

Scientific report



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"Interference with hypoxia-signalling pathways in mesenchymal stem cells prior to transplantation as a strategy to enhance myocardial recovery post infarction"

Summary:

The OXI-SCENARIO project aimed to improve the effector properties of human mesenchymal stromal cells (MSCs) by *in vitro* targeting of cellular mechanisms of response to hypoxia (low non-physiological oxygen concentration) and to evaluate the therapeutic potential of hypoxia-signalling modulated cells in a preclinical experimental model of mouse with myocardial infarction (MI).

In the last objective we evaluated the role of miR210 locus on the regenerative capacity and migration of MSCs in mice with MI. Our data from gain-of-function and loss-of-function experiments indicated that:

- MiR210 positively modulates MSCs survival after intravenous cell transplantation in mice with myocardial infarction;

- Transplantation of MSCs overexpressing miR210 improved cardiac function by reducing myocardial cell apoptosis in MI border zones and increasing the percentage of immune cell sub-populations involved in the myocardial repair post-infarction (M2 macrophages, and Treg lymphocytes).

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