



ALGYL®

Marine guardian of skin barrier functionality



Multifaceted ways of action
for a complete skin barrier protection

Actions on the outside-in * inside-out * immune * antioxidant functions



A healthy skin starts with a healthy barrier that implies multifactorial process including better hydration, efficient lipid composition, regulation of keratinocyte differentiation, quicker healing, prevention of damage from oxidative stress or microbiologic attacks.

A commonly used approach in the cosmetic industry is to temporarily improve epidermal barrier function

- * either through the formation of occlusive films on the skin that impede water evaporation and prevent transepidermal water loss (e.g. by using mineral oils or petrolatum),
- * or through humectants that attract and retain moisture on the skin surface (e.g. by using glycerin or butylene glycol).

Although these solutions have shown some effectiveness, it remains a need for new cosmetic agents more effective for improving skin barrier.

In fact it exists different but linked and interrelated types of skin barriers.

The **outside-in barrier** provides a physical protection mediated by the *stratum corneum*, the outermost cell layer of the epidermis. It is established by a precisely regulated keratinocyte differentiation program that results in distinct cellular layers (*stratum basale*, *stratum spinosum*, *stratum granulosum*, *stratum lucidum* and *stratum corneum*), each one showing specific characteristics.

The **inside-out barrier** provides tight mechanical cohesion between the cells of the same and different epidermal layers. In addition it regulates the loss of fluid and electrolytes *via* the paracellular permeability function.

The epidermal barrier system also deploys other functions including notably the defense against microorganisms and the protection from antioxidant and environmental stress. These defensive functions, supported by **the immune and antioxidant barriers** depend on the ability of the skin barrier to detect danger from a broad range of physical, chemical and microbiological challenges. They are interconnected to minimize the potential for damage.

So it appears important to preserve all functions of epidermis. A healthy barrier is regulated by a fine balance among the major players, the *stratum corneum* being the barometer for what is happen beneath.

GELYMA proposes ALGYL® to restore epidermal health by acting on several barrier functions, notably on

▶ the outside-in barrier by

- * restructuring the structural basis of the *stratum corneum* *via* the improvement of different process e.g. keratinocyte differentiation (action at different cellular layers), lipid synthesis, desquamation, epidermal renewal, epidermal recovery after stress or else aging conditions

▶ the inside-out barrier by

- * increasing epidermal adhesion and cohesion *via* notably the increase of the synthesis desmosomes proteins
- * boosting the paracellular permeability function *via* the stimulation of the synthesis of tight junctions components, particularly several claudins but also occludin and cingulin,

▶ the defensive barriers by increasing the production of antimicrobial peptides and bringing exogenous protection against oxidative stress, thus regulating innate and adaptive functions.

ALGYL® conjugates the properties of three red seaweeds in synergism with glycerin.

- an extract prepared from a blend *Gigartina stellata* (*Mastocarpus stellatus*) and *Kappaphycus alvarezii* supplying different kinds of sulphated polysaccharides.
- an extract prepared from *Corallina officinalis*, known as “coral alga” rich in minerals, notably in calcium required for the regulation of barrier function.

ALGYL® induces multifunctional barrier activation through innovative modes of action for strengthening and regenerating skin barrier functions while limiting barrier deterioration.

As a consequence, with ALGYL®, the skin is more hydrated, better protected and more resistant to external damage with healthier appearance.

Mechanisms of action

The mechanisms of action of ALGYL® have been demonstrated by using the transcriptomic analysis on *in vitro* 2D culture of normal human epidermal keratinocytes (NHEKs) using qRT-PCR on the expression of 96 genes relevant for epidermal biology (collaboration Strati CELL-Belgium) completed by immunolabeling on irradiated skin human explants (collaboration SEPhRA PHARMA-France) and clinical studies (collaborations COMPLIFE-Italy and EUROFINs-France) in order to provide valuable data.

Gene expression profiling and immunolabeling studies

ALGYL® reinforces the outside-in barrier for fortifying the structural basis of the *stratum corneum*

ALGYL® is able to overexpress the major key genes involved in the outside-in function, notably in

- * keratinocyte differentiation
- * lipid synthesis
- * desquamation regulation and epidermal renewal

in order to maintain and restore the structural basis of the *stratum corneum*, therefore improve the physical protection and preserve the integrity of the skin barrier.

ALGYL® also may modulate the expression of genes related to

- * specific syndecans, playing important roles in the regulation of keratinocyte proliferation and epidermis cohesion,
- * the recovery of epidermal homeostasis in stress conditions.

all that leading to healthier epidermis.

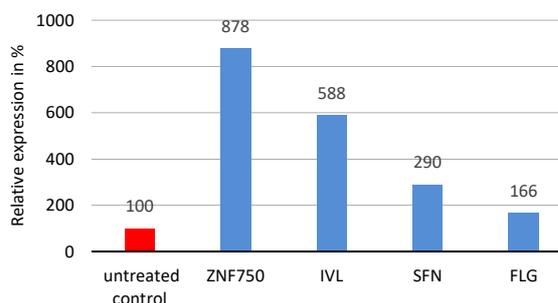
Action on keratinocyte differentiation

Keratinocyte differentiation (also called cornification) appears as essential key process in formation and maintenance of the skin barrier against the outside environment.

Each stage is characterized by the expression of specific markers and shows particularities in terms of transcription, morphology and function.

► Evaluation of the gene expression of key biomarkers

ALGYL® upregulates major differentiation markers involved in different steps of the cornified envelope formation.



Gene abbreviation	Gene name	Expression change*	p value (t-test)
ZNF750	Zinc Finger Protein 750	8.78	0.0154
IVL	Involucrin	5.88	0.0041
SFN	Stratifin	2.90	0.0112
FLG	Filaggrin	1.66	0.0170

*relative expression compared to untreated control

- **ZNF750** *Zinc Finger Protein 750*
major regulator of keratinocyte terminal differentiation.
- **IVL** *Involucrin*
marker synthesized in the *stratum spinosum* and cross linked in the *stratum granulosum* by the transglutaminase enzyme.
- **SFN** *Stratifin*
marker associated to numerous intracellular functions notably cell proliferation and differentiation of keratinocytes.
- **FLG** *Filaggrin*
major role in regulating terminal differentiation and epidermal homeostasis.

► By stimulating these key markers, ALGYL® may potentially (1) maintain efficient control of cornification necessary to support high performance of epidermal homeostasis and (2) provide mechanical strength and resistance to water loss and entry of chemicals and micro-organisms.

➤ Stimulation of involucrin synthesis (immunolabeling on irradiated skin human explants)

Collaboration: SEPhRA PHARMA - France

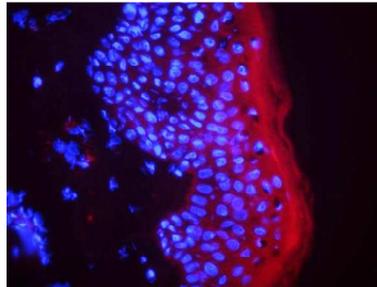
Method

Topical application of a basic gel containing either 1% or 2% ALGYL® versus placebo on skin explants of Caucasian female (46 years old) irradiated with UVA (8 J/cm²) and UVB (0.2 J/cm²).

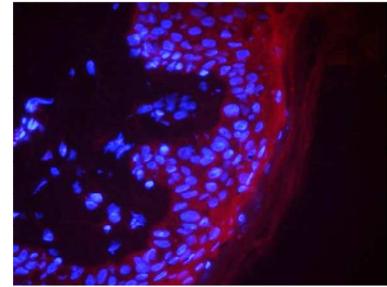
Results

▶ *Involucrin* is an important protein involved in the formation of the cornified envelope during terminal epidermal differentiation.

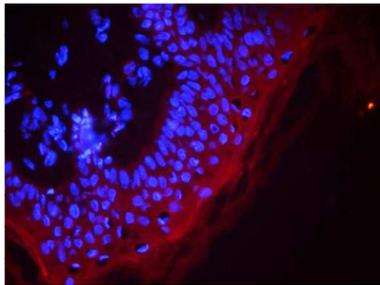
When its production is reduced due to various factors, skin barrier function is deteriorated.



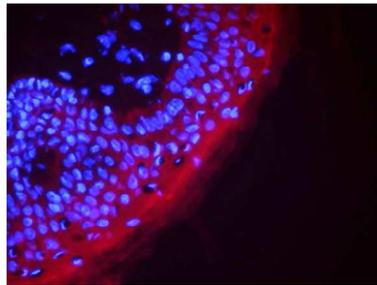
Non irradiated control



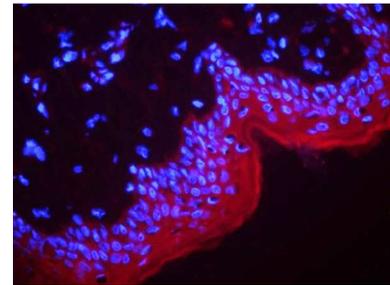
Irradiated control



Placebo



ALGYL® 1%



ALGYL® 2%

➤ **ALGYL® increases involucrin synthesis compared to placebo, therefore reinforces the corneocyte envelope.**

➤ **ALGYL® comforts the mechanical barrier function for maintaining skin integrity after radiation stress.**

Action on lipid synthesis

Ceramides, cholesterol and long-chain free-fatty acids are the three major lipid constituents in the *stratum corneum*, forming the “mortar” between corneocytes “the bricks”.

Their presence is essential for the maintenance of a moist and healthy skin barrier and the prevention of Trans Epidermal Water Loss (TEWL).

➤ Evaluation of the expression of genes involved in sphingolipid metabolism

Ceramides are sphingolipids vital to the organization and function of the barrier. Their synthesis begins with condensation of palmitate and serine catalyzed by the enzyme serine palmitoyl transferase (SPTLC1).

Gene abbreviation	Gene name	Expression change*	p value (t-test)
SMPD1	Sphingomyelin phosphodiesterase	2.31	0.0161
SPTLC1	Serine palmitoyl transferase 1	1.87	0.0239

*relative expression compared to untreated control

These two key enzymes are implicated in sphingolipid metabolism known for its important role in skin permeability barrier formation and homeostasis.

➤ **By promoting epidermal lipid synthesis, ALGYL® may limit skin dehydration and control moist maintenance as well as barrier permeability for avoiding water loss.**

Action on desquamation

Epidermal desquamation leads to the shedding of dead corneocytes from the outermost layers of the *stratum corneum*. It plays an essential role in regulating the process of cornification. It depends on controlled degradation of corneodesmosomes by several proteases including notably kallikreins and cathepsins.

► Evaluation of the expression of kallikreins genes

Gene abbreviation	Gene name	Expression change*	p value (t-test)
KLK7	Kallikrein-7	4.39	0.014
KLK5	Kallikrein-5	3.06	0.002

*relative expression compared to untreated control

- *KLK7* important actor of the maintenance of skin homeostasis. It is involved in the regulation of Caspase 14 during terminal keratinocyte differentiation by breaking down filaggrin in essential amino acids of the Natural Moisturizing Factor (NMF).
- *KLK5* key molecule in profilaggrin maturation. It activates *KLK7* in epidermis.

► **ALGYL® may regulate desquamation for improving soft and smooth appearance of the skin surface.**

► **ALGYL® may favour filaggrin degradation, so reinforce the hydration of the cornified layer for maintaining efficient skin homeostasis.**

Action on keratinocyte proliferation during epidermis formation

Epidermal proliferation and differentiation are regulated by growth factors that are modulated by heparin sulphate proteoglycans. These proteoglycans includes the major family "Syndecans" known to mediate cell binding, cell signaling and cytoskeletal organization.

► Evaluation of the expression of syndecans genes

Gene abbreviation	Gene name	Expression change*	p value (t-test)
SDC1	Syndecan-1	1.54	0.0418
SDC4	Syndecan-4	2.30	0.0023

*relative expression compared to untreated control

- *SDC1* important modulator in the regulation of keratinocyte proliferation during skin development and wound healing. Known to improve skin cohesion and junction formation.
- *SDC4* mediator of numerous processes through signaling pathways affecting cellular proliferation and cell adhesion.

► **By overexpressing gene expression of syndecan-1 and syndecan-4, ALGYL® may regulate keratinocyte proliferation during epidermis formation while increasing skin cohesion.**

Action on epidermal recovery after stress/aging conditions

When the skin is stressed or injured, notably by environmental aggressors, the *stratum corneum* integrity decreases. The capacity of barrier recovery reduces and epidermal homeostasis is perturbed. During aging, skin barrier function changes too. Consequently, it is important to restore the breached skin barrier and reestablish homeostasis.

► Evaluation of the expression of specific genes related to epidermal recovery after stress / aging conditions

Gene abbreviation	Gene name	Expression change*	P value (t-test)
HBEGF	Heparin-binding EGF-like growth factor	4.88	0.0025
IL1A	Interleukin 1 alpha	3.31	0.0014

*relative expression compared to untreated control

- *HBEGF* helps restore epidermal homeostasis in stress conditions. It plays a major role in the process of wound-healing after injury with increased action in response to cytokine production notably *IL1A*.
- *IL1A* stimulates lipid synthesis in aged epidermis therefore ameliorates barrier recovery.

► **ALGYL® would be able (1) stimulate keratinocyte migration for increasing wound-healing and (2) maintain skin homeostasis after injury or aging conditions, therefore ALGYL® may improve skin recovery.**

ALGYL® strengthens the inside-out barrier Action on desmosomes and tight junctions components

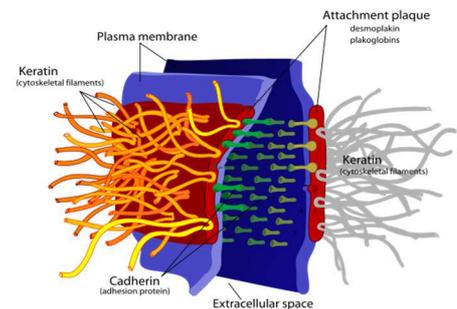
ALGYL® is able to strengthen the inside-out barrier by participating to the two major roles of this barrier:

- ◆ cellular cohesion by increasing components synthesis of desmosomes, so reinforcing mechanical cohesion between the cells of the same and different epidermal layers,
- ◆ paracellular permeability by boosting components synthesis of tight junctions, so preventing the leakage of water and electrolytes.

Action on epidermal cell cohesion

Desmosomes include several major component proteins e.g. the DCs (desmosomal cadherins), DSG (desmoglein) and DSC (desmocollin), the plakin family cytolinker DP (desmoplakin) and the arm (Armadillo) proteins notably PG (plakoglobin) and PKP (plakophilin).

Abnormalities in the desmosome complex lead to a breakdown in cell adhesion (fragility) and increase the Trans Epidermal Water Loss (TEWL). It can run numerous skin diseases.



➤ Evaluation of the expression of genes related to desmosomes proteins

Gene abbreviation	Gene name	Expression change*	p value (t-test)
JUP	Junction plakoglobin	2.04	0.0131
DSP	Desmoplakin	1.70	0.0452

*relative expression compared to untreated control

- ▶ **Plakoglobin** regulates clustering of the desmosomal components, notably cadherins and mediates important signal transduction pathways.
- ▶ **Desmoplakin** anchors intermediate filaments to desmosomal plaques and maintains cytoskeletal architecture for reinforcing stable intercellular adhesion.

➤ By stimulating the expression of plakoglobin and desmoplakin, ALGYL® helps provide strong adhesion between cells for maintaining efficient tissue integrity, therefore improves cellular cohesion of the upper epidermal layers for better water retention.

Regulation of the paracellular permeability

The epidermal permeability barrier controls the transcutaneous movement of water and electrolytes for maintaining skin homeostasis.

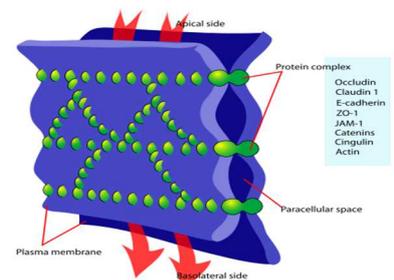
Solute transport across an epithelium can occur *via* two different pathways, highly integrated and regulated:

- ▶ transcellular → transport occurs through the cell, crossing the apical and basolateral plasma membranes,
- ▶ paracellular → transport occurs between cells *via* the intercellular space across a complex of intercellular junctions called "tight junctions" or else "kissing points".

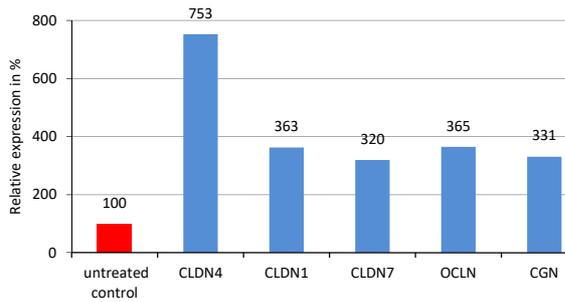
Tight junctions are composed of several types of structural specific transmembrane components: the claudin and occluding families, junctional adhesion molecule (JAM) and plaque (e.g. proteins ZO, symplekin) proteins.

They offer different important functions: barrier function, fence functions and signal transduction.

Tight junctions dysfunctions lead to aberrant barrier function.



➤ Evaluation of the expression of genes related to tight junctions components



Gene abbreviation	Gene name	Expression change*	p value (t-test)
CLDN4	Claudin-4	7.53	0.0017
CLDN1	Claudin-1	3.63	0.0102
CLDN7	Claudin-7	3.20	0.0035
OCLN	Occludin	3.65	0.0128
CGN	Cingulin	3.31	0.0129

*relative expression compared to untreated control

- ▶ **Claudins** major components of the tight junctions for regulating skin permeability and paracellular diffusion of small molecules.
- ▶ **Occludin** important roles in barrier and fence functions, also in transduction of signals.
- ▶ **Cingulin** indispensable for structure and function of tight junctions.

➤ **By overexpressing the gene expression of major proteins of tight junctions, notably several claudins, occludin and cingulin, ALGYL® may**

- ◆ increase the synthesis of main components, so triggers the formation of tight junctions,
- ◆ control the paracellular permeability by preventing leakage of solutes through the intercellular space,
- ◆ facilitate the transepithelial transport of solutes *via* the fence function by maintaining the apico-basal polarity within plasma membranes.

➤ Stimulation of claudin-4 synthesis (immunolabeling on irradiated skin human explants)

Collaboration: SEPhRA PHARMA - France

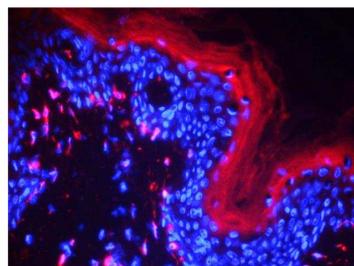
Method

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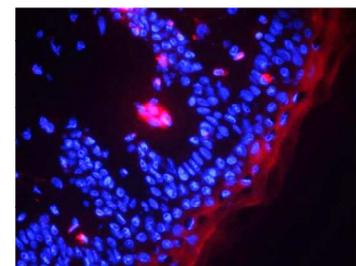
Results

▶ **Claudin-4** is known to play a major role in barrier function by modulating the tight junctions permeability.

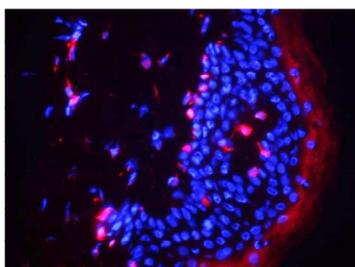
It would have the ability to influence paracellular ion selectivity in creating selective channels through the tight junctions barrier.



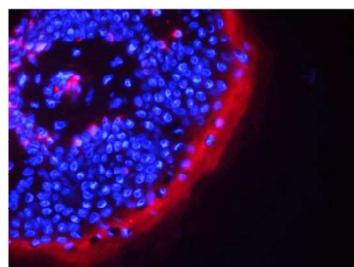
Non irradiated



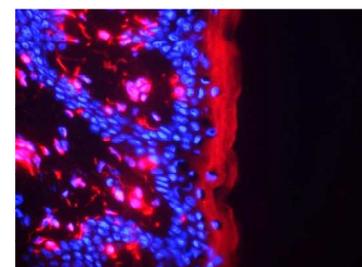
Irradiated control



Placebo



ALGYL® 1%



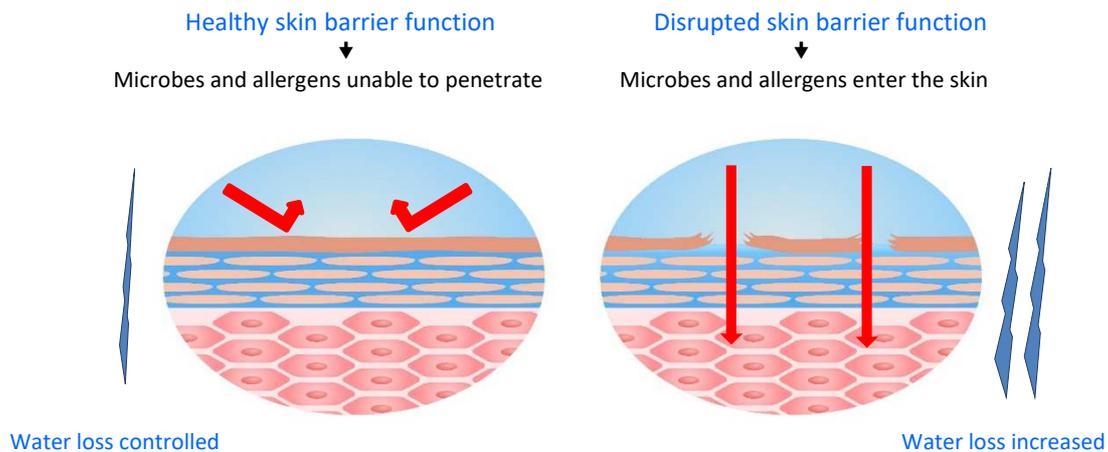
ALGYL® 2%

➤ **By increasing the synthesis of claudin-4, ALGYL® contributes to high paracellular permeability for reinforcing the inside-out barrier and preventing water loss under stressed irradiated conditions (curative effect).**

ALGYL® improves the defensive immune barrier
Action on the antimicrobial function

Disturbance of the epidermal barrier can favor the penetration of microbes and allergens.

- ▶ Enhanced penetration of agents with antigenic properties increases the risk of sensitization because it allows interaction between allergens and allergen-presenting cells in the skin and triggers the onset of inflammation once sensitization has occurred.
- ▶ Increased penetration of irritants through the skin facilitates the occurrence of no allergic inflammatory reactions.



In fact the skin deploys multiple functions to protect our bodies from external attacks *via* different receptors recognizing microbial products or other factors. Although keratinocytes play important roles in the formation of the physical barrier, they also express an array of antimicrobial molecules (AMPs) contributing to the antimicrobial properties of skin, maintaining and fighting against skin injury by microbiota.

So it appears important to regulate antimicrobial peptides expression and their interactions with the epidermal barrier properties in order to resist to microbial invasion and facilitate the capacity of barrier recovery for regaining homeostatic state.

▶ Evaluation of the expression of genes involved in the antimicrobial function

Gene abbreviation	Gene name	Expression change*	p value (t-test)
PI3	Elafin	5.35	0.0009
DEFB4	Beta-defensin 4A (Defensin, beta 2)	2.90	0.021
RNASE7	Ribonuclease 7	1.61	0.0452

*relative expression compared to untreated control

- ▶ *Elafin* showing characteristics like antimicrobial defense-like Molecules.
- ▶ *Defensins* considered as a prototype family of mediators of innate immunity. Efficient antimicrobial activity on a broad spectrum of micro-organisms.
- ▶ *RNASE 7* broad spectrum antimicrobial activity against many microorganisms. Important role in the innate immune defense of epidermis.

▶ **By upregulating gene expression involved in the immune function ALGYL® may stimulate the innate immunity for preventing infiltration of microbes and allergens.**

ALGYL® boosts the antioxidant defense

Action on several antioxidant and detoxification process
Stimulation of the Nrf2 transcription factor

When the skin is assaulted by oxidative stress or environmental aggressors, the cutaneous barrier can be severely weakened. As result, the skin becomes dehydrated and lost its brilliance. Yet to protect against such damage, the skin is equipped with a large network of enzymatic antioxidant defense systems and non-enzymatic antioxidants which work in synergy to counterbalance oxidative stress. However it can happen an imbalance in the ratio of antioxidant defence systems that contribute to an excessive accumulation of reactive oxygen species (ROS) leading to oxidative stress and damage.

Therefore, it is important to provide long-term protection for this internal defense mechanism in order to counteract ROS formation.

The induction of the antioxidant system is regulated by the nuclear factor-erythroid 2-related factor-2 (Nrf 2) which is a master switch for antioxidant signaling.

ALGYL® offers important antioxidant and detoxification potential against several kinds of stress for building strong antioxidant shield. It may stimulate the Nrf 2 transcription factor for improving the cellular defense.

► Evaluation of the expression of genes involved in antioxidant & detoxification process

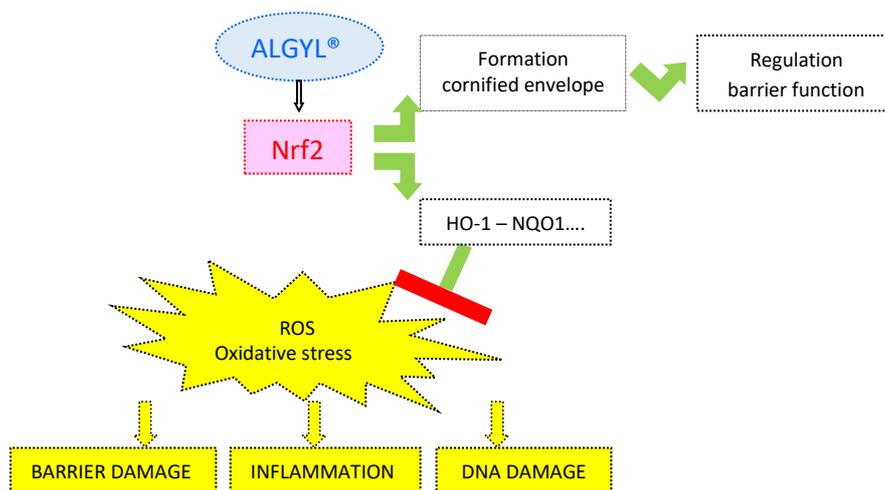
Gene abbreviation	Gene name	Expression change*	p value (t-test)
HMOX1	Heme oxygenase 1	372	0.0001
NQO1	NAD(P)H dehydrogenase (quinone) 1	10.35	0.0001
GADD45 A	Growth arrest and DNA damage-inducible protein GADD45 alpha	4.42	0.0037
HAL	Histidase	3.12	0.0126
RORA	Nuclear receptor ROR alpha	2.59	0.0115
NFE2L2	Nuclear factor erythroid 2-related factor 2 (Nrf 2)	1.98	0.0162

*relative expression compared to untreated control

- **HMOX1** protective effects against oxidative injury, cellular stress notably UVA protection.
- **NQO1** important detoxification enzyme, also antioxidant role.
- **GADD45** involved in cell cycle regulation, apoptosis, DNA repair, immune response. Its overexpression results in an increase of stress resistance.
- **HAL** produces urocanic acid that would protect the epidermis against UV radiation acting as a natural sunscreen.
- **RORA** involved in cellular stress response notably the antioxidant response.
- **NFE2L2** important transcription factor regulating antioxidant responses and controlling numerous skin barrier structural and functional components.

► By inducing numerous gene expressions related to oxidative stress and detoxification process, ALGYL® may supplement the endogenous skin protection for preventing damage induced by free radicals and environmental aggressors notably UV radiation.

► ALGYL® is able to up regulate the Nrf 2 transcription factor, a major actor in numerous process, notably antioxidant signaling but also regulation of barrier function through increased cornified envelopes.



Beneficial effects of ALGYL® on skin hydration and barrier functions

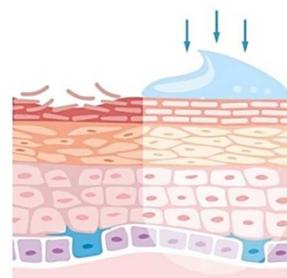
Several sets of clinical studies have been conducted on Caucasian women in order to evaluate the impact of ALGYL® included in formulations on the skin hydration and barrier functions by using different specific methods.

Effects of ALGYL® on skin hydration

Skin hydration reflects the water content of the *stratum corneum*.

Corneocytes, like living cells, require water to be metabolically active. Epidermis must retain sufficient water to

- ▶ hydrate the outer layers of the *stratum corneum* to maintain its flexibility and deformability and
- ▶ provide enough water to allow enzyme reactions that facilitate *stratum corneum* maturation events, together with corneodesmolysis and ultimately desquamation.



Collaboration: COMPLIFE - Italy

Method

This study has been performed on 20 female volunteers, aged from 20 to 62 years old, with dry-dehydrated skin with twice daily application of the product or placebo during 14 consecutive days on legs: emulsion with 3% ALGYL® on one legs (anterior surface of the thighs) and the placebo on the other legs according to a previously defined randomization scheme.

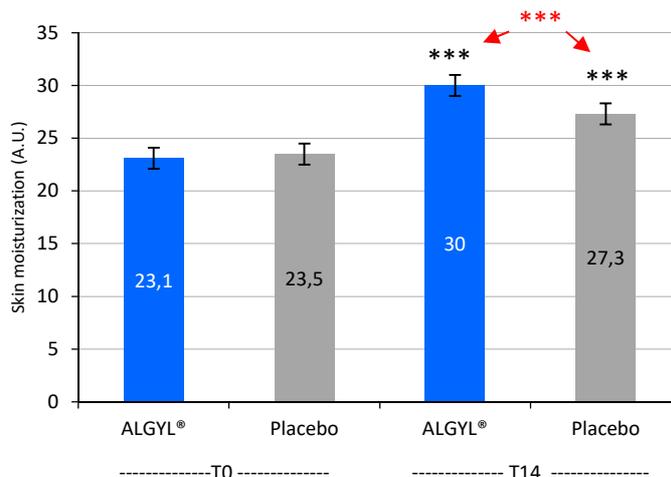
Measurement have been done with CORNEOMETER before treatment (T0) and after 14 days (T14) of used products.

Ingredients of the used emulsion:

AQUA (WATER), ISONONYL ISONONANOATE, GLYCERYL STEARATE, PEG-100 STEARATE, CETEARYL ALCOHOL, GLYCERIN, PENTYLENE GLYCOL, PHENOXYETHANOL, ALGYL (3%), ACRYLATES/C10-30 ALKYL ACRYLATE CROSSPOLYMER, CHLORPHENESIN, XANTHAN GUM, PEG-8, SODIUM, HYDROXIDE, TOCOPHEROL, ASCORBYL PALMITATE, ASCORBIC ACID, CITRIC ACID.

Results

Data are expressed as Arbitrary Corneometric Unit (A.U.). Asterisks in the graph report the intra-group (black asterisk) and inter-group (red asterisk) statistical analysis. Intra-group statistical analysis vs T0 – Inter-group statistical analysis ALGYL® versus placebo.



After 14 days of a twice daily application of an emulsion containing 3% ALGYL®, a highly significant increase (***) is observed versus placebo.

▶ ALGYL® offers hydrating effect compared to placebo.

Effects of ALGYL® on skin cohesion

The skin cohesion is indirectly assessed by the evaluation of the protein content on the first *stratum corneum* layers. It may be evaluated by using the technique of the skin stripping (selective removal of the *stratum corneum* layers).

The amount of proteins of corneocytes estimated on the strips is inversely correlated with cell cohesion.

Collaboration: COMPLIFE - Italy

Method

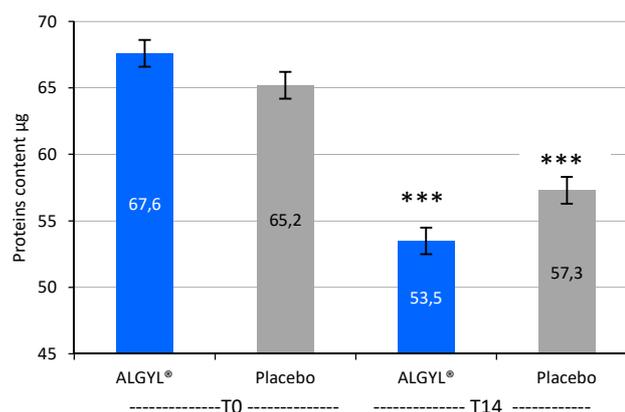
This study completes the previous study on 20 female volunteers with the same experimental conditions, with 3% ALGYL® emulsion versus placebo. Samples of the *stratum corneum* are collected by using CORNEOFIX® (Courage + Khazaka, electronic GmbH) in order to determine the protein content by the Lowry assay after 10 consecutive tape strips collected from the same skin area. Sampling is carried out before treatment (T0) and after 14 days (T14) of used products.

Results

Data are expressed in µg.

The protein content decreases by -20.6 % in the active product treated area and by -11.9 % in the placebo treated area. Variations recorded are highly significant.

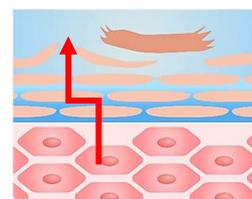
- **ALGYL® induces significant improvement of skin cohesion in the treated area compared to placebo area, therefore the skin barrier is reinforced.**



Effects of ALGYL® on water loss

The skin acts as an inside-out barrier to prevent excessive water loss by regulating Trans Epidermal Water Loss (TEWL). TEWL represents the diffusion of condensed water through the *stratum corneum* but exclude other forms of water loss such as perspiration.

Increase TEWL is associated with increased skin permeability and chemical absorption.



Collaboration: EUROFINS - France

Method

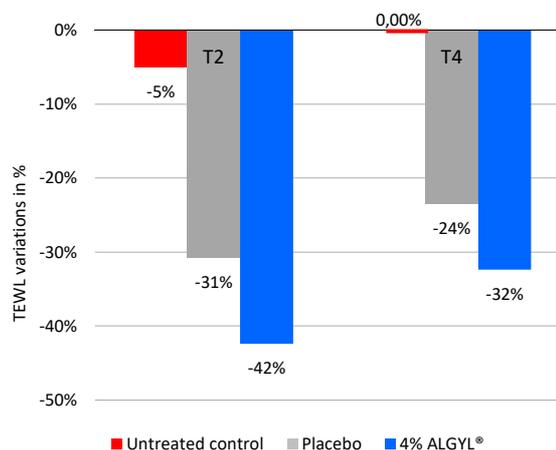
This study concerns the measurement of TEWL on 10 female volunteers with *normal skin* (aged from 30 to 70 years) at T 2 hours and T 4 hours using TEWAMETER TM 300 compared to the baseline (untreated skin) after a single and standardized application (dose 2 µL/cm²) on the forearms of a Carbopol gel containing 4% ALGYL® versus placebo.

Results

A significant decrease in the mean values is detected after 2 hours and 4 hours compared to placebo (** p < 0.05).

- **ALGYL® offers an immediate effect by significantly minimizing TEWL on normal skin after 2h and 4 h of a single application only versus placebo.**

- **ALGYL® limits water loss and keeps the water balance.**



Cosmetic benefits

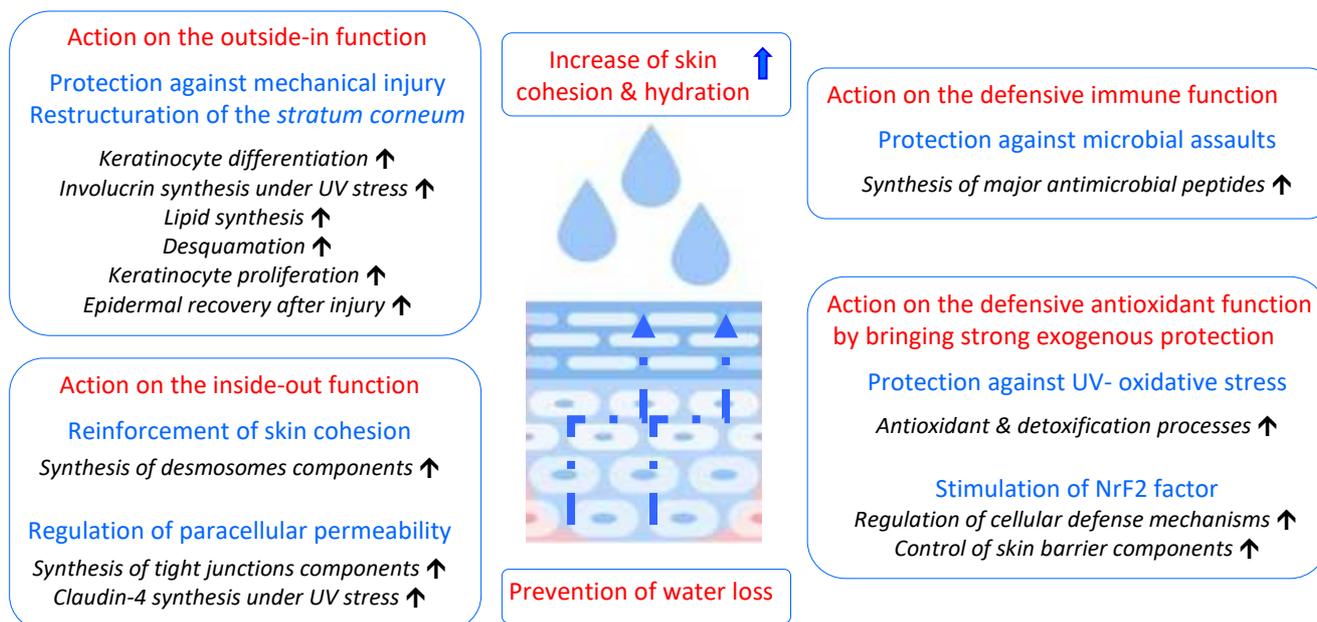
Thanks to the conjugated properties of three red seaweeds (*Gigartina stellata* - *Kappaphycus alvarezii* – *Corallina officinalis*) in synergism with glycerin, ALGYL® improves efficient skin barrier functionality with intelligent ways of action.

Its beneficial effects of ALGYL® have been demonstrated by

- (1) gene expression profiling on normal human keratinocytes (dose 1.5%) showing the up-regulation of key biomarkers involved in several pathways notably cell differentiation and
- (2) immunolabeling studies on irradiated human skin explants *versus* placebo (doses 1% -2%) illustrating the increase of involucrin and claudin-4 synthesis under stress conditions.

They have been completed by clinical studies (doses 3% - 4%) proving the improvement of skin hydration and cohesion and the decrease of water loss.

The advantageous effects of ALGYL® on skin barrier functions may be summarized here after.



As results with ALGYL® the skin appears more hydrated and protected, more resistant to external damage, notably UV radiation with healthier appearance.

Cosmetic applications

- Facial treatments for dehydrated skin,
- Specific day-care treatments for dry, damaged or mature skin.
- Sun care and after sun products.

Recommended use levels: 1 % - 4 %.



Regulatory data

INCI names	CAS n°	EINECS n°	CHINA compliant (list 2015)	
water	7732-18-5	231-791-2	06260	水
glycerin	50-81-5	200-289-5	02421	甘油
<i>Gigartina stellata</i> / <i>Kappaphycus alvarezii</i> extract	223751-69-7	-	07234	星芒杉藻 (GIGARTINA STELLATA) 提取物
	-	-	08518	长心卡帕藻 (KAPPAPHYCUS ALVAREZII) 提取物
<i>Corallina officinalis</i> extract	89997-92-2	289-730-0	05972	珊瑚藻 (CORALLINA OFFICINALIS) 提取物
Preservative	as required	-	-	-