



Stem Cells International

Special Issue on

Stem Cells and DNA Damage Response

CALL FOR PAPERS

All cells in a living organism, including stem cells, are constantly challenged with endogenous and exogenous genotoxic stress. Exposure to these agents leads to DNA damage that is normally repaired through various repair mechanisms. In conjunction with other pathways such as cell cycle checkpoints, transcription regulation, and apoptosis control, proper and error-free DNA repair ensures genome integrity. Failure of these mechanisms leads to accumulation of deleterious chromosome alterations that may drive the development of diseases, including cancer, neurodegeneration, immunodeficiency, and more.

Stem cells are clearly involved in the normal development of tissues and also the pathogenesis processes where the above-noted diseases emerge. Given the long life span and self-renewal property of stem and progenitor cells, it is conceivable that the activities of DNA damage response and repair pathways have great impacts on the genome integrity and normal functions of these cells. There is clear evidence indicating that when compared with differentiated cells stem and progenitor cells respond differently to DNA damage and that their DNA repair capacity may also be different. However, mechanisms of DNA damage response and repair in stem cells, and their associations with disease development, remain mostly unclear.

Furthermore, given the promise of stem cell based therapies in clinics, especially when such approaches are combined with the emerging genome-editing technologies, it is critical that we have a better understanding on DNA damage response and repair in stem cells in order to take full advantage of their therapeutic values, while avoiding the development of unwanted, deleterious genome instability.

Potential topics include, but are not limited to:

- ▶ DNA damage response and repair mechanisms in stem cells
- ▶ Function and activities of DNA repair and related factors
- ▶ Connection between DNA damage response and stem cells development, maintenance, or differentiation
- ▶ DNA damage, stem cells, and human diseases
- ▶ *In vitro* and *in vivo* models to study DNA damage in stem cells

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Lead Guest Editor

Yiduo Hu, Columbia University
Medical Center, New York, USA
yih2101@cumc.columbia.edu

Guest Editors

Siwanon Jirawatnotai, Mahidol
University, Bangkok, Thailand
siwanon.jir@mahidol.ac.th

Bijan Sobhian, Institut de Recherche en
Cancérologie, Montpellier, France
bijan.sobhian@inserm.fr

Hua Wang, Dana-Farber Cancer
Institute, Boston, USA
hua_wang@dfci.harvard.edu

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