

# CHRONOCYCLIN®

## COSMETIC APPLICATION

DAY AND NIGHT SKIN CARE

## TEMPORARY OR LONG-TERM CUTANEOUS DAMAGES

OVERWORKED, TIRED, LACK OF SUN EXPOSURE, JET LAG

ANTI-AGING BENEFITS

## SKIN AWAKENING

STIMULATION OF CUTANEOUS NATURAL DEFENSES

VITAMIN D BIOTRANSFORMATION ACTIVATION

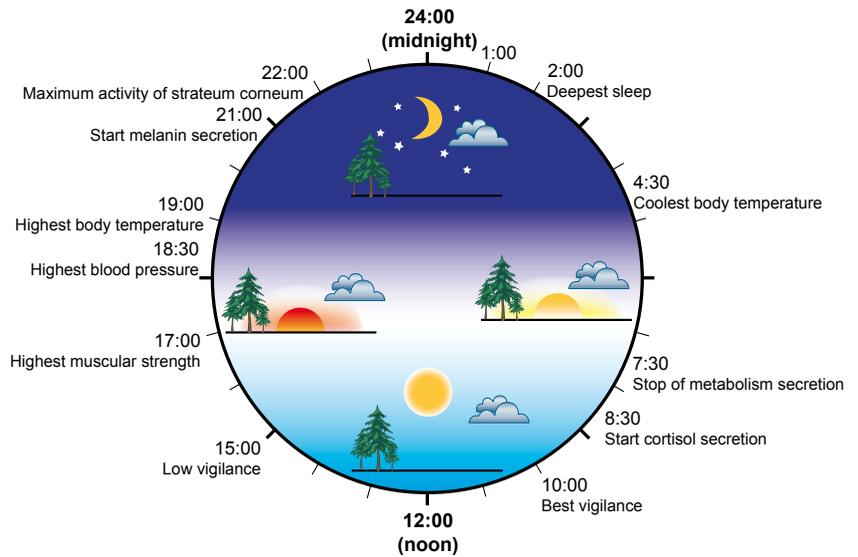
**EXSYMOL**  
MONACO

## Biorhythm circadian genes

Living organisms are regulated by an internal clock of 24 hours – the biorhythm – that controls circadian genes expression periodically.

The purpose of this rhythmic activation of the circadian genes is to initiate adapted metabolism and protein synthesis in function of the variable daily environmental constraints.

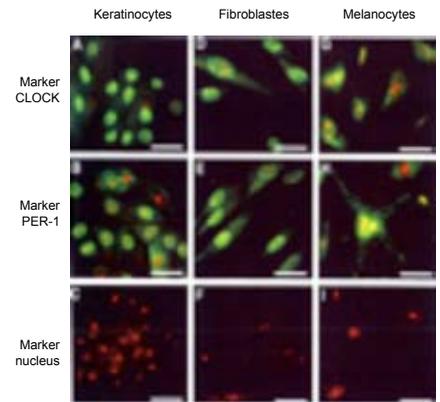
Sun exposure is one of the activator that synchronizes the **biorhythm** and therefore the adapted periodicity of the expression of the circadian genes towards the environment (seasons, jet lags..). The retina and the skin are the main receptors of the sun radiations.



## Circadian genes and cutaneous physiology

The physiological activity of the cutaneous tissue is closely controlled by the biorhythm. Cutaneous cells mainly focus on strengthening skin natural defense during daylight (resistance against U.V., pollution...), while they emphasize on regenerative metabolism at night.

Research studies have linked the activation of cutaneous circadian genes such as CLOCK and PERIOD-1 with cellular proliferative activities (keratinocytes, fibroblastes and melanocytes).

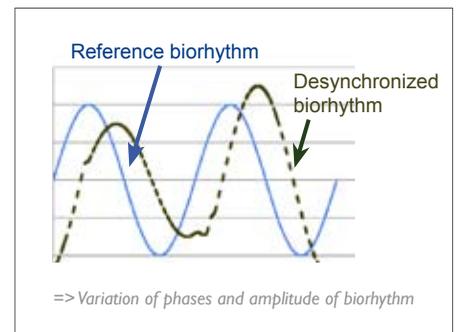


## Irregular biorhythms and skin premature aging

Numerous factors can alter biological rhythms periodicity.

Aging, seasons, variable sun exposure, fatigue, stress, insomnia and jet lag are responsible for small variations of the biorhythm that can accumulate.

This irregularity of biorhythm is at the origin of variations of the activation cycles of circadian genes and therefore of the **variations of the cutaneous physiological metabolisms**.

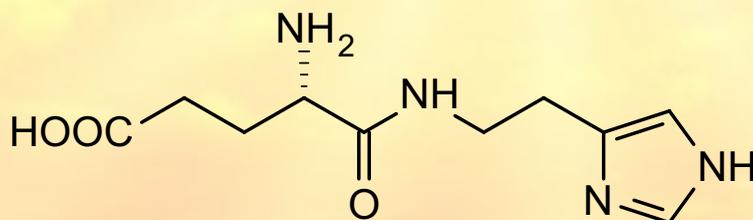


## Consequences of the circadian genes activation fluctuation

**The disorderliness of biorhythm is among the factors that can induce skin's premature aging. Indeed cutaneous cells physiological activity offering less adapted response to environmental conditions and can be responsible for:**

- weakening of skin natural defenses,
- slowdown of night cell regeneration process,
- less efficient vitamin D bio-transformation (vit D participates to calcium incorporation and therefore could improve hydration via calcic channels).

# CHRONOCYCLIN®



**INCI NAME:** GLUTAMYLAMIDOETHYL IMIDAZOLE

CHRONOCYCLIN® is an anti-aging chronopeptide that mimics sun exposure activation of the circadian genes.

CHRONOCYCLIN® is an anti-aging active ingredient that optimizes skin physiological activities of defense and cells regeneration.

## SKIN BENEFITS

SCIENTIFIC PUBLICATION\_0952

Optimized Vitamin D activity  
Resynchronized circadian rhythms  
Stimulated circadian genes

## COSMETIC USES

**Day and night skin care**

TEMPORARY OR LONG-TERM CUTANEOUS DAMAGES:

**Anti-aging:**

**Anti tiredness, anti-stress, lack of sun exposure, jet lag**

SKIN AWAKENING:

**Stimulation of cutaneous natural defenses**

**Vitamin D biotransformation activation**

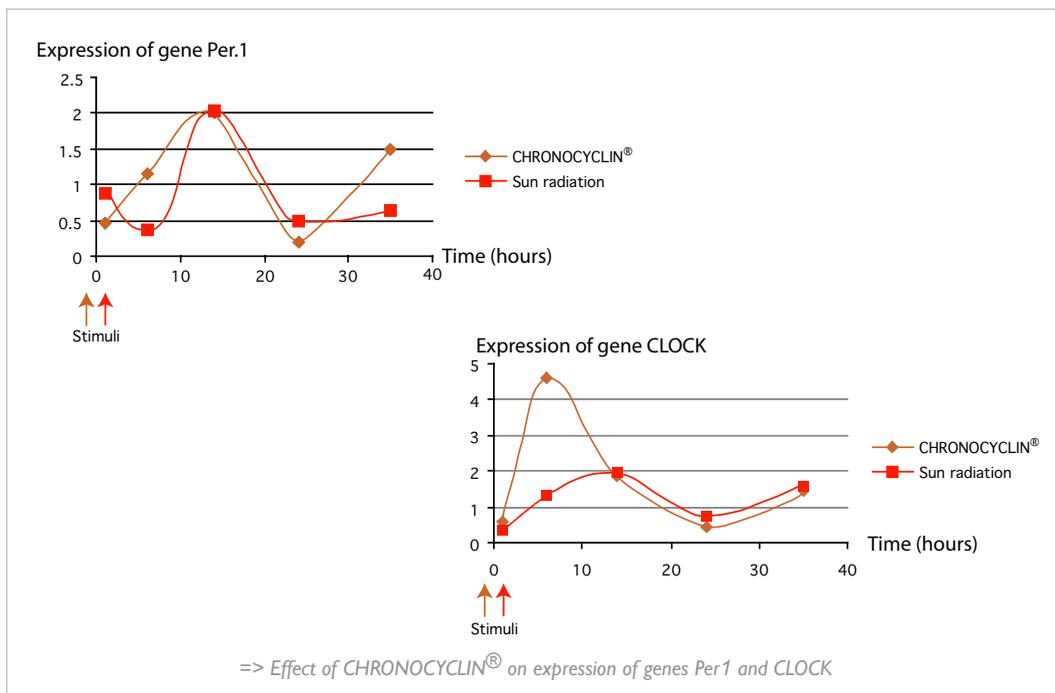
# CHRONOCYCLIN<sup>®</sup>

## Mechanism

CHRONOCYCLIN<sup>®</sup> mimics the effects of sun exposure on circadian genes expression.

## CHRONOCYCLIN<sup>®</sup> synchronizing activity

Our studies on reconstructed epidermis show that circadian genes such as CLOCK and PERIOD-1 are activated periodically following the biorhythm after initiation by UV radiation. The use of CHRONOCYCLIN<sup>®</sup> on reconstructed epidermis in dark environment demonstrated that our product is able to imitate the UV signal and to induce circadian genes expression.



## Skin benefits

CHRONOCYCLIN<sup>®</sup> stimulates the natural periodicity of expression of the circadian genes in order to have the best correlation between cutaneous cells physiological activities and the environmental constraints.

### Daytime benefits:

- optimized natural cells defenses (keratinocytes and fibroblastes)
- optimized enzymatic expression for Vitamin D bio-transformation.

### Nighttime benefits:

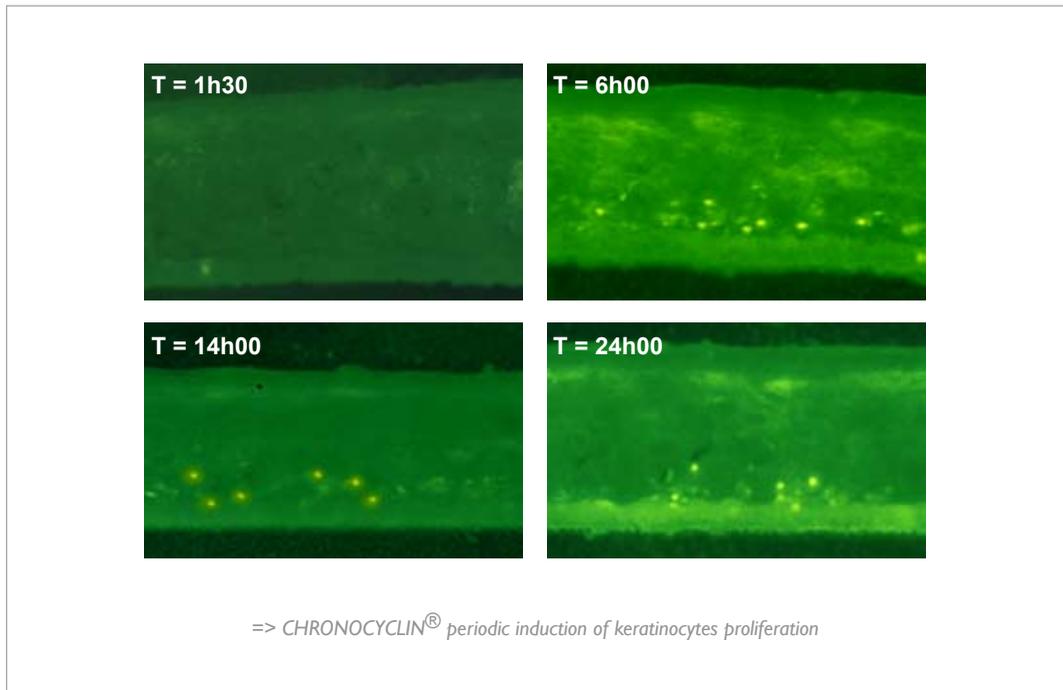
- optimized cells renewal and regeneration (corneocytes and keratinocytes)
- optimized microcirculation (detoxification and nutrient supply).

# CHRONOCYCLIN®

## CHRONOCYCLIN® anti-aging activity by circadian genes induction

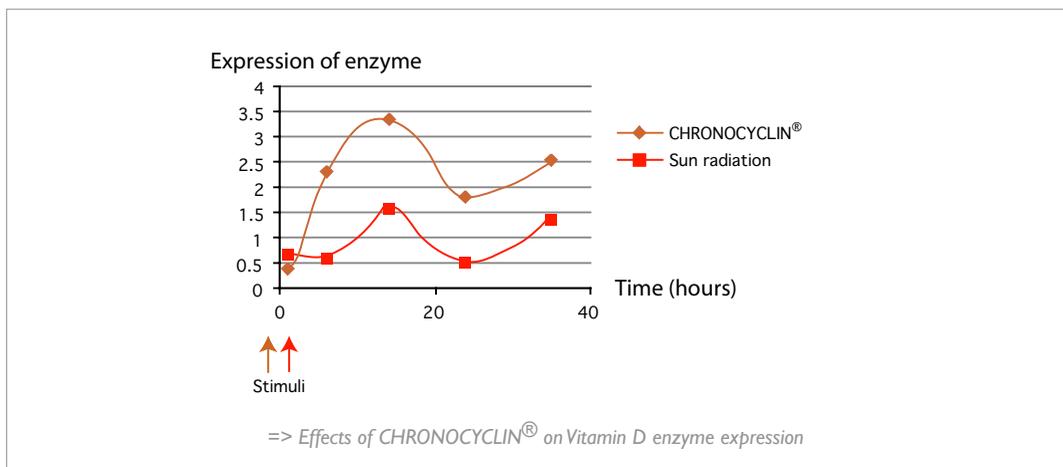
### Cellular proliferation and regeneration

Our studies on reconstructed epidermis, placed in a dark environment demonstrated that CHRONOCYCLIN® induces an equivalent periodic keratinocytes renewal to the one that can be observed when placed under sun exposure.



### Vitamin D photo-transformation activation

Circadian genes express the enzyme involved in Vitamin D photo-transformation. CHRONOCYCLIN® is able to reproduce the sun exposure periodic enzyme expression on a reconstructed epidermis placed in a dark environment.



# CHRONOCYCLIN®

## TECHNICAL CHARACTERISTICS

### ANALYTICAL COMPOSITION

L-GLUTAMYLAMIDOETHYL IMIDAZOLE 1%  
PRESERVATIVE SQ%  
WATER SQF 100%

### TECHNICAL CHARACTERISTICS

Colorless liquid.  
PH: approx 5.  
Density at 20°C: approx 1.0.  
Soluble in water, alcohol and glycols.

### PRESERVATIVE ALTERNATIVE

Different preservative systems are available in order to fit with your requirements. Among these versions, we try to develop as often as possible preservative free ingredients. Please contact us for details about the available versions.

### TOLERANCE STUDY

**CHRONOCYCLIN®** does not show any toxicity . Tolerance studies were undertaken by *in vitro* alternative methods (cell culture and reconstructed epidermis) and on volunteers.  
Details on the tolerance studies can be found on the product MSDS.

### FORMULATION

**CHRONOCYCLIN®** is a stable solution.  
Use level: 0.2 to 1%  
Incompatibilities: no particular incompatibilities.

### AVAILABILITY

1, 5 and 30 kg



EXSYMOL S.A.M. - 4 avenue Albert II - MC 98000 MONACO  
Tél. : +377 92 05 66 77 - Fax : +377 92 05 25 02  
E-mail : [exsymol@exsymol.com](mailto:exsymol@exsymol.com) - Internet : <http://www.exsymol.com>

