

Emily Olafson

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EDUCATION

Doctor of Philosophy (in progress), Neuroscience

Weill Cornell Graduate School, New York, NY, USA

August 2019 - Present

Thesis - *Prediction of post-stroke motor deficits from neuroimaging data using a machine learning approach*, Supervisor: Dr. Amy Kuceyeski

Bachelor of Science, Neuroscience

McGill University, Montreal, Quebec, Canada

September 2015 - April 2019

Thesis - *Can the tissue intensity ratio capture atypical cortical development in autism spectrum disorder?* Supervisor: Dr. Mallar Chakravarty

RESEARCH EXPERIENCE

Graduate Thesis Student

March 2020 – present

Computational Connectomics Lab, Weill Cornell Medicine, New York, USA

- Built supervised machine learning models to predict long-term stroke outcomes from acute clinical imaging data (functional and structural MRI).
- Characterized pathological brain activity after stroke using clustering techniques.
- Identified network-level reorganization of brain activity in stroke using graph theory algorithms.

Undergraduate Honours Thesis Student

September 2018 – April 2019

Douglas Mental Health University Institute, Quebec, Canada

- Developed a novel methodology to measure cortical microstructure from structural magnetic resonance images and applied it to a large multi-site imaging dataset.
- Performed a vertex-wise meta-analysis to assess diagnostic differences and to determine how factors such as age, sex, and IQ contribute to variation in cortical microstructure.

Research Assistant

May 2018 – August 2018

Douglas Mental Health University Institute, Quebec, Canada

- Processed a multi-site MRI dataset through the MAGeTbrain (Multiple Automatically Generated Templates) subcortical segmentation pipeline and assessed the outputs for segmentation quality.

Research Assistant

May 2017 – April 2018

Institut de recherches cliniques de Montréal, Quebec, Canada

- Knocked down candidate proteins using electroporation and the CRISPR-cas9 system and characterized developmental defects with immunohistochemistry and fluorescence microscopy.

PUBLICATIONS

1. Sook-Lei Liew, Nicolas Schweighofer, James H Cole, Artemis Zavaliangos-Petropulu, ... **Emily Olafson** ... Paul Thompson, *Global brain health modulates the impact of lesion damage on post-stroke sensorimotor outcomes*, bioRxiv, (2022) <https://doi.org/10.1101/2022.04.27.489791>
2. **Emily Olafson**, Georgia Russello, Keith Jamison, Danhong Wang, Hesheng Liu, Joel E Bruss, Aaron D Boes, Amy Kuceyeski, *Increased prevalence of a frontoparietal brain state at rest is associated with better motor recovery in individuals with pontine stroke affecting dominant-hand corticospinal tract*, bioRxiv (2022), <https://doi.org/10.1101/2022.02.10.479962>
3. Nayoung Kim, James O'Sullivan, **Emily Olafson**, Eric Caliendo, Sophie Nowak, Henning U Voss, Ryan Lowder, Will Watson, Jana Ivanidze, Joseph J J Fins, Nicholas D Schiff, N Jeremy Hill, and Sudhin A Shah *What about the children? Cognitive-motor dissociation following pediatric brain injury* Neurology: Clinical Practice (2022) <https://doi.org/10.1212/CPJ.0000000000001169>
4. Olivier Parent; **Emily Olafson**; Aurélie Bussy; Stéphanie Tullo; Nadia Blostein; Alyssa Salaciak; Saashi A. Bedford; Sarah Farzin; Marie-Lise Béland; Vanessa Valiquette; Christine L. Tardif; Gabriel A. Devenyi; Mallar M. Chakravarty *High spatial overlap but diverging age-related trajectories of cortical MRI markers aiming to represent intracortical myelin and microstructure* bioRxiv (2022) <https://doi.org/10.1101/2022.01.27.477925>
5. Stefan Drakulich, Arseni Sitartchouk, **Emily Olafson**, Reda Sarhani, Anne-Charlotte Thiffault, Alan C. Evans, Mallar Chakravarty, *General Cognitive Ability and Pericortical Contrast*, Intelligence (2022) <https://doi.org/10.1016/j.intell.2022.101633>
6. **Emily Olafson**, Keith Jamison, Elizabeth Sweeney, Danhong Wang, Hesheng Liu, Joel E Bruss, Aaron D Boes, Amy Kuceyeski, *Functional connectome reorganization relates to post-stroke motor recovery and structural and functional disconnection* Neuroimage (2021) <https://doi.org/10.1016/j.neuroimage.2021.118642>
7. **Emily Olafson**, Saashi A Bedford, Gabriel A Devenyi, Raihaan Patel, Stephanie Tullo, Min Tae M Park, Olivier Parent, Evdokia Anagnostou, Simon Baron-Cohen, Edward T Bullmore, Lindsay R Chura, Michael C Craig, Christine Ecker, Dorothea L Floris, Rosemary J Holt, Rhoshel Lenroot, Jason P Lerch, Michael V Lombardo, Declan G M Murphy, Armin Raznahan, Amber N V Ruigrok, Michael D Spencer, John Suckling, Margot J Taylor, MRC AIMS Consortium, Meng-Chuan Lai, M Mallar Chakravarty, *Examining the boundary sharpness coefficient as an index of cortical microstructure in autism spectrum disorder*, Cerebral Cortex(2021), <https://doi.org/10.1093/cercor/bhab015>
8. Stefan Drakulich*, Anne-Charlotte Thiffault*, **Emily Olafson**, Aurelie Labbe, Matthew D. Albaugh, Budhachandra Khundrakpam, Simon Ducharme, Alan Evans, Mallar M. Chakravarty, *"Maturational Trajectories of Pericortical Contrast in Typical Brain Development"* Neuroimage (2021), <https://doi.org/10.1016/j.neuroimage.2021.117974>

EXTRACURRICULARS

- Organizer and project leader for the first implementation of Brainhack New York 2020, a hackathon and conference with 50 registered participants

- Artificial Intelligence Health Hackathon February 2020 - Best Diagnostic Application (project: OpenCellAI)

HONORS

- 2021 - Organization for Human Brain Mapping Merit Abstract award
- 2019 - Canadian Institutes of Health Research Canada Graduate Scholarships Master's Program Award (\$17,500)
- 2017, 2019 - Natural Sciences and Engineering Research Council Undergraduate Student Research Award (\$6000) (Kania Lab 2017, Chakravarty Lab 2019)
- 2016, 2017, 2018 - Tomlinson Engagement Award for Mentoring (TEAM) for NSCI 300 (Neuroethics) and PHYS 102 (Physics - Electromagnetism) at McGill
- 2017 - Faculty of Science Scholarship - McGill University

TEACHING

Instructor - HD 3250 Neurochemistry of Human Behavior Fall 2021 - Spring 2022
Five Points Correctional Facility, Cayuga Correctional Facility

- Designed undergraduate-level neuroscience course covering the principles of chemical neurotransmission and how alterations in signalling can manifest in disease.
- Communicated complex topics to a neuroscience-naïve audience with a final course rating of 4.83/5.

Neuroscience Bootcamp organizer and lecturer August 2020
Weill Cornell Graduate School

- Along with 2 other co-organizers, I determined the syllabus and contacted lecturers to speak at a 3-day program for incoming PhD students. The goal of this mini course was to provide a common knowledge base of neuroscience fundamentals to serve as an introduction and/or refresher to students prior to official classes.
- Presented a 45 minute lecture on genetic models

CoCo lab Summer Skills Development Workshops lecturer June 2020
Weill Cornell Graduate School

- Presented two lectures, "How to read a scientific paper" and "Introduction to MATLAB for neuroimaging" to summer students in the Kuceyeski lab