

Chromophore Mapping Reveals Skin Ageing Delay

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Abstract

Beautiful and young skin is a skin without imperfections. Whereas young skin is perfect, ageing skin is less protected and vulnerable: oxidative stress has an influence on its texture and colour, red blood vessels and brown age spots are more and more visible.

Normal human skin appearance to the eye under visible light (400-700 nm) is mainly driven by the concentration and distribution of melanin, haemoglobin and collagen. One also notices a strong difference in the concentration and homogeneity of chromophores (molecules able to absorb light at a certain wavelength) between young and aged skin.

That is why we have developed an active substance which associates two plant extracts, to form an unprecedented anti-ageing skin care based on chromophore mapping. This product specifically targets each chromophore in order to confer the skin with a fresher, younger look by decreasing redness and brown spots while improving collagen homogeneity.

Introduction

Beautiful and young skin is a skin without imperfections. Whereas young skin looks even and radiant, ageing skin exhibits irregularities and blemishes that alter its homogeneity: oxidative stress has an influence on its texture and colour, red blood vessels and brown age spots are more and more visible. These heterogeneities are related to variations in the concentration and distribution of chromophores in the skin that occur with age.

Chromophores are coloured molecules. In the skin, the term refers to molecules able to absorb light and whose accumulation is readily perceived by the eyes. The two most common cutaneous chromophores are a brown chromophore: melanin, produced by melanocytes and stored in neighbouring keratinocytes, and a red chromophore: the haemoglobin contained in the blood⁽¹⁾. In addition to these chromophores visible to the naked eye and readily quantified, dermal collagen also has the ability to absorb certain types of photon and thus constitutes a particular chromophore.

Chromophore Mapping and Signs of Ageing

The distribution of chromophores in young skin is very homogeneous. Thus, a young healthy skin has a fresh glowing complexion with no apparent blood vessels. The vascularisation consists of a dense network of superficial micro-capillaries that are not visible to the eye⁽²⁾ and which supply the skin with nutrients and oxygen. With regard to pigmentation, the chromophore melanin of young skin presents insignificant visual irregularities. Stimulation of melanin synthesis by exposure to the sun provides a homogeneous pigmentation of the skin.

With age and repeated daily minor stresses, the situation tends to vary. The skin loses its radiance due to the impairment of chromophore balance⁽¹⁾. Locally, the dendricity of melanocytes expands while keratinocytes raise their ability to phagocytose melanosomes. This results in localised increases in lentigines and hyperpigmentation. In parallel, in certain places, frequently those most exposed to the sun, the vascularisation becomes visible either in the form of vessels or in the form of diffuse red areas of variable intensity⁽³⁾.

In addition, it is known that, with age and stress, the proteins of the extracellular matrix are produced less and exhibit greater degradation. This weakens the supporting network of the skin, once again heterogeneously. The degradation, in particular of the most abundant collagen molecules I and III, renders the skin thinner and underlying structures and defects become noticeable.

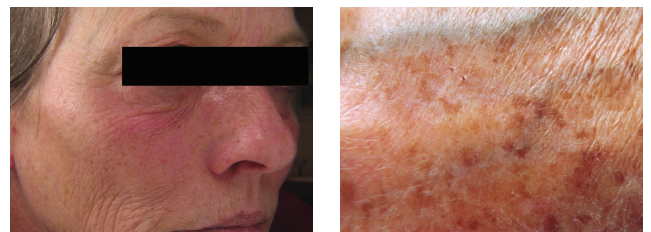


Figure 1. Ageing skin with redness (left) and lentigines (right)

VEGF, a Factor of Skin Ageing

Reactions underlying skin ageing can occasionally initiate a localised intensification in facial or décolleté skin redness.