

3rd International Conference & Exhibition on**TISSUE PRESERVATION AND BIOBANKING &**6th International Conference on**TISSUE ENGINEERING AND REGENERATIVE MEDICINE**

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Regeneration and repair of post-infarct cardiovascular tissues with rejuvenated stem cells**Yong-Jian Geng**

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Stem cell-based therapy has been emerging as novel treatment of various pathological conditions that routine medications are not effective to. Cardiovascular tissue regeneration and repair with different types of stem cells from adult tissues have been confirmed in both animal studies and clinical trials. However, autologous stem cell therapy has confronted a major obstacle that stem cells from sick, aged patients with cardiovascular diseases are often dysfunctional and have lower potency of regeneration and repair. To overcome this obstacle, several approaches have been developed in this laboratory, including genetic or epigenetic rejuvenation, preconditioning with anti-atherogenic drugs, and enhancing survival and growth with cytokines and growth factors. Recent study has shown that transplantation of mesenchymal cells rejuvenated by overexpression of telomerase and myocardin, promotes revascularization and tissue repair in a murine model of ischemia. In vitro experiments further demonstrated that co-delivery of telomerase and myocardin genes rejuvenate adult stem cells to heightened myogenic development. Delivery of the iPS reprogramming nuclear factor Oct3/4 improves the stem cell potential for tissue regeneration and repair. In atherosclerosis-prone mice, epigenetic modification of Oct3/4 gene promoter activity impacts the pathogenesis of atherosclerosis. Recent studies by this and other groups have documented evidence that treatment with statin, a cholesterol-lowering drug, augments the therapeutic efficacy of adult stem cells. Animal study has shown that atorvastatin enhances the efficacy of mesenchymal stem cells treatment for swine myocardial infarction via activation of nitric oxide synthase. Simvastatin-enhanced expression of promyogenic nuclear factors and cardiomyogenesis of murine embryonic stem cells.

Biography

Dr. Yong-Jian Geng, in 1994, received doctoral degree in clinical chemistry from Gothenburg University, Sweden, and post-doctoral training at Brigham and Women's Hospital, Harvard Medical School. 1997-1999, he joined faculty at Allegheny General Hospital, Pittsburgh, and since University of Texas Health Science Center at Houston. He was appointed as director of Center for Cardiovascular Biology and Atherosclerosis Center and laboratory of Heart Failure and Stem Cell Research, Texas Heart Institute. He is a tenured, full professor of medicine, molecular pathology and bioengineering. His research work is focused on diagnosis, prevention and treatment of atherosclerosis-associated cardiovascular diseases as well as stem cell therapy.

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