

심근 질환 치료에서의 줄기세포 연구의 최신동향

Stem Cell Therapy for Ischemic Heart Disease : A Status Report

5가 126 - 1

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Abstract

Myocardial infarction is the leading cause of congestive heart failure and deaths in developed countries. Current therapy is limited to the prevention of the progression of ventricular remodeling. The transplantation of stem cells into the injured myocardium is a novel and promising approach for the restoration of myocardial function. Various animal studies have suggested the potential of stem cell transplantation to regenerate myocardium and to improve cardiac function. Recently early phase clinical studies show that stem cell therapy may have beneficial effects on ventricular remodeling. In this article, the state of the art in both laboratory and clinic on myocardial regeneration with various types of stem cells is introduced. Finally the current and intrinsic limitations of stem cell therapy are discussed along with future directions for research on stem cell therapy for ischemic heart diseases.

Keywords : Myocardial infarction; Stem cell;

Adverse effects; Differentiation;

Mechanism; Delivery

; ; ; ; ;

가

가

가 가

가 가 ,

(adult bone marrow

stem cell line) 5 - azacytidine

(morphology)

(action potential)

(1)

(2).

(sarcomeric myosin

heavy chain)

(gap - junction)

(3~5).

13

(organ

specific differentiation)

(6)

가 가 .

(extracellular matrix) , . 가

가 가 , 가

(electro- 가 (13).

mechanical stimuli) ,

(paracrine) 가

(7 ~ 10). (extra- (cellular pro - angiogenic intervention)가

cellular matrix) (14, 15).

(11). ,

(8). MSCs

가 ,

가 가

(16).

가

(12). (In Vitro) , 가 (17).

(∞ - culture)

, 5 - azacytidine .

가 .

(cardiac homing), 가

가

(∞ - culture) 2 ~ 4 가

가 , 4 (XXXY) 가

가 가 DNA 2 가 (35, 36).

가 (epithelia)가 10,000 100,000 가 (23). MAPCs 가 , 가 (plasticity) . MAPCs 가 가 (MSCs) (cardiac stem cells)가 (HSCs)가 . Orlic (24). (HSCs) Lin⁻/C - kit⁺ 가 가 , Lin⁻/C - kit⁺/CD45⁻/CD34⁻ (18). HSCs Side Population(SP) (CD34⁺) 가 가 (19) (remodeling process) , (14). MSCs HSCs 가 (multi- potent adult progenitor cells, MAPCs)가 가 , , (20, 21). MAPCs (endodermal, mesodermal, ectodermal) SCF(stem cell factor), SDF - 1(stromal derived factor - 1) 가 가 . MAPCs MSCs cell factor), SDF - 1(stromal derived factor - 1) CXCR - 4가 가 (22). MAPCs 가 G - CSF(granulocyte - colony stimulating factor) MAPCs Lin⁻/C - kit⁺ 250 가 , 가

60%가 ,
 24% 32% 가 .
 40% , 68% 10 4
 (25). (implantable cardioverter-defibrillator)
 (26).
 G - CSF
 가 가
 가
 .
 G - CSF (action potential duration)
 가
 .
 가
 G - CSF . 가
 , . Strauer
 , G - CSF 1.2×10^7
 가 . G - CSF 가 7
 10 가 24.6%
 , , , 15.7% , 20~30% 가
 가 30%
 (27). TOPCARE - AMI study
 (endothelial progenitor cells, EPCs)

(PHASE I)

4
 8.5% 가 ,
 ,
 가 .
 . (28).
 가 Phase I
 0.35%
 874×10^6 가
 . 10.9

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