

Jillian L. King, PhD

Postdoctoral Associate

The Jackson Laboratory, Bar Harbor, ME, USA

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Education

Dalhousie University
December 2019

Doctor of Philosophy, Neuroscience
Department of Psychology and Neuroscience

Dalhousie University
December 2014

Master of Science, Neuroscience
Department of Psychology and Neuroscience

Dalhousie University
May 2011, *First Class Honours*

Bachelor of Science, Neuroscience
Department of Psychology and Neuroscience

Theses

King, JL (2019) Contributions of Genetically Defined Interneurons to Contrast Adaptation in Mouse Primary Visual Cortex, PhD Thesis, Department of Psychology and Neuroscience, Dalhousie University.

King, JL (2014) Visual Adaptation in Mouse Primary Visual Cortex. MSc Thesis, Department of Psychology and Neuroscience, Dalhousie University.

Publications and Presentations

Publications:

- Ingram TG, **King JL**, Crowder NA (2019) Divisive inhibition prevails during simultaneous optogenetic activation of all interneuron subtypes in mouse primary visual cortex. *Frontiers in Neural Circuits*, Vol. 13, Article 40.
- Korgan AC, O'Leary E, **King JL**, Weaver ICG, Perrot TS (2018) Effects of paternal high-fat diet and rearing environment on maternal investment and development of defensive responses in the offspring. *Psychoneuroendocrinology*, 91: 20-30.
- King JL**, Wong AA, Brown RE (2018) Age-related changes in the spatial frequency threshold of male and female 3xTg-AD mice using OptoMotry. *Journal of Alzheimer's Disease*. 62(2): 591-596.
- King JL** & Crowder NA (2018) Adaptation to stimulus orientation in mouse primary visual cortex. *European Journal of Neuroscience*. 47(4): 346-357.

3. **King JL**, Lowe MP, Stover KR, Wong AA, Crowder NC (2016) Adaptive processes in thalamus and cortex revealed by silencing of primary visual cortex during contrast adaptation. *Current Biology*. 26(10): 1295-12300.
2. **King JL**, Lowe MP, Crowder NA (2015) Contrast adaptation is spatial frequency specific in mouse primary visual cortex. *Neuroscience*. 310: 198-205.
1. LeDue EE, **King JL**, Stover KR, Crowder NA (2013) Spatiotemporal specificity of contrast adaption in mouse primary visual cortex. *Frontiers in Neural Circuits*. 7: 154.

Posters:

17. Shapiro JT, **King JL**, Crowder NA (2019) Characterizing optogenetic rebound effects to parvalbumin expressing interneuron photostimulation in mouse primary visual cortex. *Society for Neuroscience Annual Meeting*. Chicago, IL, USA. October 2019.
16. **King JL**, Gill CA, Erskine RJ, Shapiro JT, Crowder NA (2018) Optogenetic modulation of GABAergic interneurons affects contrast response functions in mouse primary visual cortex. *Canadian Association of Neuroscience Annual Meeting*. Vancouver, BC, CAN, May 2018.
15. Shapiro JT, **King JL**, Crowder NA (2018) The influence of optogenetic rebound effects on visual after-responses in mouse primary visual cortex. *Canadian Association of Neuroscience Annual Meeting*. Vancouver, BC, CAN, May 2018.
14. Perrot TS, Korgan AC, O'Leary E, **King JL**, Weaver ICG (2018) Effect of paternal high-fat diet exposure and maternal semi-naturalistic housing on rat offspring anxiety like behaviour. *Canadian National Perinatal Research Meeting*. Banff, AB, CAN. February 2018.
13. **King JL**, Korgan AC, Crowder NA (2017) Contrast adaptation in the mouse primary visual cortex is altered by optogenetic stimulation of parvalbumin and somatostatin expressing interneurons. *Society for Neuroscience Annual Meeting*. Washington, DC, USA. November 2017.
12. **King JL**, Korgan AC, Papsin E, Crowder NA (2017) The roles of parvalbumin and somatostatin expressing interneurons in modulating contrast adaptation in the mouse primary visual cortex. *Canadian Association of Neuroscience Annual Meeting*. Montreal, QC, CAN, May 2017.
11. JT Shapiro, Korgan AC, **King JL**, Crowder NA (2017) Reliability of spike sorting in novice analysts: Tetrodes vs. single channel electrodes. *Science Atlantic Undergraduate Psychology Conference*. Sydney, NS, CAN. May 2017.

10. Duchesne AJ, **King JL**, Crowder NA (2016) Spike2 and MClust: Comparing two cluster analysis methods on wave-marked mouse V1 tetrode data. *Science Atlantic Undergraduate Psychology Conference*. Moncton, NB, CAN, May 2016.
9. **King JL**, Crowder NA (2015) Optogenetic silencing of mouse primary visual cortex affects orientation adaptation. *Canadian Association for Neuroscience Annual Meeting*. Vancouver, BC, CAN. May 2015.
8. Crowder NA, Stover KR, **King JL**, Gordon KM (2014) Modulation of spike rate by optogenetic control of GABAergic neurons alters contrast adaptation in mouse primary visual cortex. *Society for Neuroscience Annual Meeting*. Washington, DC, USA. November 2014.
7. **King JL**, Crowder NA (2014) Orientation plasticity in mouse primary visual cortex. *Canadian Association for Neuroscience Annual Meeting*. Montreal, QC, CAN. May 2014.
6. Stover KR, **King JL**, Gordon K, Crowder NA (2014) Optogenetic modulation of GABAergic activity in mouse primary visual cortex affects contrast adaptation. *Canadian Association for Neuroscience Annual Meeting*. Montreal, QC, CAN. May 2014.
5. Abouleish MT, Frank K, **King JL**, Crowder NA (2014), Retinofugal projections of Octodon degus: A potential rodent model for vision research. *Graham Goddard Psychology Conference*. Halifax, NS, CAN. May 2014.
4. Lowe MP, **King JL**, Crowder NA (2014), Contrast adaptation in mouse V1 depends on spatial frequency but not firing rate. *Graham Goddard Psychology Conference*. Halifax, NS, CAN. May 2014.
3. **King JL**, LeDue EE, Stover KR, Crowder NA (2013) Spatio-temporal selectivity of contrast adaptation in mouse primary visual cortex. *Canadian Association for Neuroscience Annual Meeting*. Toronto, ON, CAN. May 2013
2. **King JL**, Farrell S, Brecha N, Barnes S (2011) Changes in guinea pig retinal ganglion cell spiking after application of somatostatin and the somatostatin subtype 4 receptor agonist L-803,087. *Society for Neuroscience Annual Meeting*. Washington, DC, USA. November 2011.
1. Farrell S, Sargoy A, **King JL**, Brecha N, Barnes S (2011) Acute administration of gabapentin reduces voltage-gated calcium channel current in mammalian retinal ganglion cells. *The Association for Research in Vision and Ophthalmology Annual Meeting*. Fort Lauderdale, FL, USA. May 2011.

Presentations:

8. Shapiro JT, **King JL**, Crowder NA (2018) Optogenetic modulation of Parvalbumin-expressing interneurons affects mouse primary visual cortex pyramidal cell after-responses. *Science Atlantic Psychology Conference*. Halifax, NS, CAN. May 2018.
7. **King JL**, Gill C, Shapiro JT, Crowder NA (2018) Modulating GABAergic interneuron activity in mouse primary visual cortex alters response to contrast. *Graham Goddard Psychology Conference*. Halifax NS, CAN. April 2018.
6. **King JL**, Korgan AC, Crowder NA (2017) The roles of parvalbumin and somatostatin expressing interneurons in modulating contrast adaptation in mouse primary visual cortex. *Graham Goddard Psychology Conference*. Halifax NS, CAN. May 2017.
5. Duschene AJ, **King JL**, Crowder NA (2017) The effect of modulating parvalbumin expressing interneurons on receptive field structure in mouse primary visual cortex. *Science Atlantic Undergraduate Psychology Conference*. Sydney, NS, CAN. May 2017.
4. Erksine RJ, **King JL**, Crowder NA (2017) The inhibitory role of somatostatin expressing interneurons on contrast response in mouse primary visual cortex. *Science Atlantic Undergraduate Psychology Conference*. Sydney, NS, CAN. May 2017.
3. **King JL**, Korgan AC, Papsin E, Crowder NA (2016) Contrast adaptation in mouse primary visual cortex is not driven by parvalbumin interneurons. *Graham Goddard Psychology Conference*. Halifax NS, CAN. May 2016.
2. **King JL**, Stover KR, Lowe MP, Crowder NA (2015) Optogenetic silencing of GABAergic modulation in mouse primary visual cortex affects contrast adaptation in the primary visual cortex, but not the lateral geniculate nucleus. *Graham Goddard Psychology Conference*. Halifax, NS, CAN. May 2015.
1. **King JL**, Crowder NA (2014) Orientation plasticity in mouse primary visual cortex. *Graham Goddard Psychology Conference*. Halifax, NS, CAN. May 2014.

Scholarships and Awards

Postgraduate Doctoral Scholarship (\$42,000) - Natural Sciences and Engineering Research Council of Canada, 2017-2019.

Dr. Mabel E. Goudge Award (\$18,000) – Dalhousie University, 2014-2015. *Awarded to the most outstanding woman graduate student in experimental or clinical psychology.*

Molly Appeal Neuroscience Trainee Award (\$8000) – Dalhousie University, 2014.

Canadian Merit Scholarship (\$12,000), 2007-2008. *The Canadian Merit Scholarship Foundation invests in the potential of Canada's young people, supporting talented students who show promise of leadership and a strong commitment to community service.*

Research Experience

Graduate Student, Crowder Visual Neuroscience Laboratory, Dalhousie University
Dr. Nathan A. Crowder, Supervisor, Department of Psychology and Neuroscience
MSc: May 2013 – December 2014, PhD: January 2015 – December 2019

Research Assistant, Crowder Visual Neuroscience Laboratory, Dalhousie University
Dr. Nathan A. Crowder, Supervisor, Department of Psychology and Neuroscience,
September 2012 – April 2013

Student Researcher, Retina and Optic Nerve Laboratory, Dalhousie University
Dr. Steven A. Barnes, Supervisor, Department of Physiology and Biophysics
September 2010 – June 2012

Assisted Supervision

2019 **MSc Student:** Jared Shapiro
Honors Student: Nicole Michaud

2018 **MSc Student:** Jared Shapiro
Summer Student: Lola Leving

2017 **Honors Students:** Jared Shapiro, Alexander King and Cheryl Gill

2016 **Honors Students:** Anthony Duschene and Rachel Erskine
Independent Research Project: Jared Shapiro
Comprehensive PhD Students: Austin Korgan and Tony Ingram

2015 **Honors Student:** Emily Papsin
Independent Research Project: Anthony Duschene

2014 **Honors Students:** Matthew Lowe, Jordan Boudreau and Malik Abouleish
Comprehensive PhD Students: Kurt Stover

2013 **Honors Student:** Kaitlyn Gordon
Independent Research Projects: Matthew Lowe and Malik Abouleish

Invited Seminars

The Jackson Laboratory, Bar Harbor, ME, USA, April 2018

Using the Mouse to Study Vision: What We've Learned About Contrast Adaption

Teaching Experience

Teaching Assistant, *Sensory Neuroscience I* – Dalhousie University

Dr. Nathan A. Crowder, Department of Psychology and Neuroscience
January - April 2014, 2015, 2016, 2018

Teaching Assistant, *Neuroscience Laboratory II* – Dalhousie University

Dr. Janusz Borycz, Department of Psychology and Neuroscience
September - December 2014, 2017

Teaching Assistant, *Behavioral Neuroscience* – Dalhousie University

Dr. Tamara B. Franklin, Department of Psychology and Neuroscience
January - April 2017

Laboratory Instructor, *Methods of Psychological Inquiry (Neuroscience Lab)* – Dalhousie University

Dr. Simon Gadbois & Dr. Kevin Duffy, Department of Psychology and Neuroscience
September - December 2011, 2013

Teaching Assistant, *Introductory Physiology* – Dalhousie University

Dr. Cindy Penney, Department of Physiology and Biophysics
September 2011 - April 2012

Guest Lectures

Introduction to Neuroscience (BIO 307), University of Maine

Current Experimental Methodology in Neuroscience, November 8, 2018

Obtained teaching reviews from 38 students with an avg. rating of 89% (4.47/5)

Sensory Neuroscience I Vision (PSYO/NESC 3051), Dalhousie University

Contrast Adaptation in the Mouse Visual Cortex, April 4, 2018

Perceptual Processes (PSYO/NESC 2051), Dalhousie University

Auditory Localization, November 22, 2017

Introduction to Psychology and Neuroscience (PSYO/NESC 1021), Dalhousie University

Basics of Electrophysiology, October 12, 2017

Personal Qualifications

Research Techniques:

Optogenetics, single- and multi-cell *in vivo* electrophysiology, multiple animal surgeries, animal perfusions, immunohistochemistry, tissue sectioning (cryostat), stereology, OptoMotry, rodent maternal behaviour scoring, some anxiety and depressive-like behavioural assays.

Computer Software Proficiency:

MATLAB, Spike2, SPSS, Microsoft Word, Microsoft Excel, Microsoft PowerPoint, PC and Mac platforms.

Organization Memberships:

Society for Neuroscience, 2011, 2014, 2016-2017

Canadian Association for Neuroscience, 2012-2015, 2017-2018

Professional Development

Neural Signal and Image Processing: Quantitate Analysis of Neural Activity,

Canadian Association for Neuroscience, May 2018, Vancouver, BC, Canada.

This full-day workshop was to provide an overview of different analysis methods used in variety of neuroscience fields to help to understand complex brain signals.

Skills of Communication, Mitacs, June 2016, Halifax, NS, Canada

This full-day workshop features tools and tips for better verbal communication. The goal is to make you more aware of the tools available to help you become a better communicator in both your work and personal lives.

Networking Skills, Mitacs, June 2014, Halifax, NS, Canada

This full-day workshop is designed to provide insight and interaction along with the know how to build and stabilize professional relationships through effective networking.