1067-34-2230 **Justin R. Dunmyre***, 301 Thackeray Hall, University of Pittsburgh, Pittsburgh, PA 15260, **Christopher A. Del Negro**, PA , and **Jonathan E. Rubin**, PA. *Interactions of the CAN and NaP currents yield a novel bursting pattern in a model for a respiratory neuron.*

The preBötzinger complex (preBötC) of the mammalian brainstem is a neuronal network that generates the inspiratory phase of the respiratory cycle by maintaining a synchronous bursting rhythm. To investigate burst generation in preBötC neurons, previous modeling efforts have studied the individual role of either the persistent sodium (NaP) current or the calcium-activated non-specific cationic (CAN) current. However, both the NaP current and the CAN current are found in various strengths in virtually every preBötC neuron. Using tools from geometric singular perturbation theory, we present a model neuron that includes both the CAN and NaP currents, and explain how the interaction of these currents yields a new bursting pattern that has been observed in data, but not has not been seen in previous models of the preBötC. In our model, the mechanisms underlying the CAN and NaP currents evolve on a slower timescale than the rest of the system, and this fact is critical to our results. (Received September 22, 2010)