Bin Wang et al., J Cell Sci Ther 2017, 8:1 (Suppl)
http://dx.doi.org/10.4172/2157-7013.C1.039

A targeted drug delivery system for selective deliver of insulin-like growth factor-1 to infarcted myocardium to improve stem cell survival

Bin Wang[1,2], **Ji Zhou**[1], **Yuan Tang**[2], **Andrew C Issekutz**[3] and **Mohammad F Kiani**[1]
[1]Widener University, USA
[2]Temple University, USA
[3]Dalhousie University, Canada

Stem cell therapy for treating MI has been widely studied, but the clinical applications of these studies have been disappointing, since current stem cell therapy has shown poor survival and engraftment of the stem cell in the diseased tissue. In this study, a novel approach was employed to improve the engraftment and viability of transplanted mesenchymal stem cells (MSCs) by selectively delivering insulin-like growth factor 1 (IGF-1) to the infarcted myocardium. One week after the MI surgery, immunoliposomes containing IGF-1 were infused into rats via. tail vein and MSCs were injected intramyocardially around MI area. Left ventricular fractional shortening (FS) was measured as an index of heart contractility. The combination of targeted IGF-1 and MSCs treatment significantly improved the FS function (2.5% gain) during 3 weeks (no treatment: 8% FS loss, targeted IGF-1: 4% FS loss, MSCs treatment 8% FS loss). Immunochemical staining shows that both IGF-1 alone and IGF-1+MSCs treatment facilitated vessel regrowth into the MI area, and much stronger stem cell fluorescence in the IGF-1+MSCs treatment group compared to the MSCs alone treatment group, indicating that IGF-1 treatment greatly improved the survival of the transplanted stem cells. The combination of targeted IGF-1 and stem cell transplantation results in a larger recovery in cardiac function compared to either IGF-1 or stem cell treatment alone. This recovery is probably achieved by targeted IGF-1 improved the stem cell survival and the subsequent stem cell therapy in the damaged myocardium.

Biography

Bin Wang has completed his PhD from Temple University in 2007 and Postdoctoral studies from Medical College of Georgia. He is the Assistant Professor of Widener University. He has published more than 30 papers in reputed journals and has been serving as an Editorial Board Member of several reputed journals.

bwang@widener.edu

Notes: