

The melanin pigmentation: cellular and biomolecular mechanisms

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Several factors are determinant for the color of human skin: the thickness of the stratum corneum, the speed of blood flow, the degree of oxygenation of hemoglobin but the main role is played by the presence of pigments such as carotenoids and, above all, melanin. The amount and the type of melanin is genetically determined, but they are strongly influenced by the other conditions such as hormonal and environmental: age, presence of metal ions, and inflammatory processes, and specifically exposure to sunlight. In vertebrates, melanocytes cells, responsible for the production of melanin, have the main function, but not exclusively, to protect the skin from the genotoxic stress produced by ultraviolet rays (UV); melanin absorbs the UV and neutralizes reactive oxygen species (ROS) they produce. Some studies clarified, at least in part, enzymatic and non enzymatic factors involved in the biosynthesis of melanin and the molecular mechanisms underlying the different responses of skin pigmentation to external stimuli, particularly to solar radiation. In this review we want to revise the cellular and biochemical aspects of skin pigmentation.