VIAL WHITENING

The depigmenting agents or skin lighteners are the products whose main function is to diminish the coloration of the skin. This appears by aging or continuous exposure to the sun.

The molecule responsible is melanin, a pigment produced by tyrosine, an essential amino acid. This is also responsible for protecting the skin from the UV rays of the sun. Why do hyperpigmentations occur on the skin? All skin spots are produced by an excess, defect or absence of skin pigments. There may be an increase in the melanin production of the existing melanocytes (cells responsible for the production of melanin), or an increase in the appearance of active melanocytes.

There are two types of melanins:

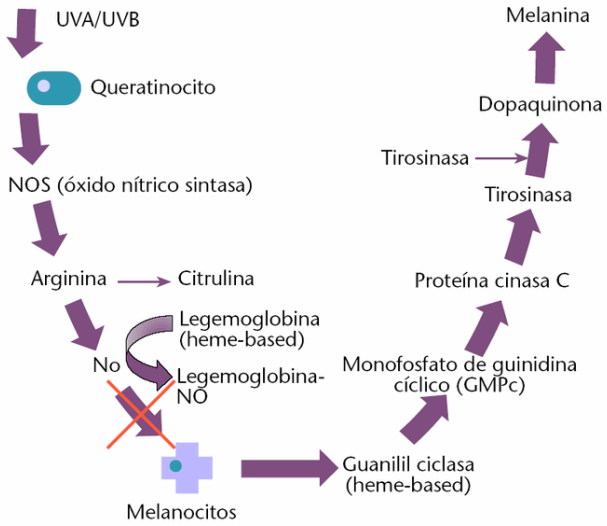
1. EUMELINES: known as "photoprotective melanin", is responsible of protecting against UV rays and is present in a greater proportion in people with matte skin.

2. FEOMELANINES: also known as "red or pink melanin", in greater quantity in people with clear skins. These do not protect from UV radiation.

Depending on the type of skin, a greater quantity of one or other melanin, will be generated, determining the color of the skin and the tanning capacity of the same.

How does skin pigmentation take place?

1- UV rays and biological mediators (molecules present in skin cells) stimulate pigmentation and, therefore, the production capacity of meloncytes.



2- The melanocyte produces melanin.

3- Melanin migrates to the layers of the epidermis.

4- Melanin reaches the most superficial layers of the skin due to the constant and natural renewal of the epidermis. Therefore the stain appears on the surface.

Skin spots appear when the production of melanin increases abnormally and it does not spread evenly on the surface of the skin, accumulating in some points of the skin.

A continuous exposure to the sun generates excess melanin. In addition, the risk of hyperpigmentation increases with the aging of the cells.

How can you prevent the appearance of spots on the skin?

Use of sun protection. Use a cream with SPF depending on the type of skin.

Avoid exposure during the hours of greatest radiation.

Use cosmetics that diffuse existing stains and that slow down the extreme melanin synthesis.

The ingredients of *Whitening* inhibit the excessive melanin formation that causes new spots to be created.

NATURAL ACTIVE INGREDIENTS:

- Actinidia Chinensis Fruit Water:

KIWI's water. It is obtained from the distillation of the kiwi. It is a great antioxidant, it has high amounts of vitamin C and E. It keeps the skin hydrated as well as helps to regenerate the cells delaying wrinkles, fine lines and blemishes. It is a powerful protector of collagen and stimulates the synthesis of it.

It is perfect to help clean pores and combat acné. It has anti-inflammatory properties.

Prevents sun damage and spots.

- Glycyrrhiza Glabra Root Extract:

It is well-known as REGALIZ. It has anti-inflammatory effect and antioxidant properties. It takes care of the mature skins clarifying the spots produced by the age.

❖ Sophora Flavescens Root Extract:

Extract obtained from the roots of a leguminous shrub plant.

It is a powerful antioxidant and a skin conditioner.

It is a specie of plant in the genus Sophora of the family Fabaceae. This genus contains about 52 species, nineteen varieties, widely distributed in Asia, Oceania, and the Pacific islands. It is commonly-used in traditional Chinese medicine. It is anti-inflammatory and an antioxidant and useful for preventing hypercholesterolemic atherosclerosis
A promising source of a natural, novel, new antifoulant.Therefore, a potential source of novel whitening agents for ultraviolet (UV)-sensitive skin.

❖ PURE ASCORBIC ACID:

Vitamin C, or L-ascorbic acid, acts as a cofactor for collagen synthesis. It has a high regenerating ability.

Vitamin C is essential for the proline hydroxylation, therefore in the development and maintenance of collagen integrity. In addition, vitamin C inhibits the synthesis of Extracellular Matrix Metalloproteinase enzymes which stimulates collagen degradation in dermis.

Vitamin C's collagen stimulating atributes provides it with wound healing properties, caused by trauma, cuts, burns, or surgery. It is also suitable for the formation of new tissues.

Vitamin C belongs to the group of water soluble vitamins, and like most of them, it is not stored in body for a long period of time, but in small quantities which are eliminated through urine. For this reason, Vitamin C daily administration is important in order to provide sufficient antioxidant protection.

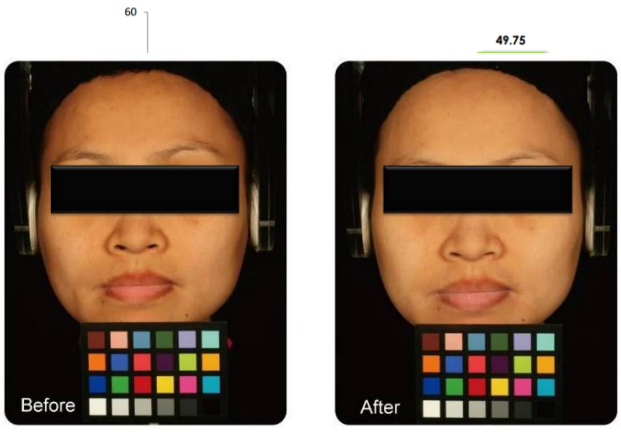
Its chemical structure is similar to All compounds which possess the biological activity of ascorbic acid are known as Vitamin C. We should note that the only active form of Vitamin C is L-Ascorbic Acid.

As Vitamin C is a water-soluble substance, it is rapidly eliminated from the organism. Our body tends to protect vital organs, so any vitamin deficiency is felt primarily in the skin (less vital organ), which explains the **importance of its topical application**.

Clinical Efficacy Studies

1- In-vitro whitening activity study - melanin assessment on human melanocytes:

An in-vitro evaluation of the **Ethyl Ascorbic Acid anti-pigment ability** was performed Theophylline was incubated with melanocytes in order to increase melanin production. Subsequently, **Ethyl Ascorbic Acid** was added at concentrations of 15 mg / ml and 20 mg / ml respectively, and comparing with kojic acid, a known anti-pigment ingredient.



2- In-vivo whitening efficacy

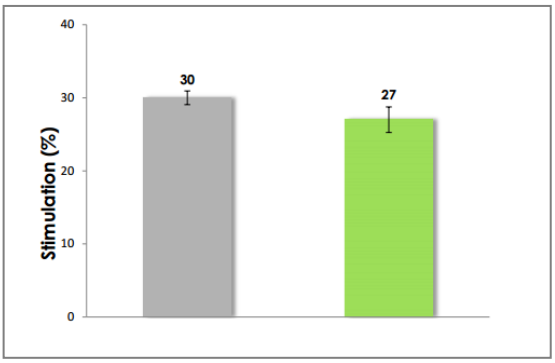
A study in-vivo **whitening** capacity of Vitamin C (as **Ethyl Ascorbic Acid**) for 28 days in 20 healthy Asian women aged 25 to 40 years old with skin type III was performed.

A significant improvement in the skin lightening measured by chromatography observed:

Natural collagen synthesis (%)

3- Stimulation of natural collagen synthesis:

The **Stimulation of natural collagen synthesis** activity was evaluated on human fibroblast culture. After 24 hours of culture, the collagen was quantified using a Sircol Quantification Kit. Vitamin C had a similar effect on collagen synthesis that of TGF β1 (growth factor which stimulates collagen synthesis):



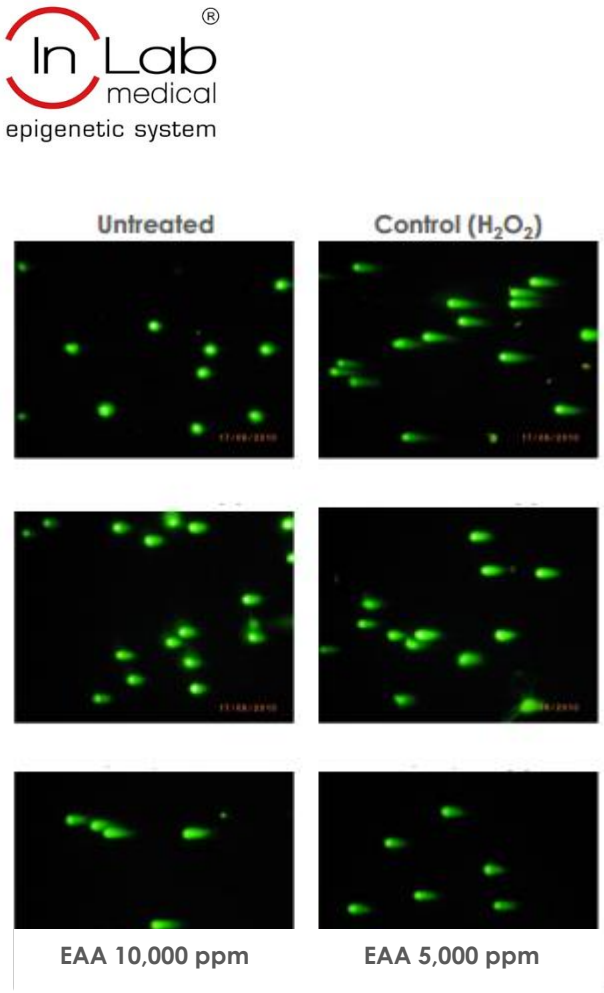
10 ng/ml TGF β1 **500 ppm E.A.A ***

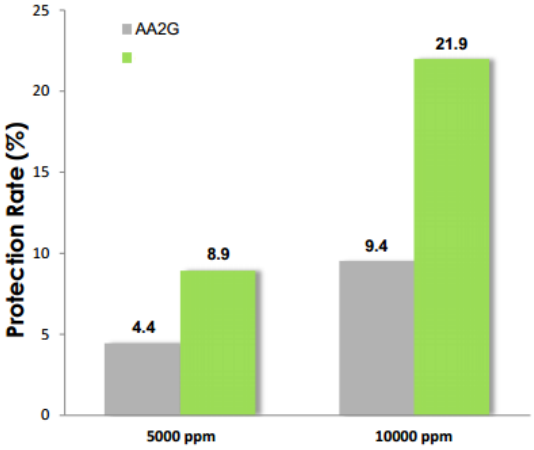
*** E.A.A: Ethyl Ascorbic Acid**

4- DNA protection by Comet assay in human fibroblasts:

When DNA is in good condition, it has a highly organized association with matrix proteins in cell nucleus. When damaged, this organization is interrupted. The single DNA strands losing their compact structure and relaxes, expanding out.

Human fibroblasts were treated with Vitamin C (Ethyl Ascorbic Acid) for 24 hours, and then exposed to 100 mM H2O2. It was shown that **Vitamin C** at concentrations of 5000 ppm and 10,000 ppm, **was able to protect DNA:**





Vitamin C Mechanisms of action:

Vitamin C anti-aging action is exerted through several ways:

1. Synthesis and repair of dermal collagen

Deficiency of ascorbic acid (AA) produces significant alterations in connective tissue, since Vitamin C is essential for collagen synthesis.

Vitamin C is essential for the transformation of proline in hydroxyproline and lysine in hydroxylysine (essential constituents of collagen). Consequently Vitamin C offers stability to the extracellular matrix.

2. Antioxidant activity

Vitamin C protects cells from free radicals. From all the scientific publications regarding Vitamin C, the most interesting are those related to the photoprotective effect of ascorbic acid when topically applied.

A study published by the **Journal of Investigative Dermatology** in May 1996, describes how topical application of vitamin C, vitamin E and Selenium protects rats skin cells from damage caused by exposure to UVB rays.

In parallel, the **British Journal of Dermatology** some years before, evidenced this protective effect of vitamin C, when used topically, on pig skin damaged by ultraviolet radiation.

The **Spanish Journal of Physiology** published a study showing how direct application of vitamin C protects, and thus prevents the aging in human skin cells in culture subjected to a strong oxidation stimulus with hydrogen peroxide.
One might think that its photoprotective effect was physical, that is to say, topical vitamin C behaves as a sunscreen, and however, its absorption spectrum has nothing to do with the emission of UV radiation. Later it was found that UV radiation produced a significant decrease in levels of ascorbic acid in the skin.

All this goes to show that the UV light, after exhausting all the vitamin C present in the skin, cause an increase in free radicals, making manifest the neutralizing action of vitamin C.

3. Anti-inflammatory action

Vitamin C inhibits NFkB, which is responsible of activation of a number of pro-inflammatory cytokines. Therefore, Vitamin C has a potential anti-inflammatory activity and can be used in conditions like acne vulgaris and rosacea. It can promote wound healing and prevent post-inflammatory hyperpigmentation.

4. Vitamin C as a whitening agent

When choosing a whitening agent, it is important to differentiate between substances that are toxic to the melanocyte and substances that interrupt the key steps of melanogenesis. Vitamin C falls into the latter category of depigmenting agents. Vitamin C interacts with copper ions at the tyrosinase-active site and inhibits action of the enzyme tyrosinase, thereby decreasing the melanin formation.

Indications

VITAMIN C contains a combination of active ingredients that bring light and vitality to the skin, providing, immediately, a glowing and healthy look. It improves the texture and elasticity of the skin, homogenizes skin color and minimizes wrinkles and expression lines.

- ✓ Recovers the lost brightness and light as a result of the chronological aging, UV exposure (photoaging), as well as numerous aggressions to which our skin is exposed daily (pollution, cold , snuff, poor diet, lack of sleep, stress, ...).
- ✓ In a continued treatment, it gets to **homogenize the skin tone** and reduce unwanted pigmentation.
- ✓ **Reduces wrinkles and fine lines** through the synthesis of collagen and elastin.
- ✓ **Increases skin firmness, smoothness and elasticity,** and helps regenerate the dermal matrix by stimulating collagen synthesis.