



MIRUAL®

Marine moisturizer & cell protector

*

Nourishes the skin & helps to reconstitute the NMF

Improves skin hydration

Invigorates cell metabolism

Adapts its behaviour to free radical protection

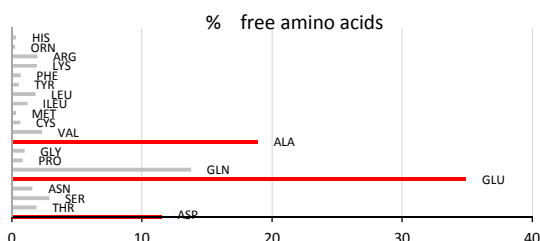


MIRUAL® is used to ensure a healthy metabolism & moisture balance with additive & targeted anti-oxidant properties.

MIRUAL® is a calibrated fraction prepared from the green seaweed *Codium fragile* (Suringar) Harot, known in Japan as “Miru”.

Mechanisms of action

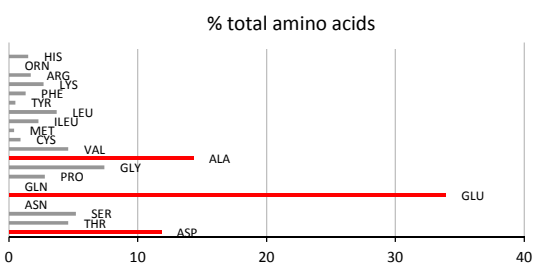
MIRUAL® nourishes the skin & helps to reconstitute the NMF



Essential amino acids match more than 10% of the total free pool and 21% of the combined pool.

The major amino-acids are glutamic acid, alanine and aspartic acid in both pools (red lines). They constitute 79% of the total free pool and 60% of the total combined pool.

Glutamic acid and aspartic acid play important role in the Krebs cycle which brings indispensable energy to cells. Alanine is involved in glycogenosynthesis.



MIRUAL contains balanced composition in minerals, specially magnesium 498 ppm
calcium 377 ppm
potassium 203 ppm.

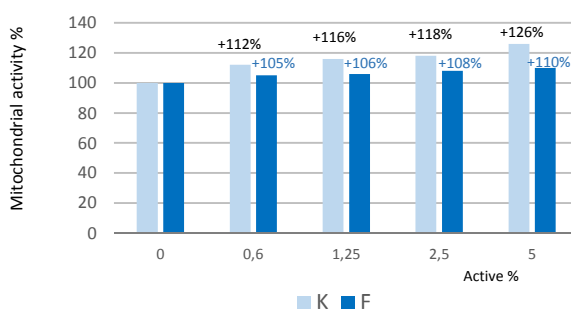
Magnesium is involved in collagen synthesis and acts as an important enzymatic cofactor. Calcium regulates several metabolic functions. Potassium contributes to cellular membrane permeability.

All trace minerals required for skin protection are present in significant quantities, compared to the amounts quoted in certain thermal waters.

TRACE ELEMENTS (PPM)		FE.	CU	ZN	SE	MN
THERMAL WATERS	MIRUAL*	1.19	0.07	0.05	0.07	0.98
	AVENE	0.02	0.02	0.02	0.005	
	ROCHE POSAY		0.005	0.022	0.06	
	URIAGE	0.015	0.075	0.16	0.15	

MIRUAL® replenishes amino acids and minerals in the skin, restoring its balance.

MIRUAL® invigorates the metabolism of skin cells



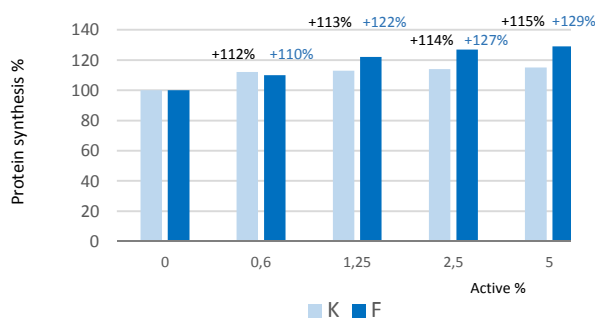
Evaluation of the mitochondrial activity of keratinocytes (K) and fibroblasts (F) in the presence of different doses of active. Statistical validation.

With 1.25 % active, the stimulation of the mitochondrial activity equals:

- +116 % for keratinocytes
- +106 % for fibroblasts.

With 2.5 % active, the stimulation of the mitochondrial activity equals:

- +118 % for keratinocytes
- +108 % for fibroblasts.



Evaluation of the protein content of keratinocytes (K) and fibroblasts (F) in the presence of different doses of active. Statistical validation.

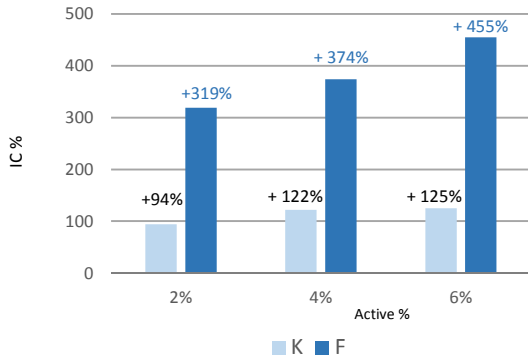
With 1.25 % active, the protein content reaches:

- +113 % for keratinocytes
- +122 % for fibroblasts.

With 2.5% active, the protein content reaches:

- +114 % for keratinocytes
- +127 % for fibroblasts.

MIRUAL® shows cytostimulant activities for both keratinocytes & fibroblasts.



Evaluation of the growth index (IC) of both keratinocytes (K) and fibroblasts (F) after 24h cultivation in the presence of active: 2% - 4% & 6%. Statistical validation.

With 2% active, the cell proliferation equals:

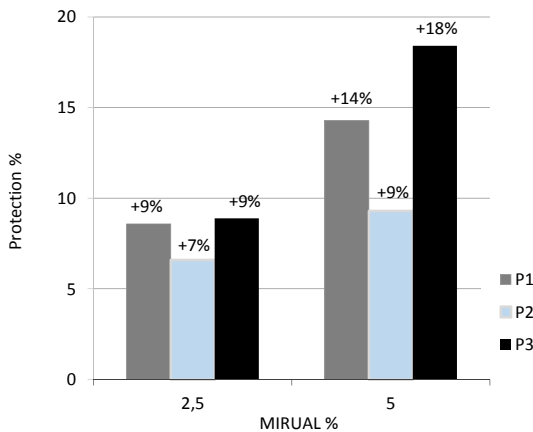
- + 94 % for keratinocytes
- +319 % for fibroblasts.

With 4% active, the cell proliferation equals:

- +122 % for keratinocytes
- +374 % for fibroblasts.

MIRUAL® enhances the proliferation of skin cells.

MIRUAL® offers targeted anti-oxidant protection in order to activate appropriate responses against free radicals



Keratinocytes submitted to HX (80 µg.ml⁻¹) - XO (40 mU.ml⁻¹) system that generates superoxide anion & hydrogen peroxide. Active (2% or 5%) introduced according to 3 ways: P1 before aggression during 24h (absence during aggression) - P2 during aggression - P3 before & during aggression. Protection evaluated by MTT test.

MIRUAL® inhibits the activity of free radicals generated by the HX-XO system according to its concentration.

The different ways of introducing MIRUAL® allow its mechanism of action to be explored:

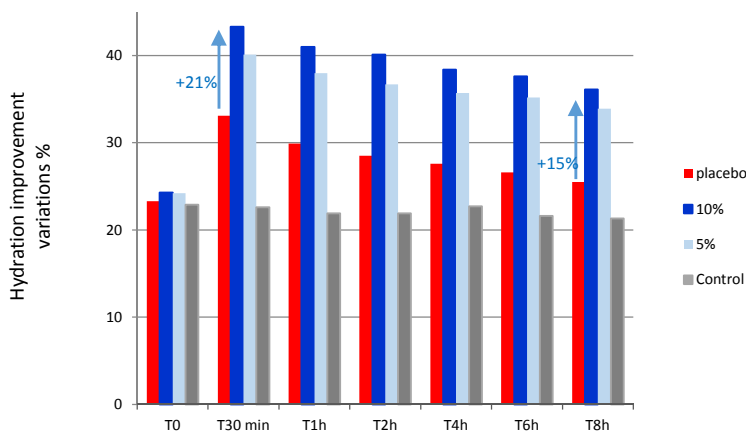
- P1 (before cell injury, absence during injury) reveals the ability of MIRUAL® to enter the cell and protect it against intracellular radicals.
- P2 (during cell injury) proves that MIRUAL® is able of intercepting oxygen radicals.
- P3 (P1+P2) confirms these results.

MIRUAL® is able of stimulating the endogenous anti-oxidant system and of adapting its behaviour according to requested action.

MIRUAL® improves skin hydration

Clinical study

10 volunteers with dry skin. Unique application of a gel with 10% or 5% Mirual on the leg. Comparisons with placebo and no treated area (c). Hydration effect measured with a corneometer.



Hydration gain with 5% active:

- +21% vs placebo after 30min
- +15% vs placebo after 8h application

Compared to placebo and control, MIRUAL® causes a noticeable immediate moisturizing effect that is maintained for at least 8 hours.

MIRUAL® rapidly improves skin hydration and maintains hydration effect over 8 hours for healthier look.



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& cell protector

Algal source

Codium fragile is a Japanese green alga probably introduced from Japan in the Mediterranean about 1940 and in Long Island Sound about 1957.

In Japan, it is named "Miru". According to the Manyoshu (VIII century Japanese poetry), the Taiho laws (701) established *Miru* as currency. Moreover, *Miru* was defined in Japan as ritual offerings during some Imperial Days and in several sanctuaries, such as *Ise* & *Iwashimizu Hachiman-gu*.

Cosmetic benefits

MIRUAL® appears as a very interesting cosmetic ingredient in two regards.

Firstly, it assumes a repairing & hydrating role.

Due to its well-balanced composition, MIRUAL® provides the necessary supplies for cells to maintain an appropriate energy level & moisture level in the *stratum corneum* by acting as an NMF-like mechanism.

MIRUAL® stimulates cell growth, invigorates metabolism & hydrates the skin for a young and healthy looking.

Secondly, MIRUAL® takes on a protective role by acting as an efficient free radical scavenger:

- boosts cellular defence.
- prepares the skin to defend itself against free radicals by adapting its behaviour according to the requested action.
- can enter the cell and protects it against intracellular radicals.
- is also able of intercepting oxygen radicals.

Because of its powerful influence on the cell metabolism, its anti-free radical and moisturizing properties, MIRUAL® is the ideal active principle for skin youthfulness maintenance and for treating skin regeneration, skin aging and stimulation of fatigued skin.

Cosmetic applications

Skin care: Repairing and restructuring care. Protecting and anti-aging care.

Recommended use levels: 1.25% - 10%.

Characteristics

INCI names water CAS n° 7732-18-5 EINECS n°: 231-791-2
 Codium fragile extract

Limpid liquid transparent to light yellow colored.

Preservatives by selection: microcare SB or phenoxyethanol.

Packing size: 1kg - 5kg - 10kg.



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GELYMA

Parc d'Affaires Marseille Sud (C4) - 1 Boulevard de l'Océan - 13009 Marseille - France
Phone: +33 4 96 14 09 82 - Fax: +33 4 96 14 09 83 - E-mail: gelyma@wanadoo.fr