1155-76-126 **Ebrahim M. Kolahdouz*** (ebrahimk@email.unc.edu), 220 E Cameron Ave, 396 Philips Hall, Mathematics Department, Chapel Hill, NC 27514, and **Brent A. Craven** and **Boyce E. Griffith**. *An Immersed Lagrangian Eulerian Method for Biological Fluid Structure Interaction.* Preliminary report.

The interaction of incompressible viscous flows with immersed objects is ubiquitously found in biology and medicine. An immersed Lagrangian Eulerian coupling strategy is presented within the framework of the immersed interface method that allows fluid and solid subproblems to be solved in a partitioned manner and coupled through interface conditions. The present fluid-structure interaction (FSI) approach allows for general complex geometries with discrete surfaces while retaining sharp resolution of stresses at the fluid-solid interface. In the coupling of the fluid to the solid, the interfacial fluid stresses drive the solid motion, and a penalty method is used to ensure that the fluid satisfies the no-slip condition along the fluid-solid interface. The method is extensively tested against benchmark computational and experimental studies in two and three dimensions including geometries with non-smooth features. In particular, with no FSI sub-iterations for problems with so called artificial added-mass instabilities, the method is shown to be stable for simulations involving low, nearly equal, equal and high solid-fluid density ratios. Applications of this method to the simulation of deformable blood clots inside inferior vena cava will be presented. (Received January 07, 2020)