Special Issue

Oxidative Stress in Cancer Biology

Message from the Guest Editor

Cellular oxidative stress results from an imbalance between pro-oxidant and antioxidant mechanisms, caused by increased production of free oxygen radicals and/or insufficient antioxidant defenses. Under physiological conditions, normal cells continuously produce free oxygen radicals, which play a dual role. At low levels, they modulate cell signaling, activate stress response pathways, and regulate differentiation, gene transcription, proliferation, and apoptosis. Mild oxidative stress can also help cells adapt to more severe stress. However, excessive free radicals damage DNA, lipids, proteins, and sugars, leading to cell toxicity. To prevent this, cells have developed antioxidant mechanisms to maintain redox homeostasis. Oxidative stress is strongly linked to the development and progression of many diseases, including cancer. It plays a role in cancer initiation, promotion, progression, and metastasis. This Special Issue welcomes studies exploring the molecular mechanisms connecting oxidative stress and cancer.

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