1048-65-304 **Padmanabhan Seshaiyer*** (pseshaiy@gmu.edu), 4400, University Drive, MS 3F2, Department of Mathematical Sciences, George Mason University, Fairfax, VA 22030. *Advances in computational methods for soft-tissue biomechanics.* Preliminary report.

In the last decade, there has been a lot of development in understanding the biomechanics of an intracranial saccular aneurysm, the rupture of which is the most common cause of nontraumatic subarachnoid hemorrhage (bleeding onto the surface of the brain). Modeling the mechanical behavior of such soft-tissues in their service configuration is often challenging because of their complicated geometry, material heterogeneity, nonlinear behavior under finite strains and the associated fluid-structure interaction problem. Efficient solutions to such complex coupled biological processes are still a challenging problem in computational sciences. Direct numerical simulation of the associated non-linear equations, governing even the most simplified model depends on the convergence of iterative solvers which in turn rely heavily on the properties of the coupled system. In this talk we will review analytical, computational and experimental approaches for quantifying the multiaxial mechanical properties of hyperelastic membranes interacting with fluid dynamics. Some numerical findings on the dynamic stability and the influence of contact constraints on these lesions will also be presented. (Received February 10, 2009)