1038-92-139 **Leonid L Rubchinsky*** (leo@math.iupui.edu), Dept Math Sci and Stark Neuroscience Res Inst, IUPUI and Indiana Univ School of Medicine, 402 N. Blackford Street, Indianapolis, IN 46202, **Choongseok Park**, Dept Math Sci, IUPUI, 402 N. Blackford Street, Indianapolis, IN 46202, and **Robert M Worth**, Dept of Neurosurgery and Dept Math Sci, Indiana Univ School of Medicine and IUPUI, 545 Barnhill Drive, Indianapolis, IN 46032. *Synchronization in Basal Ganglia Networks.*

The basal ganglia are a group of interconnected subcortical nuclei, which are involved in neural control of movement and are impacted in Parkinson's disease. Earlier studies provided various evidences for relation of oscillatory synchronized activity to physiology of basal ganglia at health and pathophysiology of basal ganglia in Parkinson's disease. We employed short running window analysis to characterize temporal patterns of phase-locking in neural activity, as revealed by local field potentials and spikes measured in human basal ganglia during surgical procedures. Dynamics of basal ganglia is marked by intermittency of synchronous episodes. These observations allowed us to develop mathematical models of basal ganglia circuits (conductance-based models in the form of ordinary differential equations) which produce realistic patterns of synchronous activity and study these patterns in the model. (Received February 05, 2008)