



Stem Cells International

Special Issue on  
**Mechanotoxicity: Adverse Effects of Stiff Matrices on Stem Cells and Their Derivatives**

CALL FOR PAPERS

Stem cells and their differentiated progenies are utilized in basic research, regenerative medicine, and *in vitro* toxicological and pharmacological studies. For use in each of these diverse approaches, the stem cells need to be cultured *in vitro*. This is frequently performed in a 2-dimensional adherence culture on conventional polystyrene tissue culture plastic. Such conventional tissue culture dishes support the adhesion and expansion of various cell types, and attachment and growth can be further increased by surface-coating with protein ligands. The surface of such matrices is rigid and does not match the elasticity of native tissues, with exception of bone and teeth. Many studies in the past 10 years have demonstrated that rigid culture substrates can influence the physiology of many cell types in an undesired way ranging from moderate restrictions of cellular functions to more severe effects such as malignant transformation.

Stiff matrix conditions may affect cells *in vivo* as well. Tissue damage can result in the formation of scar tissue with increased extracellular matrix deposition and increased tissue stiffness, potentially affecting resident tissue stem cells or transplanted cells in settings of cell replacement therapies.

This special issue addresses the impact of rigid culture conditions on embryonic and induced pluripotent stem cells as well as adult stem cells and their derivatives *in vitro* and *in vivo*. High quality research reports are invited. Furthermore, reviews discussing aspects related to challenges in the field are encouraged.

Potential topics include, but are not limited to:

- ▶ Modulation of stem cells and stem cell-derived cells by rigid culture substrates with effects on cellular physiology, cell cycle regulation, cell fate decision, and others
- ▶ Mechanical memory of stem cells
- ▶ Effect of stiff tissue structures evolving from pathophysiological events (such as scar tissue and solid tumor formation) on stem cells and cancer stem cells
- ▶ Undesired interaction of stem cells with rigid implant materials
- ▶ Dynamic modulation of matrix stiffness to influence stem cell behavior

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

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