Journal of Nucleic Acids

Hindawi

Special Issue on

Impact of Environmental Factors on Human Health: Underlying Mechanisms in ROS induced DNA Damage

CALL FOR PAPERS

Various *in vitro* and *in vivo* studies showed that reactive oxygen species (ROS) mediated DNA damage is associated with the unregulated biological process such as iron overload, lipid peroxidation, reduced antioxidant capacity, inflammation, increased cellular damage, and gene mutations which can further result in various complications including cancer, mutations, neurodegenerative disorders, alcoholic steatohepatitis, liver cirrhosis, metabolic disorders, aging, and inflammation. Growing research evidence indicates that the environmental factors play a major role in the development of toxicity, and the underlying mechanism involves generation of ROS and the subsequent DNA damage. It is well established that exposure to environmental factors such as human made chemicals, pesticides, heavy metals, and xenoestrogens induces oxidative stress mediated DNA damage. Further, unhealthy lifestyle behaviors such as tobacco smoking, alcohol consumption, consumption of high calorie diet, and wide use of medical drugs could also significantly contribute to DNA damage.

Oxidative stress induced by environmental factors not only leads to the development of chronic diseases but also influences the early stages of prenatal development and postnatal complications. The reduction in capacities of detoxification and free radical scavenging has been shown to be associated with excess production of ROS, which can cause DNA damage. When DNA damage exceeds the cellular capacity to repair it, it will result in augmentation of more errors, cell death, and genome mutations that can be transferred to future cell generations. These complications further put a deleterious impact on future generations. Currently, there is a growing awareness on healthy lifestyle and diet consumption to maintain overall health. Clear understanding of mechanisms of ROS induced DNA damage by exposure of environmental factors such as tobacco smoking, alcohol consumption, high calorie food intake, use of high nitrogen containing pesticides, alcoholic beverages production, and chemical substances produced in food processing will further enhance our awareness to maintain a healthy lifestyle.

The objective of this special issue is to refine the understanding of the role of environmental factor-ROS induced DNA damage in the development of various chronic diseases and epigenetic modulations. The authors are invited to contribute to this special issue. It can be their own research data and review articles from various fields such as biological, nutritional, medical, chemical, and reproduction ones.

Potential topics include, but are not limited to:

- Role of environmental factors on human health with the focus on refined underlying ROS induced DNA damage and detailed mediated mechanisms
- Role of ROS induced DNA damage on prenatal and postnatal development induced by environmental factors
- Characterization of chemical substances which are produced during food processing and beverage production and oxidative stress and DNA damage induced by these compounds
- Development of strategies to reduce the risks caused by environmental factors

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