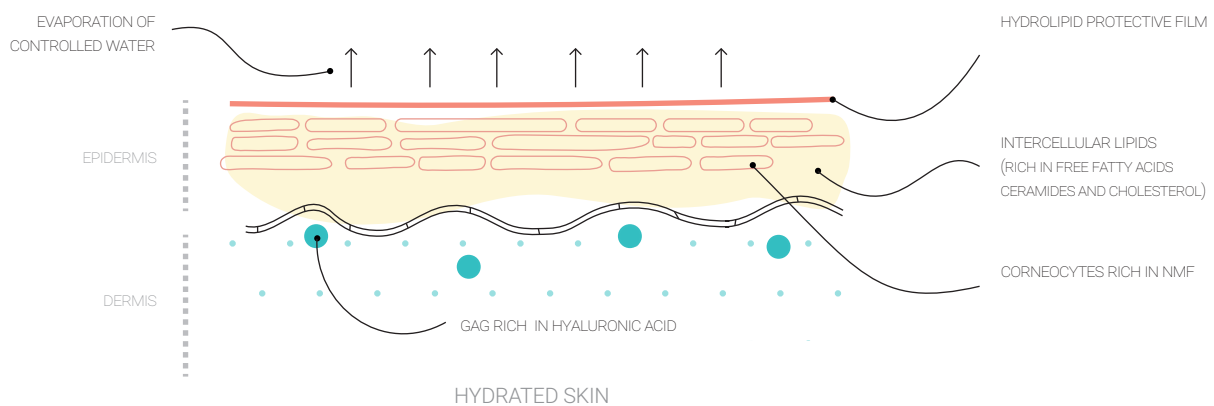
Strengthens the density of the dermis and epidermis.

To be used in skincare or make-up products like cream, fluid, serum, balm, lotion, milk, foundation, concealer, etc. In any cosmetic or skincare product dedicated to maintain or to reinforce skin hydration.

HOW IT WORKS

HydraSourcing [AM+PS] restores the necessary balances to an optimal level of hydration

Water is a vital component of the human body: we are 65% water. However with age, the proportion of water decreases, because as tissues such as the skin become older they tend to dehydrate. The upper part normally contains between 13 and 15% water. Like the other organs in the human body, the skin cannot store water and it evaporates from the skin's surface on a continuous basis. Due to numerous factors (dry atmosphere, frequent use of soap, exposure to wind and sun, etc.) the skin sometimes becomes dry, it can then become rough and less flexible, making wrinkles more apparent. Women in particular have skin that tends to become drier with age. Various components are responsible for the amount of moisture in the skin, it is therefore necessary to act on several moisture regulating mechanisms in order to keep this at an optimal level.



HydraSourcing [AM+PS] acts on the fundamental mechanisms for moisture regulation

Controlling the water supply to the skin

There is water in the skin's two main layers: the dermis and the epidermis. In the dermis, it is linked to protein macromolecules, glycosaminoglycans. They retain water, some of which is regularly transported to the epidermis: they form a reservoir of water for the epidermis. In the epidermis, water is found in and around the keratinocytes. The free water diffuses naturally up to the skin's surface and evaporates.

HydraSourcing [AM+PS] encourages the presence of water in the skin by increasing the amount of water in the epidermis and dermis.

Strengthening the water barrier in the corneous layer

Skin hydration is inextricably linked to the transformation of keratinocytes known as keratinisation. Keratin creates components which slow the water down on its way to the surface, such as the NMF (Natural Moisturizing Factor) in the corneocytes, and, mixed with sebum, the hydrolipid film on the skin's surface. Combined with lipids derived from the decomposition of keratinocytes in the granular layer, which form a mortar between the corneocytes, they enable better control of the transepidermal flow, thereby trapping water and keeping it in the corneous layer.

HydraSourcing [AM+PS] strengthens the skin's water barrier by increasing the presence of lipids, NMF and the hydrolipid film.

Thanks to its multidirectional action on water flow and the corneous layer, HydraSourcing [AM+PS] increases skin hydration.

CLINICAL TESTING RESULTS

A significant moisturizing effect on the face in 24 hours and in 28 days on dry skin

+40% hydration in 24 hours

+67% hydration in 28 days

- **90%** of women reported that their skin was moisturized
- **95%** of women reported that dry areas were repaired

At a concentration of 0.5%

IN VITRO TESTING RESULTS

Moisturizing effect

- Due to an increase in water retention in epidermis
- Due to a decrease in transepidermal flow
- Due to a **23%** increase in the synthesis of GAGs

Moisturizing, regenerating action

- Due to an **18%** increase in cell proliferation
- Due to greater homogeneity of the filaggrin

Protective, lipid-restoring action

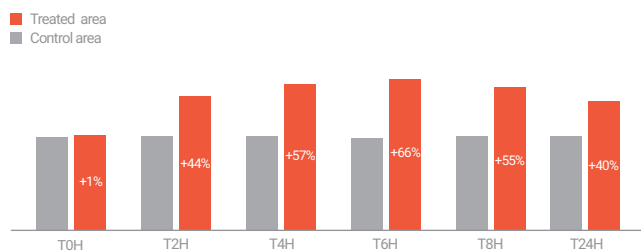
- Due to a **20%** increase in free fatty acids
- Due to a **23%** increase in ceramides

At a concentration of 0.5%

Clinical testing results

Moisturizing effect after 24 hours, single application

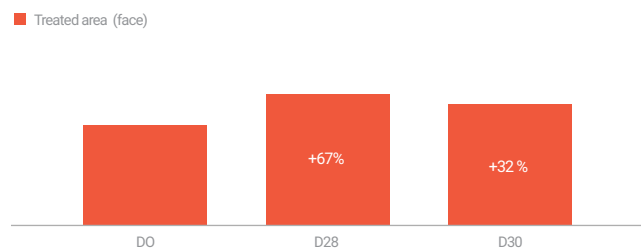
MEAN DATA OF CORNEOMETRIC INDEX OF CONTROL AND TREATED AREAS AFTER A SINGLE APPLICATION



40% increase in corneometric values for the face

Moisturizing effect after 28 days, application twice a day

MEAN DATA OF CORNEOMETRIC INDEX OF TREATED AREA AFTER 28 DAYS OF TREATMENT



67% increase in corneometric values for the face (32% after 30 days)

Study conditions:

- Tests performed over 24 hours and 28 days, on 20 women aged between 30 and 64 years-old with dry, damaged or sensitive skin
- Study of the moisturizing effect measured by corneometer
- Emulsion containing 0.5% of HydraSourcing [AM+PS] (dispersion form, 20% of cells)

Technical information on the formulation of HydraSourcing [AM+PS]

INCI name

Argemone Mexicana Callus Extract
(and) Pullulan

form

cells (20%) in glycerin
or sunflower oil (80%)

aspect

liquid

Concentration

starting at 0.5%

dispersible

in any formulation
(emulsion, lotion, fluid)

In vitro testing results

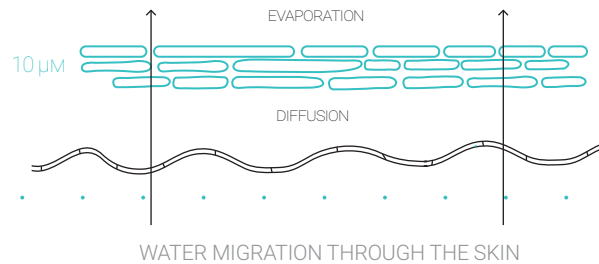
Maintaining an optimal percentage of water in the epidermis and dermis

Skin hydration

Skin contains between 60% and 80% water depending on its age; the stratum corneum contains 13% to 15%. Skin is considered to be hydrated when this percentage is above 10%, and dehydrated when it is below 10%, resulting in the stratum corneum becoming rough and flaky and losing its integrity. Most water in the dermis is in the proteoglycans, which can hold large quantities of water. There are two types of water in the epidermis:

→ Static water in the stratum corneum that cannot move, this water is held in the corneocytes due to the NMF (Natural Moisturizing Factor) and between corneocytes, where it is trapped by lipids, especially ceramides, that are located in the hydrolipid film (cf. cell renewal). This gives the skin elasticity and suppleness.

→ Dynamic water that moves, circulating from the dermis to the various layers of the epidermis, also known as transepidermal flux. This water from the dermis brings essential nutrients to the epidermis. It helps to protect the epidermis and maintain homeostasis.



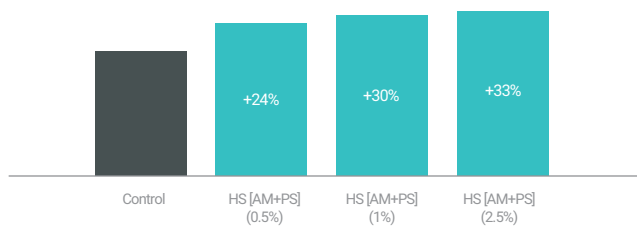
Water follows a path from beneath the skin to its surface; when it arrives at the surface, the water evaporates. This occurs at a rate of about 5g water/m²/hour. 300 to 500 ml of water evaporates every 24 hours; its main obstacle is the skin barrier, so it is important that this barrier's integrity is maintained (cf. cell renewal). This depends on external factors such as temperature and humidity, and internal factors, such as the state of the stratum corneum, the water gradient in the different layers of the epidermis and the integrity of the lipid network between corneocytes. It does not depend on the quantity of static water in the stratum corneum.

Most of the skin's water is in the dermis, held in protein macromolecules called proteoglycans. They are made up of glycosaminoglycans (GAGs), some of which can hold large quantities of water. Among these GAGs is hyaluronic acid, 1 gram of which can fix 300 to 500 ml. The water in the dermis does not circulate very much; however a small proportion of this dermal water passes into the epidermis.

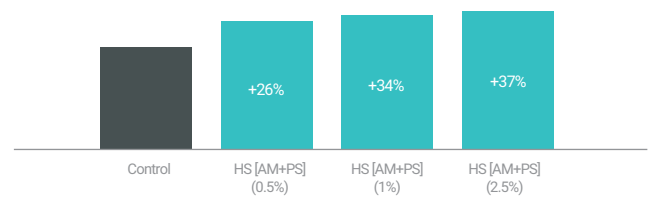
That is why Naolys not only studied HydraSourcing [AM+PS]'s effect on the water retention factors in the epidermis and dermis - by looking at the synthesis of GAGs - but also the effect on the circulation of water in the epidermis.

Study of the static water – epidermis

(³H)-H₂O (cpm): T0 + 15 min



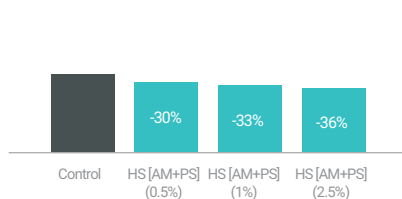
(³H)-H₂O (cpm): T0 + 30 min



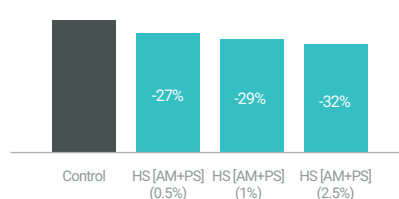
→ At concentrations of 0.5%, 1% and 2.5%, increase of water retention in the dehydrated epidermis at T0+15 min respectively by 24%, 30% and 33%; and at T0+30 min, respectively by 26%, 34% and 37% compared to non treated controls.

Study of the dynamic water – epidermis

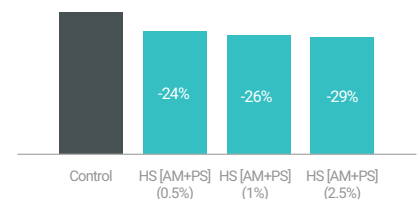
(³H)-H₂O (cpm): T0 + 15 min



(³H)-H₂O (cpm): T0 + 30 min



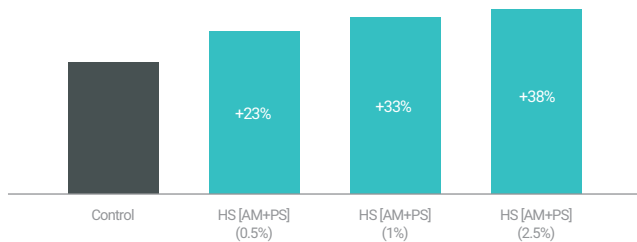
(³H)-H₂O (cpm): T0 + 60 min



→ At concentrations of 0.5%, 1% and 2.5%, decrease of the trans-epidermic transfer of the treated water, (³H)-H₂O, at T0+15min respectively by 30%, 33% and 36%; at T0+30 min respectively by 27%, 29% and 32%; and at T0+60 min, respectively by 24%, 26% and 29%, compared to non treated controls.

Study of glycosaminoglycans – dermis

[³H]-glucosamine (cpm)



→ At concentrations of 0.5%, 1% and 2.5%, increase of the neosynthesis of total glycosaminoglycans by 23%, 33% and 38% at the level of the treated cultured human fibroblasts.

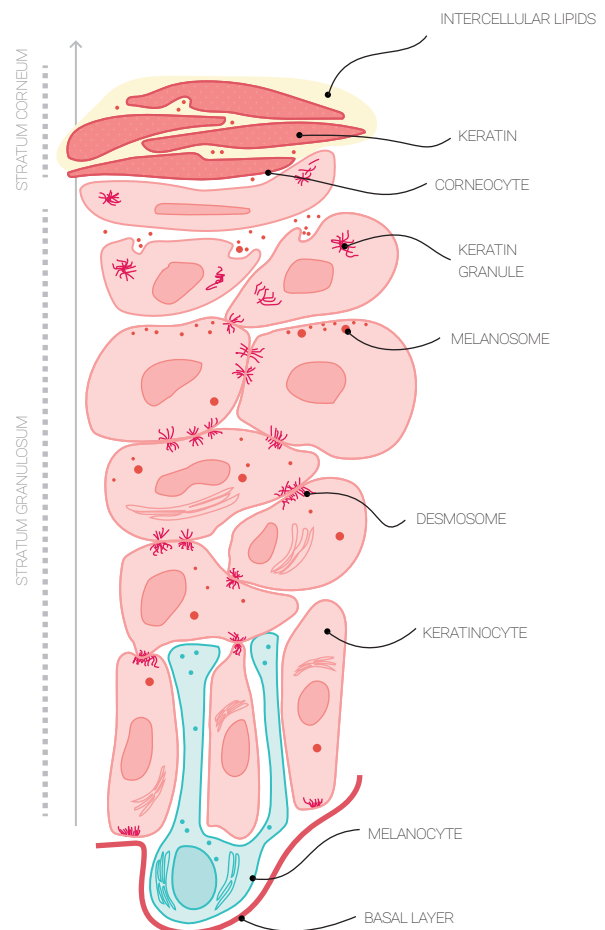
Strengthening the skin's water barrier

Cell renewal, source of the hydrolipid film and NMF

The epidermis, a superficial layer of skin, starts with cells called keratinocytes which constantly renew themselves on a 21 day cycle. This renewal of the epidermis takes place through a process of cell proliferation and differentiation that maintains the balance of adult tissue; keratinocytes divide at the basal layer of the epidermis, which is mainly made up of non-differentiated cells, and migrate to the surface changing their form: they lose their nuclei and become filled with hard filaments of keratin. When they reach the corneous layer, they become corneocytes, dead cells that create a solid, impermeable, protective membrane (thanks to the keratin): this is the epidermis' natural protective barrier. This layer of corneocytes breaks down in a natural shedding process. Keratin contains several substances, in particular the NMF (Natural Moisturizing Factor) between cells; this is a mixture of hygroscopic substances that enable corneocytes to hold water, consisting of free amino acids ($\pm 50\%$), pyrrolidone carboxylic acid (12%), lactates (12%), urea, sugars and mineral salts.

Keratin contains, among other things, the intracellular NMF (Natural Moisturizing Factor); this is a mixture of hygroscopic substances which enable the corneocytes to fix water: free amino acids ($\pm 50\%$), pyrrolidone carboxylic acid (12%), lactates (12%), urea, sugars and mineral salts.

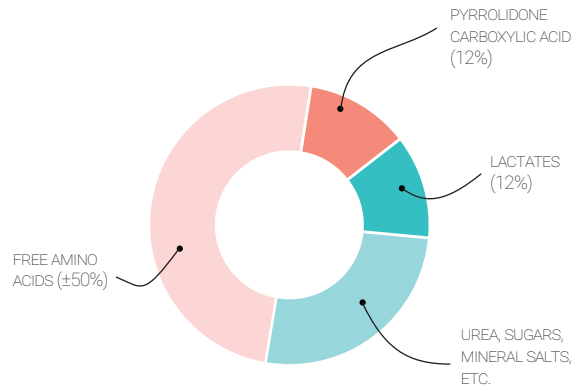
The content of the keratohyalin granules dispersed in the cytoplasm causes filaggrin to develop from its precursor, profilaggrin. Filaggrin eventually undergoes proteolysis to yield free polar amino acids, urocanic acid (UCA) and pyrrolidone carboxylic acid (PCA), which are components of the NMF.



THE EPIDERMIS AND KERATINISATION PROCESS

At the same time, during the keratinisation process, keratinocytes release epidermal lipids which, combined with secretions from the sebaceous glands and water from sudoral secretions, form the hydrolipid film, an emulsion located in the stratum corneum.

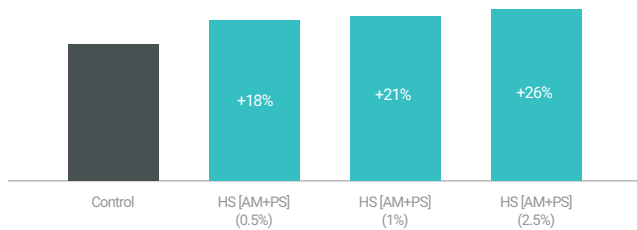
By stimulating cell renewal, HydraSourcing [AM+PS] contributes not only to the creation of keratin, which acts as a skin barrier, but also to the creation of the NMF and the hydrolipid film, both of which retain the dynamic water diffused into the epidermis via the corneocytes.



COMPONENTS OF NATURAL MOISTURIZING FACTOR

Study of epidermis cell proliferation

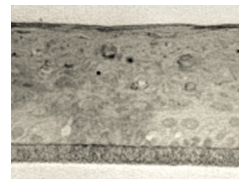
Number of labelled cells (Ki67)



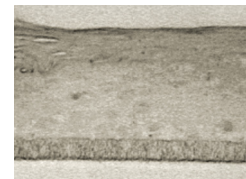
→ At concentrations of 0.5%, 1% and 2.5%, stimulation of the proliferation of keratinocytes of the basal layer at the level of the treated epidermis, respectively by 18%, 21% and 26%.

Study of epidermis cell differentiation

LABELLING OF FILAGGRIN: EPIDERMIS CONTROL



LABELLING OF FILAGGRIN: TREATED EPIDERMIS WITH HYDRASOURCING [AM+PS] AT 2.5%



→ Epidermal cell differentiation decreases, which is reflected by less intense but more uniform marking of the filaggrin.

Hydration and aging

With age, the quantity of GAGs decreases, thereby decreasing the hydration of the dermis and epidermis. The thickness of the epidermis decreases, but the thickness of the stratum corneum increases. Cell renewal and differentiation slows down, and so the epidermis is again less hydrated.

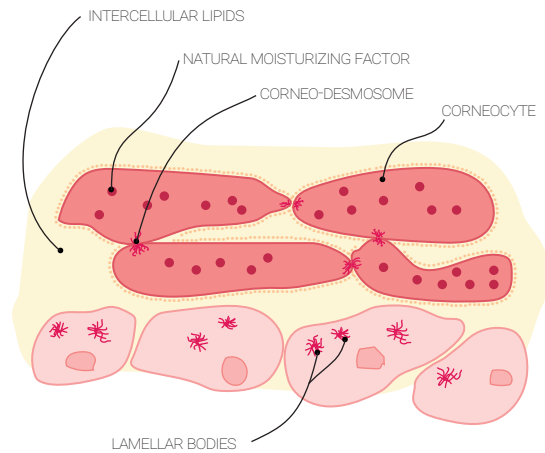
Lipid compounds, vital for corneocyte cohesion

In addition to the creation of the NMF and hydro lipid film, keratinocyte differentiation results in the formation of an extracellular lipid barrier that plays a fundamental role in maintaining hydration.

In the epidermis, at the junction between the granular layer and the corneous layer, the lamellar bodies contained in the keratinocytes fuse with the plasma membrane in the form of lamellar granules that stack up parallel to the surface of the corneocytes and release their lipid content into the spaces between the corneocytes, forming a compact mortar.

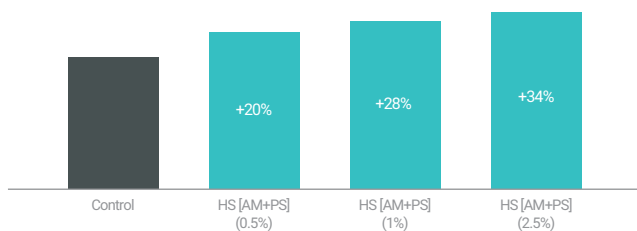
The lipids in the lamellar granules consist of phospholipids, cholesterol and glucosylceramides, which are then modified in the spaces between the corneocytes, by specialized enzymes, into ceramides (SC Cer 1-7), cholesterol, cholesterol sulphate and free fatty acids.

Naolys thus studied the presence of ceramides and free fatty acids, the intercellular lipids essential for corneocyte cohesion, and therefore the quality of the skin barrier, which prevents the evaporation of water.



Study of free fatty acids

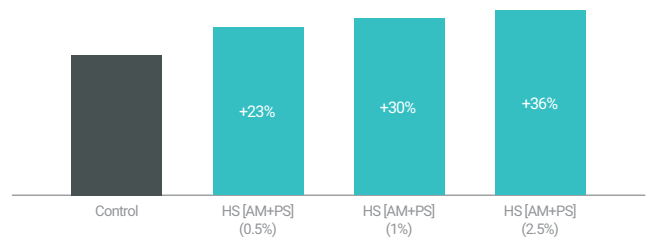
Incorporation of [¹⁴C] acetic acid



→ At concentrations of 0.5%, 1%, and 2.5%, increase of free fatty acids respectively by 20%, 28% and 34%.

Study of ceramides

Ceramides (nmoles/mg of proteins)



→ At concentrations of 0.5%, 1% and 2.5%, increase of the synthesis of ceramides respectively by 23%, 30% and 36%.



See also

[HydraSoothing Indian olibanum](#)

[HydraGeneration Almond tree](#)

[HydraGeneration Papyrus](#)

[HydraGeneration Pale rose](#)

[Pure Light Chinese peony](#)



