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Interleukin-10 aids survival of cells transplanted to repair cardiac tissues after MI

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The long-term, positive benefits of transplanted allogenic (other-donated) smooth muscle cells (SMCs) to repair cardiac tissues after myocardial infarction (MI) have been enhanced by the addition of interleukin 10 (IL-10) to the transplanted cells, report researchers in Canada. Their study with rats modeled with MI has shown that SMCs modified with IL-10 - a small, anti-inflammatory protein - benefitted cell survival, improved heart function, and also provided protection against the host's rejection of the allogenic SMCs.

The study will be published in a future issue of *Cell Transplantation*.

Three groups of rats modeled with MI were treated with SMC injections into the MI-damaged area of the heart. One group received unmodified autologous (self-donated) SMCs; a second group received unmodified allogenic (other-donated) SMCs; the third group received allogenic SMCs modified with IL-10. After three weeks, the unmodified autologous cells had engrafted while the unmodified allogenic cells had been rejected by the hosts. However, the IL-10-modified allogenic cells were found to greatly improve cell survival, improve ventricular function, increase myocardial wall thickness, and also prevent host immune response and rejection of the foreign cells.

"While the most appropriate cell type for cardiac repair remains controversial, mesenchymal stem cells (MSCs) that have been

differentiated toward myogenic cells restore ventricular function better, as previous studies have shown," said study co-author Ren-Ke Li of the MaRS Centre in Toronto, Canada. "This study demonstrated that IL-10 gene-enhanced cell therapy prevented immune response, increased survival of SMCs in the heart, and improved cardiac function when compared to the results with the control groups."

The researchers noted that while the use of autologous SMCs donated by patients may be optimal for cell therapy, SMCs self-donated by older, debilitated patients who likely have other serious health problems, have limited regenerative capability. Thus, allogenic SMCs from young, healthy donors are the most beneficial cells, but rejection of foreign cells by the host has been a problem in allogenic cell transplantation. This study suggests that the use of allogenic SMCs modified with IL-10 can prevent host rejection.

"Future studies will be required to determine the long-term effects of IL-10 transduced SMCs to evaluate cell survival and cardiac function at six months and one year," concluded the researchers.

"The use of IL-10 overexpression to reduce rejection of allogenic SMCs is an interesting idea" said Dr. Amit N. Patel, director of cardiovascular regenerative medicine at the University of Utah and section editor for *Cell Transplantation*. "Further studies will help to determine if this manipulation could prove useful for translation of allogenic SMC therapies to humans".

More information: www.ingentaconnect.com/content … ontent-CT1170Dhingra

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