

# Focus on the Dysfunction of the Basal Ganglia

Mark Bevan, PhD, professor of Physiology



[Mark Bevan, PhD](#), professor of [Physiology](#), leads a lab focused on the basal ganglia, a group of subcortical nuclei. Educated in the United Kingdom, he established an independent laboratory 15 years ago and has trained and mentored more than a dozen graduate students and postdoctoral fellows, with several going on to run their own labs in academia.

Bevan takes training and mentorship as seriously as any aspect of a running a laboratory, with the goal of producing ethical, independent and creative scientists who will make impactful contributions to biomedical research and related fields. His love for research puts him in the lab most days, either performing his own experiments or participating in and supervising the work of others.

## Q&A

### What are your research interests?

I am interested in the basal ganglia. The basal ganglia are group of subcortical brain nuclei important for habitual, goal-directed and motivated behavior. They're also the sites of dysfunction in psychomotor disorders including Parkinson's disease, Huntington's disease, obsessive compulsive disorder and addiction.

### What is the ultimate goal of your research?

I want to determine the mechanisms underlying basal ganglia function and dysfunction and to use this knowledge to better inform patient therapy.

### How does your research advance medical science and knowledge?

Our work utilizes animal models of human diseases so we can determine how disease processes affect the normal operation of the basal ganglia. The recent development and application of powerful new tools like optogenetics and chemogenetics to interrogate and manipulate brain microcircuits has been critical in this regard.

Specifically, we focus on the causes of abnormal brain activity and behavior at the molecular, cellular, and circuit levels. We then use this knowledge to try to correct brain activity and rescue function in animal models. Ultimately, we hope this information will be used to design more effective treatments for patients.

### Who makes up your research team and what role does each individual play in your research?

My lab members include [Jeremy Atherton, PhD](#), research assistant professor of Physiology; postdoctoral scientists Hong-Yuan Chu, PhD, and Josh Callahan, PhD; and three graduate students from Northwestern University Interdepartmental Neuroscience ([NUIN](#)); Eileen McIver, Ryan Kovalski and Asha Lahiri.

The lab is a meritocracy with minimal hierarchy to promote the best science. Although each scientist has his or her own major project, there is also considerable interaction and collaboration within the group. Each week there is a lab meeting where projects, ideas and opinions are freely exchanged. Ultimately, each member of the team is encouraged to develop expertise in and utilize all the technical approaches that are available in the lab.

### What resources at Northwestern have been helpful for your research?

Although our research at Northwestern is well supported by the numerous state-of-the-art cores facilities, the major source of help, guidance and inspiration comes from the outstanding and vibrant neuroscience research community at Northwestern in Chicago and Evanston. Northwestern faculty, post- and pre-doctoral scientists and support staff make this institution a wonderful place to conduct neuroscience research.

### How is your research funded?

My funding is mainly from the National Institutes of Health National Institute of Neurological Disorders and Stroke ([NINDS](#)). I have a NINDS Javits Neuroscience Investigator Award and I also participate in the NINDS-funded [Northwestern University Udall Center of Excellence for Parkinson's Disease Research](#). My lab's Huntington's disease research is funded by the Cure Huntington's Disease Initiative. We have also been supported by the Parkinson's Disease Foundation.