

Active Beauty  
Unilucent™ PA-13  
Dark spot lightener

Crafted by green technology



## Focus on the product

### Melanin: a natural UV shield for our skin...

Skin color is defined by different factors, the type and amount of melanin being the most important ones. Melanin is a brown pigment produced in the skin to protect important cell structures from UV radiation and from free radicals. This pigment is formed in specialised cells, the melanocytes, located in the basal layer of the epidermis. It is then transferred to the keratinocytes where it will arrange around the nucleus, mainly on top of it, to protect the cell DNA from UV damage. This natural protection process is increased by UV exposure, resulting in the tanning of the skin.

### ... that may lead to uneven complexion and age spots

Whereas the general skin color is genetically determined, the occurrence of hyperpigmentation and dark spots are strongly influenced by the ageing process and external factors, such as sun exposure or inflammatory processes. All this can lead to a local overproduction of melanin.

An even skin complexion without imperfections, such as pigmented spots is a very important factor for a youthful appearance. This is why skin lightening actives are widely used in anti-ageing products.

### Unilucent™ PA-13

is based on acetylated hydroxystilbenes from *Rheum Rhaponticum* (Rhubarb) and Panthenyl Triacetate (PTA). Rhapontin belongs to the hydroxystilbenes and derivatives, that have been investigated for their efficiency in decreasing melanin synthesis. Considering the association between inflammation and melanin synthesis, PTA is an ideal complement because of its anti-irritant and anti-inflammatory activity.



### A double mode of action

Unilucent™ PA-13 has been shown to decrease melanin synthesis in melanocytes and its accumulation in keratinocytes. Furthermore, it reduces the melanin transfer from melanocytes to keratinocytes. These results were confirmed in an *in vivo* study on 20 subjects, assessing pigmented spots, skin brightness and skin radiance.

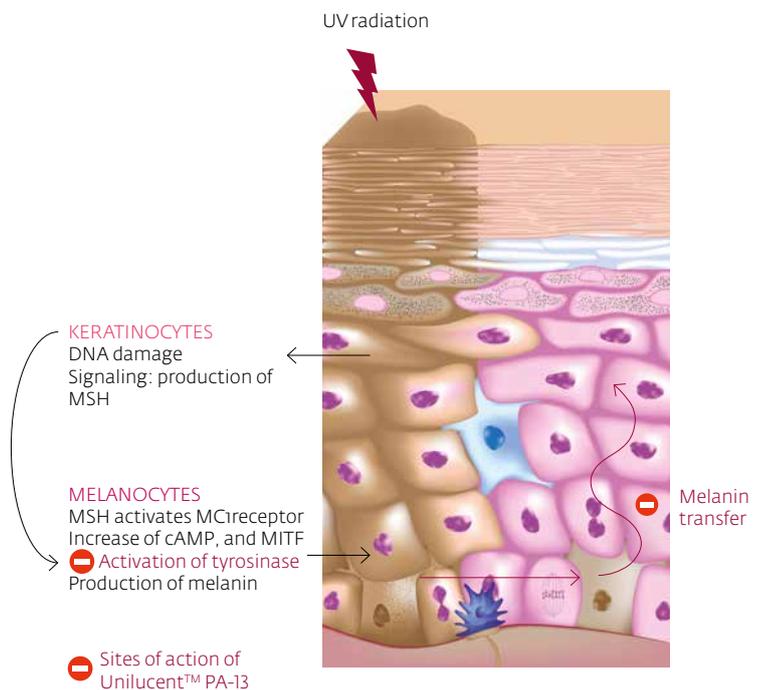
# Biological activity

## Mechanism - Dual Mode of Action

UV radiation (UVR) triggers the expression of the melanocyte-stimulating hormone (MSH). MSH is secreted by keratinocytes and acts on melanocytes by binding to melanocortin-1 receptor (MC1R) and leading to the elevation of cAMP levels. This in turn increases transcription of microphthalmia-associated transcription factor (MITF), which leads to the synthesis of melanin from tyrosine. Melanin is packed in melanosomes and transported to keratinocytes, where it acts to protect the nuclei from further UV exposure. The accumulation of melanin in keratinocytes also leads to the appearance of tanning.

As a global skin lightener, the acetylated hydroxystilbenes contained in Unilucent™ PA-13 interfere in this complex process by:

- ▶ inhibiting tyrosinase, an enzyme involved in several steps of the process;
- ▶ hindering the melanin transport from melanocytes to keratinocytes.

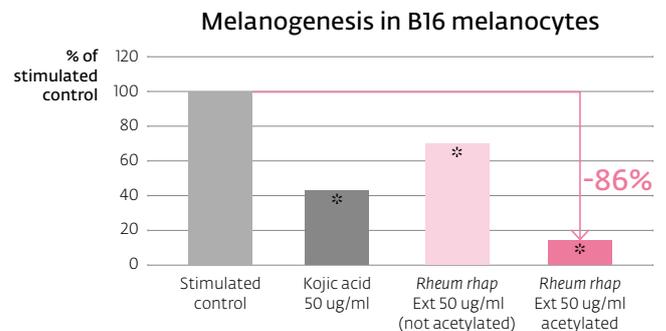


## Inhibition of melanogenesis (*in vitro* tests)

The active compound of Unilucent™ PA-13, the acetylated *Rheum rhaponticum* extract, was tested for its ability to inhibit melanogenesis in B16 melanocytes stimulated by NDP-MSH. It was compared to its non-acetylated version and to Kojic acid as a benchmark.

**Results:** The active compound of Unilucent™ PA-13 **inhibits melanogenesis by 86%** compared to the stimulated control. Its activity is superior to the non-acetylated version and to Kojic acid.

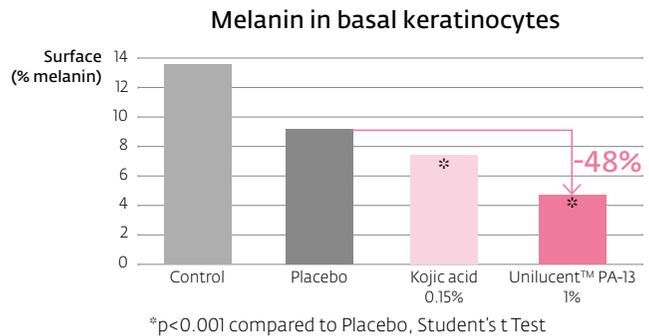
\*p<0.001 compared to Placebo, Student's t Test



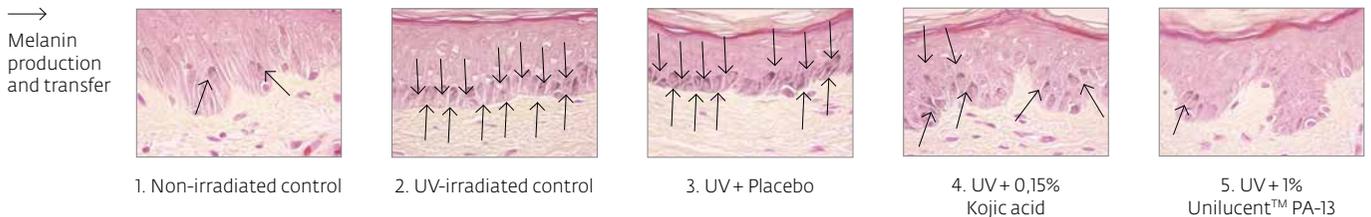
# Efficacy

## Control of melanin production and transfer to keratinocytes (ex vivo evaluation)

Unilucent™ PA-13 was tested for its ability to inhibit melanin synthesis and deposition in human skin explants. It was compared to placebo and to Kojic Acid as a benchmark. Skin explants were UV-irradiated for 10 consecutive days, application of the products took place every other day on D0, D2, D4, D6, D8, D10. The explants were evaluated on D6 and D10 for melanin content in melanocytes, melanocytes contact to basal layer keratinocytes, melanin transfer to keratinocytes and melanin content in keratinocytes.

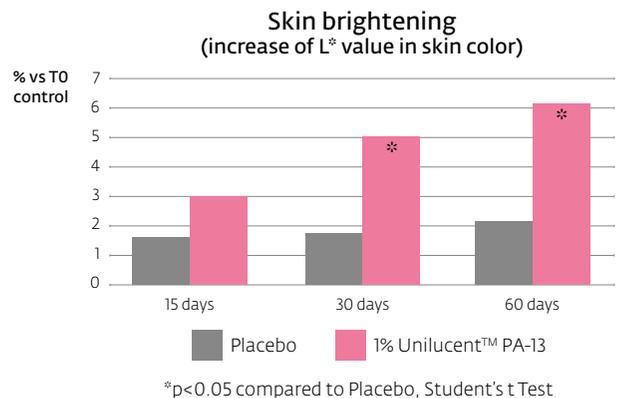
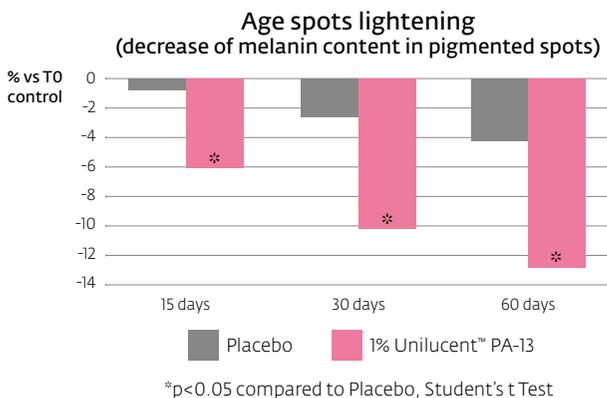


**Results:** Unilucent™ PA-13 significantly reduces melanin content in keratinocytes compared to placebo. Furthermore, it decreased melanin content in melanocytes, melanocytes contact to keratinocytes and melanin transfer to keratinocytes.



## Reduction of dark spots, increase in skin brightness (clinical efficacy)

A cream containing 1% Unilucent™ PA-13 was compared to placebo in a blind study on 20 human volunteers. The products were applied twice per day for 60 days on either half of the face. Melanin content in dark spots (Mexameter), skin brightness and skin radiance (Spectrophotometer) were evaluated after 15, 30 and 60 days.



**Results:** Unilucent™ PA-13 significantly reduces melanin content in pigmented spots compared to placebo in only 15 days. Furthermore, it increases skin brightness and also skin radiance significantly after 30 days.

# Summary

## Technical information

INCI:	Panthenyl Triacetate (and) Acetyl Rheum Rhaponticum Root Extract
Origin:	Acetylated plant extract
Preservation:	Preservative free
Appearance:	Brown, highly viscous solution
Solubility:	Oil-soluble
Dosage:	0.5-1%
Processing:	Can be added at the end of the formulation process under stirring or homogenising or can be heated for a short time with the oil phase of a formulation. Formulate at pH below 7.5 and temperature below 45°C

## Claims

Claims:	Anti-dark spots, skin lightening, evening out skin tone, radiance enhancing
Applications:	Skin lightening face or body care products, anti-ageing products, hand creams, skin radiance products

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