1154-AG-2138 **Laura A Miller*** (lam9@email.unc.edu), CB 3280 Coker Hall, Department of Biology, Chapel Hill, NC 27510. *Using computational fluid dynamics to understand muscle driven movement: Case studies in tubular hearts and jellyfish.*

Recent advancements in computational fluid dynamics have enabled researchers to efficiently explore problems that involve moving elastic boundaries immersed in fluids for problems such as cardiac fluid dynamics and animal swimming. These advances have also made modeling both nutrient exchange in a fluid and the muscle driven motion of a flexible organ or organism through a fluid feasible. The work presented here focuses on the development and implementation of such methods and models for the pumping and pulsation of tubular hearts and jellyfish bells. We leverage existing computational algorithms for fluid-structure interactions and extend this technology to "living" boundaries. Muscle models integrate feedback between the conduction of action potentials, the contraction of muscles, the movement of tissues, and fluid motion. These models are then used to resolve pumping mechanisms in tubular hearts and resonant swimming in jellyfish. (Received September 17, 2019)