

Comparison of transplantation effects of cardiac progenitor cell types on the mitochondrial energy-producing ability after myocardial infarction in rats

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The cardiosphere-derived cell (CDC) is one of the candidate cells used for cardiac regenerative therapy. Cardiospheres are mixture of CDCs including c-Kit⁺ cells, Sca-1⁺ cells, and other types of cardiac progenitor cells. In this study, we compared effects of transplantation of isolated Sca-1⁺ cells and c-Kit⁺ cells with that of the crude CDCs (CrCDCs). We found that the transplantation of these 3 types of cells resulted in a preservation of the cardiac pump function and mitochondrial respiration. However, mitochondrial function in the c-Kit⁺ cell-transplanted group was lower than that in the other 2 experimental groups. Furthermore, we found that activation levels of intracellular signaling proteins after cell transplantation may have been development on the ability of secretion of several growth factors, such as IGF-1 and TGF- β , by these transplanted cell types. Our findings suggest the possibility that CrCDC and Sca-1⁺ cells rather than c-Kit⁺ cells are preferable for the therapy to preserve cardiac function and energy metabolism after myocardial infarction.