1046-92-518 **Ian Besse*** (ibesse@math.uiowa.edu), Department of Mathematics, 15 Maclean Hall, University of Iowa, Iowa City, IA 52242, and **Colleen Mitchell** and **Erwin Shibata**. *A modified Mitchell-Schaeffer model of cardiac action potential which incorporates caveolae-associated ionic currents.* Preliminary report.

The contraction of a cardiac cell is initiated by a transient depolarization of the cell membrane called an action potential. Action potentials result from the rapid flux of ions across the membrane through voltage-dependent ion channels. Recent electrophysiological data regarding caveolae, microdomains on the subsarcolemma, reveal that caveolae are reservoirs of 'recruitable' ion channels. As such, caveolar ion channels constitute a substantial and previously unrecognized source of ionic currents that can significantly influence action potential morphology. We formulate and analyze a new model of cardiac action potential based on the incorporation of these caveolae-associated currents into the existing Mitchell-Schaeffer two-current model. This new model reproduces emerging experimental data on the function of caveolae and suggests that some cardiac arrhythmias might arise from caveolae-related biophysical mechanisms. (Received September 16, 2008)