Maria Ivana Perica, Ph.D.

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Education & Training

2025 - present	**Postdoctoral Fellowship** Institute of Psychiatry and Behavioral Sciences, Medical University of South Carolina, Charleston, SC
2024 – 2025	**Predoctoral Internship, Adult Psychopathology track (APA accredited)** Charleston Consortium, Charleston, SC
2018 – 2025	**Ph.D., Clinical Psychology** University of Pittsburgh, Pittsburgh, PA Dissertation (defended 5/31/24): "Impact of neighborhood deprivation on excitation and inhibition in frontal cortex through adolescence"
2018 – 2025	**Graduate Certificate, Cognitive Neuroscience** Center for the Neural Basis of Cognition, Carnegie Mellon University and University of Pittsburgh, Pittsburgh, PA
2018 – 2021	**M.S., Clinical Psychology** University of Pittsburgh, Pittsburgh, PA Master's Thesis: "Characterizing how age-related changes in GABA and Glutamate underlies development of working memory through adolescence"
2012 – 2016	**B.S., Neural Science (with Honors)** Minors in Chemistry and Child and Adolescent Mental Health Studies New York University, New York, NY

Grants

T32DA007288 Perica (Trainee) 10/17/25 – 10/17/26
NIH/NIDA
This T32 training grant will provide me with training in basic and clinical substance use research, as well as general research career development skills and didactics.
Role: Postdoctoral Trainee

L30AA032673 Perica (PI) 07/01/25-06/30/27
NIH/NIAAA
"Impact of adverse life events on plasticity trajectories and problematic alcohol use through adolescence"
This Loan Repayment Program award will allow me to continue in academic biomedical research and advance my program of study in understanding how early life adversity impacts neurodevelopment and contributes to the development of substance use disorders in adolescence.
Role: PI

Grants In Prep

F32AA032966 Perica (PI) In revision
NIH/NIAAA Impact score: 37
"Neuroplasticity as a Mechanistic Link Between Adversity and Alcohol Use in Adolescence"
This postdoctoral individual training grant provides training in alcohol and substance use, big data methods, and advanced statistical modeling for longitudinal data. The proposed project examines the relationships between adversity, neuroplasticity, and alcohol use during adolescence.
Role: PI

R01 Perica (Postdoctoral Fellow) In Prep
NIH/NIDA
"Neurometabolic Trajectories of the Adolescent Brain: Implications for Substance Use and Treatment Development"
This R01 will investigate 1) longitudinal, within-person trajectories of neurometabolite development, including the key neurotransmitters GABA, glutamate, and dopamine, using multi-modal neuroimaging methods (Magnetic Resonance Spectrscopy, tissue iron imaging), and 2) how substance use impacts neurometabolite trajectories in adolescents.
Role: Postdoctoral Fellow; Key Personnel

Honors and Awards

2025	John C. Roitzsch Memorial Scientist-Practitioner Award, Charleston Consortium Psychology Internship Program
2025	Honorable Mention, Internship Paper Competition, Charleston Consortium Psychology Internship Program
2025	Research Society on Alcohol Student Merit Award
2025	International Society on Biomedical Research on Alcoholism Travel Award
2025	Emerging Scholars Travel Award, Medical University of South Carolina
2025	First Place Poster Award, Brady/Lydiard Excellence in Psychiatry Research Day, Medical University of South Carolina
2024	Bassell Student Publication Award, University of Pittsburgh
2023	Bassell Student Publication Award, University of Pittsburgh
2022	Bassell Student Publication Award, University of Pittsburgh
2021	David & Grace Lazovik Grant, University of Pittsburgh
2020	David & Grace Lazovik Grant, University of Pittsburgh
2018	Pittsburgh Supercomputing Grant, University of Pittsburgh
2016 – 2018	Post-Baccalaureate Intramural Research Training Award, NIH/NIMH
2016	Founder's Day Award, New York University
2016	Dean's List, New York University
2015	Dean's Undergraduate Research Fund Grant, New York University
2014	Dean's Undergraduate Research Fund Grant, New York University
2013	Freshman and Sophomore Training Grant, New York University

Publications (* denotes co-first author)

1. **Perica, M.I.**, Kirkland, A. E., Mewton, L., Squeglia, L. M. (2026). Age- and alcohol-related differences in adolescent neurometabolite levels. *Alcohol, Clinical and Experimental Research*, 50, e70256. PMCID: in progress.

2. Browning, B.D., Kirkland, A.E., **Perica, M.I.**, Engevik, M.A., Alekseyenko, A.V., Tomko, R.L., Ferguson, P.L, & Squeglia, L.M. (2025). Preliminary Associations between Brain Metabolites and Oral Microbiome Profiles during Adolescence. *Scientific Reports*, 15, 27141. PMCID: in progress.

3. Parr, A.C., **Perica, M.I.,** Calabro, F., Foran, W., Moon, C.H., Hetherington, H., Luna, B. (2024). Dopamine-related neurobiology contributes to the maturation of prefrontal cortex glutamate:GABA balance and cognitive function during adolescence. *Molecular Psychiatry*, 1-15. PMID: 39653761

4. McKeon, S.D., **Perica, M.I.**, Calabro, F., Foran, W., Hetherington, H., Moon, C.H., Luna, B. (2024). Prefrontal excitation/inhibition balance supports adolescent enhancements in circuit signal to noise ratio. *Progress in Neurobiology*, 243, 102695. PMID: 39622336

5. McKeon, S.D., **Perica, M.I.**, Parr, A.C., Calabro, F., Foran, W., Hetherington, H., Moon, C.H., Luna, B. (2024). Aperiodic EEG and 7T MRSI evidence for maturation of E/I balance supporting the development of working memory through adolescence. *Developmental Cognitive Neuroscience,* 66, 101373. PMCID: PMC11000172

6. Ravindranath, O.*, **Perica, M.I.*,** Parr, A.C., Ohja, A., McKeon, S., Montano, G., Ullendorf, N., Luna, B., Edmiston, K. (2024). Adolescent neurocognitive development and decision-making abilities regarding gender-affirming care. *Developmental Cognitive Neuroscience,* 67, 101351. PMCID: PMC11247355

7. **Perica, M.I.,** Luna, B. (2023). Impact of stress on excitatory and inhibitory markers of adolescent cognitive critical period plasticity. *Neuroscience and Biobehavioral Reviews,* 153, 105378. PMCID: PMC10591935

8. Mayeli, A., Sonnenschein, S. F., Yushmanov, V.E., Wilson, J.D., Blazer, A., Foran, W., **Perica, M.I.,** Calabro, F.J., Luna, B., Hetherington, H., Sarpal, D. K., Ferrarelli, F. (2022). Dorsolateral prefrontal cortex GABA/Glutamate alterations in clinical high risk and first-episode schizophrenia: a 7-T magnetic resonance spectroscopic imaging study. *International Journal of Molecular Sciences. 23*(24), 15846. PMCID: PMC9781166

9. **Perica, M.I**., Calabro, F.J., Larsen, B., Foran, W., Yushmanov, V.E., Hetherington, H., Tervo-Clemmens, B., Moon, C., Luna, B. (2022). Development of frontal GABA and glutamate supports excitation/inhibition balance from adolescence into adulthood. *Progress in Neurobiology,* 219, 102370. PMID: 36309210

10. Sonnenschein, S. F., Mayeli, A., Yushmanov, V.E., Blazer, A., Calabro, F.J., **Perica, M.I.**, Foran, W., Luna, B., Hetherington, H.P., Ferrarelli, F., Sarpal, D. K. (2022). A longitudinal investigation of GABA, glutamate, and glutamine across the insula during antipsychotic

treatment of first-episode schizophrenia. *Schizophrenia Research.* 248, 98–106. PMCID: PMC10018530

11. **Perica, M.I.***, Ravindranath, O.*, Calabro, F.J., Foran, W., Luna, B. (2021). Hippocampal-prefrontal connectivity prior to COVID-19 pandemic predicts stress reactivity. *Biological Psychiatry: Global Open Science,* 1(4), 283–290. PMCID: PMC8612769

12. O'Reilly, K.C., **Perica, M.I.,** Fenton, A.A. (2018). Synaptic plasticity and dysplasticity in schizophrenia. *Schizophrenia Research,* 207, 22–36. PMCID: PMC6395534

13. O'Reilly, K.C., Levy, E.R.J., Patino, A.V., **Perica, M.I.**, Fenton, A.A. (2018). Sub-circuit alterations in hippocampus metabolic coupling, structure, and function after global neurodevelopmental insult. *Brain Structure and Function,* 223(8), 3543–3556. PMCID: PMC6278823

14. O'Reilly, K.C., **Perica, M.I.**, Fenton, A.A. (2016). Memory deficits with intact cognitive control in the Methylazoxymethanol Acetate (MAM) exposure model of neurodevelopmental insult. *Neurobiology of Learning and Memory,* 134 Pt B(Pt B), 294–303. PMCID: PMC6478019

Publications Under Review

1. **Perica, M.I**., Fronk, G., Kirkland, A., Varle, D., Sunderland, M., Mewton, L., Squeglia, L. (Under review, invited review for *Current Addiction Reports*) Identifying impulsivity and substance use measures in neuroimaging datasets: A scoping review and searchable dataset repository for researchers.

Publications In Prep

1. **Perica, M.I.**, Moore, A., Kirkland, A. E., Hanson, J., Squeglia, L. M. (In prep.) Cumulative Adverse Life Events Predict Neurometabolite Concentrations in the ABCD Study.
2. **Perica, M.I.**, Moore, A., Hanson, J., Mewton, L., Squeglia, L. M. (In prep.) Mapping Environmental Influences on Adolescent Substance Use: An Elastic Net Analysis of the ABCD Study
3. Moore, A., **Perica, M.I**., Mewton, L., Squeglia, L. Gray, K. (In Prep) Impact of cannabis use on neurocognition.

Book Chapters

1. Ravindranath, O., Parr, A.C., **Perica, M.I.**, Elliot, S., Luna, B. (2022) Adolescent neurocognitive development. In: Halpern-Felsher, Bonnie (eds.) *Encyclopedia of Child and Adolescent Health*. pp. 40-62. Oxford: Elsevier.

Presentations

Oral presentations

1. **Perica, M.I**. (2025) *Adolescent neurometabolite development and the effect of alcohol use.*Talk given at MUSC Research Seminar, Medical University of South Carolina, Charleston, SC.
2. **Perica, M.I.** (2024) *Probing plasticity through adolescence.* Talk given at MUSC Youth Collaborative – University of Sydney Matilda Centre/MUSC Collaboration Symposium, Medical University of South Carolina, Charleston, SC.

3. **Perica M.I.** (2024). *Measuring excitation and inhibition using human neuroimaging methodologies.* Data blitz talk presented at the National Institutes of Mental Health, virtual.
4. **Perica, M.I.,** Calabro, F.J., Larsen, B., Foran, W., Yushmanov, V.E., Hetherington, H., Tervo-Clemmens, B., Moon, C., Luna, B. (2021). *Characterizing how age-related changes in GABA and glutamate underlie development of working memory through adolescence.* Talk given at the Center for the Neural Basis of Cognition Brain Bag series, Carnegie Mellon University, Pittsburgh, PA.
5. **Perica, M.I.**, Calabro, F.J., Larsen, B., Foran, W., Yushmanov, V.E., Hetherington, H., Tervo-Clemmens, B., Moon, C., Luna, B. (2021). *Age-related changes in excitation, inhibition, and their balance through adolescence.* Talk given at the University of Pittsburgh Clinical Psychology Seminar Series, Pittsburgh, PA.
6. **Perica M.I**., O'Reilly K.C., Fenton A.A. (2016). *Altered functional connectivity due to neurodevelopmental insult in the MAM model of schizophrenia.* Talk given at the NYU Undergraduate Research Conference, New York, NY.

<u>Poster presentations</u> (* denotes student mentee presenter)

1. **Perica, M.I.**, Kirkland, A.E., Mewton, L., Squeglia, L. (2025). *Adolescent neurometabolite development and the effect of alcohol use.* Poster presented at the 2025 Research Society on Alcohol conference, New Orleans, LA.
2. **Perica, M.I.**, Kirkland, A.E., Mewton, L., Squeglia, L. (2025). *Adolescent neurometabolite development and the effect of alcohol use.* Poster presented at the Brady/Lydiard Excellence in Psychiatry Research Day, Medical University of South Carolina, Charleston, SC.
3. Gillen A.*, **Perica, M.I.**, Calabro, F., Foran, W., Hetherington, H., Moon, C., Luna, B. (2023). *Understanding the neurological basis of externalizing behaviors during adolescence.* Poster presented at Undergraduate Research and Creative Expression Fair, 2023. Pittsburgh, PA.
4. **Perica, M.I**., Calabro, F., Foran, W., Hetherington, H., Moon, C., Luna, B. (2023). *Environmental impacts on adolescent excitatory and inhibitory processes in frontal cortex.* Poster presented at the 2023 Flux Society conference, Santa Rosa, CA.
5. **Perica, M.I**., McKeon, S.D., Calabro, F., Foran, W., Hetherington, H., Moon, C., Luna, B. (2023). *Developmental change in GABA and glutamate underlies changes in aperiodic neural activity through adolescence.* Poster presented at the 2023 UPMC Western Psychiatric Hospital Research Day. Pittsburgh, PA.
6. Parr, A.C., **Perica, M.I.**, Calabro, F., Tervo-Clemmens, B., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2023). *Dopamine modulation of prefrontal GABA/Glutamate suggests critical period plasticity during adolescence.* Poster presented at the 2023 Society for Neuroscience conference, Washington, DC.
7. Ojha, O., **Perica, M.I**., Foran, W., Calabro, F., Luna, B. (2023). *Unique age-related amygdala-cingulate functional connectivity is associated with emotion regulation difficulties in human adolescents: a high-field longitudinal 7T study.* Poster presented at the 2023 UPMC Western Psychiatric Hospital Research Day. Pittsburgh, PA.
8. McKeon, S.D., **Perica, M.I**., Parr, A.C., Calabro, F., Foran, W., Luna B. (2023). *Aperiodic EEG evidence for maturation of E/I balance supporting the development of working memory through adolescence.* Poster presented at the 2023 UPMC Western Psychiatric Hospital Research Day. Pittsburgh, PA.
9. **Perica, M.I**., Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Moon, C., Luna, B. (2022). *Longitudinal changes in glutamate and GABA balance through adolescence.* Poster presented at the 2022 Flux Society conference, Paris, France.

10. McKeon, S., Calabro, F., **Perica, M.I**., Luna, B. (2022). *Reliability of cortical signal processing is driven by glutamate maturation and supports working memory development.* Poster presented at the 2022 Society for Psychophysiological Research, Vancouver, Canada.
11. McKeon, S., Calabro, F., **Perica, M.I**., Luna, B. (2022). *Reliability of cortical signal processing is driven by glutamate maturation and supports working memory development*. Poster presented at the 2022 Flux Society conference, Paris, France.
12. Parr, A.C., **Perica, M.I.**, Calabro, F., Tervo-Clemmens, B., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2022). *Variation in striatal dopamine-related neurophysiology is associated with GABA and glutamate in human adolescence.* Poster presented at the 2022 Flux Society conference, Paris, France.
13. Ohja, A., Calabro, F., Foran W., **Perica, M.I.**, Jalbrzikowski, M., Luna, B. (2022). *Characterizing fronto-amygdala circuitry development during adolescence: implications for internalizing symptoms.* Poster presented at the 2022 Flux Society conference, Paris, France.
14. Parr, A.C., **Perica, M.I.**, Calabro, F., Tervo-Clemmens, B., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2022). *Variation in striatal dopamine-related neurophysiology is associated with GABA and glutamate in human adolescence.* Poster presented at the 2022 UPMC Western Psychiatric Hospital Research Day. Pittsburgh, PA.
15. **Perica, M.I.**, Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Tervo-Clemmens, B., Luna, B. (2021). *Age-related changes in glutamate and GABA support excitatory/inhibitory balance during adolescence.* Poster presented at the 2021 UPMC Western Psychiatric Hospital Research Day. Pittsburgh, PA.
16. **Perica, M.I.**, Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2021). *Linking changes in excitatory and inhibitory balance through adolescence with working memory*. Poster presented at the Flux Society conference, virtual due to COVID-19.
17. Ravindranath, O., **Perica, M.I.**, Calabro, F., Foran, W., Luna, B. (2021). *Hippocampal-prefrontal connectivity prior to COVID-19 pandemic predicts later anxiety in adolescents.* Poster presented at the Flux Society conference, virtual due to COVID-19.
18. **Perica, M.I**.* & Ravindranath, O.* (2021). *A brain marker of heighetened anxiety during the COVID-19 pandemic in teens.* Infographic presented at COVGEN Summit 2021, virtual due to COVID-19.
19. **Perica, M.I.**, Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2020). *Association between changes in GABA and Glutamate through adolescence and age-related change in brain activity underlying working memory.* Poster presented at the Flux Society conference, virtual due to COVID-19.
20. Sarpal, D., Sonnenschein, S., Blazer, A., Foran, W., **Perica, M.I**., Luna, B., Hetherington, H. (2020). *Antipsychotic efficacy and associated changes in prefrontal neurotransmitter levels: preliminary results from a 7-Tesla neuroimaging study of early phase schizophrenia.* Poster presented at the America College of Neuropsychopharmacology conference, virtual due to COVID-19.
21. **Perica, M.I.**, Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2019). *Changes in GABA and Glutamate associated with age-related improvements in working memory ability through adolescence.* Poster presented at the 2019 Flux Society conference, New York, NY.
22. Ravindranath, O., Calabro, F., **Perica, M.I**., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2019). *Associations between the development of GABA and Glutamate and emotion processing through adolescence.* Poster presented at the 2019 Flux Society conference, New York, NY.
23. **Perica, M.I.**, Calabro, F., Foran, W., Yushmanov, V., Hetherington, H., Luna, B. (2019). *Mechanisms underlying age-related improvements in visuospatial working memory ability through adolescence.* Poster presented at the 2019 Organization of Human Brain Mapping conference in Rome, Italy.

24. **Perica, M.I**., O'Reilly, K.C., Fenton, A.A. (2015). *Learning-induced long-term changes as measured by Cytochrome Oxidase activity*. Poster presented at the NYU Undergraduate Research Conference, New York, NY.
25. **Perica, M.I.**, O'Reilly, K.C., Fenton, A.A.. (2014). *Cognitive control circuits in the gestational methylazoxymethanol (MAM) model of schizophrenia*. Poster presented at the NYU Summer Student Conference, New York, NY.

Research Experience

2025 - present **Postdoctoral Fellow**
Addiction Sciences Division, Department of Psychiatry, MUSC
Primary Investigator: Lindsay Squeglia, Ph.D.

- Postdoctoral training will focus on gaining expertise with substance use, multi-modal neuroimaging methods, big data methodology, advanced quantitative and statistical methods, and clinical trials methodology

2024 – 2025 **Predoctoral Psychology Intern Researcher**
Addiction Sciences Division, Department of Psychiatry, MUSC
Primary Investigator: Lindsay Squeglia, Ph.D.

- Intern year research project investigated how neurometabolites associated with key neural functions (e.g., plasticity) develop through adolescence and how adolescent alcohol use was associated with differences in metabolite levels
- Gained knowledge in youth alcohol and substance use disorders; furthered knowledge in magnetic resonance spectroscopy methods

2018 – 2024 **Graduate Student Researcher**
Laboratory of Neurocognitive Development, University of Pittsburgh
Primary Investigator: Beatriz Luna, Ph.D.

- Research projects focused on how neurometabolites associated with plasticity change through adolescence and influence cognitive development, and how environmental factors may impact those developmental trajectories
- Developed novel analytic and statistical pipeline to analyze 7T magnetic resonance spectroscopic imaging data (R01 MH067924)
- Gained proficiency in neuroimaging methodology, R coding, longitudinal data analysis, mixed effects models

2016 – 2018 **Postbaccalaureate Intramural Research Training Award (IRTA) Fellow**
Systems Neuroscience Imaging Resource, NIH
Primary Investigator: Theodore Usdin, M.D., Ph.D.

- IRTA Fellow project centered on developing a novel pipeline for high-throughput imaging of neural tissue labeled to detect c-Fos to quantify and map activity patterns in mice at a larger and faster scale
- Gained experience with mouse models, histology, CLARITY, microscopy, perfusion

2013 – 2016 **Research Assistant**
Neurobiology of Cognition Laboratory, NYU
Primary Investigator: Andre Fenton, Ph.D.

- RA project focused on examining how neural plasticity was altered in a rodent model of schizophrenia from adolescence to adulthood, and how aberrant plasticity impacted cognitive control
- Gained experience with rodent behavioral tasks, histology, microscopy

Media Coverage

1. Technology Networks (November 10, 2022). "Revealing the plastic landscape of the teen brain"
2. Neuroscience News (November 9, 2022). "A clearer picture of the developing teen brain"
3. Science Daily (November 8, 2022). "Scientists get clearer picture of developing teen brain"
4. UPMC News (November 8, 2022). "Scientists get clearer picture of developing teen brain: new evidence for neuroplasticity in frontal cortex during adolescence."

Specialized Training

2026	Responsible Conduct of Research retreat, MUSC
2026	ABCD-ReproNim Hackathon, Florida International University
2025	MoCA Cognition Training Web
2025	Longitudinal Structural Equation Modeling, SMaRT Workshop
2025	Structural Equation Modeling, SMaRT Workshop
2025	5-day Integrative Behavioral Couple Therapy workshop, VA
2024	1-day Written Exposure Therapy workshop, MUSC
2024	2-day Prolonged Exposure workshop, MUSC
2024	Trauma Focused Cognitive Behavioral Therapy Web
2024	2-day Trauma Focused Cognitive Behavioral Therapy workshop, MUSC
2024	Cognitive Behavioral Therapy for Insomnia (CBT-I) Web
2024	1-day Basic Training in Child Trauma workshop, University of Pittsburgh
2023	1 hour seminar on approaches to discussing firearm safety, University of Pittsburgh
2023	1.5-hour seminar on mental health needs of LGBTQ+ communities, University of Pittsburgh
2022	Columbia Suicide Severity Rating Scale training, Columbia Light House Project
2021	1-hour Motivational Interviewing training, University of Pittsburgh
2021	Semester-long weekly course in teaching of Psychology, University of Pittsburgh
2020	Telepsychology Best Practice 101, American Psychological Association

Research Mentorship

2021 – 2024	Mentored an undergraduate honors thesis student, Anna Gillen, B.S. in Neuroscience • Awarded Brackenridge Fellowship ($4000 stipend) for senior thesis research project
2023 – 2024	Organized and led a journal club for the undergraduate students and research assistants in the Laboratory of Neurocognitive Development
2020 – 2022	Mentored undergraduate students Sydney Galipeau, B.A. in Psychology and Jacqueline Joo, B.S. in Neuroscience

Teaching Experience

Summer 2022	Psychopathology Course Guest Lecturer; Topic: Developmental Psychopathology

	University of Pittsburgh, Department of Psychology
Spring 2022	Psychopathology Course Instructor
	University of Pittsburgh, Department of Psychology

Service

2025	MUSC Charleston Consortium Faculty Award Committee
2021 – 2022	University of Pittsburgh Graduate Education Committee
2020 – 2022	Pitt Science Policy Group Member
2020	Project SHORT Consultant (www.project-short.com)
2020	Peer Mentor, University of Pittsburgh

Professional Memberships

Research Society on Alcohol
The International Society for Biomedical Research on Alcoholism
Flux Society
Organization for Human Brain Mapping
American Psychological Association
Society for Neuroscience

Ad-Hoc Journal Reviewing

Translational Psychiatry (co-reviewer)
Journal of Neuroscience
Biological Psychiatry: Cognitive Neuroscience and Neuroimaging
Developmental Psychobiology
Brain Imaging and Behavior