SUN'ALG®

Natural protective shield

against

UVA + UVB + blue light hazards

Gelyma

The sun is vital source of energy for all life on Earth and the life is impossible without sun. It emits roughly 3-7% UV radiation (290-400 nm), 44% of visible light (400-700 nm) and 53% of infrared radiation (700-1440 nm).

The solar spectrum is composed of various wavelength radiations having specific as well as overlapping and synergistic effects on skin, all generating important damage as described by Dupont E. *et al.* (2013 - J. Int. Cosmetic. Sci. 1-9 - *cf.* Fig. 1).

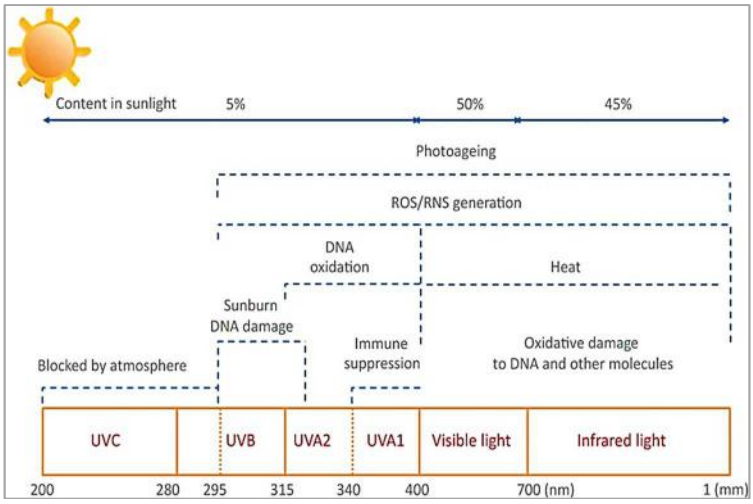


Fig. 1

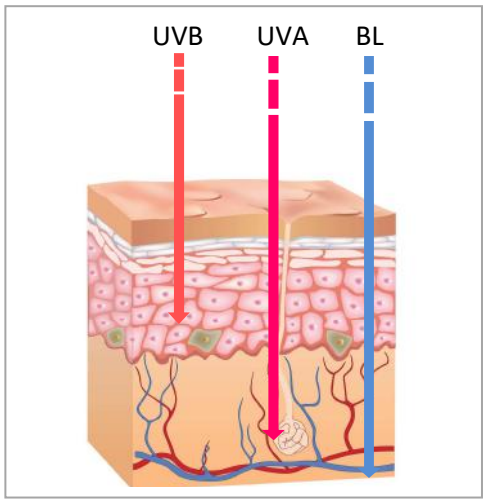


Fig. 2

UVB radiation (290-320 nm) is biologically very active. It penetrates the superficial layers of skin, down to the basal layer of the epidermis (Fig. 2) where it generates dangerous reactive oxygen and nitrogen species (ROS and RNS respectively), inducing inflammation, sunburn and skin aging.

UVA radiation (320-400 nm) penetrates more deeply in the dermal layers (Fig. 2). It also generates ROS and RNS that alter proteins, lipids and DNA, therefore contributing to premature skin aging, wrinkle formation and risk of cancers through the formation of oxidized DNA bases.

Visible light presents a high energy visible zone (HEV) between 380-495 nm that corresponds to blue-violet. It is also generated indoor by LED lighting and numerous man-made devices *e.g.* smart phones, tablets, flat-screen TV.
Blue light penetrates deeply into biological tissues (Fig. 2) and about 20% reaches the hypodermis (Svobodova A. & J. Vostalova J. 2010 - Int. J. Radiat. Biol. 86: 999-1030). It affects the skin differently that UV rays without any association with sunburn and skin cancer. It can cause photoaging and formation of age spots as UVA and UVB through many ways, notably the generation of oxidative damage. It additionally appears to damage DNA through the formation of oxidized DNA bases as seen with UVA (Cadet J. *et al.* 1997- Biol. Chem. 378: 1275-1286; Kielbassa C. *et al*. 1997- Carcinogenesis 18: 811-816) but not through dimer formation (Liebel F. *et al*. 2012 - J. Invest. Dermatol. 132: 1901-1907). It induces drastic molecular and cellular changes in normal human fibroblasts (Oplander C. *et al.* 2011- J. Photoderm. Photobiol. B Biology 103: 118-125; Rascalou A. *et al*. 2018 - J. Dermaol. Sci. 5 pii SO923-1811).

In fact, all solar wavelengths notably high energy blue-light exposure generates ROS and contribute to skin damaging and therefore to skin aging.

Consequently, the prevention of such damage became a big health concern. Until recently, sun protection was essentially addressing the effects of UV radiation on skin. However, taking into account the damaging effects of other wavelengths, notably blue light, it appears that UVB-UVA sunscreen may not be sufficient to bring a performant protection. Skin should also be protected from HEV light/Blue light.

The study of Liebel F. *et al.* (2012 - J. Invest. Dermatol. 132: 1901-1907) proved that an application of a UVA/UVB sunscreen was unable to inhibit free radicals generated from visible light, whereas addition of a combination of anti-oxidants to the formulation significantly reduced their number by 54%. According to Haywood R. *et al.* (2012 - Free. Radic. Res. 46: 265-275), even a cream with SPF 50 and high UVA protection was only efficient at 53% against solar-generated ROS without any protection against visible light induced ROS.

So, it appears important to:

- neutralize the influence of reactive species emitted from visible radiation, notably from blue light, in addition to an efficient UVA/UVB protection,
- satisfy an increasing demand of natural products for healthier, safer and more effective solar protection.

Thanks to advanced research and testing, GELYMA proposes SUN'ALG® an innovative combination of natural bioactive ingredients, sustainably sourced:

- *Pongamia glabra* seed oil (Karanga seed oil, deodorised grade) provides a primary shield against UV radiations, acting as natural sunscreen thanks to its important absorption ability especially for UVB but also for UVA,
- two microalgal extracts bring additional protective capacity against the oxidative stress thanks to their mixed carotenoids content, these two microalgae having not been chosen by random:
  - *Dunaliella salina* extract is mainly rich in β-carotene,
  - *Haematococcus pluvialis* extract is chiefly rich in astaxanthin.

Due to its unique ingredients combination, stable to temperature and UV radiations, rich in carotenoids, known as efficient photoprotectants against sun light (Stahl W & H. Sies 2012 – Am. J. Clin. Nutri. 1179S-1184S) as well as blue light exposure, SUN'ALG® :

- increases free radical scavenger potential,
- reinforces the skin's metabolism by boosting genes linked to oxidative stress, DNA repair, skin defence barrier function,
- protects against both UVA and UVB radiations,
- prevents epidermal cell apoptosis associated with DNA damge by reducing the number of sun burn cells,
- inhibits the release of reactive oxygen species generated by blue light,
- prevents dermis from degradation under blue light exposure, notably preserves elastin capital,
- protects against protein carbonylation induced by blue light,
- limits inflammatory skin reactions.

Clinically tested, SUN'ALG® reduces redness and soothes sunburns.

Hence, SUN'ALG® provides efficient skin protection against the harmful damage caused by the exposure to UV radiations as well as to blue light , therefore SUN'ALG® reduces skin damage caused by these light sources and minimizes signs of premature photoaging.

With SUN'ALG® , the skin looks healthier , visibly revived and well protected.

Mechanisms of action

The mechanisms of action of SUN'ALG® have been proven by using different methods *e.g*. transcriptomic analysis, *in vitro*, *ex vivo* testing and clinical study.

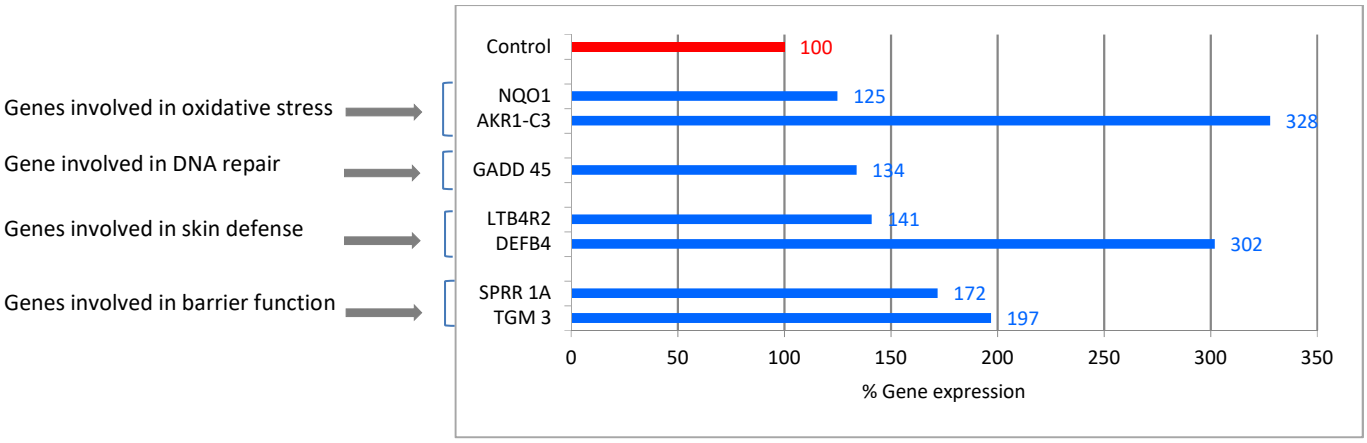
SUN'ALG ® reinforces the skin's metabolism by boosting defense mechanisms

Human skin is constantly directly exposed to solar radiation, other environmental pollutants or other mechanical and chemical insults which are able to induce important damaging effects.

So it is important to actively and effectively combat factors which harm the skin *e.g*. cellular aging, oxidative stress, skin barrier deterioration and DNA degeneration.

Method:
Genomic analysis on pigmented reconstituted epidermis treated with 5% active in a basic Carbopol gel for 24h. Analysis by qRT-PCR on TaqMan cards
Collaboration Strati CELL-Belgium.

➤ Overexpression of major genes related to several protective mechanisms.



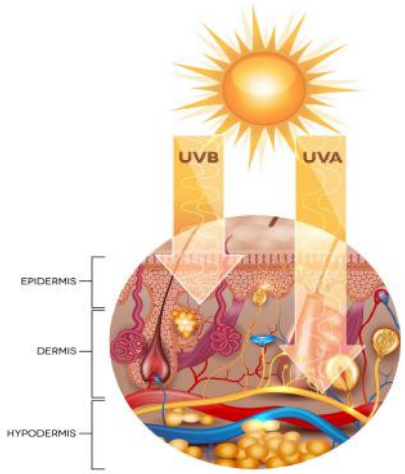
By over expressing genes linked to:	
the oxidative response	→ SUN'ALG® detoxifies skin cells & protects towards oxidative and cellular stress with up regulating: ➤ NQO1 a multifunctional detoxification and antioxidant enzyme ➤ AKR1-C3 involved in cell resistance and regulation of Nrf 2 factor
DNA repair	→ SUN'ALG® helps maintaining genomic integrity in UV-exposed skin: ➤ GADD 45 known to take part in DNA repair and stress resistance
the anti-microbial defense	→ SUN'ALG® is able to contribute to the innate skin defense by improving: ➤ the epidermal capacity against microbial attacks (action on DEFB4) ➤ the ability of cell responses to activate host defense (action on LTB4R2)
the reinforcement of the barrier function	→ SUN'ALG® reinforces the epidermal barrier function by: ➤ helping catalyse cross-linking reactions between proteins during the skin cornification (action on TGM3) ➤ providing the outer layer with a highly protective antioxidant shield (action on SPRR1A-cornifin).

➤ SUN'ALG® is able to boost skin metabolism by stimulating major defense mechanisms.

Therefore, SUN'ALG® helps skin to defend itself from cutaneous damage provoked by different kinds of stress.

SUN'ALG ® protects against both UVA and UVB radiations

UVA and UVB radiations are known to generate severe oxidative stress in skin cells *via* interactions with intracellular chromophores and photosensitizers, resulting in transient and permanent genetic damage, and in the activation of cytoplasmic signal transduction pathways that are related to growth, differentiation, replicative senescence and connective-tissue degradation.

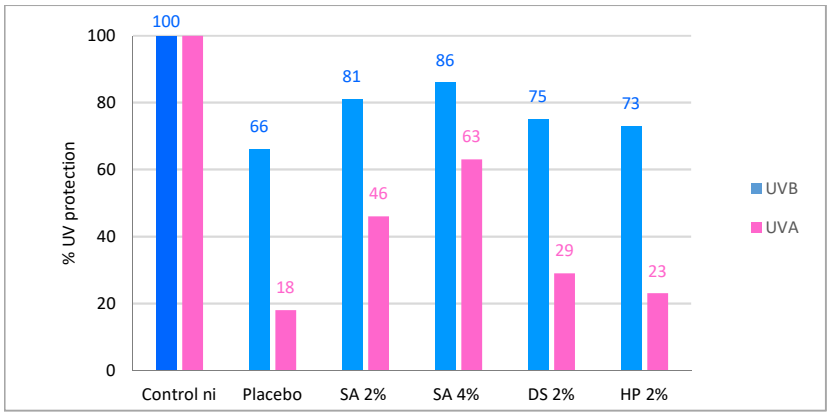


UVA radiation penetrates deeper into the epidermis and the dermis of the skin and acts indirectly through the generation of reactive oxygen species which subsequently can exert a multitude of effects such as lipid peroxidation and generation of DNA-brand breaks. It is more abundant in sunlight than UVB radiation (95% of UVA and 5% UVB) and therefore exhibits more severe damage than UVB. Long term UVA exposure can cause premature skin photoaging and produce structural changes in DNA which in turn results in cancerous condition.

UVB radiation acts predominantly in the epidermal cell layers of the skin.
It is 1000 times more capable of causing sun burn than UVA due to its most energetic wavelengths. It is more genotoxic than UVA inducing direct and indirect adverse biological effects such as free radical production in the skin, cell cycle growth arrest, photoaging and photocarcinogenesis.

➤ Increase of cell viability under UVA and UVB exposure *(ex vivo study on reconstituted human epidermis)*

Method:
In vitro studies on reconstituted human epidermis submitted to UVA (20 J/cm²) or UVB (200 mJ/cm²) in the absence or the presence of basic Carbopol gels including (or not Placebo) SUN'ALG® (SA 2% or SA 4%) or algal extracts (same concentration than in SUN'ALG®) Dunaliella salina extract (DS 2%) or Haematococcus pluvialis extract (HP 2%).



Results show that the both microalgae are suitable to fight UVA and UVB radiations but the complex is more effective.

SUN'ALG® and the two algal extracts show superior protection than placebo against both UVA and UVB.

➤ SUN'ALG® protects against UVA and UVB induced damage.

With 2% SUN'ALG®, the protection reaches:
+ 46 % against UVA
+ 81 % against UVB.

SUN'ALG ® prevents the formation of sun burn cells associated to DNA damage

Acute UV radiation exposure is associated with formation of dyskeratotic cells, called sun burn cells in the epidermis. (Young A.R. 1987 - Photodermatol. Photoimmunol. Photomed. 4: 127-134, Kulms D. & T. Schwarz 2000- Photodermatol. Photo-immunol. Photomed 16: 195-201).

Their formation appears as a consequence of UVB-induced DNA damage. However, it is also found after irradiation with UVC and high doses of UVA, though to a much lesser extent (Kumakiri M. *et al*. 1977 - J. Invest Dermatol. 69: 392-400; Young A.R. 1987 - Photodermatology 4: 127-134). They are not associated with visible light.

Sun burn cells show typical morphologic features such as a shrunken eosinophilic cytoplasm with a condensed pyknotic nucleus which make them easily recognizable in sections (Danno K. & T. Horio 1987 - Photochem. Photobiol. 45: 683-690). They represent the morphological ultimate stage of apoptotic cell death induced when the amount of DNA damage is too elevated to be repaired (Ziegler A. *et al*. 1994 - Nature 372: 773-776).

Their density is another indicator of the amount of DNA damage (Bayerl S. *et al*. 1995 - Photodermatol. Photoimmunol. Photomed. 11: 149-154).

Sun burn cells are detectable as early as 8h after UV exposure and are maximally expressed after 24-48h (Woodcock A. & I.A. Magnus, 1976 - Br. J. Dermatol. 95: 459-468). Their number would decrease and DNA fragmentation would be reduced in proportion to the UVA/UVB ratio (Green E.A. *et al*. 2002 - Immunity 16: 183-191).

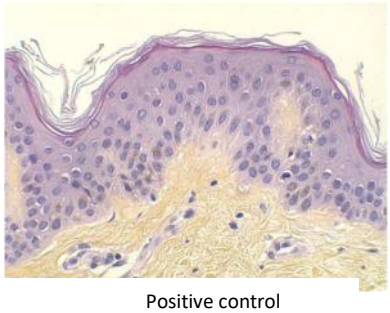
➤ Reduction of the number of sun burn cells *(ex vivo study on irradiated skin human explants)*

Method:
Ex vivo studies on skin human explants submitted to basic Carbopol gels with 2.5% or 5% SUN'ALG® for 24h. Irradiation UVA 8 J/cm² + UVB 200 mJ/cm². Observation of the eventual presence of sun burn cells 24h after irradiation. Positive control: Trade Cream SPF 50.

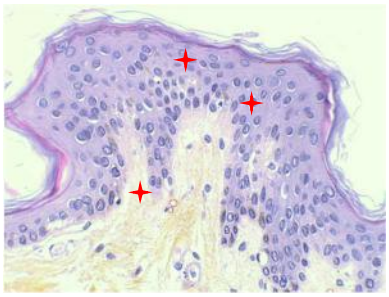
Collaboration SEPhRA-France.

Control
no irradiation-no treatment

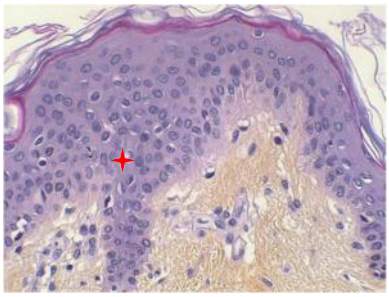
Control
UV irradiation-no treatment



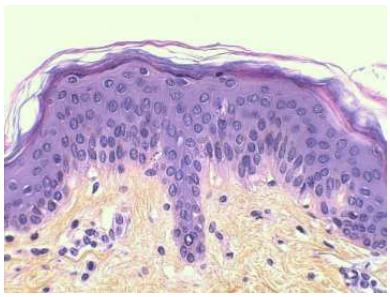
Positive control
UV irradiation Cream SPF



Placebo
UV irradiation



SUN'ALG® 2.5%
UV irradiation



SUN'ALG® 5%
UV irradiation

SUN'ALG® is able to reduce the number of sun burn cells highly significantly ✦.

With 5% in a basic Carbopol gel, the efficacy is comparable with those of the positive control (cream SPF 50).

➤ SUN'ALG® reduces the number of sun burn cells after UV exposure.

SUN'ALG ® inhibits the formation of reactive oxygen species generated by blue light

Blue light is everywhere from the sun or artificial sources such as electronic devices *e.g.* cell phones and computers as well as LED lighting. Consequently, the skin is exposed to HEV light for substantial durations of the day in addition to UV radiations.

Visible light photons are less energetic than UV photons but they penetrate deeper into dermis inducing damage due to cumulative effects, therefore HEV/Blue light contributes to premature skin aging.

Liebel F. *et al.* (2012 - J Invest. Dermatol. 132: 1901-1907) described that the irradiation of skin cells with visible light (from 400-700 nm), in doses comparable to 15–90 minutes of sunlight exposure, elicited a response similar to that induced by UV radiation in terms of inflammation and ROS production.

The generation of ROS is estimated at 50% for visible light, 46% for UVA and only 4% for UVB (Zastrow L. *et al.* 2009 - Skin. Pharmacol. Physiol. 22: 31-44). The ROS produced by blue light would be probably due to superoxide, not singlet oxygen (Nakashima Y. *et al*. 2017 - Free Radical Biol. Med. 108: 300-310).

According to Opländer *et al*. (2011 - J. Photochem. Photobiol. B 103 (2): 118-125), blue light exposure on human dermal fibroblasts induces varying degrees of intracellular oxidative stress and toxic effects in a dose and wavelength dependent.

It is also proven that the irradiation of the human skin with blue-violet light would result in a dose-dependent significant degradation of the epidermal antioxidants with the depletion of higher amount of cutaneous carotenoids (Vandersee S. *et al.* 2015 - Oxidative Medicine and Cellular Longevity, Article ID 579675, 7 pages).

Therefore, the skin protection against the generation of ROS emitted from HEV / Blue light becomes essential.

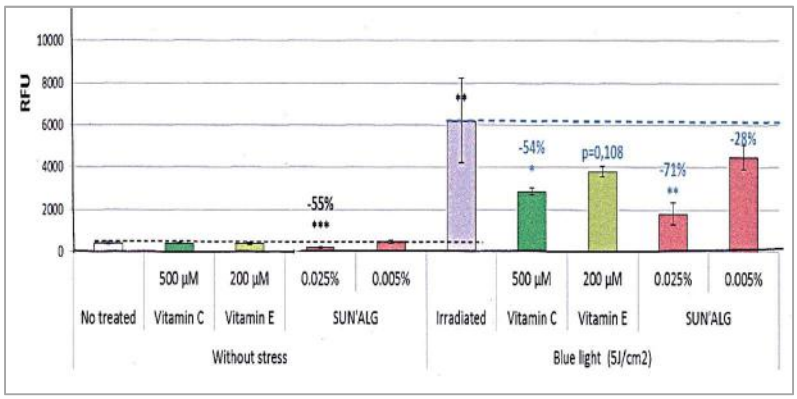
➤ Reduction of ROS production by blue light exposure *(in vitro study on normal human fibroblasts)*

Method:
In vitro studies on ROS production on normal human fibroblasts in culture submitted to blue light irradiation at 453 nm, 5 J / cm² after 24h treatment with SUN'ALG® (doses 0.025% and 0.005%) or with standards: Vitamin C (dose 500µM) and vitamin E (dose 200 µM).

Collaboration SEPhRA-France.

Results are expressed as RFU (real fluorescence units) and as percentages (ROS production induction or inhibition) reported to adapted control.

SUN'ALG® as the both standards inhibits the production of ROS caused by blue light.



SUN'ALG® inhibits by 71% ROS production caused by blue light at 5J/cm² at 0.025% (significant effect) and by 28% at 0.005%.

➤ SUN'ALG® is able to counteract the production of reactive oxygen induced by blue light exposure.

➤ Thanks to its richness in carotenoids, SUN'ALG® is able to supplement skin in anti-oxidants. Therefore SUN'ALG® may contribute to restore cutaneous carotenoid levels after their degradation by blue light.

SUN'ALG ® prevents dermis from degradation caused by blue light and preserves elastin capital

Blue light exposure is able to degrade dermis by :

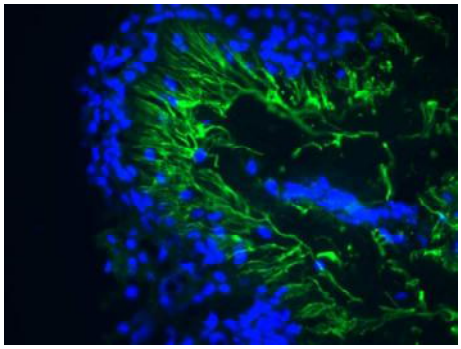
- the release of enzymes metalloproteinases (MMPs), notably MMP-1 and MMP-9, that degrade dermal fibres causing premature aging (Liebel F. *et al*.2012 – J. Invest. Dermatol. 132: 1901-1907),
- the increase of MMP-1 and MMP-9 expression and decrease type I procollagen expression in the skin (Cho S. *et al*. 2008- J. Dermatol. Sci. 50 (2) : 123-133),
- the increase of MMP-12 (elastase) expression (Barbagallo M. 2018 -Personal care Europe 12 (2).

➤ Preservation of elastin network under blue light exposure *(ex vivo study on human skin explants)*

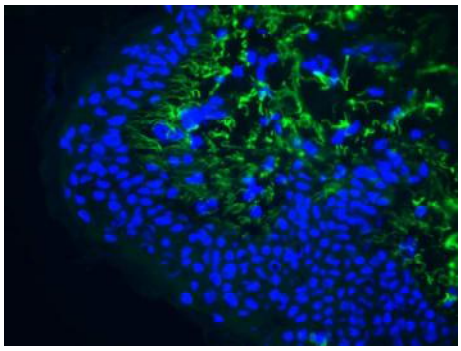
Method:
In vitro studies on human skin explants pre-treated 24 h with either placebo or basic gel with 2.5% SUN'ALG® then irradiated 3 times with blue light (453 nm-5 J/cm²) with a treatment interval of 24h between each irradiation. Immunolabelling of elastin with specific fluorochromes and of nuclei with DAPI (Roche). Observation by fluorescence. Images made with the x 40 lens.

Collaboration SEPhRA-France.

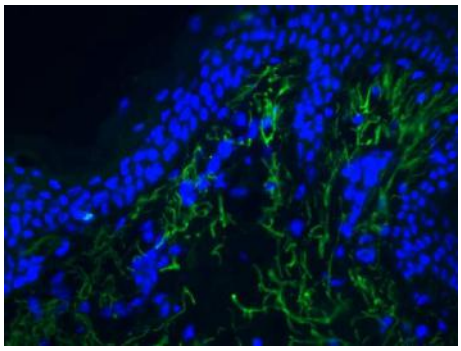
The images here after show the expression of elastin in different experiments. Cell nuclei are colored in blue and elastin fibres in green.



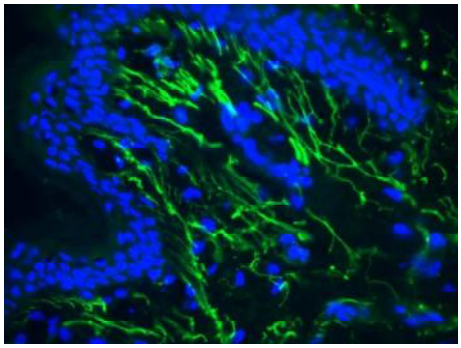
Control -no blue light irradiation-no treatment



Control – Blue light irradiation-no treatment



Placebo – Blue light irradiation



SUN'ALG® 2.5% - Blue light irradiation

The irradiated- untreated explant demonstrats elastin fibers smaller and less oriented than the unirradiated- untreated explant. Morever, the elastin network appears less dense.

Placebo looks prevent the fragmentation of elastin fibers that appears longer than in irradiated explant without any treatment.

The explant irradiated and treated with SUN'ALG 2.5% presens longer, larger and more oriented elastin fibers than placebo.

➤ SUN'ALG® at 2.5% in a basic gel is able to prevent elastin fragmentation and rupture of fibers after blue light irradiation.

Therefore SUN'ALG® safeguards elastin capital and counteracts the loss of skin elasticity.

SUN'ALG ® protects against the protein carbonylation induced by blue light

Reactive oxygen species can modify proteins in tissue to form carbonyl derivatives (Stadtman CSC. 1992 - Science 257:1220-1224; Nystrom T. 2005-The EMBO Journal 24: 1311 – 1317).

Carbonylation of proteins leads to a loss of protein function due to the implication of the proteasome complex. It is associated with a variety of metabolic diseases and conditions including aging.

UVA/UVB exposure inducing photoaging is associated with protein oxidation in human skin, due to depleting anti-oxidant enzymes (Sander C.S. *et al*. 2002 - J. Invest. Dermatol. 118: 618-625).

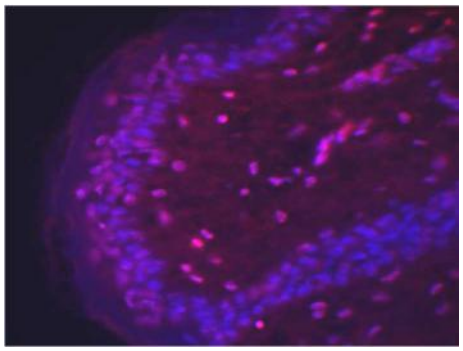
Blue light exposure also induces the oxidation of proteins du to the generation of superoxide anion radicals through a particular photosensitizing reaction (Mizutani T. *et al*. 2016 - J. Dermatol. Sci. 84 (3): 314-321).

➤ Inhibition of protein carbonylation under blue light exposure *(ex vivo study on human skin explants)*

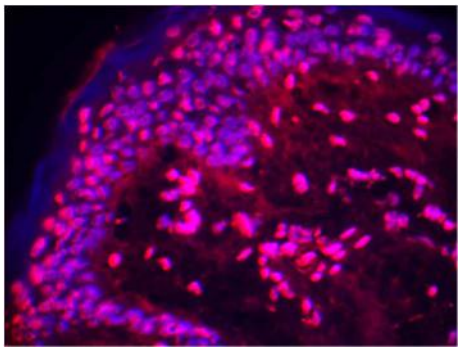
Method:
In vitro studies on human skin explants pre-treated 24 h with either placebo or basic gel with 2.5% SUN'ALG ®then irradiated 3 times with blue light (453 nm-5 J/cm²) with a treatment interval of 24h between each irradiation. Immunolabelling of oxidized proteins with specific fluorochromes (DNPH) and of nuclei with DAPI (Roche). Observation by fluorescence . Images made with the x 40 lens.

Collaboration SEPhRA-France.

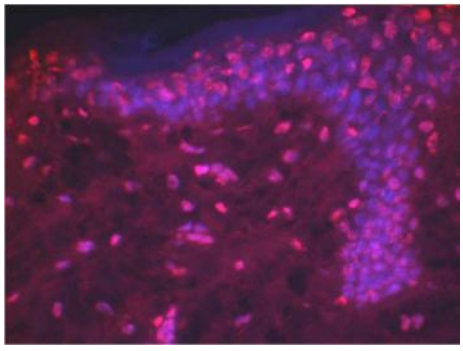
The images here after show the expression of oxidized proteins in different experiments. Cell nuclei are colored in blue and oxidized proteins in characteristic red points.



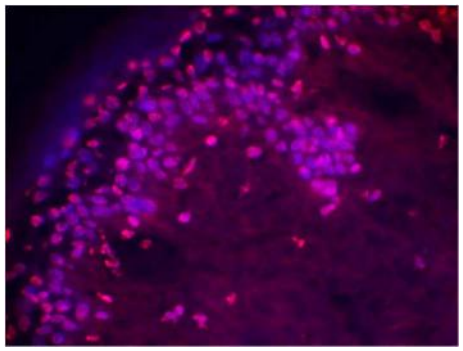
Control -no blue light irradiation-no treatment



Control – Blue light irradiation-no treatment



Placebo – Blue light irradiation



SUN'ALG® 2.5% - Blue light irradiation

The irradiated explant present more characteristic points relative to oxidized proteins than the untreated explant.

The explant irradiated and treated with SUN'ALG 2.5% show less oxidized proteins than placebo irradiated.

➤ SUN'ALG® at 2.5% in a basic gel is able to reduce protein oxidation after blue light irradiation.

Therefore SUN'ALG® protects the protein function avoiding its deterioration.

SUN'ALG ® limits inflammatory skin reactions

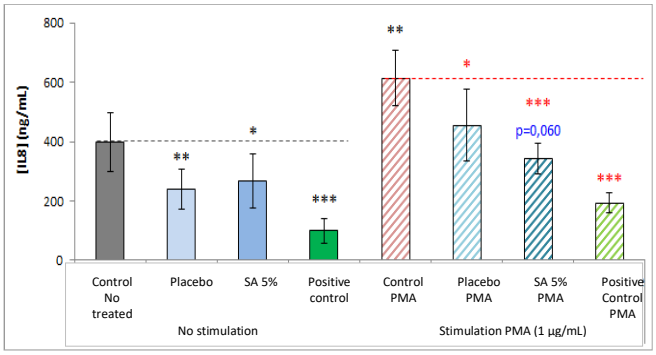
Light exposure of the skin can induce inflammatory conditions resulting from aberrant production of inflammatory factors such as chemokines, notably the chemokine IL-8. Inflammation induces oxidative stress and reduces cellular antioxidant capacity.

➤ Inhibition of the release of IL-8 *(ex vivo study on human skin explants)*

Method:

Ex vivo studies on skin human explants submitted to a basic Carbopol gel with 5% SUN'ALG® for 24h. Evaluation of the release of Il-8 by ELISA testing- Stimulation PMA (1 µg/mL). Positive control: trade Cream SPF 50.

Collaboration SEPhRA-France.



The basic Carbopol gel with 5% SUN'ALG® inhibits the release of interleukin IL-8 highly significantly by:

- 33% without PMA stimulation,
- 44% with PMA stimulation.

➤ SUN'ALG® is able to protect the skin against inflammatory stress, indirect consequence of UV radiation and cause of premature skin aging.

SUN'ALG ® diminishes redness and soothes sunburns

Sunburn also called erythema is one of the most obvious signs of UVB exposure and skin damage, increasing the risk of premature aging, dark spots, actinic keratosis and even skin cancer. It can occur in less than 15 minutes. After the exposure, skin may turn red in a little as 30 minutes but most takes 2 to 6 hours, the burn continuing to develop for 24 to 72 hours.

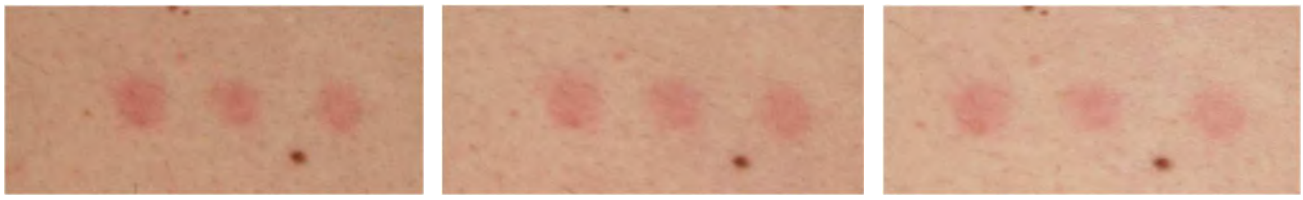
➤ Decrease of UV-induced erythema *(Clinical study)*

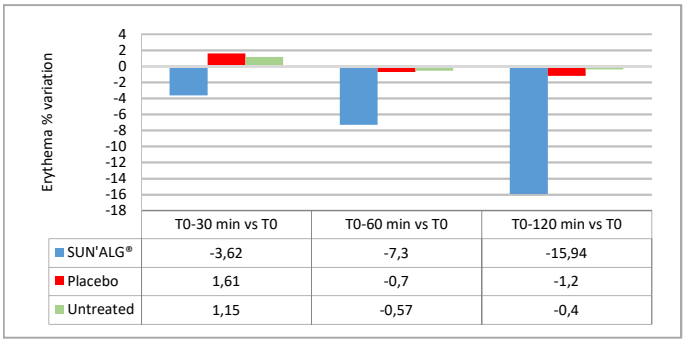
Method:

In vivo studies on 10 volunteers, male and female, 18-65 years old. Evaluation of the soothing effect of a basic Carbopol gel with 5% SUN'ALG® after UVA+UVB (DEM x 1.5) irradiation. Observation at 30 min, 60 min and 120 min from application.

Collaboration ABICH-Italy.

T0 T0 + 30 min T0 + 120 min





	T0-30 min vs T0	T0-60 min vs T0	T0-120 min vs T0
SUN'ALG®	-3,62	-7,3	-15,94
Placebo	1,61	-0,7	-1,2
Untreated	1,15	-0,57	-0,4

➤ SUN'ALG® offers a soothing effect which calms local irritations due to UV radiation.

➤ By diminishing redness and soothing erythema with a short-term efficacy, SUN'ALG® helps to prevent premature aging of the skin due to sun exposure.

Cosmetic benefits

The cooperative combination of *Pongamia glabra* seed oil and microalgae extracts brings a superior and efficient protection against damaging effects of UV exposure as well as blue light exposure.

SUN'ALG® is able to:

- reinforce the skin' defence mechanisms by up regulating various genes involved in the oxidative stress, DNA repair, the antimicrobial defence and the reinforcement of the barrier function,
- provide reinforced protection against both UVA and UVB radiations,
- prevent the formation of sun burn cells from the negative effects of UV rays.

The efficacy of SUN'ALG® under blue light exposure has been proven by *in vitro* and *ex vivo* testing. SUN'ALG® is able to:

- inhibit the formation of reactive oxygen species generated by blue light exposure,
- preserve dermis from damage, notably by its efficient action against the fragmentation of elastin fibers, therefore SUN'ALG® safeguards elastin capital and prevents the loss of skin elasticity and vitality,
- protect against protein carbonylation, therefore SUN'ALG® helps avoid the deterioration of the protein function.

Clinically tested, SUN'ALG® diminishes redness and soothes sunburns with a short term efficacy (after 30 - 60 - 120 min) from application. This soothing potential confirms *ex vivo* testing on the inhibition against inflammatory skin reactions (inhibition of the IL-8 release).

This finally leads to:

- ➤ better protect against the daily attacks by UV ray and visible blue light,
- ➤ maintain skin healthier for a beautiful complexion,
- ➤ prevent the apparition of lines and wrinkles, caused by extrinsic aging process.

Cosmetic applications

Skin care for daily protection - Suncare products
Daily creams and lotions - Anti-aging products.

INCI names: *Pongamia glabra* seed oil (and)
(Dunaliella salina / Haematococcus pluvialis) extract.

Recommended use levels: 2% - 5%.

Distinctive composition of SUN'ALG®

The cosmetic efficacy of SUN'ALG® is linked to its specific combination of a plant oil with a plankton extract made from two different microalgae: *Dunaliella salina* and *Haematococcus pluvialis* sustainably sourced.
Each component complements one another in skin protection.

➤ Benefits provided by *Pongamia glabra* seed oil

The solar protective activities of this oil are found to be highly effective in UVB region and moderately effective in UVA region.

➤ Benefits provided by combined microalgae extracts

The association of two microalgal extracts, rich in carotenoides, has been carefully chosen:

- *Dunaliella salina* is mainly rich in β-carotene including two main isomers 9-cis and all-trans, showing different functions. The 9-cis isomer is known as one of the most powerful antioxidant and the all-trans isomer is a major pro-vitamin A nutrient but with a little antioxidant activity. Moreover, these isomers are mixed with other carotenoids.
- *Haematococcus pluvialis* also contains different carotenoids. In the red cysts used for SUN'ALG® preparation, the major pigment is astaxanthin known as a powerful antioxidant, 100-500 times the antioxidant capacity of vitamin E and 10 times the antioxidant capacity of β-carotene.

Thereby SUN'ALG® contains several kinds of carotenoids extracted from two different microalgae (*Analysis performed on a standard batch by Laboratoires AGROBIO – Qualtech group – France).*

Beta carotene	0.34 mg/100 g SUN'ALG®
Astaxanthin	1.96 mg/100 g SUN'ALG®
Others carotenes	0.27 mg/100 g SUN'ALG®

Thereby, SUN'ALG® offers a composition stable to temperature (80°C) and UVA/UVB irradiation with high free scavenger potential and efficient skin protection against UV rays as well as blue light exposure.

Regulatory data

INCI names	CAS n°	EINECS n°	China IECI listed	
Pongamia glabra seed oil	-	-	06835	无毛水黄皮（PONGAMIA GLABRA）籽油
Dunaliella salina extract	-	-	07377	盐生杜氏藻（DUNALIELLA SALINA）提取物
Haematococcus pluvialis extract	-	-	08210	雨生红球藻（HAEMATOCOCCUS PLUVIALIS）提取物

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