1163-37-1161 **Kelsey Gasior*** (kgasior@fsu.edu), **Kirill Korshunov**, **Paul Trombley** and **Richard Bertram**. *Modeling Neuron Response to Ramped Input Current.*

Recently, novel experiments were performed in olfactory bulb dopamine-secreting neurons (OBDA neurons) wherein current applied to the individual neurons was ramped to mimic biologically realistic neuronal input (at Florida State University, the Trombley lab performed). However, this new stimulus protocol raises the questions of what is the proper way to interpret these data and how can mathematical analysis help? We have developed a methodology to study transient dynamics in the electrical activity of single neurons while maintaining a collaboration with the biologists who carry out these experiments. This work allows us to understand how different ion channels shape the transient response dynamics in OBDA neurons. In particular, we are using linear regression to model a slow-activating M-type Potassium channel and bifurcation analysis to understand the influence of both the applied current and ramp duration in the spiking behavior. These mathematical tools we developed can be used to explore the behavior of other cell types as it is our belief that the ramping technique could be extended to study the dynamics of all neuron types. Ultimately, this work helps close the gap between mathematical modeling and biological data in computational neuroscience. (Received September 14, 2020)