

Special Issue on
Mitochondria: More than Just “Power Plants” in Stem Cells

CALL FOR PAPERS

Primary role of mitochondria is to provide energy to cells in the form of ATP via oxidative phosphorylation. But besides ATP, which is the main product of this metabolic process, also by-products are generated such as reactive oxygen species, for instance. These by-products can have serious detrimental effects on cells since they can damage DNA and even oxidize lipids and proteins. The mitochondria are also special since they are besides nucleus the only organelle in animal and human cell with DNA and despite the fact this DNA codes only 37 genes, this suggests they have a special position in navigating the life and faith of a cell. The importance of mitochondria/mitochondrial DNA (mtDNA) is also reflected in the fact that even minor mtDNA mutations can cause lethal diseases.

Similarly as in differentiated cells, the special role of mitochondria was revealed in stem cells. Stem cells have specific distribution and metabolic profile of mitochondria and the changes of these features are correlated with differentiation of stem cells or reprogramming of somatic cells. Recently the influence of mtDNA mutations in generating induced pluripotent stem cells (iPSCs) due to aging was highlighted and it raised concerns about using iPSCs in cell therapies and regenerative medicine. These are just few of the reasons why mitochondria should be in more detail studied in stem cells and since the main aim of stem cell research is in fact to use stem cells in cell therapies and regenerative medicine, these issues should be clarified as much as possible to provide safe treatments.

The aim of this special issue is to answer some aspects of these important questions and to summarize the most recent and advanced developments and approaches on this field. We invite researchers to contribute high quality original research articles as well as review articles.

Potential topics include but are not limited to the following:

- ▶ The role of mitochondria on stem cell fate and stem cell differentiation
- ▶ The impact of mitochondria on stem cell therapies and regenerative medicine
- ▶ The influence of mtDNA mutations on stem cells
- ▶ Metabolic changes in mitochondria during reprogramming
- ▶ The mitochondria as an obstacle in reprogramming of somatic cells
- ▶ The importance of mitochondria in reproductive medicine
- ▶ Replacing of old mitochondria with younger ones as a therapeutic strategy (in regenerative and in reproductive medicine)
- ▶ Mitochondria as therapeutic target in cancer treatment via targeting mitochondria in cancer stem cells

Authors can submit their manuscripts through the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/sci/mppsc/>.

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First Round of Reviews

Friday, 5 May 2017

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