

## **BHE-042**

### **Understanding the Regional Mechanics of the Left Atrium: Implications for Atrial Fibrillation**

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#### **Abstract**

Through the expertise in diagnostic imaging available through the Cardiovascular Institute and the Department of Radiology at the University of Pittsburgh Medical Center, and our in-house simulation capabilities at ICES at Carnegie Mellon, our ambition is to leverage in-vivo measurements with computational biomechanics to form the foundation for accurately quantifying the mechanics of the heart's left atrial chamber for a specific patient.

We will apply our methods to a clinical problem of great relevance: the mechanical foundation of atrial fibrillation. Atrial fibrillation is hypothesized as the precipitant of a vast proportion of strokes and, as such, is a considerable clinical problem. The regional mechanics of the left atrium appear to play key roles in the initiation and sustenance of atrial fibrillation. Within this project we will investigate the hypothesis that altered regional stress status mediates degeneration of the left atrium wall. We will leverage data from an ongoing study in the Cardiovascular Institute on the effects of ventricular pressure elevation on atrium function. The data will serve to correlate clinical findings to biomechanical indices to lead the way for new therapeutic treatments of atrial fibrillation.