Fakultät für Medizin

Dokumenttyp: journal article

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Titel des Beitrags: Mitochondria and Reactive Oxygen Species in Aging and Age-Related Diseases.

Abstract: Aging has been linked to several degenerative processes that, through the accumulation of molecular and cellular damage, can progressively lead to cell dysfunction and organ failure. Human aging is linked with a higher risk for individuals to develop cancer, neurodegenerative, cardiovascular, and metabolic disorders. The understanding of the molecular basis of aging and associated diseases has been one major challenge of scientific research over the last decades. Mitochondria, the center of oxidative metabolism and principal site of reactive oxygen species (ROS) production, are crucial both in health and in pathogenesis of many diseases. Redox signaling is important for the modulation of cell functions and several studies indicate a dual role for ROS in cell physiology. In fact, high concentrations of ROS are pathogenic and can cause severe damage to cell and organelle membranes, DNA, and proteins. On the other hand, moderate amounts of...
ROS are essential for the maintenance of several biological processes, including gene expression. In this review, we provide an update regarding the key roles of ROS-mitochondria cross talk in different fundamental physiological or pathological situations accompanying aging and highlighting that mitochondrial ROS may be a decisive target in clinical practice.