

THE ROLE OF MESENCHYMAL STEM CELLS IN THE THERAPY OF MYOCARDIAL INFARCTION

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Mesenchymal stem cells (MSCs) are multipotent stromal cells that can differentiate into osteoblasts, chondrocytes, adipocytes. During the early 21st century, *in vivo* studies demonstrated that human MSCs can transdifferentiate into endoderm-derived cells and cardiomyocyte phenotype. Without blood to supply cardiomyocytes (CMs), as in myocardial infarction, the loss of functional CMs progresses as an imbrication of necrosis, apoptosis and autophagy. Besides progressing through different stages of inflammation and healing, the dynamic microenvironment in the infarcted tissue also expresses cardiac cytokines that promote stem cell migration and homing. Given the uncertainty of myocardial salvage, dictated by the degree of necrosis from the sentinel event, it soon became clear that in order to change the long term outcomes of acute myocardial infarction, it is needed to search for a therapy that takes the time to presentation out of the equation. A possible solution to that dilemma appeared in the form of targeted stem cell therapy.

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