1145-00-2019 **Min Wu**, **Huaming Yan**, **Daniel Ramirez-Guerrero*** (ramired3@uci.edu) and **John Lowengrub**. *Mechanical feedback and stress relaxation in tumor spheroid growth.* Preliminary report.

In this work, the dynamics of tumor growth is simulated using a continuum model of tissue elasticity in an Eulerian frame. The model incorporates nonlinear elastic stresses and cell substrates to regulate cell proliferation and death. We also consider tissue remodeling, a result of structural and adhesive molecules, and recover linear elastic models when the relaxation rate is large. The model investigates the relation between stress and growth in tumor spheroids. Parameters are extrapolated from tumor growth experiments. Results from this model are in close agreement with experiment in simulating mechanotransduction and feedback regulation. Stress relaxation is quantified to predict spatial distributions of stress and net proliferation. We find that mechanotransduction and feedback regulation result in more stable proliferation states than those without feedback. We also extend the model by formulating tissue elasticity without assuming incompressibility. (Received September 24, 2018)