1158-65-234 **Yifan Wang*** (qcutexu@berkeley.edu), UC berkeley, Berkeley, CA 94704, and **Suncica Canic**, berkeley, CA 94704. *Numerical simulation of the islet encapsulation device using fluid poroelastic structure interaction model.*

Artificial pancreas is a microelectromechanical (MEMS) device that encapsulates the transplanted islets by using the silicon nanopore membranes and allows islets to survive without immunosuppressive therapy. Our work is motivated by promoting the survival time of transplanted islets inside the device. We propose a Navier-Stokes-Biot model involving a poroelastic material and incompressible Newtonian fluid to mimic the fluid-poroelastic interaction between the islets compartment and blood flow. A monolithic approach is adopted to solve the proposed problem, with Nitsche's method to enforce the coupling conditions at the fluid-poroelastic structure interface. Numerical simulations are carried out carefully with promising findings in improving the design of the artificial pancreas. (Received March 02, 2020)