J Clin Cell Immunol 2014, 5:5
http://dx.doi.org/10.4172/2155-9899.S1.019

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference and Exhibition on
Clinical & Cellular Immunology
September 29-October 01, 2014 DoubleTree by Hilton Baltimore-BWI Airport, USA

Therapeutic potential of ixmyelocel-T, an expanded autologous multicellular therapy, derived from bone marrow, for treatment of ischemic cardiovascular diseases

Ross Tubo and **Kelly Ledford**
Aastrom Biosciences Inc., USA

A variety of bone marrow derived cell therapies have been utilized to treat ischemic tissue damage and promote more balanced tissue repair under inflammatory conditions. Ixmyelocel-T, is an autologous, culture expanded, bone marrow-derived multicellular therapy which contains MSCs and M2-like macrophages, as well as many of the CD45+ cells found in the bone marrow. MSC and M2-macrophages have been shown to exhibit properties useful for angiogenesis and modulation of tissue repair in response to ischemia. In this study, it was used a rat model of hind limb ischemia to determine the effects of ixmyelocel-T on restoration of blood flow to the ischemic limb. Further, the mechanism(s) for action of ixmyelocel-T in angiogenesis on endothelial cells, by co-culturing with human umbilical vein endothelial cells (HUVEC) in non-contacting Transwell® inserts, in vitro was explored. Co-culture of HUVECs with ixmyelocel-T resulted secretion of a variety of pro-angiogenic factors, eNOS expression and nitric oxide (NO) production, and enhanced migration, proliferation, and branch formation. In TNFα-stimulated HUVECs, ixmyelocel-T co-culture decreased apoptosis and reactive oxygen species generation, increased super oxide dismutase activity, and decreased NFκB activation. Treatment with ixmyelocel-T in a rat model of hind limb ischemia resulted in significantly increased blood flow perfusion and capillary density, gene expression and plasma levels of the anti-inflammatory cytokine IL-10, plasma nitrates, plasma PDGF-BB, VEGF expression, and significantly decreased plasma TBARS. Fluorescently labeled ixmyelocel-T was detected in the ischemic limb up to six weeks after transplantation. Transplanted ixmyelocel-T did not co-localized with CD31+ endothelial cells, but did co-localize with the M2 macrophage marker CD206 in the ischemic tissue suggesting that ixmyelocel-T promotes angiogenesis in a paracrine manner. This data suggests that ixmyelocel-T could be useful for promoting of angiogenesis and tissue repair in ischemic tissue injury and disease.

Biography

Ross Tubo, PhD, is Chief Scientific Officer, Aastrom Biosciences. He has more than twenty years of experience in cell therapy, regenerative medicine, and stem cell biology. He was a pioneer in the research, development, and commercialization of the first autologous cell therapy for articular cartilage repair, known as Carticel. As Vice President of Stem Cell and Chemokine Biology for Genzyme Corporation, he developed a world-class research organization designed to understand the underlying cell and molecular mechanism(s) of action of mesenchymal stem cells (MSCs) in autoimmune disease and cancer. These efforts led to the identification of specific therapeutic targets for treatment of these diseases. He holds a PhD in Cell and Molecular Biology from State University of New York at Buffalo.

RTubo@aastrom.com