OXIDATIVE STRESS-MEDIATED EXPRESSION OF MATRIX METALLOPROTEINASES IN DERMAL SKIN CELLS EXPOSED TO HYDROGEN PEROXIDE

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Skin aging, characterized by dermal extracellular matrix degradation, loss of stem cells niches, and increased number of senescent in detriment of normal cells, occurs mainly as a result of Reactive Oxygen Species (ROS) production during normal aerobic metabolism, inflammation and exposure to ultraviolet and ionizing radiations. ROS play an important role in biological processes, such as carcinogenesis, cell death, and senescence. The action of ROS was also linked to increased levels of matrix metalloproteinases (MMPs) in mammalian skin, leading to premature ageing and cancer susceptibility. We investigated the action of different concentrations of hydrogen peroxide (1.5; 0.87 and 0.087 uM), corresponding to 1/5, 1/10 and 1/100 L_D, in the gellatinolytic activity of conditioned medium and MMP-2, MMP-9, MMP-14 gene expression. The experiments were conducted with Human Fibroblasts primary cultures *in vitro*, obtained upon informed consentment. The gellatinolytic activity of the conditioned medium was increased 0.1, 1.3, and 2 fold, respectively. Fibroblasts exposed to ROS revealed an increased mRNA expression of MMP-2 (up to 2.1-fold at 24h and 3.2-fold at 48h after exposure), when compared to unexposed cells. MMP-9 and MMP-14 mRNA levels were unaltered. These results suggest that ROS produced in the dermis may contribute to biological changes in the connective tissue matrix observed in photoaged skin, by accelerating the MMP-2-related matrix degradation system.

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