Sergey Suchkov et al., J Clin Exp Cardiolog 2015, 6:4
http://dx.doi.org/10.4172/2155-9880.S1.023

OMICS International
conferenceseries.com

5th International Conference on
Clinical & Experimental Cardiology
April 27-29, 2015 Philadelphia, USA

Modern trends in stem cell technologies as applicable to ischemic heart diseases

Sergey Suchkov[1-3], Matt Springer[4], Yuri Belov[2], Eduard Charchyan[6], Dmitrii Kostyushev[2] and **Jeroen Essers[5]**
[1,2]A.I.Evdokimov Moscow State University of Medicine and Dentistry, Russia
[3]EPMA, EU
[4]Cardiovascular Research Institute, USA
[5]Erasmus University Medical Center, Netherlands
[6]Russian Academy of Sciences, Russia

Cardiovascular atherosclerotic and ischemic diseases constitute the leading cause of morbidity and mortality throughout middle- and high-income countries since following significant injury, the heart undergoes induced compensation and gradually deteriorates towards impending heart failure. But current and canonical therapy slows and does not halt the resultant adverse remodel-ing. So, novel therapeutic strategies are required to protect the heart from acute attacks in order to reduce myocardial infarction size, preserve cardiac function and improve clinical outcomes in patients with ischemic heart diseases. And the discovery of coronary risk factors and targets of newer generations have led to the development of *personalized* cardiology whilst providing the basis for *prevention* of atherosclerotic vascular disease.

For instance, myocardial infarction (MI) is accompanied by a significant loss of cardiac myocytes (CMs) which, in turn, differentiated from human embryonic stem cells (hESCs), offer a potentially unlimited cell source for cardiac disease therapies and regenerative cardiovascular medicine. So, successful use of SC therapy in the *prevention* and *treatment* of heart failure fol-lowing cardiac infarction is so much promising!

For instance, the putative endothelial progenitor cells (EPCs) can efficiently promote angiogene-sis and restore perfusion of ischemic tissues whilst representing a biomarker to guide *preventive* or *therapeutic* interventions in this disease.

A recently discovered cell source for cardiac repair has emerged as a result of a breakthrough reprogramming somatic cells to induced pluripotent stem cells (iPSCs). Preclinical studies using a variety of cell preparations generated from iPSCs have shown great evidence of cardiac repair. The cells mentioned derived from thepatient's own cell types, including fibroblasts, have become particularly attractive.

Moreover, mesenchymalSC (MSC) transplantation would be a promising new therapy to improve cardiac function after MI whilst ameliorating interstitial fibrosis and the remodeling of gap junction as well as attenuating focal heterogeneity of repolarization.

Meanwhile, today signaling pathways that regulate pluripotencyand secreted soluble factors as key players in communication to local and distant tissueshave been the major focus of SCtranslational research as applicable to cardiology. For example, actively secreted membrane vesicles, including exosomes, are being recognized as new candidates with important roles in in-tercellular and tissue-level communication. We would critically assess the emerging role of exosomes in local and distant communicative mechanisms after MI. A comprehensive under-standing of the role of *exosomes* in postinfarctioncardiac repair could bridge a major gap in knowledge of the repair mechanism after myocardial injury.Thus SC-based therapy can become a realistic option in regenerative processes for replacing lost cells and reconstituting the damaged organ, as before.

Meanwhile treatment of heart failure, although greatly improved, remains a big challenge. And, to our mind, new promising therapeutic strategies for cardiac protection would have to include novel aspects of mitochondrial function, epigenetics, the immune system, growth factors, and SC therapyin terms of targeting and clinical application, in particular!. It is likely that in the future, a greater emphasis will be placed on *prevention*.

Biography

Sergey Suchkov, MD, PhD, male, was born in 11.01.1957, researcher-immunologist, clinician, graduated from School of Medicine, A.V.Lunacharskii Astrakhan State Medical University, Russia, in 1980. Suchkov has been trained at the Institute for Medical Enzymology, The USSR Academy of Medical Sciences, National Center for Immunology (Russia), National Institutes of Health Bethesda, USA) and British Society for Immunology to cover 4 British university facilities. Dr Suchkov worked for the Central Laboratory at Lenin's Mausoleum, then at the Insti-tute for Medical Enzymology, The USSR Academy of Medical Sciences, for the Institute of Developmental Biolo-gy, Russian Academy of Sciences (RAN), Helmholtz Institute of Eye Diseases, and for Moscow Regional Clinical Research Institute including a position of the Immunologist-in-Chief of the Health Services of the Moscow Region. Since 2005, he has been working as Professor of A.I.Evdokimov Moscow State Medical & Dental University and I.M.Sechenov First Moscow State Medical University. From 2007, Suchkov was the First Vice-President and Dean of the School of Preventive and Personalized Medicine of the University of World Politics and Law. In 1991-1995, Dr Suchkov was a Chief Scientific Secretary of the Editorial Board of the International Journal "Biomedical Science" (issued by the Russian Academy of Sciences and Royal Society of Medicine, UK). In 1995-2005, Suchkov was a Director of the Russian-American Program in Immunology of the Eye Diseases. Dr Suchkov is a member of the Advisory Board, EPMA (European Association of Predictive, Preventive and Personalized Medicine), Brussels, EU, member of the Editorial Boards, Open Journal of Autoimmunity, EPMA J., Personalized Medicine Universe, American J.Cardiovascular Res. Dr Suchkov has published more than 500 papers. He is known as an author of the Concept of postinfectious clinical and immunological syndrome, co-author of the concept of abzymes and their impact into the pathogenesis of aotuimmunity conditions, and as one of the pioneers in promoting the Concept of Predictive, Preventive and Personalized Medicine.

ssuchkov57@gmail.com