

UNIVERSITY *of* DELAWARE
BIOMEDICAL ENGINEERING
SEMINAR

DECEMBER 11, 2014

Jeff Jacot, Ph.D.

ASSISTANT PROFESSOR

BIOMEDICAL ENGINEERING

RICE UNIVERSITY AND TEXAS CHILDREN'S HOSPITAL

***"Engineered Heart Tissue For Correction Of
Heart Defects. "***

Congenital heart defects are the most common noninfectious cause of death in infants in the US. Repair of many heart defects includes the surgical placement of an acellular patch, and these non-conductive and non-contractile patches are associated with the development of arrhythmias and increased long-term risk of sudden cardiac death. Our laboratory is developing living, contractile heart tissue made from a child's own stem cells for use in repair of heart defects. Because these functional patches enhance heart function, they can be used in areas critical to heart function, and could lead to the development of a total bioartificial heart.

I will present the results of four projects in our lab: 1) The culture, characterization and differentiation of a population of human stem cells isolated from second trimester amniotic fluid, which are genetically matched to the fetus and have the potential to differentiate into endothelial cells and cardiac-like cells; 2) the effect of extracellular matrix elastic modulus and contractile strain on the electrophysiology of cardiac cells; 3) the design and characterization of multi-layered scaffolds combining natural and polymeric components for full-thickness ventricular replacement; and 4) the incorporation of single-walled carbon nanotubes or voltage-responsive liquid crystal elastomers to create electrically and mechanically active materials for cardiac tissue engineering.

11:00am in 322 ISE Lab. Refreshments served at 10:45am.