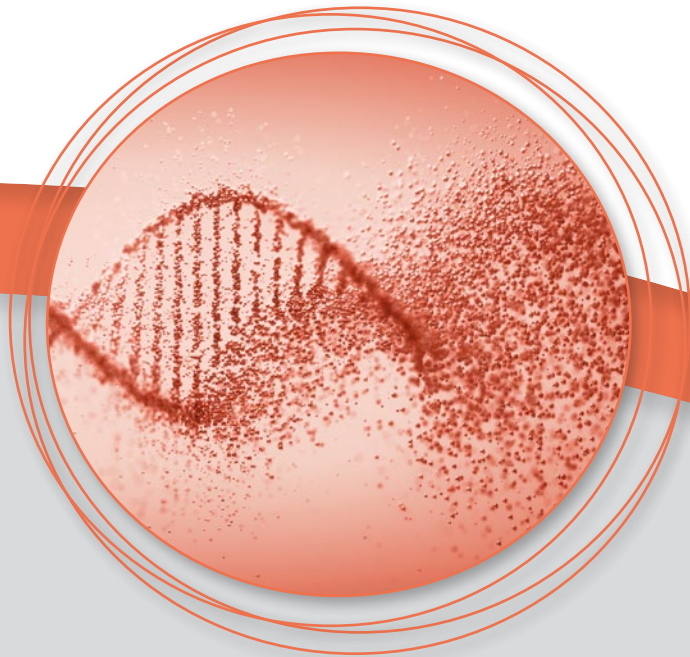


# TOSOLIN®P

*Kiss of beauty*



*Natural & Sustainable*



Tosolin®P is a multifunctional active preserving and protecting the skin's health and beauty through numerous pathways. In a series of in-vivo and in-vitro tests, Tosolin®P demonstrated the following activities:

**TANNING**

**PROTECTION**

**SOOTHING**

**REPAIR**

**HYDRATION**

**PURIFYING**

Tosolin®P is based on purified polysaccharides obtained through the fermentation of molasses, a by-product from sugar refinery. These polysaccharides improve and control communication between different skin cells.

Our skin is constantly challenged by the environment. Especially UV light and wind are harmful to the skin. As a result, the skin ages faster and becomes more sensitive, drier, and less healthy.

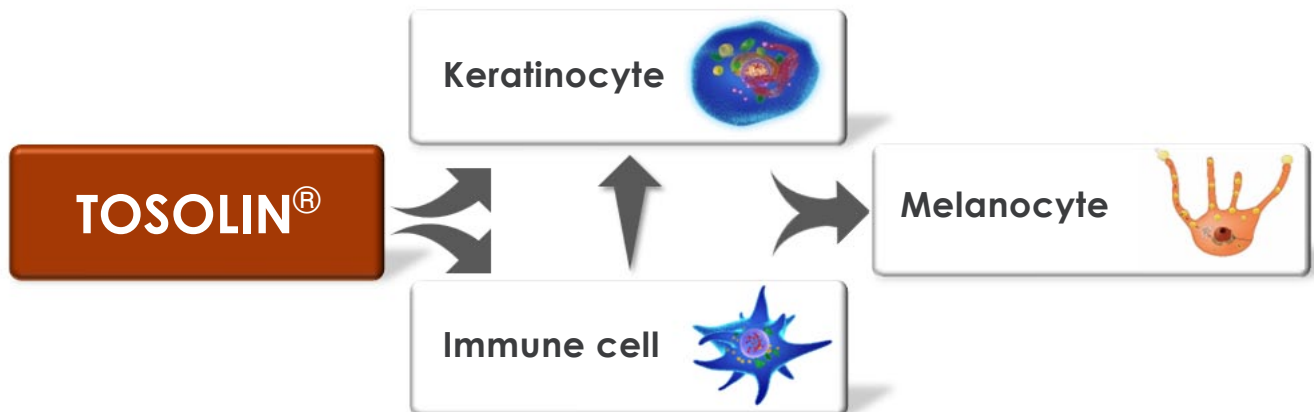
Tosolin®P offers a total solution. It awakens and improves all the defences in our skin under all stressful circumstances. Tosolin®P even awakens and improves the skin tanning process.



## Mechanism

Tosolin®P directly supports the communication between

- **Keratinocytes and melanocytes**, resulting in optimized tanning and overall UV-protection.
- **Keratinocytes and keratinocytes**, resulting in an improved skin barrier.
- **Epidermal Immune cells and keratinocytes**, resulting in enhanced skin protection and soothing.
- **Epidermal immune cells and melanocytes**, resulting in the long-term protection of the skin.
- **Epidermal immune cells and fibroblasts**, resulting in fewer wrinkles and healthier-looking skin.



The skin is protected by 3 cells against sun exposure and environmental stress:

### Keratinocytes

Production of  $\alpha$ -MSH and endothelin-1 (ET-1). Two crucial proteins to activate and protect simultaneously the melanocytes.

### Epidermal immune cells

Production of proteins, growth factors and antioxidants to protect the keratinocytes, melanocytes and fibroblasts. Purifying the skin from dangerously mutated cells and unwanted micro-organisms.

### Melanocytes

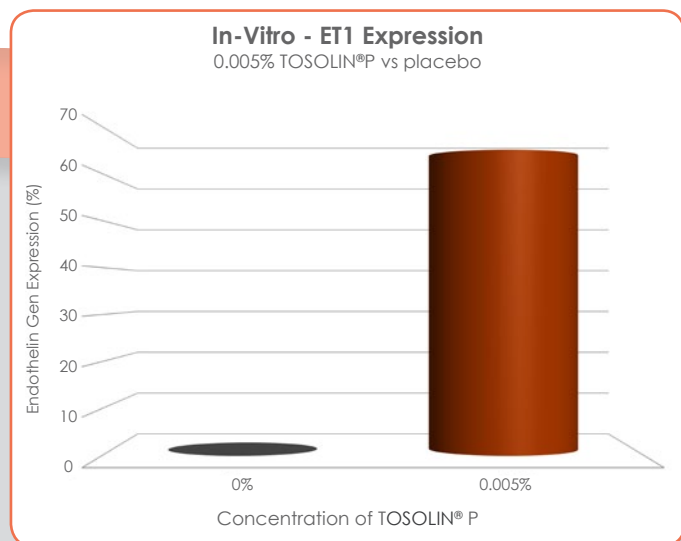
Production of eumelanin that shields the keratinocytes, and fibroblasts from UV light.



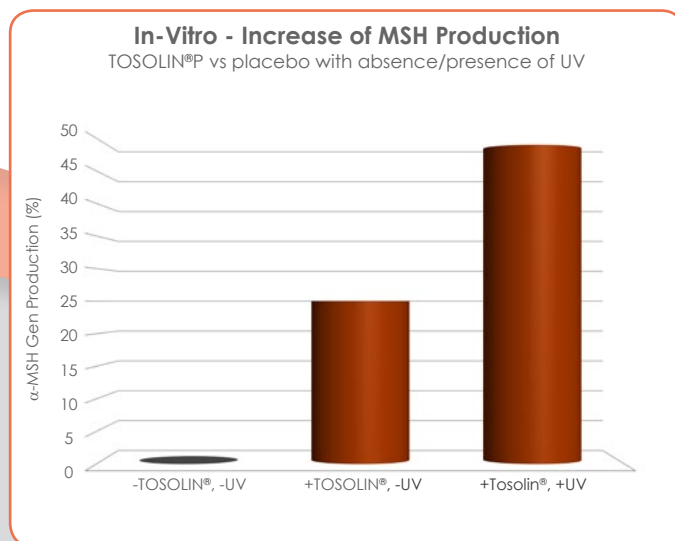
## Sun protection vs tanning

The natural sun protection of the skin is cursed by a paradox. Both the protection of the keratinocytes and melanocytes is activated by UVB light, while the immune cells are inactivated by the same UVB light. The use of UV filters indeed shields the skin from UV light but inhibits the powerful natural skin protection provided by keratinocytes and melanocytes.

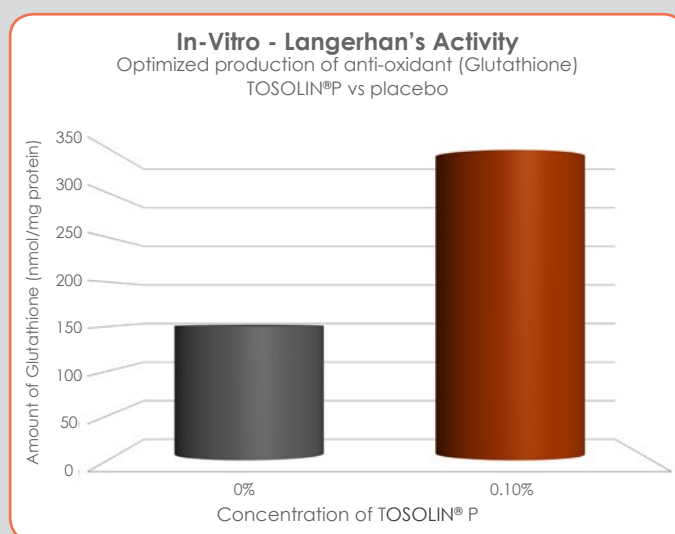
Tosolin®P improves the protective performance of the keratinocytes and melanocytes even under reduced UVB light and keeps the immune cells active under increased UVB light. With Tosolin®P the natural skin protection is always fully activated, no matter the circumstances.



- The keratinocytes produce 60% more ET-1 with Tosolin®P.
- ET-1 improves the overall activity of the melanocytes.
- ET-1 also protects the melanocytes from dying.



- The keratinocytes produce 47% more α-MSH with Tosolin®P. Even without UVB light, α-MSH is produced.
- α-MSH improves the production of eumelanin, which is the most protective melanin.



- The epidermal immune cells produce more glutathione with Tosolin®P in the presence of UVB light.
- Glutathione is an indication of activity level of the epidermal immune cells.



# Tosolin®P is a tan activator with a quadruple improvement on tanning:

## 1) Faster tanning

90% out of 22 volunteers tanned in 2 days faster with 0.06% Tosolin®P compared to the placebo.

## 2) More intense tanning

90% out of 22 volunteers got a darker, more intense tan with 0.06% Tosolin®P compared to the placebo.



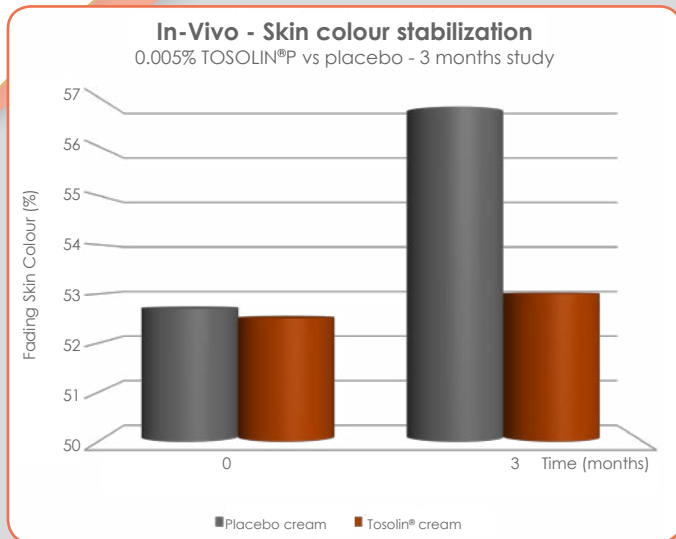
Tested at 0.6% TOSOLIN®P in sunscreen + 0.9% TOSOLIN®P in after sun.

## 3) Prolonged short-term tanning

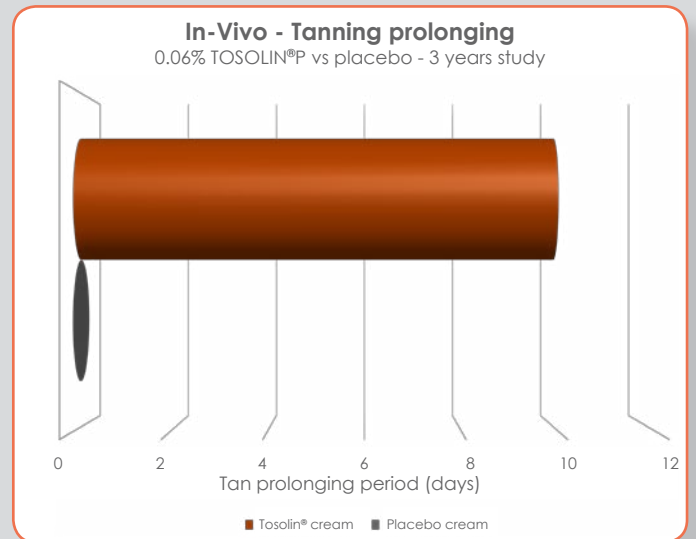
The tan was kept almost 10 days longer after the treatment with 0.06% Tosolin®P had been stopped, compared to the placebo.

## 4) Prolonged long-term tanning

When a cream with 0.005% Tosolin®P was used daily, the tan was even kept for 3 months.



- When treating the skin with a day cream containing 0.005% Tosolin®P, the tan was kept for 3 months (the length of the test). With the placebo, the skin lost its tan.
- Tested on 37 persons. ITA is a measurement to determine the brown color of the skin. Higher ITA means lighter skin.



- After the treatment with 0.06% Tosolin®P had been stopped, the tan was kept almost 10 days longer compared to the placebo.
- Tested on 22 persons. Self-evaluation.



## Everyday skin protection

UVB radiation damages our skin not only in the summer but all year around. Even when the sky is clouded, or if we are sitting behind glass.

Tosolin®P protects the skin in many ways against both short-term and long-term sun damage.

### Short-term damage

- Barrier disruption
- Dry skin
- Erythema (redness/pain)

### Long-term damage

- Wrinkles
- Skin cancer (DNA damage)

## Protection against short-term damage

### Barrier disruption and dry skin

Tosolin®P improves the communication between keratinocytes resulting in increased integrin expression and cell adhesion. Tosolin®P also improves the communication between keratinocytes, melanocytes and epidermal immune cells. This communication improves the production of:

- **$\alpha$ -MSH (+46%)**, a powerful antioxidant that protects the melanocytes from sun damage.
- **Glutathione (+120%)**, an antioxidant that protects keratinocytes, melanocytes and skin lipids.
- **Eumelanin** that protects all skin cells.

This protection of all skin cells results in a stronger skin barrier. In an in-vivo test, the TEWL was reduced by 22% (0.06% Tosolin®P). The skin becomes less dry and looks and is healthier.

### Soothing (reduction of redness)

Tosolin®P improves the communication between epidermal immune cells and keratinocytes. 13 inflammation proteins responsible for redness are reduced. This has been shown in keratinocytes irradiated with UVB light and incubated with 0.006% Tosolin®P for 48h. This decrease results in a reduction of redness / erythema. 0.11% Tosolin®P applied on UVB-irritated skin reduces erythema 50% better than a placebo. The erythema reduction is already noticeable after 4h (-22%).

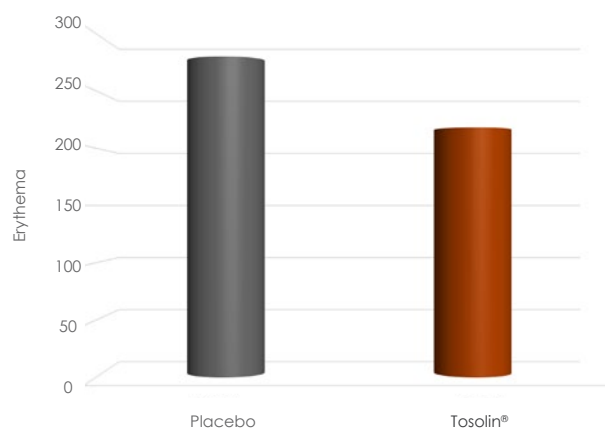
#### Improvement of integrins

ITGA2 (+100%)  
ITGB3 (+100%)

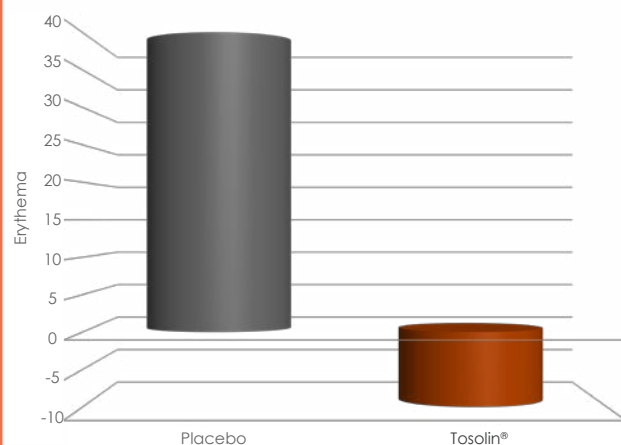
#### Adhesion of integrins

ITG  $\alpha$ 1 (+140%) ITG  $\alpha$ 5 (+15%)  
ITG  $\alpha$ 2 (+120%) ITG  $\alpha$ V (+166%)  
ITG  $\alpha$ 3 (+116%) ITG  $\alpha$ V $\beta$  (+133%)  
ITG  $\alpha$ 4 (+8%)

Erythema measured after 4h (-22%)  
(Mexameter)



Erythema measured after 2 weeks (-50%)  
(Mexameter)



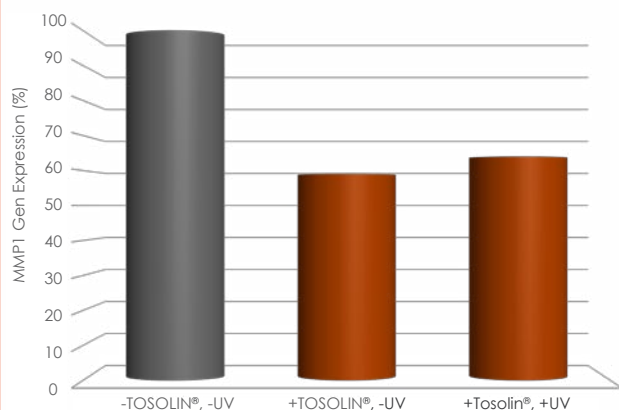
# Protection against long-term damage

## Premature ageing - wrinkles

Collagen and elastin are degraded by UV light, which leads to premature ageing. Tosolin®P protects the dermis in many ways:

- The indirect higher production of eumelanin protects the dermis from UV degradation.
- The increased production of the growth factor for collagen TNF- $\alpha$  (+80%).
- The quality of collagen and elastin is preserved.

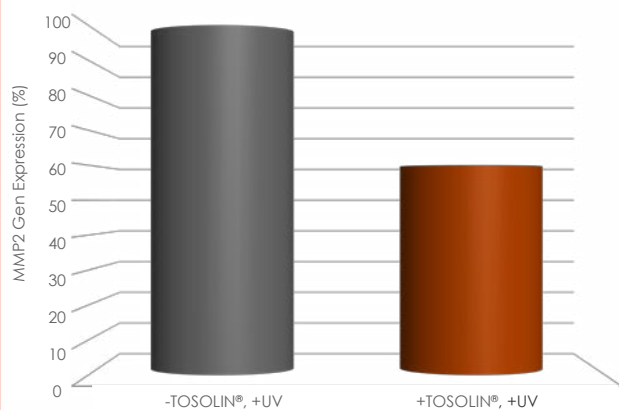
**In-Vitro - Decrease of MMP1 Expression**  
TOSOLIN®P vs placebo with absence/presence of UV



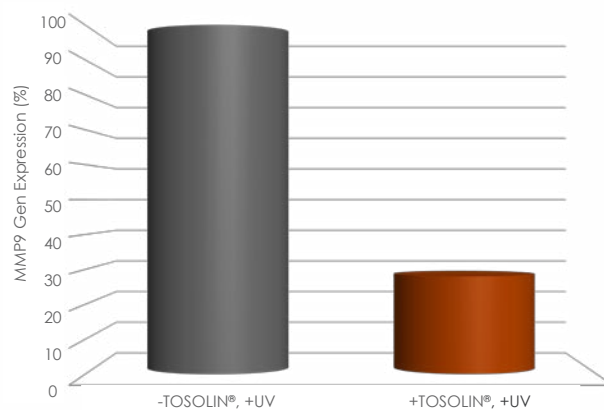
MMP is an indication of the quality of collagen/elastin. It is an enzyme that removes low-quality collagen/elastin. When collagen/elastin degrades, MMP becomes more active. In the presence of Tosolin®P (0.06%), MMP-1 and MMP-2 decreased by 40% and MMP-9 by 72%.

The protection of the dermis results in younger-looking skin. In an in-vivo test, the wrinkle reduction reached 28% after 4 weeks (0.06% Tosolin®P).

**In-Vitro - Decrease of MMP2 Expression**  
TOSOLIN®P vs placebo with absence/presence of UV



**In-Vitro - Decrease of MMP9 Expression**  
TOSOLIN®P vs placebo with absence/presence of UV

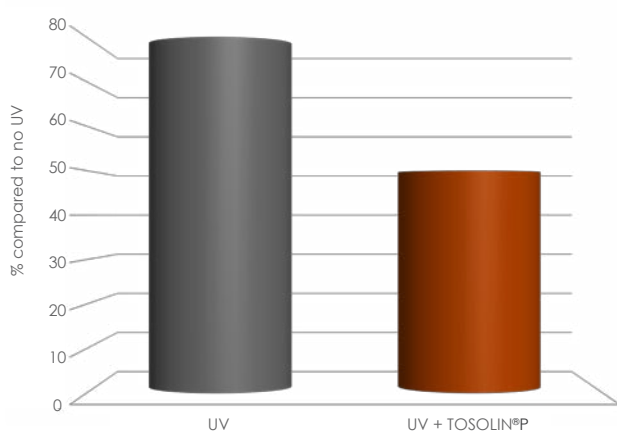


## DNA damage

UV light changes and destroys the DNA of the skin cells leading to cell death, malfunctioning and mutations. Especially mutations in the melanocytes cause dangerous skin cancer. Tosolin®P protects all the skin cells from cell death and DNA mutations through the increased production of:

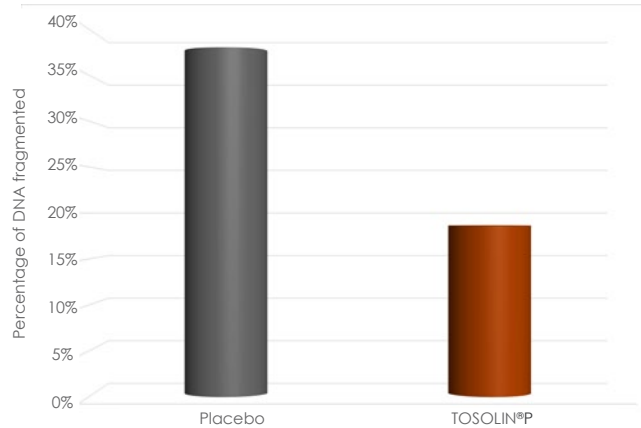
- **$\alpha$ -MSH (+46%)**, a powerful antioxidant that protects the melanocyte from DNA mutation.
- **ET-1 (+60%)**, which protects the DNA of the melanocyte and keeps the melanocyte alive and active.
- **Glutathione (+120%)**, an efficient antioxidant protecting all cells from apoptosis and mutation.

Apoptosis after 5h UV (15mJ/cm<sup>2</sup>)



- The cell death of keratinocytes irradiated with UVB light is decreased by 38% in the presence of 0.06% Tosolin®P.

DNA Fragmentation



- The destruction of DNA of keratinocytes irradiated with UVB light is decreased by 50% in the presence of 0.06% Tosolin®P.



## Purifying the skin

During and after exposure to daylight and other environmental stress, the skin needs to be purified for 2 reasons:

1. The skin barrier has been harmed. Microorganisms can easier and deeper penetrate into the skin. They need to be eliminated from the skin to avoid infections.
2. During sun exposure some cells have mutated. They need to be cleared away as mutated cells evolve towards cancer cells.
3. This purifying task is performed by the epidermal immune cells which use peroxides to remove micro-organisms and mutated cells. Without Tosolin®P they show reduced activity under UV light. Thanks to Tosolin®P, they produce purifying peroxides 36% more efficiently.

## Applications

### DAY CREAM

### BB CREAM

Tosolin®P offers a complete activity of protection/soothing/hydration and offers a healthy-looking tan.

### SUNSCREEN

Tosolin®P offers together with sunscreens maximum sun protection. The sunscreens reduce the UVB light in the skin, while Tosolin®P keeps the natural protection active.

### AFTER SUN

Tosolin®P offers soothing, reduces the sunburned and regenerate the skin.

## TOSOLIN®P - technical data

INCI	Mannose, Glucose, Beta-glucan, Sodium hyaluronate
DOSAGE	0.006 - 0.6%
ASPECT	Powder
SOLUBILITY	Dispersible in water



Download this brochure here