1014-92-1232 **Charles J Wilson*** (Charles.Wilson@utsa.edu), 6900 N. Loop 1604 W, San Antonio, TX 78249. *Ionic mechanisms of bursting in neostriatal cholinergic interneurons.*

In the neostriatum of the mammalian brain, the cholinergic innervation arises from giant interneurons that account for about 1% of all cells. These neurons maintain a tonic firing in the absence of input, insuring a continuous background activation of acetylcholine receptors. Cholinergic cells fire in vitro in patterns similar to those of intact animals, including rhythmic single spiking, rhythmic bursting, and irregular patterns that include bursts and pauses. Rhythmic single spiking depends on a persistent sodium current that precludes the existence of any stable resting potential negative to action potential threshold. The period of rhythmic single spiking is determined by the action of a calcium-dependent potassium current. In cells showing bursting patterns, a second oscillatory mechanism operates at membrane potentials below spike threshold. A rapid hyperpolarization-activated potassium current (KIR2) generates the hyperpolarizing phase of the oscillation. Recovery from that regenerative hyperpolarization is mediated by a much slower hyperpolarization-activated nonspecific cation current (HCN). This mechanism could amplify hyperpolarizations, regardless of their cause. In some neurons, it could sustain ongoing rhythmic subthreshold membrane potential oscillations. (Received September 27, 2005)