1077-92-918 **Andrew M. Oster*** (ostera@wlu.edu), **Philippe Faure** and **Boris S. Gutkin**. *Mechanisms for multiple activity modes of midbrain DA neurons.*

Midbrain dopamine (DA) neurons send numerous projections to cortical and subcortical areas and, in a manner dependent upon their activities, diffusely release DA to their targets. Recent experimental studies have shown that DAergic neuronal bursting is associated with a significantly greater degree of DA release than an equivalent tonic activity pattern. Past computational models for DA cell activity relied upon somatodendritic mechanisms in order to generate DA cell bursting. However, recent experimental studies indicate that burst firing can be generated somatically with the dendrites silenced. These bursts have characteristics consistent with normal bursting, suggesting that a single-compartmental model should be sufficient for generating the observed DA neuronal dynamics. In this talk, we introduce such a model for DA neuronal dynamics and compare the simulated activities to data. In our approach, the interplay between the L-type calcium and the calcium-dependent SK potassium channel provides a scaffold for the underlying oscillation for the pacemaker-like firing patterns. We observe that a reduction of the SK conductance may induce DA bursting. Moreover, our model captures burst firing elicited via a stimulus driven event, manifested by rises in the amount of NMDA. (Received September 14, 2011)