1048-92-258 **Laura A Miller*** (lam9@email.unc.edu), CB 3250 Phillips Hall, Department of Mathematics, Chapel Hill, NC 27599. *An electromechanical model of myocardial contraction in the embryonic heart tube.*

Recent work on the fluid dynamics of the embryonic heart has been motivated by studies that suggest that fluid forces are necessary for heart morphogenesis. These intracardiac flows depend upon the electrophysiology and muscle mechanics of the developing heart. Contraction kinematics and electrocardiograms recorded when the embryonic heart tube first forms suggest that the blood is pumped by peristaltic contractions of the heart; however, recent work based on particle image velocimetry suggests that the heart uses a valveless suction pump mechanism, whereby active pumping occurs only in a localized region of the heart and waves of contraction are passive.

Although work that has attempted to integrate the electrophysiology of the heart with pumping kinematics and fluid dynamics is limited, recent improvements in numerical methods and scientific computing are starting to make such studies possible. In this project, an electromechanical model of the embryonic heart based on the Fitz-Hugh Nagumo equations will be presented. The local electropotential along the heart tube will then be used to trigger muscle contractions and drive the flow in immersed boundary simulations of the heart tube. (Received February 09, 2009)