“A Model of Basal Ganglia Function, Inspired by the Songbird”

The songbird is an excellent model system for understanding how the brain generates and learns complex sequential behaviors. Song acquisition is thought to proceed by reinforcement learning, and involves a basal ganglia (BG)-thalamocortical loop in which the cortical component drives exploratory vocalizations. I will present a model of song learning in which the BG evaluates an efference copy of variability commands to detect and reinforce variations that lead to better song outcomes. I will describe recent experimental support for the model, as well as implications of the model for mammalian BG function.