

3rd International Conference & Exhibition on

TISSUE PRESERVATION AND BIOBANKING &

6th International Conference on

TISSUE ENGINEERING AND REGENERATIVE MEDICINE

August 23-24, 2017 San Francisco, USA



Luiz C. Sampaio

Texas Heart Institute, Houston, USA

Maximizing Cardiac Repair: Should We Focus on Cells or Matrix?

Cardiac extracellular matrix (ECM) is a complex architecturally-organized mixture of proteins glycosamino-, and proteoglycans that contains an embedded vascular network. Furthermore, ECM binds growth factors that can drive vasculogenesis. In fact, during cardiac development, cell-matrix interactions give rise to regional cell fate specifications including atrial ventricular, pacemaker, vascular, and neural cells. We hypothesize that cardiac ECM plays a critical role in SC fate, location and function after myocardial injury. Using decellularized ECM from neonatal, adult and old animals, we tested the hypothesis that ECM composition and architecture provides physical, mechanical and biochemical cues that direct stem or progenitor cell fate – and show evidence that age, sex and disease state can alter those biologic cues and in turn alter cell phenotype. Furthermore, by exploring the gene expression profiles of SCs in response to infarcted heart matrix vs collagen type 1 or non-infarcted matrix, we have begun to define cues that may begin to explain clinical outcomes after cell therapy. We have also transplanted repopulated and “naked” ECM *in vivo* either as a cardiac patch after infarction or as a whole heart to investigate SC recruitment and differentiation in response to acellular or recellularized ECM. Finally, we are convinced that creating and being able to manipulate the right environment can be more valuable than engineering cells. Our perfusion-based method to remove cells from myocardium giving rise to decellularized ECM (dECM) with intact micro and macrostructure, and a patent vascular tree has been proved to be the perfect environment for stem cells.

Biography

Dr. Luiz C. Sampaio has devoted his entire career to reducing the burden of cardiovascular disease, first as a cardiovascular surgeon then as a regenerative medicine researcher. In his current positions as associate medical director for the Department of Regenerative Medicine Research and director of the Cullen Cardiovascular Research Laboratories at Texas Heart Institute, he is able to apply his medical and surgical skills to developing new approaches to preventing, diagnosing, and treating heart disease.

lsampaio@texasheart.org

Notes: