

"POTENCY OF MESENCHYMAL STEM CELLS DERIVED FROM PLURIPOTENT STEM CELLS FOR CARDIOVASCULAR REPAIR: INTERCELLULAR MITOCHONDRIAL TRANSFER"

by

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Abstract

Heart failure results from cardiomyocyte necrosis. After myocytes death, transplantation of adult bone marrow stem cells or mesenchymal stem cells (MSC) achieves limited repair mainly through paracrine effects. However, the repair capacity of such stem cells is insufficient to restore cardiovascular damage, especially transplantation of those stem cells derived from aged or diseased population ("stem cell aging"). We recently established mesenchymal stem cell lines from human pluripotent stem cells (hESC/iPSC-MSCs) that possess much stronger potency to rejuvenate cardiomyocytes. By integrating genetic technologies and humanized mice models, we have discovered a novel mechanism that hESC/iPSC-MSCs-based cardiovascular repair is associated with high efficiency of intercellular mitochondrial transfer. In addition, from our early clinical observation that genetically engineered hematopoietic stem cells rescue severe neurodegeneration, we will also explore MSC for genetic mitochondrial disorder in near future.

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All are welcome