Stem Cells International

Special Issue on

Bone Microenvironment, Stem Cells, and Bone Tissue Regeneration

CALL FOR PAPERS

Stem cell-based bone tissue engineering offers a promising approach for regenerating critical sized bone defects or repairing nonunion bone fracture. Understanding and recreating a signalling environment to control the differentiation of stem cells into the bone lineage would be of great importance. The components in bone microenvironment, which include a mineral phase (hydroxyapatite nanocrystals), an organic phase (composed of 90% collagen type I), a cellular phase (osteoblasts, osteoclasts, and osteocytes), and a soluble factor phase (growth factors and/or cytokines), provide a specific and balanced signalling network, which contribute to the innate bone metabolic and anabolic activities and maintain the structure and functions of the bone. Substantial efforts, therefore, are needed to mimic the bone tissue microenvironmental components for controlling the commitment of stem cells into osteogenic lineage cells for bone tissue regeneration.

In this special issue, we invite investigators to contribute original research as well as review articles related to priming stem cell fate into the osteogenic lineage via mimicking the components of the bone microenvironment.

Potential topics include, but are not limited to:

- Biomaterials mimicking chemical and/or physical characteristics of the bone extracellular matrix (ECM) such as molecular, architectural, topographical, and mechanical properties
- Biomechanical stimulations mimicking the innate mechanical environment of bone tissue, such as mechanical loading and fluid flow
- Cell-cell cross talk, such as osteoblast- (or osteocyte-) stem cell and macrophage-stem cell interactions
- Growth factors or cytokines which provide instructive cues for directing stem cells differentiation into bone lineage
- Signalling pathways underlying osteogenesis and their synergy of directing stem cells into osteogenic lineage
- Novel tissue engineering approaches for bone regeneration, such as cell sheet-based scaffold-free technologies

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

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