BIOGRAPHICAL SKETCH

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NAME: Pedapati, Ernest

eRA COMMONS USER NAME (credential, e.g., agency login): ernpeda14

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
University of Massachusetts Amherst, Amherst, MA	BS	05/2000	Neuroscience and Behavior
University of Massachusetts Amherst, Amherst, MA	MS	05/2002	Neuroscience and Behavior
University of Massachusetts Medical School, Worcester, MA	MD	05/2009	
Cincinnati Children's Hospital Medical Center, Cincinnati, OH	Resident	06/2014	Pediatrics/Adult and Child Psychiatry

A. Personal Statement

I am an MD/MS trained physician-scientist who has maintained a productive NIH-funded lab since 2017 and an active Fragile X Syndrome and Neurodevelopmental Clinic since 2014 in the Department of Psychiatry at Cincinnati Children's Hospital (CCHMC)/University of Cincinnati. I am also the Director of the Neurobehavioral Neurophysiology (EEG/TMS) Laboratory at CCHMC. We are an active EEG lab collecting over 700 recordings a year, primarily from pediatric neurodevelopmental populations. I received a 5-year K23 in 2017, focusing on translational biomarker development in Fragile X syndrome, and am co-I of the U54 Fragile X Center at Cincinnati. My laboratory studies neurophysiology-based biomarkers and novel therapeutics in FXS, including a transcranial magnetic stimulation laboratory and co-director of the FXS AAV gene therapy program. My goal is to identify precision markers of individual variability and are involved in the underlying mechanics of neurodevelopmental disorders apply this knowledge towards the development of new therapeutics. The markers include cutting-edge EEG techniques that capture transient and non-continuous events in unaveraged EEG data, brain-computer interface, and multivariate analysis techniques. I have extensively trained in EEG and TMS data acquisition, advanced signal processing programming, and high dimensional statistical analysis, including cluster permutation, hierarchical modeling, and network-based statistical approaches. My lab was the first to model LTP-like cortical plasticity in healthy pediatric subjects (Pedapati et al., **Front Hum Neurosci** 2015) and youth with ASD (Pedapati et al., **J Child Adolesc Psychopharmacol**, 2016). We recently identified intracortical facilitation as a marker of ADHD co-occurrence in ASD (Pedapati et al., **Nat Trans Psychiatry** 2019). I am Co-I on a joint R01 with UCLA and demonstrated similar impairments in perceptual learning between humans and mice with FXS (Goel et al., **Nat Neurosci** 2018). Most recently, our extensive resting-state EEG source analysis of a large cohort of FXS patients (n=71) is under revision for Nature Communications Biology and available via preprint (Pedapati et al. **Medrxiv** 2021).

The current proposal entitled, "FX ENTRAIN: Perturbation of neurodynamics underlying sensory hyperarousal and statistical learning in Youth with FXS", ties together the expertise of the investigative team and many years of experience in the Fragile X field. We are highly enthusiastic about our preliminary findings

and advancing precision studies that measure variability and test causative inference through perturbations studies. My laboratory is well-suited for the proposed project, housed within a significant NIH Fragile X Center, and has broad access to high-quality phenotyping through collaborative psychologists, modern electrophysiological equipment, and appropriate behavioral measures to ensure pediatric patient comfort and high-quality data collection. I currently supervise three full-time EEG technicians who acquire the data. In terms of Q.I. and data analysis, I supervise an EEG preprocessor for data preparation, a computer scientist who supports software development, a Ph.D. level computational research associate, and training a postdoctoral student in EEG analysis

Ongoing and recently completed projects I would like to highlight:

K23MH112936
Pedapati (P.I.)
04/07/2017 – 03/31/2022
Anomalous Sensorimotor Physiology in Fragile X

U54HD104461
8/01/2020-8/01/2025
Erickson (P.I.), Role: co-investigator
Mechanisms and Brain Circuits Underlying Fragile X Syndrome. Fragile X U54 Center Grant

R01NS117597
Erickson (Co-P.I.), Portera-Cailliau (Co-P.I.), Role: co-investigator
3/16/2020-3/16/2025
Circuit Disruptions Underlying Atypical Sensory Processing In Fragile X Syndrome

U54NS092090
Krueger (P.I.), Role: co-investigator
8/1/2020-7/31/2024
Developing Biomarkers and Treatments for ASD and I.D. in Tuberous Sclerosis Complex

5U54HD082008-02
Huber (P.I.), Role: co-investigator
6/1/2016-6/1/2019
Mechanisms and Brain Circuits Underlying Fragile X Syndrome.

B. Positions, Scientific Appointments, and Honors

Positions and Employment

2020 –	Associate Professor, Cincinnati Children's Hospital Medical Center, Division of Psychiatry, Division of Neurology, Cincinnati, OH. University of Cincinnati College of Medicine.
2014 – 2020	Assistant Professor, Cincinnati Children's Hospital Medical Center, Division of Psychiatry, Division of Neurology, Cincinnati, OH. University of Cincinnati College of Medicine.
2013 – 2014	Research Fellow (Craig Erickson, PI), Autism and Developmental Disabilities, Cincinnati, OH
2009 – 2014	Resident Physician, Cincinnati Children's Hospital Medical Center, Cincinnati, OH
2002 – 2005	Research Associate, Electrophysiologist, UCB Research Inc., Cambridge, MA
2000 – 2002	Research Assistant, Center of Neuroendocrine Studies, University of Massachusetts, Amherst, MA

Other Experience and Professional Memberships

2014-2024	Board Certification in Pediatrics, American Board of Pediatrics
2014	Member, Autism and Intellectual Disability Committee, American Academy of Child and Adolescent Psychiatry

2013 - Member, Research Committee, American Academy of Child, and Adolescent Psychiatry

Honors

2017 Champion Award, Developmental and Behavioral Pediatrics
2016 Child Neurology Grand Rounds, Cincinnati Children's Hospital Medical Center
2015 Junior Investigator Award, American Academy of Child & Adolescent Psychiatry
2015 Child Psychiatry Grand Rounds, Cincinnati Children's Hospital Medical Center
2015 Symposium Speaker, TMS, American Academy of Child and Adolescent Psychiatry
2015 Pediatric Grand Rounds, Cincinnati Children's Hospital Medical Center
Leonard Tow Humanism in Medicine Award and Scholarship, University of Massachusetts Medical School
2014 19th Annual Research Colloquium for Junior Investigators, American Psychiatric Association
2014 Proctor Scholar Award, Cincinnati Children's Hospital Research Foundation
2014 National Institutes of Health Loan Repayment Program, National Institutes of Health
2014 Brian McConville, M.D., Child & Adolescent Psychiatry Award, Cincinnati Children's Hospital Medical Center
2013 Pilot Research Award American Academy of Child & Adolescent Psychiatry
2012 Resident Teaching Award, University of Cincinnati College of Medicine
2011 Gold Foundation Humanism & Excellence in Residence Teaching Award, University of Cincinnati College of Medicine
2010 Resident Teaching Award, Cincinnati Children's Hospital Medical Center
2009 Leonard Tow Humanism in Medicine Award & Scholarship, University of Massachusetts Medical School

Professional Memberships American Academy of Child and Adolescent Psychiatry (since 2011)

B. Contributions to Science (h-index=16)

1. The investigator has been a co-investigator in the Fragile X field for over seven years with expertise in cortical physiology and EEG analysis. Along with his team, they been on the forefront of describing FXS physiology including identifying elevated asynchronous gamma oscillations as cross-species marker of FMRP deficiency. In 2018, in collaboration with UCLA conducted parallel behavioral experiment between humans affected with Fragile X and mice with the Fmr1 knockout. The findings uncovered circuit-level alterations conserved between species. The conclusions were high impact and published in Nature Neuroscience late in 2018. Most recently, his source analysis of a large FXS cohort is under revision for Nat. Comm. Bio and raises important findings suggesting thalamocortical involvement as unifying framework for cortical physiology in FXS.

    a. Pedapati EV, Schmitt LM, Liu R, Ethridge LE, Smith E, Sweeney JA, Shaffer RC, Dominick KC, Gilbert DL, Wu SW, Horn PS, Binder D, Lamy M, Axford M, Miyakoshi M, Erickson CA. Neocortical Localization and Thalamocortical Modulation of Neuronal Hyperexcitability in Fragile X Syndrome. medRxiv Preprint Server for Health Sciences. 2021.

    b. Smith EG, Pedapati EV, Liu R, Schmitt LM, Dominick KC, Shaffer RC, Sweeney JA, Erickson CA. Sex differences in resting EEG power in Fragile X Syndrome. J Psychiatr Res. 2021;138:89-95. Epub 2021/04/10.

    c. Ethridge LE, De Stefano LA, Schmitt LM, Woodruff NE, Brown KL, Tran M, Wang J, Pedapati EV, Erickson CA, Sweeney JA. Auditory EEG Biomarkers in Fragile X Syndrome: Clinical Relevance. Front Integr Neurosci. 2019;13:60.

    d. Goel A, Cantu DA, Guilfoyle J, Chaudhari GR, Newadkar A, Todisco B, de Alba D, Kourdougli N, Schmitt LM, Pedapati E, Erickson CA. Impaired perceptual learning in a mouse model of Fragile X syndrome is mediated by parvalbumin neuron dysfunction and is reversible. Nature neuroscience. 2018 Oct;21(10):1404.

2. The investigator has been involved in several electrophysiological investigations in typical youth and youth with ASD to characterize cortical physiology, cortical plasticity, and safety. Most recently, we identified diminished intracortical facilitation associated with ADHD co-occurrence in ASD which was highly related to measures of inattention.

    a. Pedapati EV, Mooney LN, Wu SW, Erickson CA, Sweeney JA, Shaffer RC, Horn PS, Wink LK, Gilbert DL. Motor cortex facilitation: a marker of attention deficit hyperactivity disorder co-occurrence in autism spectrum disorder. Transl Psychiatry. 2019;9(1):298.

    b. Pedapati EV, Gilbert DL, Erickson CA, Horn PS, Shaffer RC, Wink LK, Laue CS, Wu SW. Abnormal Cortical Plasticity in Youth with Autism Spectrum Disorder: A Transcranial Magnetic Stimulation Case-Control Pilot Study. Journal of child and adolescent psychopharmacology. 2016.

    c. Pedapati EV, Gilbert DL, Horn PS, Huddleston DA, Laue CS, Shahana N, Wu SW. Effect of 30 Hz theta burst transcranial magnetic stimulation on the primary motor cortex in children and adolescents. Front Hum Neurosci. 2015;9:91. Epub 2015/03/13.

    d. Hong YH, Wu SW, Pedapati EV, Horn PS, Huddleston DA, Laue CS, Gilbert DL. Safety and tolerability of theta burst stimulation vs. single and paired pulse transcranial magnetic stimulation: a comparative study of 165 pediatric subjects. Front Hum Neurosci. 2015;9:29.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/ernest.pedapati.1/bibliography/public/