

Modeling the Origin of Parkinsonian Tremor

Andrei Dovzhenok and Leonid Rubchinsky

School of Science

Indiana University – Purdue University Indianapolis

Abstract

Even though much is known about the biophysics, anatomy and physiology of basal ganglia networks, the cellular and network basis of parkinsonian tremor remains an open question. Multiple experimental data suggest that the physiological origin of parkinsonian tremor is different from the physiological origin of other parkinsonian motor symptoms. However, the exact origin of the tremor genesis in Parkinson's disease remains unknown. A large body of experimental evidence supports the hypothesis, that the tremor arises due to pathological interaction of potentially oscillatory cells within the loop formed by basal ganglia and thalamocortical circuits. We suggest a model of this circuitry, which helps to clarify this potential mechanism of tremor genesis.