Active Beauty
Mariliance™
Marine neuro-soother

Crafted by blue technology

Givaudan

engage your senses

Focus on the product

Skin neuro sensitisation

Sensitive skin is a complex dermatological condition, defined by abnormal sensory symptoms. This condition affects equally men and women. In the US, 44.6% of the population declared having "sensitive" or "very sensitive" skin[1].
Skin sensitivity is defined by the self-reported presence of different sensory perceptions, including tightness, stinging, burning, tingling, or sometimes pain. It could affect any kind of skin type, and it is mostly subjective and has no external evidences, and it is worsening with environmental factors (pollution, UV, temperature...). Symptoms suggest the involvement of cutaneous nerve fibers and neuronal, as well as epidermal thermochannels such as TRPV-1 receptor[2].

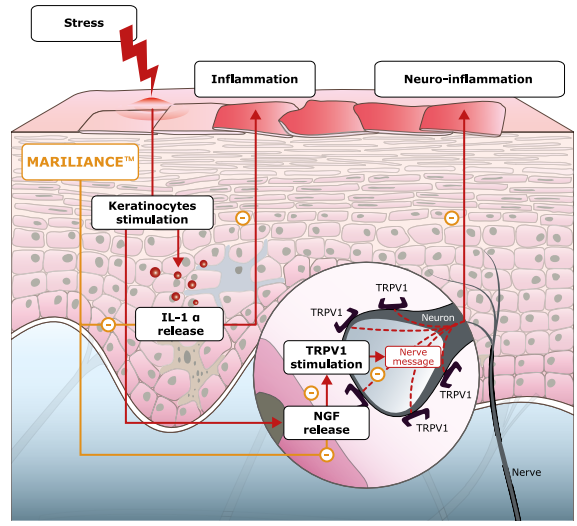
TRPV-1 mediated neuro inflammation

It exists different kind of inflammation; the classical pathway, involving cytokines release (Interleukines) with visible effects, and; the neuro inflammation, perceived by subject only.

When skin is assaulted by external factors, the keratinocytes in the epidermidis will firstly release Interleukine-1α (IL-1α) as an immediate inflammatory response. In a second time, the keratinocytes will communicate with neuron fibers through the Nerve Growth Factor (NGF).

The NGF is responsible of the activation of its specific receptor the trkA (Tropomyosin receptor kinase A) which will interact with the TRPVI receptor and enhance its expression level at the surface of nerve fibers. TRPVI controls the release of neuropeptides and delays barrier recovery.

Upon time a number of inflammatory mediators are released and will increase the sensitivity of nociceptors to noxious stimuli[2] leading to skin long term sensitivity.

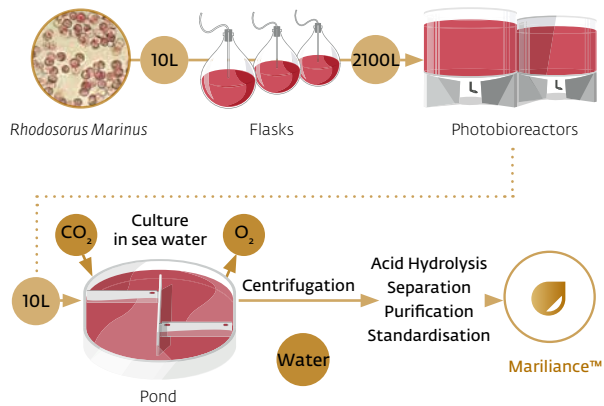


Mariliance™: microalgae extract acting on neuro-inflammation

Mariliance™ is a specific extract from a red unicellular microalgae (*Rhodosorus Marinus*) which was isolated in the French West Indies (Caribbean). Mariliance™ has shown amazing properties to reduce release of inflammatory and neuro-inflammatory mediators in order to reduce the skin sensitivity to external aggressions.

The culture and production of this strain is done in Britanny (France) with a very sustainable process involving no use of petrochemical solvents.

Mariliance™ shows outstanding results after 1 month at the clinical level.



[1]Source: Int J Dermatol. 2011 Aug;50(8):961-7..

[2]Source: J Eur Acad Dermatol Venereol. 2016 Feb;30 Suppl 1:2-8..

Biological activity

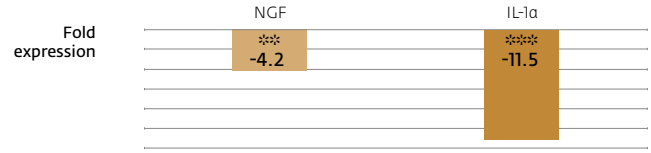
Inhibition of inflammation mediators release (*in vitro* tests)

1. Pro inflammatory genes modulation

Human keratinocytes obtained from skin explants were incubated at 37°C with or without Mariliance™ at 3% for 24 hours. The RNAs sample were extracted and quantified using RT-qPCR.

Results: Mariliance™ shows a **significant down regulation** of **Nerve Growth Factor** (NGF) gene expression and **Interleukine-1α** (IL-1α) gene expression by **4.2** and **11.5** fold respectively. Those two genes are respectively **involved in neuro and classical inflammation pathways**.

Inflammatory gene expression



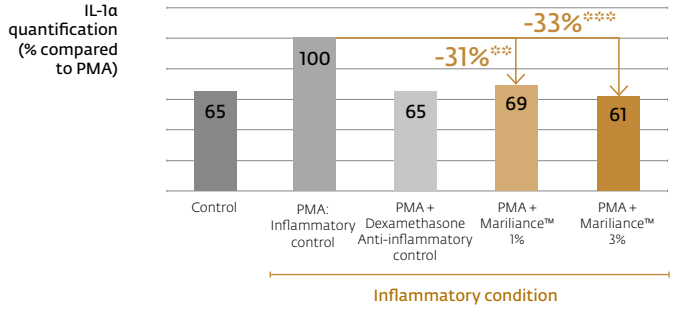
** 0.001<p<0.01 *** p<0.001 (ANOVA, Volcano plot)

2. Reduction of IL-1α release

The release of IL-1α was evaluated by ELISA assay. The study was performed on a monolayer of human normal keratinocytes (NHEK). Cells were treated for 2 hours at 37°C with Mariliance™ at 1% or 3% or Dexamethasone (10µM). Cells were then stimulated with Phorbol Myristate Acetate (PMA), a pro inflammatory agent, for 48 hours. Supernatants were collected and IL-1α assay was performed using an ELISA kit.

Result: Mariliance™ significantly **reduces by -39% the release of pro inflammatory mediator: IL-1α** in pro-inflammatory condition with an effect as strong as the Dexamethasone reference and a return to the basal release.

Quantification of IL-1α release



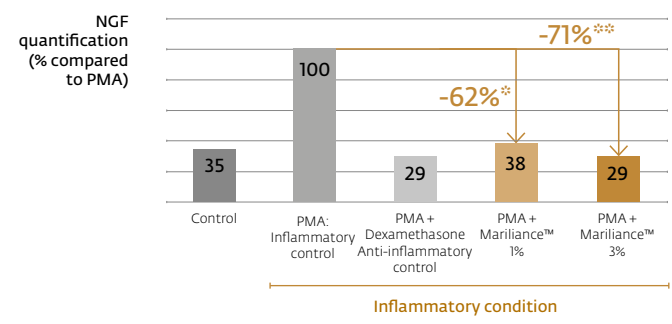
** 0.001<p<0.01 *** p<0,001
(ANOVA variance analysis and Dunnett comparison test)

3. Reduction of Nerve Growth Factor (NGF) release

The release of NGF was evaluated by ELISA assay. The study was performed on a monolayer of human keratinocytes (NHEK). Cells were treated for 2 hours at 37°C with Mariliance™ at 1% or 3% or Dexamethasone (10µM). Cells were then stimulated with Phorbol Myristate Acetate (PMA), a pro inflammatory agent, for 48 hours. Supernatants were collected and NGF assay was performed using an ELISA kit.

Result: Mariliance™ significantly r**educes by -71% the release of neuro inflammatory mediator: NGF** in pro-inflammatory condition with an effect as strong as the Dexamethasone reference and a return to the basal release.

Quantification of the NGF release

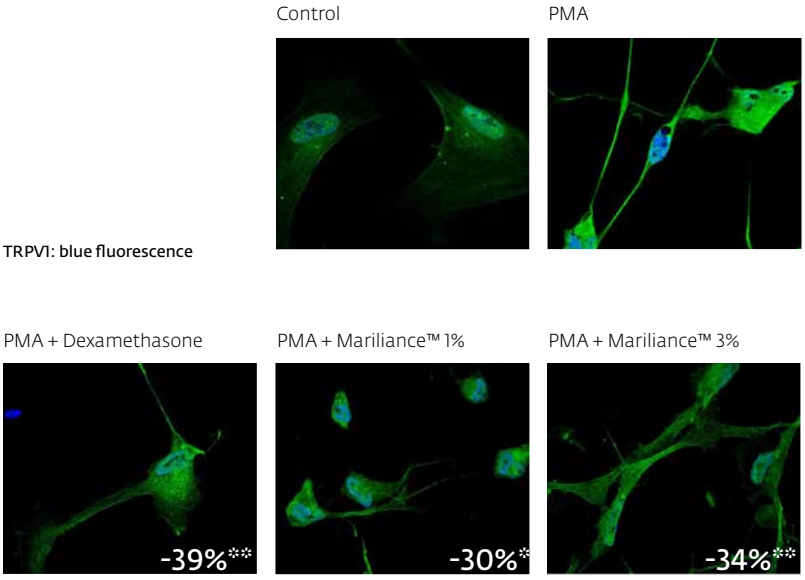


* p<0.05 ** 0.001<p<0.01
(ANOVA variance analysis and Dunnett comparison test)

Biological activity

Down regulation of TRPV1 expression on astrocytes (*in vitro* tests)

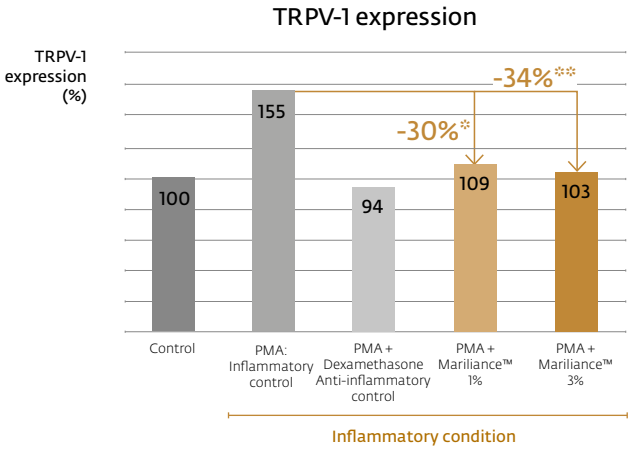
Normal human astrocytes (characteristics close to neurons) were treated for 2 hours with Mariliance™ at 1% or 3%, or Dexamethasone (10µM), the anti-inflammatory positive reference.



TRPV1: blue fluorescence

The astrocytes were then stimulated with PMA, a pro-inflammatory molecule, for 24 hours at 37°C. TRPV1 immuno-labelling was performed and quantified with a fluorescence microscope.

Results: Mariliance™ visibly **reduces the expression of the TRPV-1 receptor** at the surface of astrocytes (as neuron models).



* p<0.05
** 0.001<p<0.01
(ANOVA variance analysis and Dunnett comparison test)

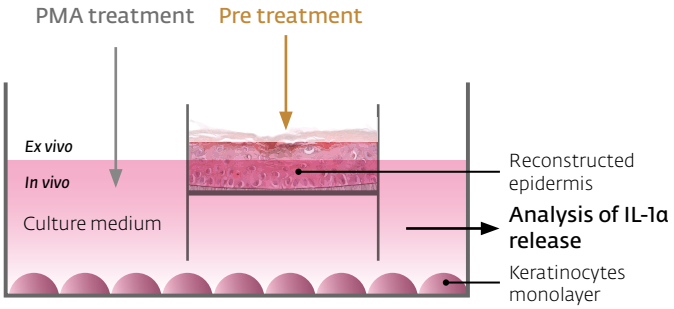
Efficacy

Mediated action through skin layers (*ex vivo - in vitro* penetration)

The evaluation of the efficacy of the product through the epidermis was done using an ex vivo – in vitro model. The aim of this study was to demonstrate the mediated action through epidermis of Mariliance™ at 1% or 3% in emulsions.

Reconstructed epidermis were used and placed on a monolayer of keratinocytes. The skin explant was isolated from the culture of the keratinocytes. A placebo cream or a cream containing 1% Mariliance™, 3% Mariliance™ or 0.2% Dexamethasone was applied at the surface of the epidermis for 2h at 37°C. PMA was added into the culture medium of the keratinocytes (not able to interact with the reconstructed epidermis) for 48h at 37°C.

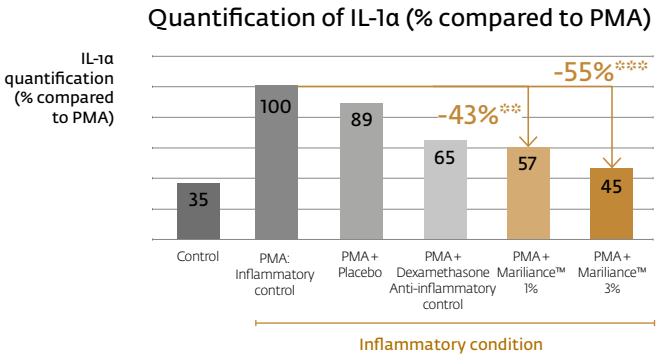
Quantification of IL-1α in supernatant was performed using the ELISA method. The IL-1α release could be significantly reduced if the product at the surface of the epidermis was able to penetrate to have an action on the monolayer of keratinocytes beside.



Ingredients	Placebo Cream	Dexamethasone Cream	Mariliance™ Cream
Xyliance	4%	4%	4%
Kendi oil	0.5%	0.5%	0.5%
Phenoxyethanol	0.5%	0.5%	0.5%
Aqua	QSP	QSP	QSP
Mariliance™	-	-	1% or 3%
Dexamethasone	-	0.2%	-

Results: Mariliance™ significantly **reduces IL-1α release by the keratinocytes of the monolayer by 55%**. Which means that the product is able to deliver an activity through the epidermis to have an action on the keratinocytes below the reconstructed epidermis.

The IL-1α release is dependent to the treatment made on the explant which is not in contact with the epidermis.



**0.001<p<0.01
***<0.001
ANOVA variance analysis and Dunnett comparison test

Efficacy

Skin sensitivity reduction (clinical evaluation)

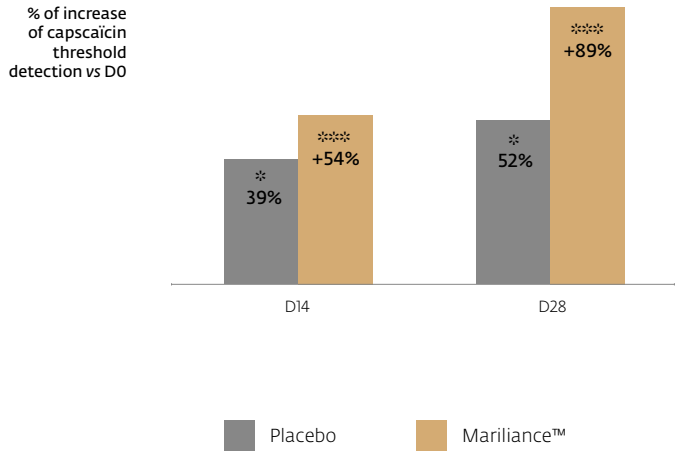
The skin sensitivity reduction capacity of Mariliance™ is evaluated by a capsaïcin clinical evaluation. 64 individuals with sensitive skins applied the first day (D0) increasing concentration of capsaïcin (main component of red chili pepper known to provoke irritation and skin discoumfort) on the nasal crease. The pain detection threshold is registered for each panelist.

Panelists then applied twice daily, a cream containing 3% of Mariliance™ or a placebo cream during 28 days on the face. The 14th and 18th day, the capsaïcin protocol is repeated and the new threshold is registered.
At the end of the study, the panelists evaluate the efficacy of the product through an individual questionnaire.

Results: Mariliance™ significantly **decreases the pain sensation** compared to D0 **by -89%** which means that over 28 days the skin sensitivity is significantly reduced.

**0.001<p<0.01
***<0.001
ANOVA variance analysis and Dunnett comparison test

Evolution of capscaicin threshold detection



Results: **100% of panelists** confirm that a cream containing Mariliance™ at 3% really:

- **Improves** the general feeling of **comfort of the skin**
- **Soothes the skin** from non-visible discoumpfort
- **Softens the skin**

Self assessment on volunteers with sensitive skin

Summary

By equivalence

Technical information

INCI (US):	Water (and) Propanediol (and) Rhodosorus Marinus Extract
INCI (China):	Water (and) Propanediol (and) Hydrolysed algae extract
Origin:	Marine biotechnology
Preservation:	Preservative free
Appearance:	Clear, yellow liquid
Solubility:	Water soluble
Dosage:	1-3%
Processing:	Can be added at the end of the formulation process under stirring or homogenising or can be heated for a short time <80°C. It can be stable from pH 2 to 10.

Claims

Claims:	Neuro-soothing , calming, anti-tightening.
Applications:	Every day creams for sensitive skin, Cold cream, After-sun, Shampoo, Post-depilatory, Post-peeling, After-shaving.

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