

NEURO LUMINOUS CLINICAL STUDIES

NEUROLIGHT – Anti-dark spots Neuroactive ingredient

NEURAL PATHWAY – NEW APPROACH IN TREATMENT OF PIGMENT SPOTS

Pigment spots are characteristic of aged skin and of photo-exposed skin, both of which have cumulated a high cellular stress level.

Recent studies demonstrate the role of two types of intrinsic factor in the formation of dark spots:

- cellular stress molecules
- epidermic neuropeptides.

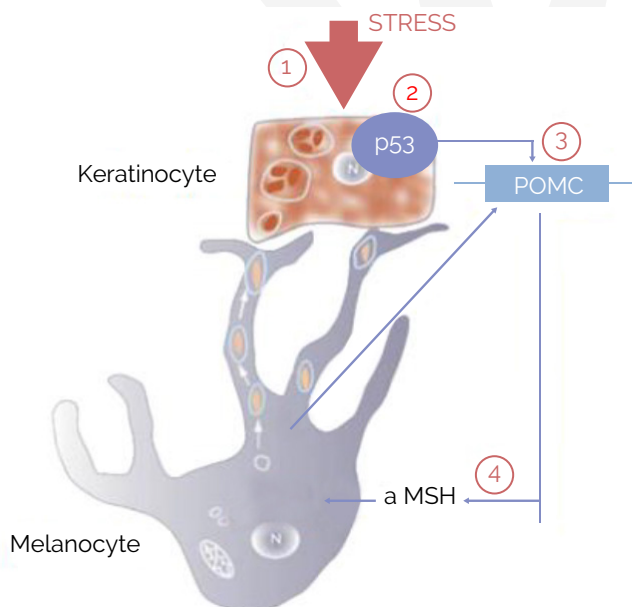
Codif International laboratories have put in evidence the role of the neuropeptide Substance P in the export of melanin.

By inhibiting cellular stress molecules and the action of Substance P, Neurolight explores an original and innovative action mechanism to significantly reduce the size and the pigmentation of dark spots.

ROLE OF CELLULAR STRESS IN THE FORMATION OF PIGMENT SPOTS

1. Pigment spots are the result of a group of pigment-producing cells in response to repeated skin stress.
2. In cells, p53 protein is traditionally defined as THE stress protein. Its expression is multiplied in case of intense cellular stress.
3. Recently, it has been proven that p53 directly regulates the expression of a protein called POMC (pro-opio-melano-cortin complex)
4. POMC encodes alpha-MSH which is involved in the activation of melanogenesis.

The role of p53 protein is critical for cell survival, therefore it is not conceivable to alter its expression.

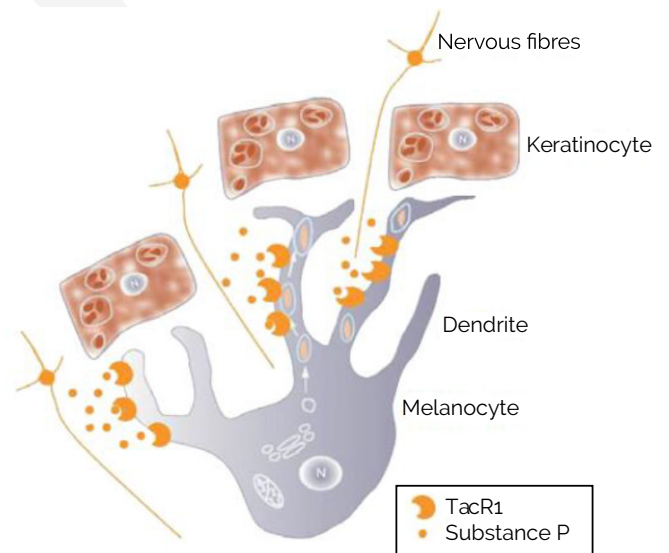


Inhibition of POMC expression, would make it possible to inhibit the activation and thus the overproduction of melanin which results in pigment spots.

ROLE OF EPIDERMIC NEUROPEPTIDES IN THE FORMATION OF PIGMENT SPOTS

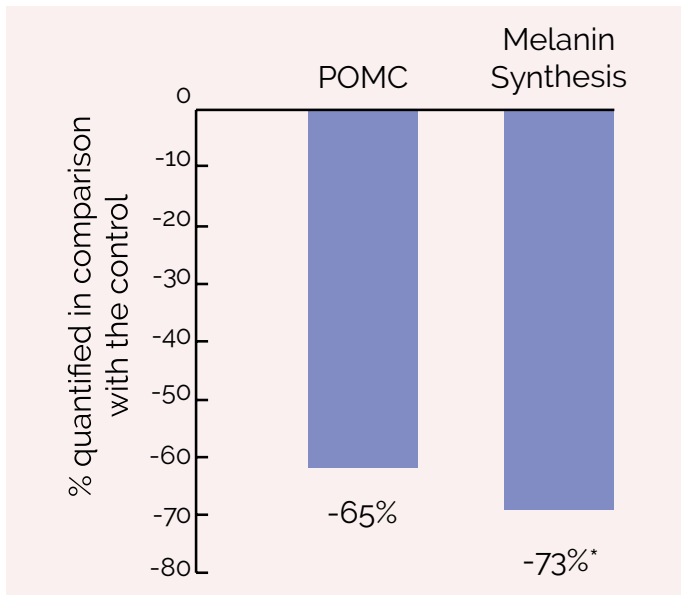
Thanks to their dendrites, melanocytes communicate with keratinocytes and nervous fibres.

1. Melanocytes communicate with keratinocytes for the export of synthesized melanin
2. Nervous fibres communicate with melanocytes by releasing messengers called neuropeptides. When they bind their receptors at the surface of dendrites, neuropeptides trigger the synthesis and/or the export of melanin to the keratinocytes.
3. There is a correlation between the degree of skin innervation and photo-induced skin damage including pigment spots. The formation of dark spots, characteristic of photodamaged skins, is therefore linked to a high innervation degree of the epidermis and an important release of neuropeptides.
4. One of the known epidermic neuropeptides, Substance P has its TacR1 receptor on the surface of the melanocyte dendrites. Its binding action activates the export of melanin to the upper layers of the skin.



Limiting the length of dendrites as well as the synthesis of Substance P receptors enables reduction of the quantity of melanin exported to the surface of the pigment spots.

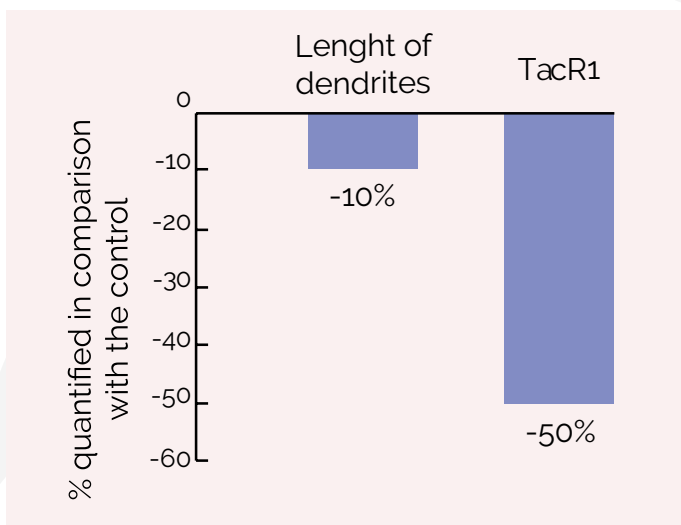
IN-VITRO TESTS: NEUROLIGHT INHIBITS POMC EXPRESSION AND INTRACELLULAR MELANIN SYNTHESIS



Results: Neurolight inhibits POMC expression by 65%

This inhibition directly results in a 73% reduction in melanin synthesis

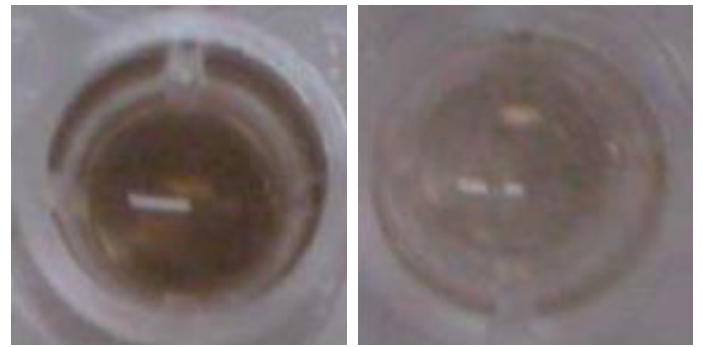
IN-VITRO TESTS: NEUROLIGHT REDUCES THE MELANOCYTE DENDRICITY AND THE SYNTHESIS OF RECEPTORS FOR SUBSTANCE P



Results: Neurolight inhibits the export of melanin initiated by substance P by 38%

This observation results from the preliminary reduction in dendricity and the quantity of receptor TacR1 on the surface of the melanocytes.

IN-VITRO TESTS: NEUROLIGHT SIGNIFICANTLY INHIBITS THE SYNTHESIS AND EXPORT OF THE MELANIN



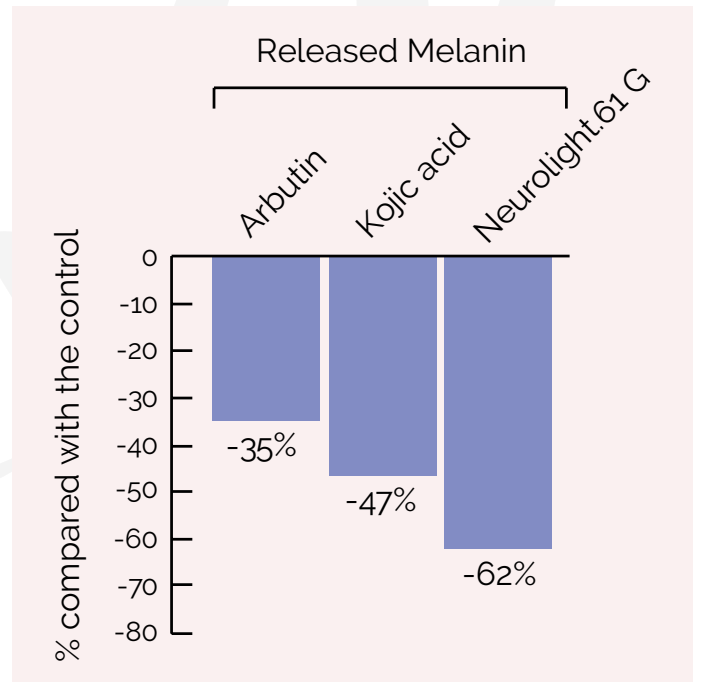
Control

Neurolight.61 G

Results: Acting jointly on the cellular stress factors and the neuropeptide Substance P, Neurolight inhibits:

- intracellular melanin synthesis by -73%
- the export of melanin by -62% (quantification of extracellular melanin)

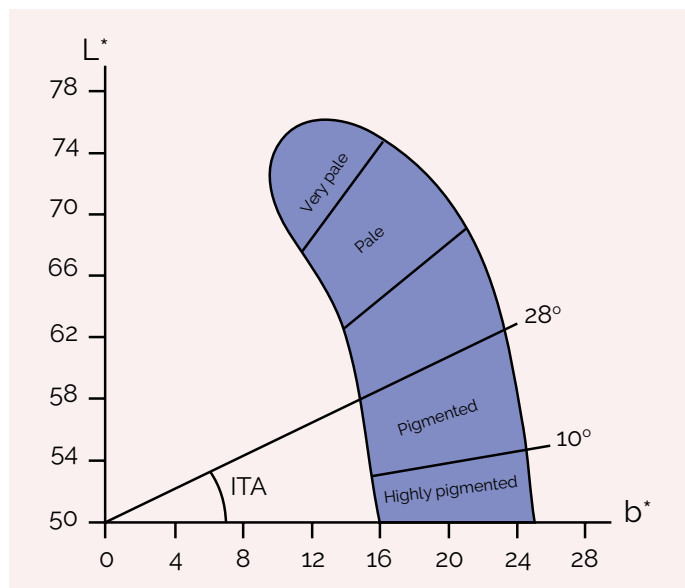
IN-VITRO TESTS: COMPARISON WITH THE REFERENCE MOLECULES



Results: Inhibition of export of melanin

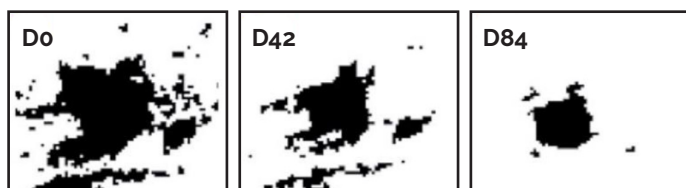
- Arbutin dry extract: -35%
- Kojic acid dry extract: -47%
- Neurolight dry extract: -62%

CLINICAL TEST: NEUROLIGHT SIGNIFICANTLY REDUCES THE SURFACE OF THE PIGMENT SPOTS



Results:

- After 42 days: decrease of the surface of dark spots by -18.9 and up to -63.4%
- After 84 days: decrease of the surface of dark spots by -24.8 and up to -61.1%



CLINICAL TEST: NEUROLIGHT SIGNIFICANTLY CLARIFIES THE PIGMENTATION OF DARK SPOTS WITHOUT LIGHTENING THE PIGMENTATION OF THE SKIN

Results:

- After 84 days: clarification of dark spots by 12.1% and up to 61.5%
- After 84 days: decrease in the difference of pigmentation spot/skin by 11.6% and up to 53%



The elucidation of the role of Substance P in the export of melanin is revolutionizing the treatment of pigment spots. This finding highlights a major metabolic pathway, the role of which in skin pigmentation has hitherto been little researched; the neural pathway.

Neurolight.61 G, acting simultaneously on the neural pathway and the cellular stress pathway, provides an effective and original solution for the treatment of pigment spots.

References:

1. Codif International product technical files
2. Rutao Cui and al, « Guardian of the genome » protein found to underlie skin tanning may also influence human fondness for sunshine. www.dana-farber.org. March 8, 2007.
3. Toyoda et al. Epidermal innervation correlates with severity of photodamage. A quantitative ultrastructural study. *Exp dermatol.* 1996 Oct; 5(5):260-6.