

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Atherton, Jeremy Francis		POSITION TITLE Research Assistant Professor	
eRA COMMONS USER NAME (credential, e.g., agency login) JATHERTON		Department of Physiology Northwestern University	
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
University of Edinburgh, Scotland, U.K.	B.Sc. (Hons)	09/93-06/97	Biological Sciences (Neuroscience)
University of Edinburgh, Scotland, U.K.	Ph.D.	09/97-12/01	Neurophysiology
University of Tennessee, Memphis, TN	Postdoctoral	02/01-09/03	Neurophysiology
Northwestern University, Chicago, IL	Postdoctoral	10/03-11/09	Neurophysiology

A. Personal Statement

My research to date has primarily focused on the cellular neurophysiology of neurons in the subthalamic nucleus and substantia nigra; basal ganglia nuclei that are strongly implicated in the genesis of the symptoms seen in conditions such as Parkinson's disease, Huntington's disease, OCD, and drug addiction. A primary goal of my research has been to understand the ionic mechanisms underlying autonomous action potential generation and synaptic integration in these neurons. My hope is that this research will contribute to the development of more effective treatments for these disorders. I have over 15 years of experience in electrophysiological and neuroanatomical techniques, which I have combined with computer modeling, 2-photon imaging and photostimulation, and viral vector-based genetic manipulation.

B. Positions and Honors**Positions and Employment**

2009–present Research Assistant Professor, Department of Physiology, Northwestern University

Other Experience and Professional Memberships

1997–2010 Member, British Neuroscience Association
 1998–2001 Member, The Physiological Society
 2001– Member Society for Neuroscience
 2006– Reviewer, Journal of Neurophysiology (ad hoc)
 2010– Reviewer, Journal of Neuroscience (ad hoc)

Honors

1997–2001 Predoctoral MRC Student, U.K.
 1997– Invited Speaker: Edinburgh, Northwestern, Tennessee, and Texas (San Antonio) Universities.

C. Selected Peer-reviewed Publications

1. Wright AK, Atherton JF, Norrie L, Arbuthnott GW (2004) Death of dopaminergic neurones in the rat substantia nigra can be induced by damage to globus pallidus. *Eur J Neurosci* 20: 1737–44. PMID: 15379994
2. Atherton JF, Bevan MD (2005) Ionic mechanisms underlying autonomous action potential generation in the somata and dendrites of GABAergic substantia nigra pars reticulata neurons *in vitro*. *J Neurosci* 25: 8272–81.

PMID: 16148235

3. Baufreton J, Atherton JF, Surmeier DJ, Bevan MD (2005) Enhancement of excitatory synaptic integration by GABAergic inhibition in the subthalamic nucleus. *J Neurosci* 25: 8505–17. PMID: 16162932
4. Blythe SN, Atherton JF, Bevan MD (2007) Synaptic activation of dendritic AMPA and NMDA receptors generates transient high-frequency firing in substantia nigra dopamine neurons in vitro. *J Neurophysiol* 97: 2837–50. PMID: 17251363
5. Teagarden M, Atherton JF, Bevan MD, Wilson CJ (2008) Accumulation of cytoplasmic calcium, but not apamin-sensitive afterhyperpolarization current, during high frequency firing in rat subthalamic nucleus cells. *J Physiol* 586: 817–33. PMID: PMC2375605.
6. Ramanathan S, Tkatch T, Atherton JF, Wilson CJ, Bevan MD (2008) D₂-like dopamine receptors modulate SK_{Ca} channel function in subthalamic nucleus neurons through inhibition of Ca_v2.2 channels. *J Neurophysiol* 99: 442–59. PMID: 18094105
7. Atherton JF, Wokosin DL, Ramanathan S, Bevan MD (2008) Autonomous initiation and propagation of action potentials in neurons of the subthalamic nucleus. *J Physiol* 586: 5679–5700. PMID: PMC2655394.
8. Baufreton J, Kirkham E, Atherton JF, Menard A, Magill PJ, Bolam JP, Bevan MD (2009) Sparse but selective and potent synaptic transmission from the globus pallidus to the subthalamic nucleus. *J Neurophysiol* 102: 532–45. PMID: PMC2712268.
9. Blythe SN, Wokosin D, Atherton JF, Bevan MD (2009) Cellular mechanisms underlying burst firing in substantia nigra dopamine neurons. *J Neurosci* 29: 15531–41. PMID: PMC2834564.
10. Atherton JF, Kitano K, Baufreton J, Fan K, Wokosin D, Tkatch T, Shigemoto R, Surmeier DJ, Bevan MD (2010) Selective participation of somatodendritic HCN channels in inhibitory but not excitatory synaptic integration in neurons of the subthalamic nucleus. *J Neurosci* 30: 16025–40. PMID: PMC3073577.
11. Atherton JF, Menard A, Urbain N, Bevan MD (2013) Short-term depression of external globus pallidus-subthalamic nucleus synaptic transmission and implications for patterning subthalamic activity. *J Neurosci* 33: 7130–44. PMID: 23616523.
12. Chu HY, Atherton JF, Wokosin D, Surmeier DJ, Bevan MD (2015) Heterosynaptic regulation of external globus pallidus inputs to the subthalamic nucleus by the motor cortex. *Neuron* 85:364–376. PMID: PMC4304914.
13. Atherton JF, McIver EL, Mullen MR, Wokosin DL, Surmeier DJ, Bevan MD (2016) Early dysfunction and progressive degeneration of the subthalamic nucleus in mouse models of Huntington's disease. *eLife* 5:e21616. PMID: 27995895.

D. Research Support

Active

- | | | |
|---|---------------------------|-----------------------|
| 1. 2R37NS041280 | Bevan (PI) | 04/01/2001–05/31/2019 |
| NIH/NINDS | | |
| Synaptic Transmission, Plasticity and Integration in the Subthalamic Nucleus | | |
| The objectives are to determine the underlying mechanisms and impact of external globus pallidus-subthalamic nucleus synaptic proliferation following loss of dopamine. | | |
| Role: Investigator | | |
| 2. P50NS047085 | Surmeier (Dir) Bevan (PI) | 09/30/2003–06/30/2018 |
| NIH/NINDS | | |
| Rhythmicity and Synchrony in the Basal Ganglia | | |
| The objectives of the Bevan lab were to determine: 1) the contributions of intrinsic voltage- and Ca ²⁺ -dependent membrane properties of STN neurons to excitability and synaptic integration; 2) how dopamine and dopamine | | |

Program Director/Principal Investigator (Last, First, Middle):

depletion modulate the intrinsic membrane properties of subthalamic nucleus neurons and synaptic patterning of subthalamic nucleus activity; 3) how glutamatergic synaptic inputs interact with the intrinsic membrane properties of substantia nigra dopamine neurons during the generation of action potential bursts.

Role: Investigator

3. A-5071

Surmeier (Dir) Bevan (PI)

04/01/2010–

CHDI

Project 6. Adaptations in the STN in mouse models of HD

The objective is to determine the effects of mutant huntingtin expression on the subthalamic nucleus.

Role: Investigator