Emily Olafson

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EDUCATION

Doctor of Philosophy (in progress), Neuroscience
Weill Cornell Graduate School, New York, NY, USA August 2019 - May 2023
Thesis - *Understanding and predicting recovery from stroke using magnetic resonance imaging and machine learning techniques* , Supervisor: Dr. Amy Kuceyeski

Bachelor of Science, Neuroscience
McGill University, Montréal, Québec, Canada September 2015 - April 2019
Thesis - *Can the tissue intensity ratio capture atypical cortical development in autism spectrum disorder?* Supervisor: Dr. Mallar Chakravarty

EXPERIENCE

Late Discovery Imaging Intern June 2022 – August 2022
Biogen, Cambridge, Massachusetts, USA

- Performed in vivo characterization and optimized image analysis parameters for an exploratory tau PET tracer of progressive supranuclear palsy.
- Developed parallelized PET preprocessing pipeline, including quantitative quality control measures.
- Planned and executed analysis of natural history clinical dataset and presented work to internal stakeholders at multiple levels of drug development to inform biomarker strategy.

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, Québec, 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.
- Used bash and R to preprocess brain imaging data on a high performance computing cluster.

Research Assistant May 2018 – August 2018

Douglas Mental Health University Institute, Québec, 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, Québec, Canada

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

PUBLICATIONS

1. **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*, Communications Biology (2022), https://doi.org/10.1101/2022.02.10.479962
2. 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
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

INVITED TALKS

Centre d'Imagerie Cérébrale Lecture Series, Montréal, Québec, May 2022 - *"Understanding and predicting recovery from ischemic stroke using magnetic resonance imaging"*

EXTRACURRICULARS

- Brainhack New York 2020: Organizer and project leader for 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 ($6,000$) (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 ($300)
- 2015 - J.W. McConnell Entrance Scholarship - McGill University ($3,500$)

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 inducible 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