Laura Green

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Education

New York University School of Medicine, New York, NY — 2018-2023 (expected)
Ph.D., Neuroscience

McMaster University, Hamilton, Ontario — 2014-2018
B.Sc (Hons), Integrated Science, minor in Physics

- Integrated Science is a four-year honours science program, with a focus on research, connecting scientific disciplines, and problem-based learning

Summary of Skills

Computational neuroscientist in learning and memory. Experience in dynamical systems modelling, statistical modelling, and time series analysis of directional data. Extensive experience in MATLAB and familiar with Python.

Scholarly and Professional Activities

Research Experience

July 2019-current — **Graduate Research Assistant**
Supervisors: Dr.György Buzsáki, NYU School of Medicine, and Dr. John Rinzel, NYU

- Develop and apply quantitative neuroscience modelling Techniques to rodent hippocampal silicon probe recordings to Determine physiological mechanisms of memory

September 2018-June 2019 — **Rotation Student**
Supervisors: Dr. Andre Fenton and Dr. Cristina Savin, Neuroscience Department, NYU

- Implemented a GP model (Savin & Tkacik, 2016) to analyze tetrode recordings of rats exploring in familiar environments, to determine the effects of ζ-inhibitory peptide (ZIP) injection on functional connectivity within CA1

June-July 2018 — **Mathematical Model of 1/f noise in EEG signals**
Supervisor: Dr. Lennaert van Veen, University of Ontario, Institute of Technology

- Created a stochastic dynamical systems model of EEG Frequencies to determine the origin of 1/f noise

Sept. 2017-April 2018 — **Undergraduate Thesis Project: Model of the Auditory Nerve Fibre**
Supervisor: Dr. Ian Bruce, Auditory Engineering Laboratory, McMaster University

- Adjusted previous Auditory Nerve Fibre model to model patch-clamp recordings from rat

- Added M-current to model to improve model
  Project led to a poster at CIAP 2019

May-Aug. 2017 **Undergraduate Student Research Award (NSERC USRA): Model of the IHC-AN Fibre Synapse**
Supervisor: Dr. Ian Bruce, Auditory Engineering Laboratory, McMaster University

- Implemented mathematical descriptions of synaptic ion channels into a Hodgkin and Huxley-based Auditory Nerve Fibre model
- Analyzed simulations results using statistical tests to improve the model

Sept. 2015-June 2017 **Volunteer project: Physiology of the Heart and Mood**
Supervisor: Dr. Paul Andrews, Evo-Health Lab, McMaster University

- Planned and implemented an experiment to investigate how expressive writing affects heart rate variability, salivary cortisol, and theory of mind in undergraduate students
- Drafted a paper on the antioxidant properties of serotonin, published in *Proceedings B*, Nov. 2022

Feb.-Apr. 2016 **Mathematical Model of a Serotonergic Neuron**
Supervisor: Dr. Deda Gillespie, McMaster University

- Modelled a serotonergic synapse in the hippocampus in MATLAB, for a six-week enrichment project; presented at an in-class poster session (2016)

Awards

Training Program in Computational Neuroscience, NIH grant R90DA043849 (2019-2021)
NSERC Canadian Graduate Scholarship-Master's (CGSM) at University of Toronto (2018 - *Declined*)
NSERC Undergraduate Student Research Award (USRA) (2018)
University (Senate) Scholarship (2016)
McMaster President's Award (2014-2015)

Publications

Green, L., Tingley, D., Rinzel, J. & Buzsáki, G. (2022). Action-driven remapping of hippocampal neuronal populations in jumping rats. *Proceedings of the National Academy of Sciences,* 119(26), e2122141119. https://www.pnas.org/doi/pdf/10.1073/pnas.2122141119

Andrews, P., Bosyj, C., Brenton, L., **Green, L.**, Gasser, P., Lowry, C., Pickel, V. (2022). All the brain's a stage for serotonin: The forgotten story of serotonin diffusion across cell membranes. *Proceedings B*. https://doi.org/10.1098/rspb.2022.1565

Undergraduate Student Publications

Panuelos, J. and **Green, L.** (2016)**.** What would the world be like to a borrower? *Journal of Interdisciplinary Science Topics* 5. https://physics.le.ac.uk/jist/index.php/JIST/article/view/187/114

Fare, I. and **Green, L.** (2016). "Formation of the Earth and Solar System" in: Eyles and Symons (eds.), *History of the Earth Vol VI*. McMaster University. pp. 4-9. [http://hdl.handle.net/11375/20732].

(Course credit was received for the above publications)

Contributed Talks and Posters

Society for Neuroscience, poster, 2021 [main presenter]

Joint Symposium in Computational Neuroscience, talk, 2021 [main presenter]

Conference on Implantable Auditory Prostheses, poster, 2019

NeuroXchange Undergraduate Neuroscience Conference, poster, 2016 [main presenter]

Courses and Conferences

Introduction to Science Policy and Advocacy, FASEB, 2022

Attendee, Cosyne 2020

Attendee, Society for Neuroscience 2018, 2019

Workshop on the Mathematics of Hearing, The Fields Institute, 2017

Software Carpentry Workshop, McMaster University, 2016

Ontario Summer School on High Performance Computing, McMaster University, 2016

Teaching

Teaching Assistant: McMaster University, ISCI 2A18 *Neuroscience* (Fall 2017)
Professor: Dr. Deda Gillespie

Neuroscience High School Workshop Co-Leader, 2017

Reviewing

The iScientist Editorial Board (2015-2018; Senior Editor 2017-2018)

- Co-wrote a grant that earned $2500 over a three-year period from the McMaster Science Society's Science Initiative Fund

Competitions

Society for Neuroscience Brain Awareness Video Contest, 2016

- Created a five-minute video, working in a group, to explain neural networks to a general audience