

HYDRO ACTIVE PLUS CLINICAL STUDIES

INNOVATIVE HYDRATING SOLUTION



HYDRASALINOL – 3 SOLUTIONS IN 1 MOISTURIZING – RESTRUCTURING – SMOOTHING OUT

HYDRASALINOL AND AQP8 TRANSPORT UREA, WHICH IS AT THE HEART OF HYDRATION

AQP8, demonstrated for the first time in the human epidermis by the Codif International, opens up new opportunities for skin moisturizing

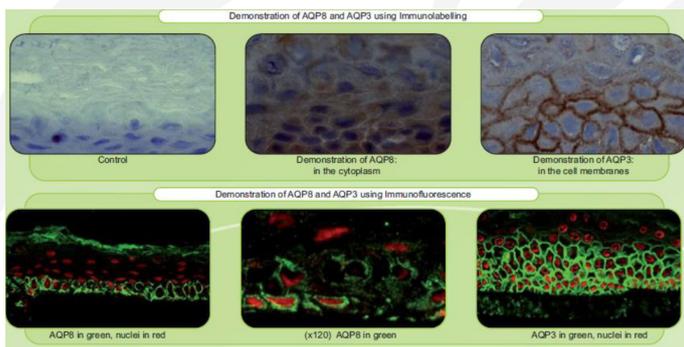
Particularly exposed to environmental aggressions such as solar radiation, wind, or pollution, our skin dehydrates, loses its radiance, firmness and becomes rougher and uncomfortable.

We already know about aquaporin AQP3, which plays an important role in the transport of water. AQP8, produced by the keratinocytes of the epidermis, is an ammonium ion transporter, an essential precursor of urea synthesis.

CODIF International's discovery places AQP8 at the center of urea metabolism, and revolutionizes the concept of cutaneous moisturizing.

DISCOVERY OF AQP8 IN THE SKIN AND DEMONSTRATION OF AQP3

AQP8 and AQP3 were demonstrated on human skin and reconstructed epidermal tissues. Whilst AQP3 is expressed in the cell membranes, AQP8 was found in the cytoplasm of the suprabasal cells and the granular layer.

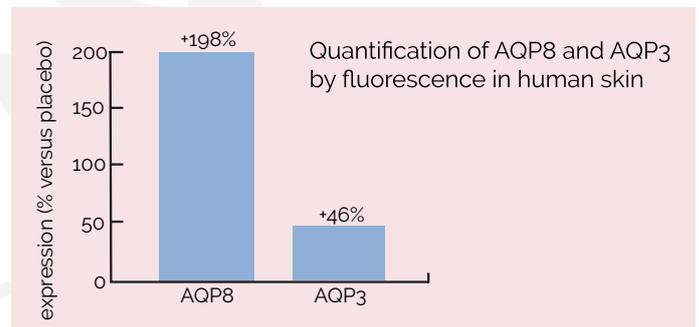
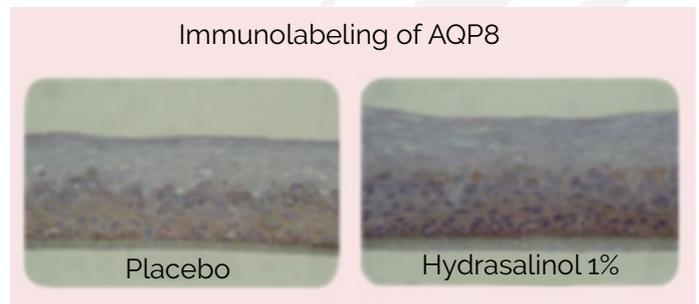


Obtained by supercritical CO₂ extraction, Hydrasalinol stimulates the expression of AQP8 in the epidermis, acting on all fronts against cutaneous dryness: production of urea, NMF, cellular cohesion, lipid matrix; this extract is an original and unique hydra-restructuring agent.

IN VITRO TEST: EFFECT OF HYDRASALINOL ON THE PRODUCTION OF AQP8 AND AQP3 IN HUMAN EPIDERMIS

Skin dryness is determined by external and internal factors. In both cases, it is essentially caused by a deficiency of Natural Moisturising Factors (NMF).

The major component of NMF is urea, produced by the mitochondria; it plays an essential role in skin hydration. It is therefore important to ensure its availability and its synthesis in the skin in order to maintain a high level of hydration.

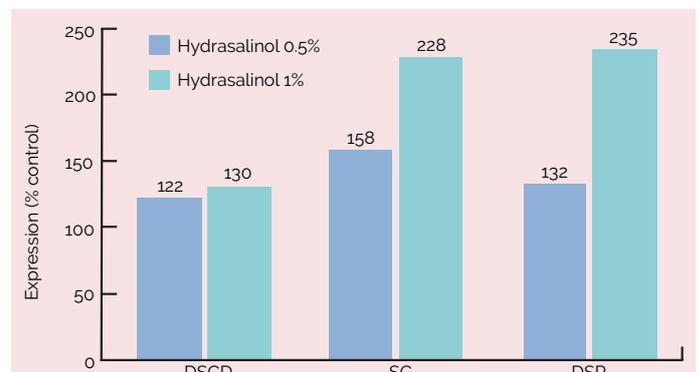


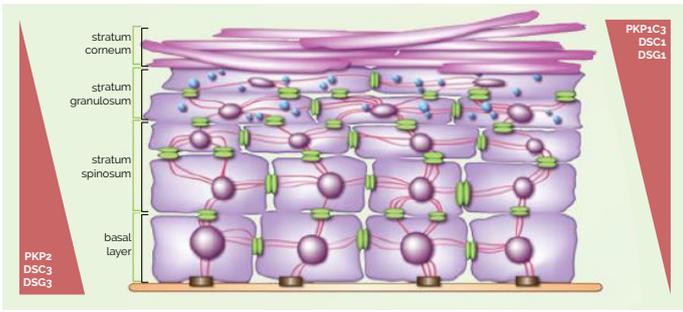
Results:

- Stimulates AQP8 (+198%) and AQP3 (+46%) synthesis in epidermis
- Increases by 43% mRNA synthesis

IN VITRO TEST: EFFECT OF HYDRASALINOL ON THE EXPRESSION OF BINDING PROTEINS

Binding proteins are involved in inter-keratinocyte adhesions. A poor production of one of these proteins disrupts epidermal cohesion and therefore promotes water loss. The following are the most important of these proteins: desmocollin (DSC), desmoglein (DSG), and desmoplakin (DSP).





Results: Increases synthesis of binding proteins:

- Desmocollin (DSC): +130%
- Desmoglein (DSG): +228%
- Desmoplakin (DSP): +235%

By increasing the synthesis of binding proteins, Hydrasalinol strengthens intercellular cohesion in the epidermis and limits water loss via hydric transfer.

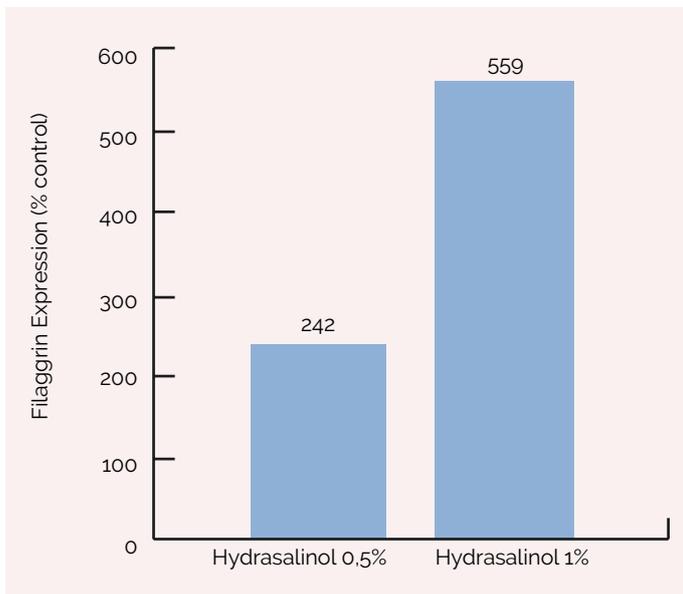
IN VITRO TEST: EFFECT OF HYDRASALINOL ON THE PRODUCTION OF FILAGGRIN

The hydrolysis of filaggrin in the epidermis generates, amongst others, the release of 2 amino acids:

- histidine and
- glutamine,

which are themselves the precursors of 2 fundamental elements of the NMF:

- urocanic acid and
- pyrrolidone carboxylic acid.



Results: Hydrasalinol increases the expression of Filaggrin by 559%

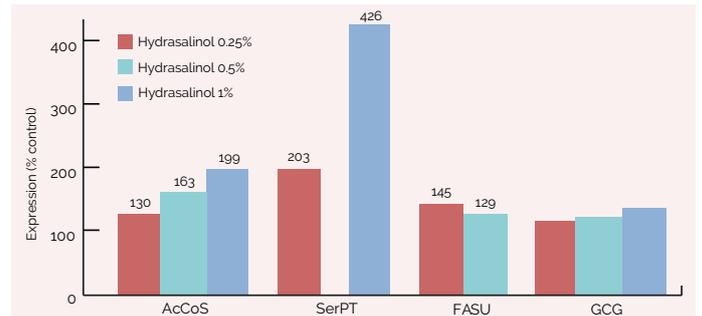
This is reflected by a reinforcement of the NMF, and therefore improved water retention in the epidermis.

IN VITRO TEST: EFFECT OF HYDRASALINOL ON THE METABOLISM OF EPIDERMAL LIPIDS

Some of the numerous enzymes produced by the keratinocytes are involved in the synthesis of epidermal lipids, which form the intercellular cement. This "cement" is thought to be a major component of the epidermal barrier.

Several enzymes have a key role in the production of the lipids of the stratum corneum, which strengthens the epidermal barrier:

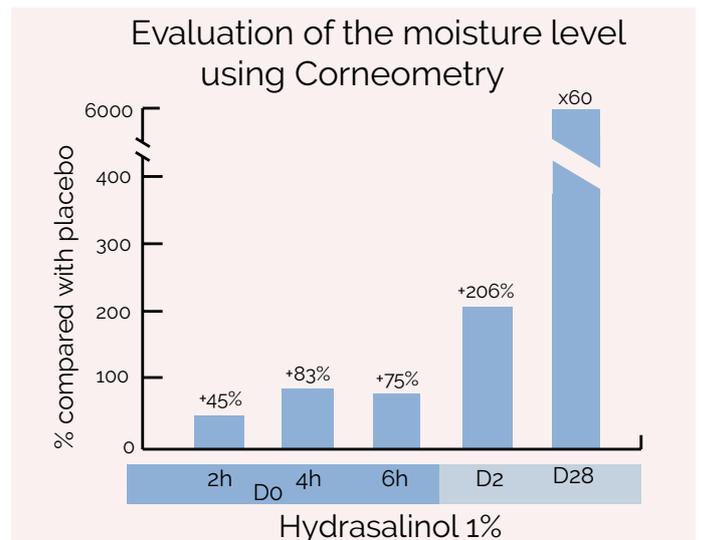
- Acetyl CoA Synthetase (AcCoS): synthesis of free fatty acids and cholesterol
- Serin Palmitoyl Transferase (SerPT) : ceramids synthesis
- Fatty Acid Synthase (FAS): fatty acids synthesis
- Ceramid Glucosyl Transferase (UGCG) : ceramids synthesis



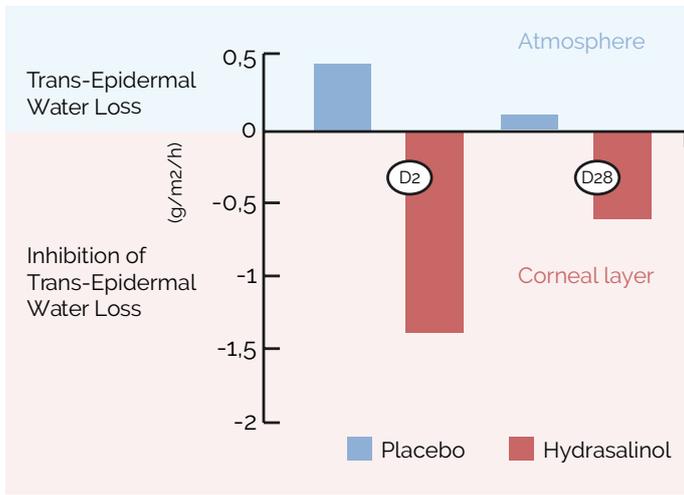
Hydrasalinol increases the expression of these enzymes, which reflects stimulation of epidermal lipid metabolism, strengthening of the lipid barrier, improved epidermal impermeability, and therefore reduced water loss.

CLINICAL TESTS: STUDY INTO THE HYDRA-RESTRUCTURING POWER OF HYDRASALINOL ON DRY SKIN

Results: Effect of Hydrasalinol 1% on skin hydration



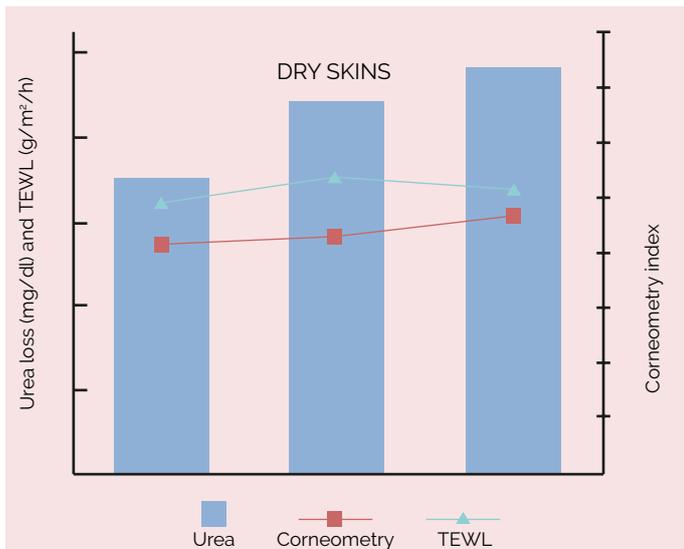
Hydrasalinol, compared to placebo, increases moisture levels by a factor of 60. It acts as a dynamic and intelligent regulator for epidermal water content and compensates water losses in a regulated and proportional manner.



CLINICAL TESTS: STUDY INTO THE HYDRA-RESTRUCTURING POWER OF HYDRASALINOL ON DRY SKIN

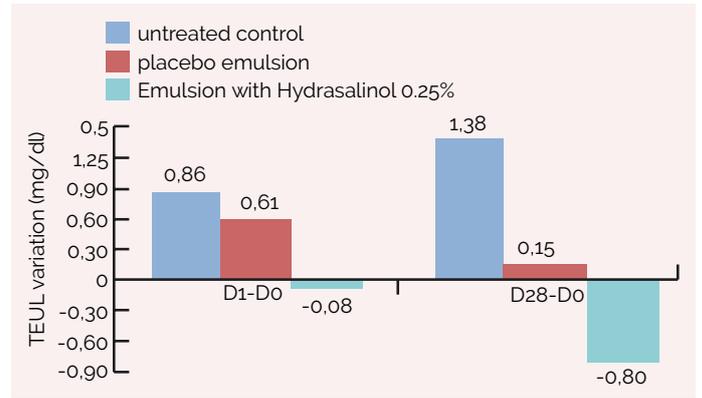
In untreated dry skin, the urea loss gradually increases while Corneometry and TEWL values do not.

Thus, the measurement of the amount of extractable urea is independent on corneometry and TEWL. This therefore constitutes an original measure, allowing to the evaluation of a new parameter, different and complementary from hydration.



Introduction of a new concept: the Trans-Epidermal Urea Loss (TEUL) equivalent to the Trans-Epidermal Water Loss (TEWL) for water.

CLINICAL TEST: EFFECT OF HYDRASALINOL ON TEUL



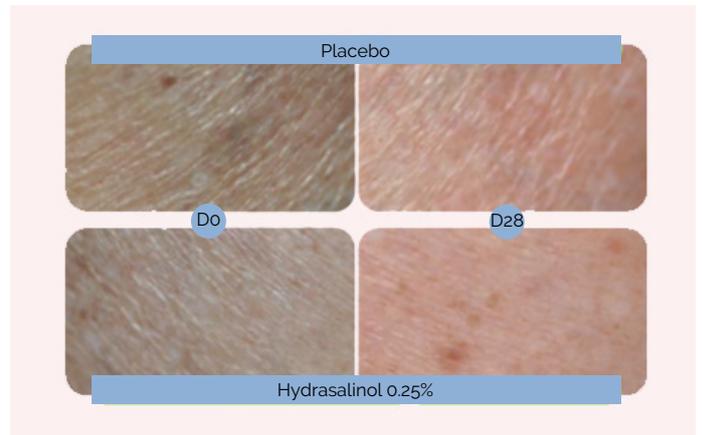
Results: By increasing the synthesis of AQP8 in epidermis, Hydrasalinol, from 0.25%:

- totally inhibits the Trans-Epidermal Urea Loss within 24 hours
- increases urea content in epidermis, by promoting transport and production

REVEAL: HYDRA-RESTRUCTURING EFFECT OF HYDRASALINOL ON DRY SKIN

Hydrasalinol boosts skin hydration for a redensifying, and hydra-restructuring effect.

The roughness, characteristic of dry skins, disappears in favor of a suppler and smoother skin.



The discovery of AQP8 in the epidermis leads the CODIF Recherche et Nature laboratories to investigate a new means of moisturizing the skin. The development of Hydrasalinol has made it possible to rapidly assess the scope of this discovery.

By activating the synthesis of AQP8 in the skin, Hydrasalinol acts at the heart of urea metabolism, to produce an immediate moisturizing action for even the driest skins.

Its combined action on the binding proteins of the epidermis and lipid cement of the cornified layer increases the cohesion of the skin and reduces water losses for a visible and prolonged action.

References:

1. Codif International products technical files