

**Kocher AA, Schuster MD, Bjonaros N, Lietz K, Xiang G, Martens TP, Kurlansky PA, Sondermeijer H, Witkowski P, Boyle A, Homma S, Wang SF, Itescu S. Myocardial homing and neovascularization by human bone marrow angioblasts is regulated by IL-8/Gro CXC chemokines. *Journal of Molecular and Cellular Cardiology*, 2006;40:455-464**

Department of Surgery, Medicine, and Pathology, Columbia University, New York, USA.

In the adult, new blood vessel formation can occur either through angiogenesis from pre-existing mature endothelium or vasculogenesis mediated by bone marrow-derived endothelial precursors. We recently isolated endothelial progenitor cells, or angioblasts, in human adult bone marrow which have selective migratory properties for ischemic tissues, including myocardium, to where they home and induce vasculogenesis. Here we show that myocardial production of the IL-8/Gro-alpha CXC chemokine family is significantly increased after acute ischemia, and that this provides a chemoattractant gradient for bone marrow-derived endothelial progenitors, or angioblasts. This chemokine-mediated homing of bone marrow angioblasts to the ischemic heart regulates their ability to induce myocardial neovascularization, protection against cardiomyocyte apoptosis, and functional cardiac recovery. Together, our results indicate that CXC chemokines play a central role in regulating vasculogenesis in the adult, and suggest that manipulation of interactions between chemokines and their receptors on autologous human bone marrow-derived angioblasts could augment neovascularization of ischemic myocardial tissue.