

Special Issue on

Re-Evolution of Tissue Regeneration: From Recent Advances in Adipose Stem Cells to Novel Therapeutic Approaches

CALL FOR PAPERS

Basic and translational research and clinical trials in stem cell biology are aimed at investigating the ability of adipose stem cells (ASCs) to enhance tissue and organ regeneration and suggest that ASCs in 3D scaffolds may be a potential alternative for wound healing, orthopedic tissue repair and tissue reconstruction after surgery. The development of regenerative medicine strategies requires an appropriate phenotypically stable and well-characterized cell source and a scaffold or “smart” biomaterials (novel “intelligent” biomaterials with appropriate physical properties that is able to support in vivo the commitment of adipose stem cells), together with a suitable microenvironment to provide the necessary cues and signals for cell growth and tissue formation. The proliferation and differentiation of ASCs can be regulated biochemically, as well as through modulation of the physical properties of the microenvironment, such as scaffold topography, the “stiffness,” and mechanical forces. However, there are many unanswered questions concerning the basic cellular biology of ASCs in situ, their differentiation potential in vitro and in vivo, and the mechanisms involved in regeneration.

ASCs have traditionally been cultured in conventional 2D conditions; however 3D tissue engineering scaffolds are better able to mimic the in vivo cellular microenvironment and more effectively recapitulate the physiological setting, resulting in improved localization, attachment, proliferation, and differentiation of ASCs. Significantly, it has been demonstrated that ASCs are able to attach, grow, and proliferate well on biocompatible scaffolds. Tissue reconstruction represents one of the most significant challenges in all surgical procedures. Scaffold design necessitates optimization of polymer blends, interpenetrating matrices, and composites used for the production of matrices in order to achieve the proper mechanical and biological characteristics required for regenerative medicine. Recently, the importance of nanostructured matrices that mimic the nanofibrous structure of the natural ECM has been recognized, together with the role that matrix topology plays in determining cellular structure, function, and differentiation. Consequently, scaffold-cell interactions are vital for the successful application of ASCs in transplantation and tissue reconstruction.

This special issue invites investigators to submit original research and review articles addressing the cell biology of ASCs, their potential for tissue engineering, biomaterial properties, and new information about methods for their characterization. Submissions are welcomed with a particular focus on the interplay between cells and biomaterials, establishing a guide for improving current strategies to refine tissue constructs for effective tissue repair in regenerative medicine.

Potential topics include but are not limited to the following:

- ▶ Isolation and characterization of ASC subpopulations
- ▶ The in vitro and in vivo perivascular ASCs niche
- ▶ Interactions between mesenchymal stem cells and biomaterials for regenerative medicine applications
- ▶ Applications for ASC-based strategies in pathological conditions
- ▶ In vivo models: enhancement of organ and tissue regeneration after ASC transplantation
- ▶ Regenerative medicine and novel therapeutic technologies

Authors can submit their manuscripts through the Manuscript Tracking System at <https://review.wiley.com/submit?specialIssue=637085>.

Papers are published upon acceptance, regardless of the Special Issue publication date.

Lead Editor

Francesco De Francesco,
Multidisciplinary Department of
Medical-Surgical and Dental Specialties,
Second University of Naples, L. De
Crecchio, 6, 80138 Naples, Italy
francesco.defrancesco@ospedaliriuniti.marche.it

Guest Editors

Ali Mobasheri, State Research Institute
Centre for Innovative Medicine,
Lithuania
ali.mobasheri@imcentras.lt

Michele Riccio, Department of Plastic
Reconstructive Surgery Hand Surgery
Unit, Azienda Ospedali Riuniti Ancona,
Italy, Italy
michele.riccio@ospedaliriuniti.marche.it

Andrea Sbarbati, Verona University,
Italy
andrea.sbarbati@univr.it

Csaba Matta, University of Debrecen,
Hungary
matta.csaba@med.unideb.hu

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