

# Unireduce R-35

## Essential reduction of sebum production

Oily skin is a very common problem due to the accumulation of sebum within the sebaceous gland.

Unireduce R-35 brings a unique combined solution for rebalancing the production of good fatty acids which will help reduce the sebum content in the skin in long term.

- 1) Good fatty acids are produced
  - › Hyperkeratosis, sebum and irritating free fatty acids accumulation are prevented;
- 2) Long lasting acetylated derivates are used
  - › Protection against oily skin is effective even after treatment.

The sebum  
regulator

# Focus on the product

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## Oily skin: common problem, major crisis

Oily skin is a very common issue affecting more than 80% of the teenagers, and almost 20% of the adults<sup>1</sup>. The negative impact on the quality of life, the psychological wellness and lowered self-esteem have been proven through many studies and publications. To find a solution, understanding the biological process of oily skin is essential.

## The biological process of oily skin

Each pore at the skin's surface has a small opening called the pilosebaceous unit. From this opening, the sebum produced by the sebaceous gland flows to the surface of the skin. Sebum lubricates the hair and protects the skin by forming a thin layer of oil (lipid) on its surface. Even if the exact mechanism of oily skin and its consequences is still unknown, many studies have shown that the over-production of sebum is a major contributing factor.

When over-produced, it mixes with hyperproliferated keratinocytes all resulting in formation of the pimples.

Based on this phenomenon, targeting the production of sebum and hyperkeratosis could be an ultimate solution to prevent pimples apparition. It has been demonstrated that oily skins with sebum accumulation are linked to abnormalities in lipids metabolisms with three major consequences: lack of correct lipid production, increased content of free fatty acids which are irritants and breakdown of sebum triglycerides. The production of good fatty acids could help avoid sebum accumulation<sup>2</sup>.

## Unireduce R-35 targets the sebum regulation to avoid accumulation

Unireduce R-35 brings three elements for a unique approach to treat oily skin with sebum accumulation. Each element will play a major role to reduce sebum accumulation and pimples:

- Panthenyl triacetate (D-PTA) is a precursor of panthotenic acid, which belongs to the vitamin B family. Its role is capital to re-balancing the production of correct fatty acids, as Coenzyme A is directly linked to acne<sup>3</sup>. By increasing the level of Coenzyme A, fatty acids are properly metabolized, lipids will not accumulate in the sebaceous gland and sebum will not increase.
- Farnesyl acetate is a precursor of farnesyl pyrophosphate, which takes part in the cholesterol synthesis. By synthesizing cholesterol, lipids production is optimized, and sebum accumulation within the sebaceous gland<sup>4</sup> will be reduced.
- Tocopheryl acetate (soluble version of vitamin E) will help soothe the skin and heal the new scars. With its outstanding antioxidant properties (ORAC index superior to 1,000 with a value of 3,309), it helps prevent oxidation of proteins.

The use of Farnesyl acetate and Panthenyl triacetate helps deliver an interesting set of components (Farnesyl Pyrophosphate and Panthenol) to restore a prolonged natural balance to the skin over time.

# Biological activity

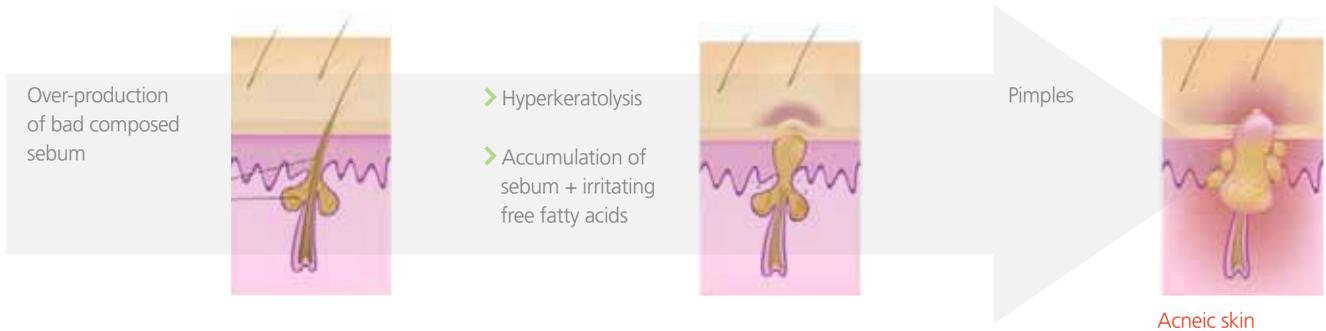
## Relaunch the product of healthy fatty acids to reduce sebum accumulation

Because it is composed by essential elements to counteract oily skin and sebum accumulation, Unireduce R-35 actions are multi-faceted:

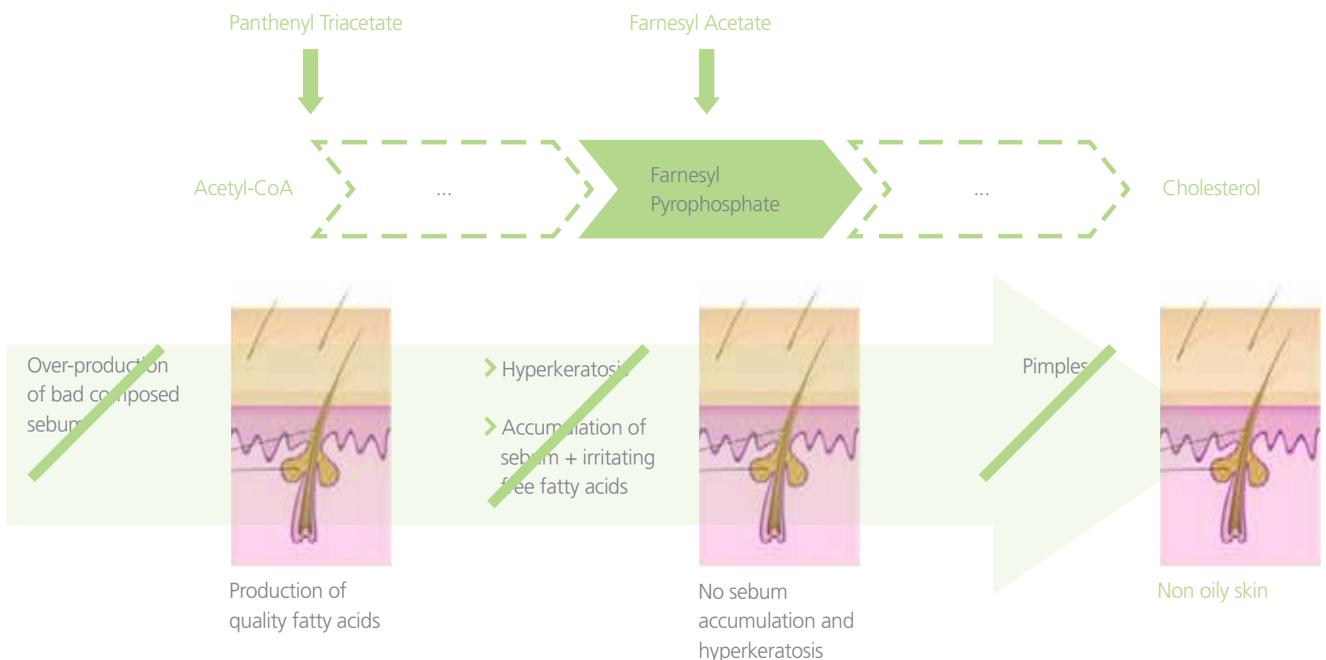
- Cholesterols are produced to rebalance the quantity of good fatty acids and avoid sebum accumulation.
- Hyperkeratosis and irritating free fatty acids accumulation are prevented.

The major consequence is the significant reduction of sebum content on the forehead after 28 days. This effect is sustained for 14 days after treatment has been abandoned.

### 1. Pimples biological process



### 2. Action of Unireduce R-35

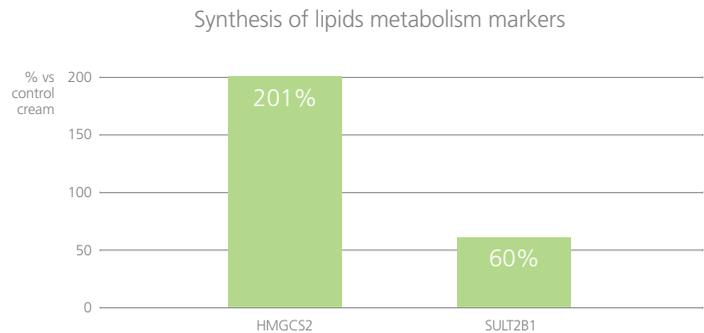


# Efficacy

## Stimulation of lipids' synthesis markers (*ex vivo* test)

D-PTA, an active of Unireduce R-35, was tested for its ability to increase the level of expression of specific genes of the lipid metabolism. Skin explants were placed in a DMEM medium and treated either with a cream containing 2% of D-PTA or one without D-PTA. Skin explants were incubated for 24 hours. qRT-PCR were run on these human skin explants and the mRNA expression level of 3-hydroxy-3-methylglutaryl-coenzyme A synthase 2 (HMGCS2 implicated in the mevalonate pathway) and Cholesterol sulfotransferase (SULT2B1 implicated in the lipids synthesis) were measured.

**Results:** After 24h, D-PTA increases the expression of the two genes implicated in the lipids metabolism pathways respectively by **+201%** and **+60%**.



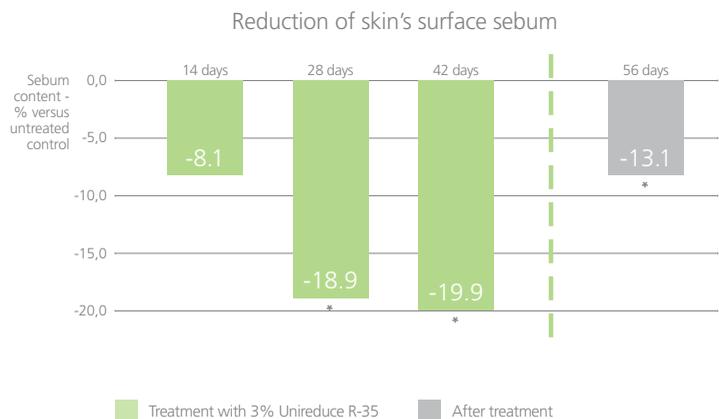
## Fast and extended sebum content reduction (Clinical efficacy)

Unireduce R-35 was tested during a clinical trial on 25 women volunteers (aged between 25-35) with an elevated superficial sebum content on the forehead ( $> 200\mu\text{g}/\text{cm}^2$  of skin). Either nothing or a basic non oily cream containing 3% of Unireduce R-35 were applied twice a day, on half of the forehead, during 42 days to evaluate the reduction of sebum content.

The sebum content was measured at day 14, 28, 42 and 56, 30 minutes after the last product application. The measurements of sebum were performed with the Sebumeter® SM 810.

**Result:** Unireduce R-35 significantly decreases the sebum content on the forehead region by **-19.9%** after 42 days.

The product shows a continuous reduction effect after 56 day, 14 days after the last application of the product.



\* $p < 0.01$  compared to untreated control, Student's t Test

# Summary

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## Technical information

INCI:	Farnesyl Acetate, Panthenyl Triacetate, Tocopheryl Acetate
Origin:	Organic synthesis
Preservation:	Preservative-free
Appearance:	Yellowish liquid
Solubility:	Oil-soluble
Dosage:	1-3%
Processing:	Can be added at the end of the formulation process under stirring or homogenizing or can be heated for a short time with the oil phase of formulation. Formulate at pH between 5.0 to 8.0 and temperature below 50°C.

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## Claims

Claims:	Sebum regulator, lipids synthesis stimulator, biological pore size reduction.
Applications:	Oily skin treatments, hair care, scalp treatment.

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