

# Laura Green

New York, NY  
[laurahgreen.com](http://laurahgreen.com)  
[Lwg229@nyu.edu](mailto:Lwg229@nyu.edu)

## Education

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*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

## Summary of Skills

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Computational neuroscientist in learning and memory. Experience in dynamical systems modelling and statistical modelling of neural data. Experience in MATLAB and Python.

## Scholarly and Professional Activities

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### 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  $\zeta$ -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. 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 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://journals.le.ac.uk/ojs1/index.php/jist/article/view/813/765>

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.

[\[http://hdl.handle.net/11375/20732\]](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**

*Attendee*, Cosyne 2020

*Attendee*, Society for Neuroscience 2018, 2019

*Science Communication Workshop*, Arthur L. Carter Journalism Institute, NYU, 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