Research Topics

The critical role played by the basal ganglia in the pathogenesis of various movement disorders such as Parkinson’s and Huntington’s diseases has been known for many years. Studies have indicated that the neural networks of the basal ganglia participate in everyday complex behaviors that require coordination between cognition, motivation and movements.

Our research is therefore aimed at both directions: first, we try to provide better understanding of the role and way of action of the basal ganglia-cortical networks in normal behavior and secondly we are studying these networks following the induction of clinical disorders such as Parkinson’s disease and dyskinesia.

We combined behavioral, multi-electrode physiological and computational approaches to probe the relations between the basal ganglia-cortex networks in normal and pathological behavior. We are recording the simultaneous activity of several neurons in different structures of the basal ganglia of monkeys that are engaged in the performance of behavioral tasks that involve visual perception, probabilistic decision making and motor action. Moreover, we are able to study the neural activity following the induction of Parkinson’s disease (with the MPTP neurotoxin) and following dopamine induced dyskinesia both in MPTP and control monkeys.

Our belief is that only through such broad and interdisciplinary understanding we will able to provide better methods for diagnosis follow-up and therapy of these common devastating human diseases.
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