# The role of antioxidation and immunomodulation in postnatal multipotent stem cell-mediated cardiac repair

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## Abstract

Oxidative stress and inflammation play major roles in the pathogenesis of coronary heart disease including myocardial infarction (MI). The pathological progression following MI is very complex and involves a number of cell populations including cells localized within the heart, as well as cells recruited from the circulation and other tissues that participate in inflammatory and reparative processes. These cells, with their secretory factors, have pleiotropic effects that depend on the stage of inflammation and regeneration. Excessive inflammation leads to enlargement of the infarction site, pathological remodeling and eventually, heart dysfunction. Stem cell therapy represents a unique and innovative approach to ameliorate oxidative stress and inflammation caused by ischemic heart disease. Consequently, it is crucial to understand the crosstalk between stem cells and other cells involved in post-MI cardiac tissue repair, especially immune cells, in order to harness the beneficial effects of the immune response following MI and further improve stem cell-mediated cardiac regeneration. This paper reviews the recent findings on the role of antioxidation and immunomodulation in postnatal multipotent stem cell-mediated cardiac repair following ischemic heart disease, particularly acute MI and focuses specifically on mesenchymal, muscle and blood-vessel-derived stem cells due to their antioxidant and immunomodulatory properties.

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