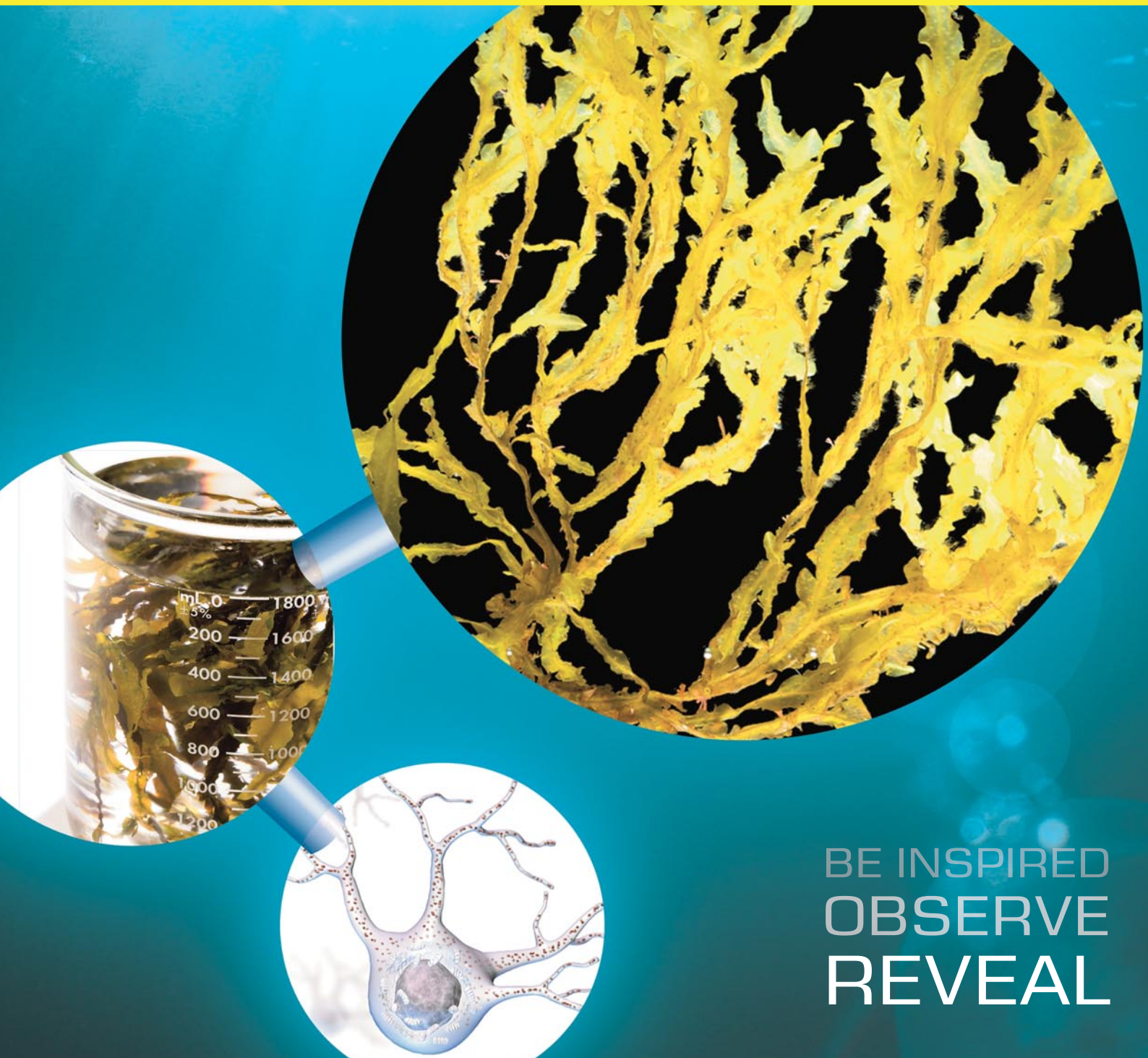


CODIF

R&N

3M3.WHITERIS G

Lightener - Melano-minimiser



BE INSPIRED
OBSERVE
REVEAL

3M3.WHITERIS G :

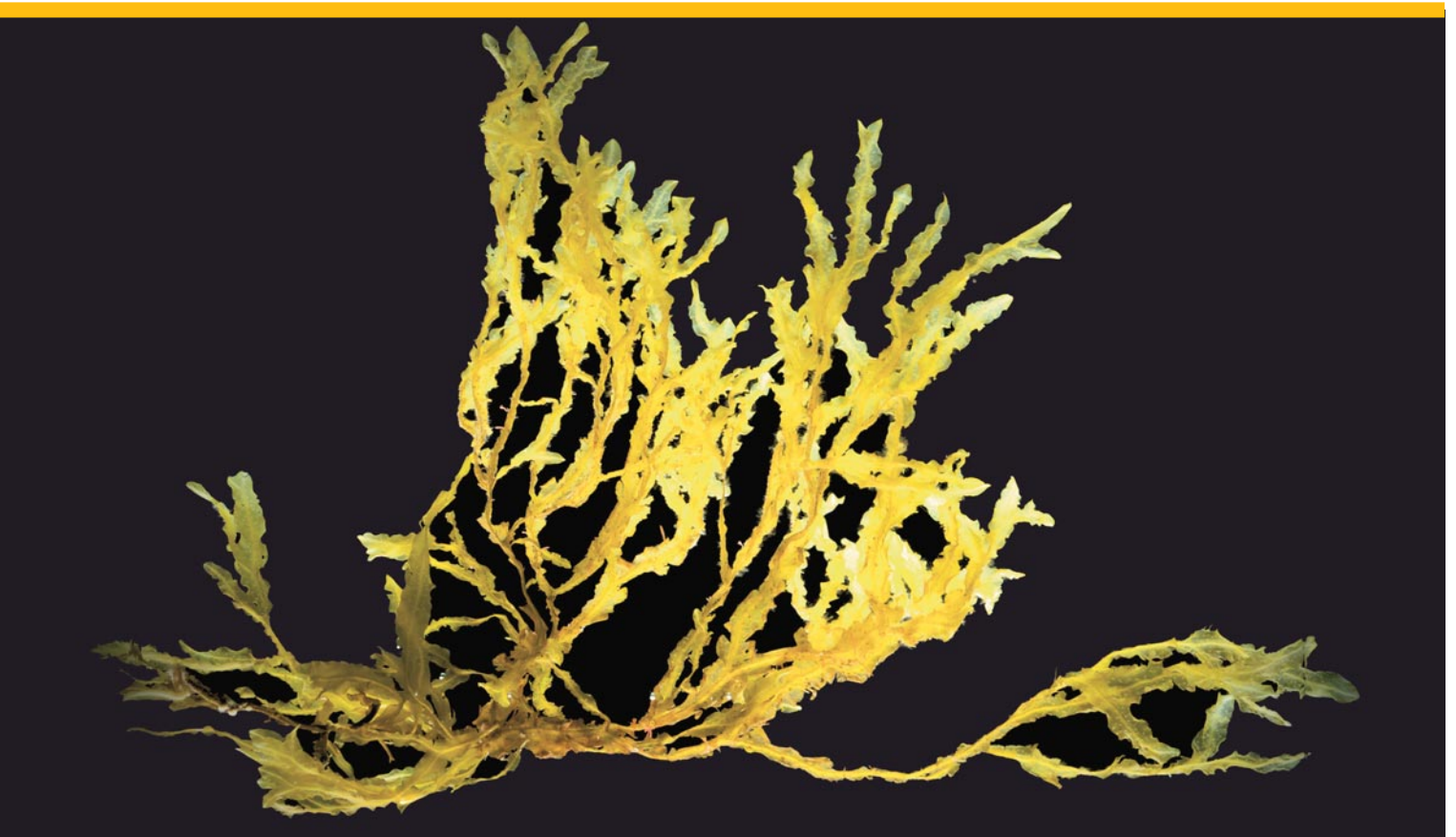
Lightener - Melano-minimiser



3M3.WHITERIS G acts on the genes that control the three key mechanisms involved in the pigmentation of the skin: the Maturation of melanosomes, Melanogenesis (occurring in mature melanosomes), and the Migration of melanosomes (responsible for the exportation of melanin towards the keratinocytes).

3M3.WHITERIS G reduces the size of the melanin-transporting melanosomes, inhibits the activating factors of melanogenesis, and decreases the quantity of melanin exported in the epidermis.

Through its “melano-minimiser” action, 3M3.WHITERIS G reduces the size of dark spots and decreases the pigmentation of the skin for a lightening effect.



BE INSPIRED

Dictyopterus membranacea, also known as sea fern in France, is a brown alga from the European Atlantic coast line, belonging to the Dictyotaceae family.

Harvesting the seaweed from its natural habitat presents several problems, firstly it can only be collected by divers, secondly it is widely dispersed in the Channel, and lastly it is a protected species in the Mediterranean. CODIF Recherche et Nature have therefore developed culture techniques on long-lines in the open sea to ensure a regular supply without diminishing natural resources.

Small quantities of the algae are initially collected from their natural habitat; they are then placed in hatcheries where they emit spores that ensure a continuous supply of new plants. After germination the resulting small algae are transferred to the open sea in controlled culture zones. One year after the hatchery stage, the algae are harvested for extraction.

The aromatic fragrance of *Dictyopterus membranacea* is very characteristic and gives certain bays (such as in Hawaii) a sea smell due to the presence of dictyopterene type pheromones.

OBSERVE

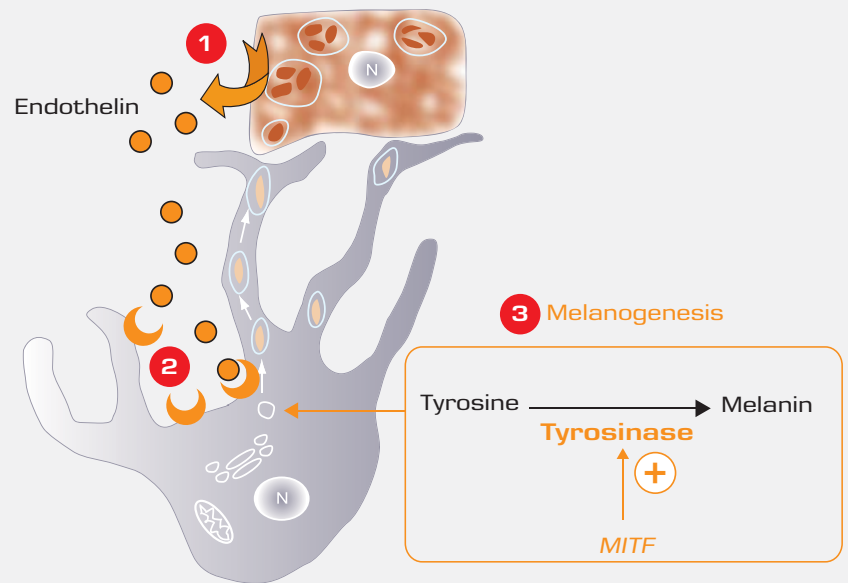
Melanin is synthesised and then exported to epidermis to give its final pigmentation to the skin, thanks to melanosomes (sort of liposomes produced by the melanocytes).

3 main mechanisms are involved in skin pigmentation :

- Biogenesis and maturation of melanosomes
- The activation and synthesis of melanin into mature melanosomes
- The migration of mature melanosomes into the dendrites for the transfer of melanin.

Activation and synthesis of melanin

1. Under exposure to UV light, keratinocytes secrete endothelin.
2. Endothelin binds to specific receptors at the surface of the melanocytes, thus activating the synthesis of melanin from tyrosine.
3. The synthesis of melanin is catalysed by tyrosinase, an enzyme that is controlled by the MITF gene.

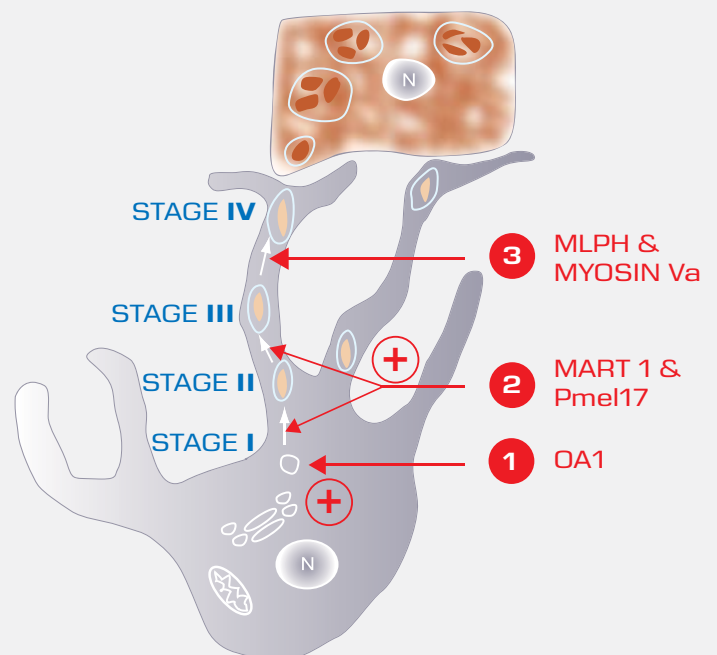


Maturation and migration of the melanosomes

Melanin is synthesised in melanosomes, which transport the former to the keratinocytes, where it gives the skin its final pigmentation. The number, size, maturation, and migration of melanosomes within the melanocytes therefore play a major role in the pigmentation of the skin.

There are 4 stages of melanosome maturation :



1. At stage 1, the OA1 gene controls the size and number of pre-melanosomes.
2. The MART 1 and Pmel17 genes then stimulate the maturation of melanosomes (stages 2 and 3), allowing the synthesis of melanin into the mature melanosomes.
3. Finally, at stage 4, the MLPH and MYOSIN Va genes control the migration of melanosomes within dendrites towards the keratinocytes.

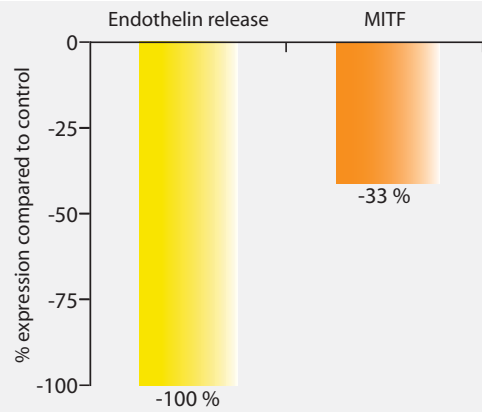


IN-VITRO TESTS

3M3.WHITERIS G inhibits the activation of melanogenesis


- = The inhibition of endothelin release by keratinocytes is reflected by a decrease in melanogenesis activation.
- = The inhibition of MITF gene is reflected by a decrease in tyrosinase activation.

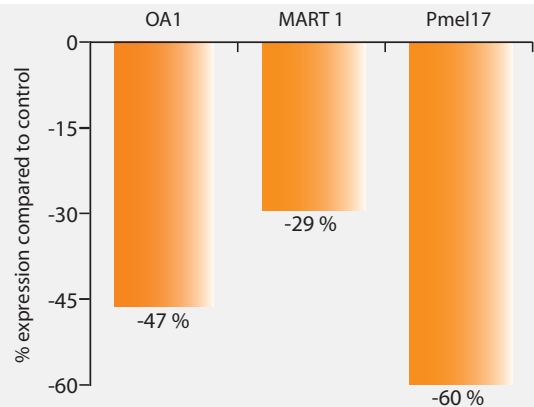
-  Minichips on keratinocytes cultivated with 2% 3M3.WHITERIS G
-  RT-qPCR B16 melanocytes cultivated with 10% 3M3.WHITERIS G



3M3.WHITERIS G controls the number of mature melanosomes



- = The inhibition of OA1 gene is reflected by a reduction in the number and the size of melanosomes.
- = The inhibition of MART 1 and Pmel17 genes slows down the maturation of melanosomes.

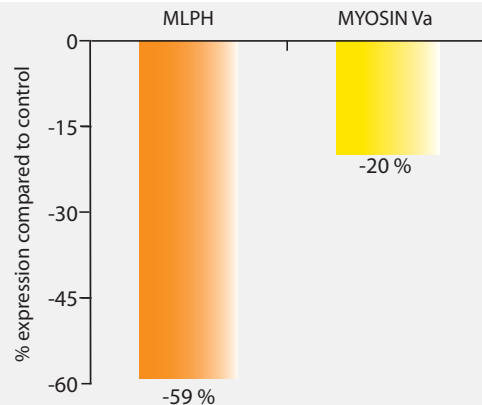
-  RT-qPCR B16 melanocytes cultivated with 10% 3M3.WHITERIS G



3M3.WHITERIS G controls the exportation of melanin towards the keratinocytes

- = The decrease in the expression of MLPH and MYOSIN Va genes inhibits the migration of melanosomes towards the keratinocytes and therefore the transfer of melanin.

-  Minichips on human melanocytes cultivated with 2% 3M3.WHITERIS G
-  RT-qPCR B16 melanocytes cultivated with 10% 3M3.WHITERIS G



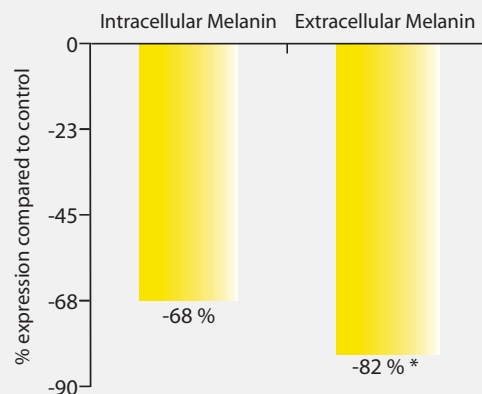
3M3.WHITERIS G inhibits the synthesis and the exportation of melanin

The reduction in the quantity of intracellular melanin results from the inhibition of the genes involved in the synthesis of melanin and in the biogenesis of melanosomes.

The reduction in the quantity of extracellular melanin results from the inhibition of the genes controlling the migration of melanosomes.

* $p < 0.05$, Student T test

Stimulation of melanin synthesis by alpha-MSH in cultures of B16 melanocytes in the presence of 2% 3M3.WHITERIS G.

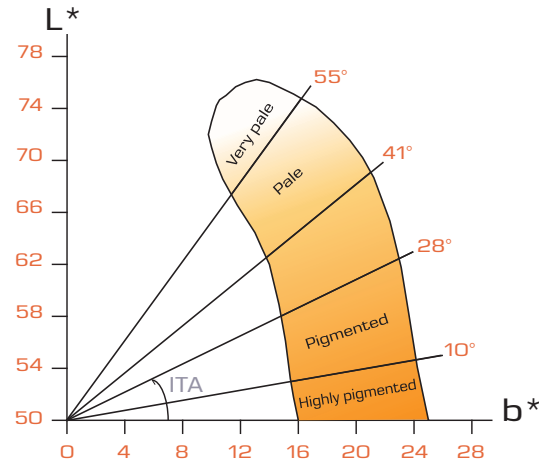


Protocol :

- = Test realized in Thailand on 15 volunteers presenting with a type III-IV phototype
- = Twice daily application of 3% 3M3.WHITERIS G for 84 days
- = Evaluation of the surface area of dark spots
- = Evaluation of the pigmentation of the skin (chromametric analysis)

Chromametric analysis enables the definition of two parameters of skin pigmentation:

- A luminosity parameter L^* : measures the clarity of the skin, from dark to pale.
- A chrominance factor, b^* : defines the range from blues to yellows. These parameters were studied to measure the Individual Typological Angle, which defines the degree of pigmentation of an individual's skin.



CLINICAL TRIAL : Whitening effect of 3% 3M3.WHITERIS G

After 84 days of application, 3M3.WHITERIS G lightens the skin's pigmentation.

+9% on average and up to +36% increase in the ITA.

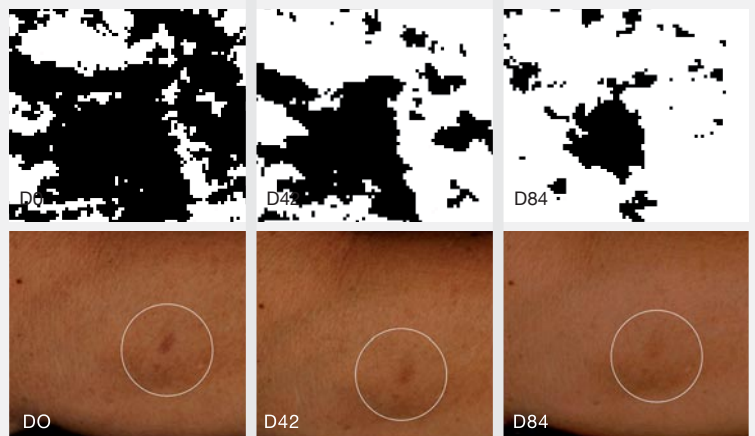


CLINICAL TRIAL : Anti-dark spot effect of 3% 3M3.WHITERIS G

3M3.WHITERIS G significantly reduces the surface area of dark spots :

After 42 days: -11%** on average and up to -32%
After 84 days: -29%** on average and up to -75%

** $p < 0.01$, Student T test



3M3.WHITERIS G acts on the mechanisms responsible for the activation of melanin synthesis, the number, size, and maturation of melanosomes, and controls the transfer of melanin via the migration of melanosomes within the melanocytes.

By decreasing intracellular melanin synthesis, then its exportation towards the keratinocytes, 3M3.WHITERIS G significantly reduces the surface area of pigment spots and lightens the complexion.

3M3.WHITERIS G : Lightener . Melano-minimiser

Cosmetic actions

- = Inhibition of melanogenesis
- = Inhibition of the maturation and migration of melanosomes
- = Reduction in the quantity of melanin produced and exported
- = Reduction in the surface area of dark spots
- = Reduction in the pigmentation of the skin

INCI name : On demand

Recommended % of use

3M3.WHITERIS G : 3%



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Iris, water mint, flowering rush, willows etc... now form part of the image of the brand which is recognized for its commitment to the preservation of natural resources.