Shane Devine McKeon

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EDUCATION

Doctor of Philosophy, Bioengineering, NRSA F31 Fellow August 2019 – June 2024 (Expected)
University of Pittsburgh, Center for the Neural Basis of Cognition (CNBC)
Advisor: Beatriz Luna, PhD
Thesis: Underlying Brain Mechanisms of the E/I Balance through Adolescence

Bachelor of Science, Bioengineering; Minor, Neuroscience
University of Pittsburgh, Pittsburgh, PA August 2015 – April 2019
Certificate: Conceptual Foundations of Medicine

WORK EXPERIENCE

PhD Candidate, NRSA F31 Fellow August 2019 – Present
The University of Pittsburgh, *Laboratory of Neurocognitive Development*
Advisor: Beatriz Luna, PhD

- Developed a MATLAB pipeline to assess trial level transient events of EEG activity to investigate the neural underpinnings of improved executive function during our memory guided saccade working memory task, resulting in two conference presentations and a publication in *NeuroImage.*
- Implemented a python pipeline to assess aperiodic resting state EEG activity to investigate EEG-derived measures of the excitatory/inhibitory balance, their associations with 7-Tesla spectroscopy measures of GABA and glutamate, and working memory, resulting in three conference presentations and a publication under review.
- Built a MATLAB protocol to calculate the evoked and spontaneous power of derived from EEG activity during an auditory steady state stimuli to assess cortical signal-to-noise ratio (SNR) as an indirect measure of the excitatory/inhibitory balance, resulting in two conference presentations and a publication in prep.
- Developing a MATLAB pipeline to assess entropy in stereoelectroencephalography (sEEG)

Undergraduate Research Assistant
The University of Pittsburgh

Geriatric Psychiatry Neuroimaging Lab May 2017 – August 2019
Advisor: Howard Aizenstein, MD, PhD

- Created a nonlinear registration method to align postmortem histology samples to in-vivo T1 and T2 weighted MRIs and ex-vivo T1 weighted MRI using MATLAB and FSL to correlate in-vivo white matter hyperintensities with post-mortem histology resulting in four conference presentations.
- Developed a protocol to evaluate the segmentation performance of 3-Tesla and 7-Tesla T1-weighted images using FreeSurfer and SPM, resulting in a conference presentation.

Clinical Applications of Neuroscience Lab January 2018 – May 2019
Advisor: Rebecca Price, PhD

- Developed a MATLAB script that analyzed eye tracking data and reported the number of times the participant blinked, the average duration of a blink, the number of fixations, and the average time of a fixation.
- Assisted in patient recruitment for a compulsive behavior study and a depression treatment clinical trial

Milcarek Lab January 2016 – May 2016
Advisor: Christine Milcarek, PhD

- Confirmed the presence of ELL2 and ELL3 genes in cell lines via PCR analysis and western blots
- Responsible for gel electrophoresis, western blotting, and data analysis
- Used chemiluminescence to prove which cell lines contained ELL3 and/or ELL2

Undergraduate Research Intern May 2016 – August 2016
The Biomedical Institute of NJ, Cedar Knolls NJ

- Investigated whether perinatal antibiotics impacted the rat microbiome, intestinal inflammation, and behavior using quantitative PCR, H&E tissue staining, and behavioral tests through a radial arm maze

SKILLS

- **Research Techniques:** Electroencephalography (EEG), stereoelectroencephalography (sEEG), data analysis and statistics, multimodal imaging, signal processing, technical writing, scientific communication, data visualization, scripting and automation
- **Programming:** MATLAB, R, Python
- **Software:** FieldTrip, EEGLAB, Brainstorm
- **Project Management:** collaboration and communication, attention to detail, organization, team management, documentation, Wiki management, version control (GitHub), study participant data management (REDCap), grant writing, conference presentations

PUBLICATIONS

1. Ravindranath, O, Perica, M.I., Parr, A.C., Ojha, A, **McKeon, S.D.**, Montano, G, Ullendorf, N, Luna, B, Edmiston, E.K. Adolescent neurocognitive development and decision-making abilities regarding gender-affirming care. *Developmental Cognitive Neuroscience*. (2024).
2. **McKeon, S.D.** *et al.* Aperiodic EEG and 7T MRSI evidence for maturation of E/I balance supporting the development of working memory through adolescence. *BioRxiv.* (2023). doi: https://doi.org/10.1101/2023.09.06.556453
3. **McKeon, S.D.** *et al.* Age-related differences in transient gamma band activity during working memory maintenance through adolescence. *NeuroImage.* 120112 (2023) doi:10.1016/j.neuroimage.2023.120112

FELLOWSHIPS

National Research Service Award (NRSA) / F31 Predoctoral Fellowship April 2023 – Present
National Institute of Mental Health
Project entitled "Brain Mechanisms Underlying Changes in Neural Oscillations through Adolescent Cognitive Maturation" (1F31MH132246-01A1)
- Three-year fellowship with $27,000/ year stipend with $16,000/ year cost of education allowance

Bioengineering in Psychiatry T32 April 2022 – April 2023
National Institute of Mental Health
Bioengineering in Psychiatry Training Program (5T32MH119168-04)
- One-year fellowship with $25,836/ year stipend

PEER REVIEWS

1. Reviewer. *Brain and Cognition.* 2023.
2. Ad hoc reviewer. *Epilepsia.* 2022.
3. Ad hoc reviewer. *Developmental Cognitive Neuroscience.* 2020

AWARDS

1. **Flux Society Ambassador Award.** Flux Society Annual Meeting. Paris, France. Sept. 2022
2. **Third Place Poster Award.** Women in STEM Conference. Pittsburgh, PA. Feb. 2018
3. **Swanson Undergraduate Research Internship Stipend**. University of Pittsburgh. Apr. 2017
4. **Best Undergraduate Research Paper**. Freshman Engineering Conference. Pittsburgh. PA. Apr. 2016

LEADERSHIP AND SERVICE

Communication Committee Chair Apr 2023 – Present
Center for the Neural Basis of Cognition, Carnegie Mellon University and University of Pittsburgh
- Founding member of the communications committee, aimed at increasing inter organization communication and recognizing its members achievements.

- Co-Editor of the inaugural CNBC newsletter recognizing new faculty members, recent publications, and awards

Social Committee Chair Aug 2022 – Present
Center for the Neural Basis of Cognition, Carnegie Mellon University and University of Pittsburgh
- Organized bi-monthly social events for the graduate and postdoc members of the CNBC, including starting the first CNBC book club, to bolster interpersonal relationships between the center's members across universities
- Managed committee budget

Undergraduate Researcher Mentor Aug 2022 – Present
Laboratory of Neurocognitive Development, University of Pittsburgh
- Mentored an undergraduate research assistant on EEG analysis using MATLAB, R Studio, and applying for a summer research stipend
- Co-run an undergraduate journal club to help the undergraduate research assistants in their science communication skills

MindHive Mentor Jan 2021 – Apr 2021
MindHive
- Mentored high school students who were split into groups and asked to design a simple study to answer a scientific question via zoom 2-4/ week for 4-5 weeks

NICU Volunteer Oct 2019 – Mar 2020
UPMC Magee Women's Hospital
- Assisted in stocking linens throughout the NICU, answering phones at reception, and helping the patient care technicians

Vice Regent Aug 2018 – Apr 2019
Theta Tau Engineering Fraternity (Nu Delta Chapter), University of Pittsburgh
- Supervised all committee chair positions, assisted in event planning in meeting all national requirements and day to day operations
- Attended the 2019 National Convention as the Nu Delta Chapter representative

TEACHING

Graduate Teaching Assistant, Bioinstrumentation Spring 2019 – Fall 2020
University of Pittsburgh
- Responsible for the laboratory, writing, and grading all assignments and exams

Undergraduate Teaching Assistant, Bioinstrumentation Spring 2018
University of Pittsburgh
- Laboratory instructor for 10 three-hour labs on circuit development

CONFERENCE PRESENTATIONS

1. **Developmental Affective Neuroscience Symposium.** Pittsburgh, PA. Poster Presentation Nov. 2023
2. **Society for Psychophysiological Research Annual Meeting.** New Orleans, LA. Poster Presentation Sept. 2023
3. **Flux Society Annual Meeting.** Santa Rosa, CA. Poster Presentation Sept. 2023
4. **Society for Psychophysiological Research Annual Meeting.** Vancouver, Canada. Poster Presentation Sept. 2022
5. **Flux Society Annual Meeting.** Paris, France. Poster Presentation Sept. 2022
6. **CuttingEEG.** Virtual. Poster Presentation Oct. 2020
7. **Flux Society Annual Meeting.** Virtual. Poster Presentation Sept. 2020
8. **Society for Neuroscience Annual Meeting.** San Diego, CA. Poster Presentation Nov. 2018
9. **Biomedical Engineering Society Annual Meeting.** Atlanta, GA. Poster Presentation Oct. 2018
10. **Women in STEM Conferences.** Pittsburgh, PA. Poster Presentation Feb. 2018
11. **SCIENCE 2017.** University of Pittsburgh. Poster Presentation Oct. 2017
12. **Biomedical Engineering Society Annual Meeting.** Phoenix, AZ. Poster Presentation Oct. 2017

ORGANIZATIONS

1. **Flux Society** Spring 2020 – Present
2. **Society for Psychophysiological Research** Fall 2022 – Present
3. **Theta Tau Engineering Fraternity** Fall 2016 – Present
4. **Biomedical Engineering Society (BMS)** Fall 2015 – Fall 2019
5. **Society for Neuroscience (SfN)** Fall 2019 – Fall 2020