1073-92-111 **Andrew M. Oster*** (andrew.oster@ens.fr), Robinson Hall (Math Dept), Washington & Lee University, 204 West Washington Street, Lexington, VA 24450-2116, and **Philippe Faure** and **Boris S. Gutkin**. *Mechanisms for multiple activity modes of midbrain DA neurons.*

Midbrain dopaminergic neurons send numerous projections to cortical and sub-cortical areas, and in a manner dependent upon their activities, diffusely release dopamine (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 neuronal bursting. However, recent experimental studies indicate that burst firing can be generated somatically, suggesting that a single-compartmental model should be sufficient for generating the observed DA neuronal dynamics.

In this work, we introduce such a model for DA neuronal dynamics and demonstrate that this model captures the qualitative behavior of DAergic neuronal dynamics: quiescence, tonic firing and bursting. Our modeling studies suggest that a reduction of the SK conductance often primes DA neuronal bursting. Moreover, our model exhibits burst firing events elicited via stimulus driven events, manifested by rises in the amount of NMDA. This model for DA cell activity could be further modified to elucidate key differences between two classes of midbrain DA neurons: VTA or SNc. (Received July 29, 2011)