1077-37-1545 **Abraham Freiji*** (afreiji@uab.edu), FOT 1020, 1530 3RD Ave S, Birmingham, AL 35294-3410, and **Hassan M Fathallah-Shaykh** (hfathall@uab.edu), FOT 1020, 1530 3RD Ave S, Birmingham, AL 35294-3410. *Limit Cycles, Bistability, and Global Stability by Two-Element Negative Loops in Biological Networks,.*

Negative loops, present in almost all prokaryotic and eukaryotic networks, are key to generating molecular oscillations. Here, we study the dynamics of 2-element negative loop motifs modeled by a new nonlinear system of ODE. The results reveal that a 2-element negative loop with a single positive and constant input leads to globally stable critical points while an interconnection with a positive loop admits limit cycles, Hopf birfurcations, and bistability but no tristability. The system of ODE, related to the Lotka-Volterra equations, offers insights on how the architecture of the network impacts its dynamics. (Received September 20, 2011)