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Pre-clinical studies and clinical trials with application of myogenic stem cells

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From more than a decade intensive clinical trials with variety of stem cells have been pursued. Among the candidates, the most often used stem cells were originated from bone marrow or adult tissue reservoirs. The low turnover organs (heart, pancreas, central nervous system) were mostly in the focus of regenerative medicine. Due to low renewal and high morbidity, post-infarction heart served as a model for cellular therapies. Cells of myogenic origin, namely, myoblasts were accessible rather from skeletal muscles than from the heart itself, although cardiac precursor cells (CPC) were also applied in some experiments. As early as in 2001/2, human autologous myoblasts to post-infarction heart at the opportunity of coronary artery bypass grafting (CABG) were delivered. Next series included endoscopic delivery of myoblasts by using percutaneous approach and coronary vein (known in the literature as Poznan trial). Myoblasts often induced arrhythmic episodes and were suspected of low degree electromechanical coupling with recipient organ cardiomyocytes as well as they have been low paracrine factors secretors. Therefore in further studies, pre-clinical models (mouse, rats) were exercised when using genetic modifications of human myoblasts with variety of genes. Among others, pro-angiogenic genes, cytoprotective genes and/or conductivity genes were tried with a good success in, *in vitro* and *in situ* scenarios. The last clinical trial applied human myoblasts modified with *GJA1* gene. Previously, we have tried this modification in rats (with induced ventricular arrhythmia) and mice (prevention of heart remodeling). The latest decoded results of clinical trial will be discussed.

Biography

Maciej Kurpisz is the Head of Department of Reproductive Biology and Stem Cells, Institute of Human Genetics, Polish Academy of Sciences, Poznan, Poland. He has completed his graduation from Poznan Medical Sciences University and promoted as MD in Immunology. Since 1996, he is a full Professor. He did professional training in UK, USA, Japan and Germany. He is expert in stem cells, anti-aging and male infertility. He invented experimental therapy for post-infarction heart regeneration. He is a Board Member of eight international journals and recipient of 20 professional awards.

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