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氧化应激与DNA损伤

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Oxidative Stress and DNA Injury

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摘要 人和动物机体细胞在遭受氮氧化合物、钙和病原体等体内外环境的刺激后,氧化和抗氧化系统之间的平衡被破坏,从而促进细胞内活性氧分子(ROS)的大量产生和积累,最终导致机体产生氧化应激。氧化应激可以导致DNA链断裂、DNA位点突变、DNA双链畸变和原癌基因与肿瘤抑制基因突变等形式的DNA损伤;同时,DNA也在遭受脱嘌呤和脱嘧啶、X射线、紫外线、烷化剂和嵌入剂等体内外物理或化学因素的刺激下造成DNA损伤,DNA损伤也能诱导机体产生氧化应激。本文主要对氧化应激与DNA损伤之间的联系作一综述,以期为后续的相关研究提供参考。

关键词: 氧化应激 ROS DNA损伤

Abstract: After challenged by intra-and extracellular environmental factors, such as nitric oxide, calcium and pathogenic organisms, the balance between oxidative and antioxidant defense systems in human and animal cells is broken, which results in the accumulation of reactive oxygen species (ROS) within cells, and finally oxidative stress occurs. Oxidative stress can cause DNA damage, such as DNA strand breaks, point mutations, aberrant DNA cross-linking, and mutations in proto-oncogenes and tumor suppressor genes; meanwhile, when challenged by physical or chemical factors, such as depurination and apyrimidinic factors, X-ray, ultraviolet, alkylating agent and intercalator, DNA also could be injured, furthermore, DNA damage is a source to oxidative stress in body. This paper mainly reviewed oxidative stress, DNA damage, and their relationship, which could provide a theoretical basis for a further research.

Keywords: oxidative stress, ROS, DNA damage

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