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Oxidative Stress and Inflammation in Aging and Cancer: Biological Bases, Therapeutic Strategies and Opportunities

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Message from the Guest Editor

Oxidative stress and inflammation are two interconnected processes, playing a crucial role in physiological and pathological conditions, such as aging and cancer. Oxidative stress is generated by an imbalance between the production of reactive oxygen species (ROS) and antioxidant defenses, leading to damaged cells, proteins and DNA. This damage accelerates the aging process and increases the risk of developing cancer. In turn, chronic inflammation appears when the activation of the immune system is maintained over time. This state promotes the growth and spread of cancer cells, as well as contributes to age-related impairments. Both processes can further exacerbate the aging-related manifestations and cancer development. Based on that, growing interest in developing therapeutic strategies targeting oxidative stress and inflammation against aging consequences and cancer are being reported. Antioxidant and anti-inflammatory drugs, as well as natural interventions, such as lifestyle modifications have shown promising results in reducing oxidative stress and inflammation, thereby exhibiting the potential of slowing down the aging process and reducing the risk of cancer.

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