

# Cell & Stem Cell Research

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## Regenerative medicine-use of stem cells as therapeutic options to treat degenerative conditions mediated by inflammation and aging

Vincent S Gallicchio  
Clemson University, USA

The science driving the current revolution in regenerative medicine continues to focus on advances in research made in tissue biology and engineering along with molecular medicine. The goal is to advance the field such that the application of stem cells can improve clinical outcomes when it addresses the issue of altered or damaged cells, tissues or body organs. Another exciting area of research in regenerative medicine addresses the need to grow new body organs to replace damaged or dysfunction body parts, thus addressing the current problem, where there is a shortage of organs available from potential donors. If the source of stem cells is derived from the same individual in whom the body tissue or organ needs to be replaced will eliminate the problem of organ transplant rejection. Another area of research will also focus on the expanding sources of stem cells such as the use of induced pluripotent stem cells (iPCs), mesenchymal stem cells (MSC) derived from adipose and amniotic tissue or cord blood beyond blood and bone marrow. Any advance in applied use of stem cells beyond blood and immunological use is limited by the fact that cord cells are hematopoietic stem cells (which can differentiate only into blood cells), and are not pluripotent stem cells, as embryonic stem cells, which can differentiate into any type of tissue, they can be induced to “dedifferentiate” as iPCs. Cord blood has been studied as a treatment for diabetes. However, apart from blood disorders, the use of cord blood for other diseases is not a routine clinical modality and remains a major challenge for the stem cell community. Along with adipose and amniotic tissue, cord blood, chord lining, and Wharton’s jelly, have been explored as sources of MSC in order to treat conditions mediated as a function of aging and inflammation. MSC have been studied *in vitro*, in animal models, and in early stage clinical trials for cardiovascular diseases, as well as in osteoarthritic conditions, neurological deficits, liver diseases, immune system diseases, diabetes, lung injury, kidney injury and leukemia. This presentation will review the use of MSCs in these clinical indications.

### Biography

Vincent S Gallicchio received his PhD in Hematology from New York University and his Diploma in Medicine from the University of Arad, Romania. He performed Postdoctoral studies at the University of Connecticut Medical Center and conducted his fellowship in Hematology from the Memorial Sloan Kettering Cancer Center. He has published more than 150 research articles in peer-reviewed journals on topics focused on stem cells and hematology, seven books, many book chapters, and has been awarded eleven United States and one international patent for developmental therapeutics for AIDS and Cancer. He currently serves as a Director of Stem Cell Therapy for out-patient clinical use.

vsgall@clemson.edu

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