

SKIN AGEING.



The natural consequence of growth is the ageing process. It consists in the evolution of the tissues' structure, in changes occurring starting from the embryonic period to old age: it simply concerns the inevitable physiological transformation all the living being are subjected to. In general it can be affirmed that the ageing process is characterized by the smaller regeneration ability of tissues.

For instance, the healing process of a cutaneous wound, becomes slower and slower with the passing of years. In the infancy, in absence of a hormonal activity, there is a very intense growth and a reproductive ability; during the puberty the organism keeps on growing up to reach the maximum level at the end of this growth process. Then follows a cycle characterized by an balance among the various physiological activities. At about 50, the third phase of life, the climacteric, starts and it is identified as an evident signal of ageing. The gerontology, that is the science that studies the phenomena related to ageing, defines the various aspects of ageing and diversifies them in the following way:

Histological ageing, that corresponds to the state of functionality of the various tissues of the organism;

Relative ageing, that is assessed in different way according to the organ taken into consideration; for example for the sensorial apparatus, ageing starts around 60, for the muscular one, that is of the physical power starts around 50;

External ageing, that is closely related to the cutaneous ageing. This is caused both by the general physical condition, such as the ageing of the various internal organs, and by the action of various external agents as sun radiations, environmental conditions, atmospheric agents.

The ageing process determines modifications both in the different tissues making up the skin and in its appendages. Besides the genetic, individual factors determining ageing, environmental factors notably affect the human skin ageing, causing changes both in the epidermis and in the dermis.

EPIDERMIS AGEING. The epidermis ageing is a phenomenon that must be closely connected to the dermis ageing. The epidermal cells of the basal layer reach the surface of the skin through a natural progression and during this trial process, they pass from a mature and functional stadium to a stadium of keratinized cells, by now deprived of life. With the passing of years the ageing process is added to this physiological succession and the epidermis tends to a general thinning and to a loss of elasticity due to the diminution of the cells proliferation ability.

The cartilaginous aspect of the horny layer, appears poorly moisturized and rather shrunken, is certainly the most evident feature of ageing. This happens because the keratinic lamellas (that in the young skin are quickly and regularly replaced by fresh protein material) in the aged skin has the tendency to cement and to form a compact



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layer that gives a characteristic appearance to the skin. All this gives evidence of the cellular reproduction slowdown, the consequent smaller stratification of the malpighian cells, the unbalance occurring in the normal processes of water evaporation. The hydration of the horny layer becomes scarce and also changes the quantity of amino acids, of piroglutamic acid, of lactate of sodium, of urea, of salts and of other elements that contribute to the natural hydration of the epidermis.

And it is therefore possible to say that the epidermis cells show two types of ageing: (a) The first is due to the maturation of the cell itself, migrating towards the outside where it forms a Keratinized layer. (b) The second is due to the epidermis as a tissue, therefore associated to a reduced metabolic activity and to a scarce cellular turnover.

DERMIS. With ageing, the dermis suffers changes concerning both the number of the cells and their content of elastic tissue. In the aged dermis the turnover decreases, the old fibers are slowly replaced, tissues become more consistent, reactions of oxidative nature occur, determining remarkable changes of the collagen and of the elastic tissues. The older one gets, the bigger the fibrous part compared to the elastic percentage. Besides the nourishing exchanges between blood and cells reduce and the dermis no longer can carry out its function normally. There is also a slowdown of the circulatory activity determining a prolongation of the permanence time in loco of toxins and a tissues' scarce nutrition. The elastic and collagen fibres loose, and there are modifications in the mucopolisaccaridis making up the main cementing substance, probably because of a great variation of the enzymatic activities. There is a decrease of jaluronic acid which can fix notable quantities of water, succeeding in keeping the skin young. Visually the consequence of these regressive processes are wrinkles, cutaneous withering, loss of elasticity, the formation of streaks, of stretch marks, of double chin. Generally this skin ageing process begins around 30, it slowly increases over the time, till it reaches all the changes typical of the ageing face: from wrinkles to relaxation, from the re-absorption of the subcutaneous fatty tissue to the cheeks emptying, from the muscular relaxation to the change of the face outline.

HYPODERMIS. In the hypodermis there is a modification in the adipose layer either at a quantitative or at a qualitative level with dermo-hypodermic infiltrations.

CUTANEOUS APPENDAGES. The sebaceous and sweat glands suffer secretive changes related to hormonal, neruovegetative and psychic factors associated to ageing. The eccrine sweat glands also suffer a slow regression in terms of quantity. Insufficiencies also occur in the hair activity both for what concerns the melanogenetic activity (in fact baldness appears), and the hair production activity that stops, giving way to baldness. The hormonal activity stops and this involves the formation of a characteristic hair. The blood vessels become more fragile, their permeability increase, its functionality decreases with the appearance of erithrosis and couperose.

The phenomena causing the skin ageing are exactly irreversible as the consequences they determines on the tissues, but all this belongs to the normal evolutive process of life.