1163-76-1322 **Lucia Carichino*** (lcsma1@rit.edu) and **Sarah D Olson** (sdolson@wpi.edu). *Modeling sperm motility in a complex fluid environment.*

Sperm are navigating in a complex three-dimensional (3D) fluid environment in order to achieve fertilization. Sperm trajectories vary from planar to helical depending on species, on external fluid properties and on proximity to walls. Biochemical signaling along the sperm flagellum, such as changes in calcium, regulates sperm trajectories and flagellar beat patterns. We present a fluid-structure interaction model of the sperm flagellum 3D motion that accounts for calcium signaling in the flagellum, interactions with a planar wall, and sperm-sperm interactions. The fluid is modeled as a Newtonian viscous fluid and the flagellum is modeled as an elastic rod with preferred curvature and twist, using the Kirchhoff rod model. The fluid-structure interaction problem is solved using the regularized Stokeslets method, and the effect of a planar wall is implemented via the method of images. The calcium dynamics, represented as a reaction-diffusion model on the moving flagellum, is coupled to the sperm motility via the flagellum curvature. Model results of 3D emergent waveforms and trajectories are compared to the planar case, and to experimental data. (Received September 15, 2020)