SulforaWhite: Garden Cress Sprout Fraction with Strong Whitening Activity

Author: Dr Daniel Schmid, Mibelle Biochemistry, Switzerland

Abstract

An extract of garden cress sprouts that was incorporated into a liposomal skin carrier system, was found to exhibit a strong whitening effect. This new whitening ingredient, SulforaWhite, is characterised by a standardised content of sulforaphane, the well-known phytonutrient of Brassicaceae vegetables. In vitro, the whitening efficacy was demonstrated on B16 melanocytes after stimulation with α-MSH. The result could be clearly reproduced in vivo with a cream containing 2% SulforaWhite, tested on 21 Asian subjects for 56 days.

Introduction

In Asia there is a broad demand for whitening products, either to lighten the skin complexion generally or to adjust differences in pigmentation. For Caucasian skin, whitening products are used to treat age spots or other forms of hyperpigmentation like freckles or darkly pigmented scars. What nowadays every woman wishes is a porcelain complexion. There is a trend to brighten up the skin to give an even, radiant tone. Skin lightening is seen as part of the anti-aging skin care.

The process from exposure to UV light to pigmentation is very complex and contains many steps. As shown in Figure 1, UV light leads to the generation of reactive oxidants in keratinocytes. This causes the keratinocytes to release inflammatory mediators such as prostaglandins and NO and the alpha-melanocyte stimulating hormone (α-MSH). There are receptors for prostaglandins and α-MSH on melanocytes. A lot of research was done on the receptor for α-MSH, called melanocortin 1 receptor (MC1R). After binding with α-MSH, the receptor induces melanocytes to promote the expression of the tyrosinase gene and to enhance dendricity. Tyrosinase is the rate-limiting enzyme in the synthesis of melanin pigments. Melanin is produced in specialised organelles, called melanosomes. These organelles are gradually filled with pigments, transported to the peripheral dendrite tips and transferred to the surrounding keratinocytes. There, melanosomes form a protective shield around the cell nucleus, producing a uniform skin colour.

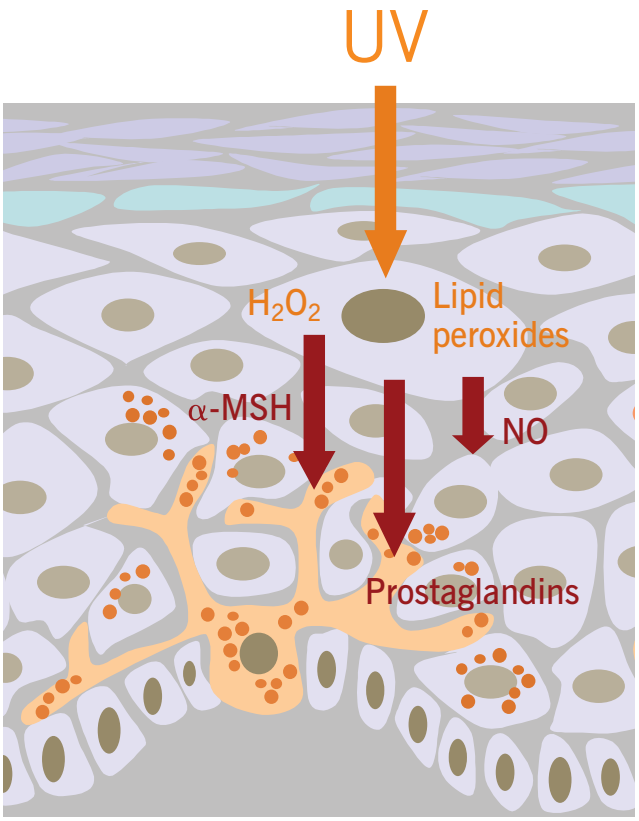

Figure 1 Signalling mediators involved in the tanning response

In the past, pigmentation was inhibited mainly by actives that reduced the enzymatic activity of tyrosinase. The whitening actives marketed today interfere at different steps in the pigmentation cascade. A series of new actives came up that were reported to block the transfer of melanosomes to keratinocytes. Another efficient way to suppress pigmentation would be to block the upregulation of the expression of tyrosinase and to block the stimulation of melanocyte dendricity. This could be achieved by interfering with the binding of keratinocyte mediators to their receptors on melanocytes or by inhibiting the production of these mediators.