Stem Cells International

Hindawi

Special Issue on

Cellular and Molecular Mechanisms of Mesenchymal Stem Cell Actions

CALL FOR PAPERS

Cell therapy approaches using mesenchymal stem cells (MSC) for the treatment of both chronic and acute immune and degenerative diseases gain more and more clinical attention. This is not surprising, since MSC have proven immunomodulatory and regenerative properties and might be isolated from most tissues investigated so far in sufficient quality and quantity without any obvious risk for the donor or ethical constraints afflicted with other types of stem cells, for example, embryonic stem cells. However, these advantages also harbour imponderables associated with MSC intended for use in the clinics. It is now clear that MSC from different tissue and organ sources may feature similar phenotypic characteristics like capacity of plastic adherence, multiple differentiation potential, and surface marker profiles, the minimal definition criteria for MSC. But, gaining knowledge of molecular signatures by global gene expression, analyses currently reveal that heterogeneity exists between different MSC populations depending on their origin, isolation, and propagation procedures and on their status of differentiation.

It is also now very obvious that the major mode of actions mediated by MSC is not that much direct impacts like functional and/or architectural substitution of tissue loss, but rather paracrine or cellular mechanisms supporting self-restoration of the diseased tissue or organ. These mechanisms, however, are still poorly defined. Since MSC display pleiotropic properties like modulation of immune responses, alleviation of inflammation, and progress of tissue damage as well as stimulation of tissue regeneration, to unequivocally elucidate the molecular and cellular impact of a defined MSC population on a specified disease environment before their clinical application will be the goal of future efforts using relevant cell or animal model systems.

This special issue invites basic research and clinical investigators to share their knowledge by contributing original research as well as review articles emphasizing the detailed description of the cellular and molecular mechanisms of MSC action. These might particularly comprise global analyses using omics technologies to unravel genetic, expressional, and metabolic signatures of native or differentiated MSC of different origins and priming for application to specified disease conditions, both experimental and clinical, to delineate the impact of MSC action on a pathological tissue environment but also the impact of disease conditions of variable pathologies on MSC biology and action.

Potential topics include but are not limited to the following:

- Molecular definition of MSC
- Global analyses of MSC molecular signatures
- Engineering of MSC for targeted actions
- Molecular mechanisms of MSC trafficking
- Therapy-tailored priming/licensing of MSC
- Model systems for analysis of MSC mechanisms of action

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

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Manuscript Due
Friday, 7 April 2017

First Round of Reviews
Friday, 30 June 2017

Publication Date
Friday, 25 August 2017