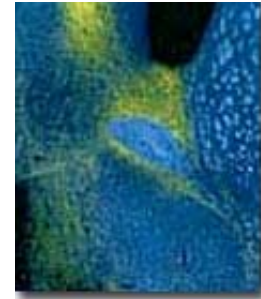




Joshua D Berke Ph.D.

Assistant Professor
Neuroscience Scholar
Department of Psychology
4014 East Hall
Ann Arbor, MI 48109
(734) 615 2712
jdberke@umich.edu
[My website](#)



 [Download](#) this page

Research Interests

My primary interests concern the role of basal ganglia circuits in the learning, selection and performance of actions, and how such neural mechanisms are altered in psychiatric and neurological disorders such as drug addiction and Parkinson's Disease. Current studies use chronic electrophysiological recording in awake, freely-moving rats and transgenic mice to examine how subpopulations of striatal neurons encode information and interact with one another, and how these neural representations are changed by learning experiences and by dopaminergic manipulations. Some of the interrelated, long-term questions I address are:

How do neural circuits involving the basal ganglia mediate action selection and implicit learning? What differences in neural representations and dynamics distinguish deliberate from automatic actions?

How do learning mechanisms in the basal ganglia differ from those in hippocampus? How do multiple memory systems interact during different types of associative learning?

By what mechanisms do neuromodulators such as dopamine affect these circuits to produce both acute and long-term changes in behavior? How do alterations in the dynamic properties of basal ganglia circuits produce the key symptoms of human behavioral disorders such as Parkinson's Disease and Tourette Syndrome?

To what extent can we think of certain compulsive behaviors as disorders of learning/memory, arising from altered synaptic plasticity? How does the prefrontal



cortex normally suppress inappropriate habits to provide behavioral flexibility?

Selected References

Berke JD, Okatan M, Skurski JA, Eichenbaum HB. (2004) Oscillatory entrainment of striatal neurons in freely-moving rats. *Neuron* 43, 883-896.

Berke JD (2003). Learning and memory mechanisms involved in compulsive drug use and relapse. In: Wang, J (ed.) *Drugs of abuse: analysis of neurological effects*. Humana Press, Totowa, NJ.

Berke JD, Sgambato V, Lavoie B, Krause M, Hyman SE (2001) Dopamine and glutamate induce distinct striatal splice forms of Ania-6, an RNA polymerase II-associated cyclin. *Neuron* 32: 277-287.

Berke JD, Hyman SE (2000) Addiction, dopamine, and the molecular mechanisms of memory. *Neuron* 25: 515-532.

Berke JD, Paletzki RF, Aronson GJ, Hyman SE, Gerfen CR (1998) A complex program of striatal gene expression induced by dopaminergic stimulation. *Journal of Neuroscience* 18: 5301-10.

Find more publications by [Dr. Joshua Berke](#)

Last updated 8/17/2006 Click here to [update](#)

02216