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Role of cardiac Sca-1+ cells in cardiac homeostasis and injury

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Multiple studies have characterized Sca-1+ cells as cardiac progenitor cells. Although the capacity of Sca-1+ cells to differentiate into functional cardiomyocytes is still controversial their natural role and function in homeostasis and injury of the adult heart is completely unknown. We have characterized the anatomical location and phenotype of all Sca-1+ cells in the murine heart. There are two main Sca-1+ populations in the heart: endothelial cells and non-endothelial cells located near vessels. These Sca-1+ non-endothelial cells are located near coronary arteries and capillaries. Sca-1+ non-endothelial cells can be distinguished from endothelial cells by the expression of PDGFR-α, which seems to be a very specific marker to label and trace these cells. We will present data of the role of these cells in maintenance of homeostasis of the heart.

Cardiac perivascular cells can be ex vivo expanded and differentiated into mesenchymal lineages. In culture, cardiac perivascular cells can deposit collagen in the extracellular matrix. Thus we hypothesize that these cells under pathological conditions contribute to collagen deposition in the perivascular tissues of the heart. Fibrosis of the heart is seen in many heart disease conditions such as hypertension, congestive fibrosis, myocardial infarction and muscular dsytrophy. The mouse model for Duchenne Muscular Dystrophy, mdx, is a good model to study fibrosis of the heart as extensive fibrosis in the heart and muscles is seen in mdx mice older than 6 month-old. Histological, morphometric and anatomical analysis of the fibrosis of the heart indicates that fibrosis is preferentially located in the perivascular tissues surrounding coronary arteries and arterioles. We will present data of the potential role of these Sca-1+ cells in cardiac fibrosis and potential therapeutics to prevent cardiac fibrosis

Biography

Morayma Reyes has received her MD/PhD degree from University of Minnesota in 2003. She has published more than 20 papers in reputed journals and is serving as an editorial board member and reviewer of reputed journals. She has been nominated and awarded multiple Junior Faculty Awards

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