

Progress Report

Award Title: Endothelialization of Engineered Coronary Artery Bypass Grafts Using Bone Marrow and Adipose-derived Mesenchymal Stem Cells

Research Grant Recipient: Robert T. Tranquillo, PhD

Grant Period: 2015-2017

Site: University of Minnesota

Tissue-engineered vascular grafts (TEVG) have the potential to overcome the major limitations of coronary artery bypass grafting. Lining TEVG with human adipose-derived stem cells (hASC) that can differentiate towards an endothelial phenotype may prevent thrombosis upon implantation, although their reduced platelet binding has never been demonstrated. Thus far, we have shown:

- A reduction in platelet binding of hASC seeded on TEVG and conditioned by flow as compared to static culture
- The hASC seeded on TEVG exposed to shear flow oriented in the flow direction
- A monolayer of hASC seeded on the luminal surface of a tubular TEVG can be maintained under flow