# Shane Devine McKeon, PhD

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## EDUCATION

**Doctor of Philosophy, Bioengineering, NRSA F31 Fellow** August 2019 – August 2024
University of Pittsburgh, Center for the Neural Basis of Cognition (CNBC)
Advisor: Beatriz Luna, PhD
Dissertation: McKeon, Shane (2024) *Underlying Brain Mechanisms of the PFC Excitatory Inhibitory Balance through Adolescent Cognitive Maturation.* Doctoral Dissertation, University of Pittsburgh.

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

## WORK EXPERIENCE

**Postdoctoral Associate** September 2024 - Present
*The University of Pittsburgh*, *Laboratory of Neurocognitive Development*
- Processed and extracted insights on neural timeseries information content (Multiscale entropy) from raw biological data

**PhD Candidate, NRSA F31 Fellow** August 2019 – August 2024
*The University of Pittsburgh*, *Laboratory of Neurocognitive Development*
Advisor: Beatriz Luna, PhD
- Extracted insights on an indirectly measured biological phenomenon (E/I balance) from neural time series data. Clearly summarized interpretational caveats of using indirect measurements to collaborators and in scientific writing.
- Developed cleaning, harmonizing, and processing pipeline for multiple data types (image and timeseries) for new neuroimaging methodologies with few established preprocessing tools.
- Developed an automated pipeline to assess trial level transient events of time series data to investigate the neural underpinnings of improved executive function using repeated measures of data.

**Undergraduate Research Assistant**
*The University of Pittsburgh*

*Geriatric Psychiatry Neuroimaging Lab* May 2017 – August 2019
Advisor: Howard Aizenstein, MD, PhD
- Designed and built protocol to spatially harmonized biological imaging data from multiple sources
- Developed a protocol to segment 3T and 7T T1-weighted images via FreeSurfer and SPM

*Clinical Applications of Neuroscience Lab* January 2018 – May 2019
Advisor: Rebecca Price, PhD
- Developed a MATLAB script to analyze eye-tracking data, calculating the duration of subject fixations on specific regions of interest within images.
- Facilitated participant recruitment and ensured data integrity by managing server and database uploads. Conducted quality control on fMRI scans to identify and address imaging errors, including brain region exclusions and motion artifacts.

*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:** Data preprocessing, analysis and statistics (generalized linear models, mixed effect models, data imputation, generative additive models, SVM), multimodal imaging, signal processing, technical writing, scientific communication, data visualization, scripting and automation, electroencephalography (EEG), stereoEEG (sEEG)
- **Programming:** R (tidyverse, ggplot, dplyr), Python (SciPy, pandas, NumPy, mne), MATLAB
- **Software:** FieldTrip, EEGLAB, Brainstorm, specParam
- **Project Management:** collaboration and communication, attention to detail, end-to-end research project ownership, project scoping, organization, team management, documentation, Wiki management, version control (GitHub), study participant data management (REDCap), technical writing, conference presentations, working with cross-functional teams

## PUBLICATIONS

1. **McKeon, S.D**, *et. al.* Prefrontal Excitation/Inhibition Balance Supports Adolescent Enhancements in Circuit Signal to Noise Ratio. (*Progress in Neurobiology;* Under Review).
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. *Developmental Cognitive Neuroscience.* (2024).

3. 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).

4. **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 – August 2024
*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. **CNBC McClelland Prize.** CNBC Annual Meeting. Pittsburgh, PA — May 2024
2. **Flux Society Ambassador Award.** Flux Society Annual Meeting. Paris, France. — Sept. 2022
3. **Third Place Poster Award.** Women in STEM Conference. Pittsburgh, PA. — Feb. 2018
4. **Swanson Undergraduate Research Internship Stipend**. University of Pittsburgh. — Apr. 2017
5. **Best Undergraduate Research Paper**. Freshman Engineering Conference. Pittsburgh. PA. — Apr. 2016

## LEADERSHIP AND SERVICE

**Communication Committee Chair** Apr 2023 – Aug 2024
*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 – Aug 2024
*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 – Aug 2024
*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 – Fall 2023
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