**STEM CELLS FOR CARDIAC REGENERATION IN THE DIABETIC AND NON-DIABETIC HEART**

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Recently, we reported that embryonic and induced pluripotent stem (iPS) cells following transplantation into infarcted heart can inhibit apoptosis and differentiate into cardiac myocytes. iPS cells can have wide application in for the treatment options in regenerative medicine including diabetes. In the present study, we explored the use of iPS cells or factors released from iPS cells in their potential for cardiac and neovascular cell type differentiation as well as in the remodeling of dysfunction heart due to diabetes. Our streptozotocin (STZ) induced diabetic rat hearts shows a significant decrease in cardiac adverse remodeling (apoptosis and fibrosis) and oxidative stress following cells or factors released from stem cells transplantation. Next, transplanted iPS cells in the infarcted heart of db/db mice demonstrated increase in neovascularization and decrease in adverse cardiac remodeling. Furthermore, our data also shows significant activation of endogenous c-kit positive cells which plays a role in the increased neovascularization. Furthermore, our heart function data shows significantly improved cardiac function in both STZ induced diabetes and infarcted heart db/db animals. Overall, our data provide strong evidences that transplanted iPS cells in the dysfunctional diabetic heart provide beneficial effects via increasing cardiac regeneration as well as inhibiting adverse cardiac remodeling which results in improved heart function.