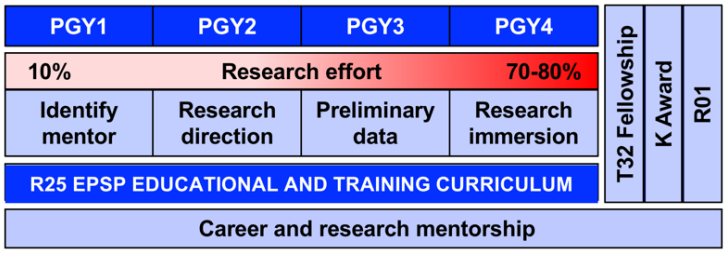
University of Pennsylvania, Department of Psychiatry
Educating Physician Scientists in Psychiatry (EPSP)
NIMH-Funded R25 Residency Research Track

Mission
Our department has a tradition of excellence in research and is the academic home of world-renowned leaders in basic, translational, and clinical neuroscience. Cutting-edge research is a priority at Penn, and so is training the next generation of leaders in research. We perennially rank among the top five in NIH funded research institutions in psychiatry, and our vibrant community creates a wealth of opportunities for residents. Established mentorship and active projects allow for resident participation in every area of psychiatry, from molecular to translational neuroscience, genetics, clinical trials, and health systems.

Structure
The program supports residency research pursuits through mentorship, monthly forums, peer networking, protected research time, funding opportunities, and career development. Potential research track residents are identified during the residency application process, though other qualified and interested residents may join during residency. Please note there is no separate ERAS match number for EPSP. Expectations and existing trends are for research track residents to secure independent academic positions after training. *Our goal is to build the next generation of Physician Scientist Psychiatrists at Penn through the EPSP Research Track pipeline.*



Program Leadership
Dr. Maria Oquendo and ***Dr. Mariella De Biasi*** serve as PIs of EPSP. Dr. Oquendo is Chairman of the Department of Psychiatry at Penn and the Ruth Meltzer Professor since January 2017. She has been continuously funded by NIH for nearly 20 years, with over 375 peer-reviewed research publications. On the education front, Dr. Oquendo has been PI of four training grants spanning translational neuroscience research training to international implementation science training. Dr. De Biasi is an Associate Professor in the Department of Psychiatry at PSOM and the Director of the Program on Cholinergic Mechanisms in Addiction and Mental Illness. Prior to Penn, she served as Director of the Graduate Program in Neuroscience for eight years at Baylor College of Medicine. Her laboratory identified the brain circuit underlying physical and anxiety-related symptoms of abstinence from nicotine and other drugs of abuse.

Dr. Matthew Kayser is an Assistant Professor of Psychiatry and Neuroscience, and serves as the EPSP Program Director. He is a former research track psychiatry resident at Penn, graduating in 2013. Dr. Kayser uses the fruit fly, *Drosophila*, to study how neural circuits give rise to complex behaviors, and how dysfunction of neural processes can cause mental illness. His particular focus is in understanding how sleep -- a highly conserved behavior whose core function remains a mystery -- contributes to sculpting brain circuits during development. His group also translates this work to understand sleep and psychiatric disease in humans. Dr. Kayser's research has been recognized by the Burroughs Wellcome Fund, Sloan Foundation, March of Dimes, Doris Duke Foundation, and the NIH Director's New Innovator Award.

For questions about the EPSP R25 program at Penn, please contact Dr. Kayser
Email: kayser@pennmedicine.upenn.edu

Timeline: Year-by-Year Structure of Rotations:

The EPSP program spans all four years of residency, with increasing amounts of protected research time each year, culminating with 70-80% protected time as PGY4.

PGY1: Research activities begin during 1st year of residency. Research track residents (Physician Scientist Psychiatrists, or PSPs) receive 1 month protected time during the year, with major goals including meeting with potential mentors and beginning to define their research direction.

PGY1 RESEARCH TRACK SAMPLE SCHEDULE											
Mo 1	2	3	4	5	6	7	8	9	10	11	12
Internal Medicine				Neuro	Research	Psychiatry					
						ER	Addiction	Geriatric	Inpatient		C-L

PGY2: In year 2, PSPs receive 10-12 weeks protected research time during which they have the opportunity to work in the lab/group of potential mentors while beginning to develop specific research aims. The time will be split into 2-3 blocks throughout the year so PSPs can pursue ~2 lab/group rotations with the goal of solidifying the decision of primary research mentor and research direction.

PGY2 RESEARCH TRACK SAMPLE SCHEDULE											
Mo 1	2	3	4	5	6	7	8	9	10	11	12
Neuro	ER		Research	C-L		Inpatient				Child	Research

PGY3-4: During years 3 and 4, PSPs immerse themselves in a research environment. Most will have 30% protected research time as PGY3s and 70% protected time during the PGY4 year. However, we provide a flexible structure to best accommodate the particular type of research being pursued. Our goal is that all PSPs submit K Awards either as PGY4s or during the first year of fellowship training. From a clinical perspective, PGY3s are engaged in general outpatient rotations and able to select specialized clinics that relate to research areas of interest. As PGY4s, residents may have as little as 1 outpatient clinic, designed to be directly related to research interests.

PGY3 RESEARCH TRACK SAMPLE SCHEDULE											
Mo 1	2	3	4	5	6	7	8	9	10	11	12
Outpatient Psychiatry (70%)											
Research (30%)											

PGY4 RESEARCH TRACK SAMPLE SCHEDULE											
Mo 1	2	3	4	5	6	7	8	9	10	11	12
Outpatient Psychiatry (30%)											
Research (70%)											

During the PGY2-4 years, PSPs will be able to apply for pilot grants. The funds come from ~$20,000 from the R25 and ~$50,000 in philanthropic departmental funds annually.

Research Mentors

Penn hosts approximately 200 neuroscientists across its schools. Scientific Mentors can include program faculty in the Psychiatry Department, along with both basic neuroscientists and clinician-scientists outside the field of psychiatry. Residents have the potential to work in the laboratory of any of these investigators, while also receiving career mentoring from Program leadership and the Steering Committee. We encourage you to explore a comprehensive list of neuroscience faculty at Penn, which includes leading researchers such as Dani Bassett, Virginia Lee, Michael Platt, Amita Sehgal, and many more.
https://www.med.upenn.edu/ngg/faculty_research.shtml#research

The following is a small sample of potential research mentors and their work.

Stewart A. Anderson, MD is a developmental neurobiologist and psychiatrist whose laboratory focuses on the molecular and cellular mechanisms that govern the development of the mammalian forebrain. He is particularly interested in understanding the molecular underpinnings behind fate determination of GABAergic interneurons implicated in autism and schizophrenia.

Gregory Corder, PhD studies how the brain generates the perception of pain. Utilizing advanced *in vivo* imaging of neural activity, neuroanatomical tracing, and optical neuromanipulation techniques in preclinical rodent models, his group deconstructs how pathological dysfunction within brain networks promotes the transition to chronic pain and drug abuse.

Marc Fuccillo, MD, PhD is interested in understanding how neural circuits generate and regulate behavior — from simple motor patterns to complex goal-directed actions. He approaches these questions from molecular, developmental, physiological and behavioral perspectives to study behavioral output and its disruption in mouse models of neuropsychiatric disease.

Raquel Gur, MD, PhD studies the brain and behavior in psychosis across the lifespan. She has established and leads the Lifespan Brain Institute at CHOP/Penn, which conducts translational research integrating basic and clinical neuroscience. Her current efforts focus on the early precursors and initial phases of psychosis within a neurodevelopmental genomics framework.

Henry Kranzler, MD studies the genetics and pharmacological treatment of substance dependence, with a particular emphasis on precision addiction medicine. His work currently focuses on the molecular genetics of substance dependence and the personalized treatment of substance use disorders using a pharmacogenetic approach.

Konrad Kording, PhD is broadly engaged in computational neuroscience and data science. He specializes in machine learning both in neuroscience and in application to behavior. Dr. Kording's modeling skills are highlighted by his Bayesian models of motor control. He also extensively works on methods for the processing of complex data, mostly in the statistical analysis of data.

David Mandell, ScD is a psychiatric epidemiologist and mental health services researcher. Dr. Mandell's research addresses the development and testing of strategies to increase the use of evidence-based care for individuals with psychiatric and developmental disabilities. His particular areas of expertise include using large, administrative datasets to study the effects of state and national policies, trials of demonstrated-efficacious interventions, and implementation science.

Desmond Oathes, PhD leverages cutting edge neuroimaging methods to develop a better understanding of brain networks that contribute to affective illness. He aims to use these tools to generate novel, individualized, brain-based treatments for affective disorders. He also pursues TMS/fMRI methods development with broad applications to cognitive and affective systems.

Theodore Satterthwaite, MD uses multi-modal neuroimaging to examine how abnormal brain development produces dimensions of psychiatric symptoms such as executive dysfunction. He has particular expertise in analysis of brain network data using resting-state functional connectivity, and mapping dimensions of psychopathology to abnormalities of brain networks. Of note, Dr. Satterthwaite was a research track psychiatry resident at Penn.

Yvette Sheline, MD conducts innovative clinical neuroscience research bridging neuroimaging, translational research and clinical treatment. Her research focuses on elucidating the neuroanatomical effects of depression on the brain by the use of neuroimaging techniques, and understanding the effects of stress in producing functional dysregulation.

Hongjun Song, PhD focuses on understanding mechanisms regulating neural stem cells and neurogenesis in the mammalian brain and how these processes affect neural function. He is interested in the endogenous function of adult hippocampal neurogenesis and exploiting this system as a robust model of neural development to investigate molecular, cellular, and circuitry mechanisms underlying the etiopathology of neurodevelopmental disorders.

Current EPSP Research Track Residents

The following residents are some of the current PSPs, and are happy to answer questions!

Nana Asabere, M.D.

I am a PGY3 resident who developed an interest in early interventions for mental illness as a medical student at Penn. This led me to the Brain and Behavior Lab at Penn where I studied the occurrence and predictors of psychiatric treatment in youths at risk for psychosis with Dr. Monica Calkins and Dr. Raquel Gur. I was awarded the Robert M. Toll Prize for meritorious research in the field of mental health at Penn. At present, I am continuing work with Dr. Gur, studying neurocognition as a possible predictive factor for psychosis within the familial high risk and clinical high risk paradigms.
Email: nana.asabere2@uphs.upenn.edu

Philip D. Campbell, M.D., Ph.D.

I am a PGY3 resident focusing on the genetic and molecular mechanisms underlying the human neurodevelopmental risk locus at 22q11.2**.** For part of my PhD research, I modeled a human neuropathy in zebrafish, gaining experience in developmental neuroscience, molecular genetics, cell biology, and animal modeling. I have clinical interests in psychosis and schizophrenia and am also interested in the molecular genetics of behavior and psychiatric disease. I am currently pursuing basic research in zebrafish with Dr. Michael Granato.
Email: Philip.Campbell@pennmedicine.upenn.edu

Sheila Shanmugan, M.D., Ph.D.

I am a PGY2 resident on the research track, working with Dr. Ted Satterthwaite. I have always been fascinated by the brain so I majored in Biological Basis of Behavior as an undergrad at Penn. I loved Philly and stayed at Penn for my MD/PhD training. I am passionate about women's behavioral health, and during grad school, I used neuroimaging to examine how childhood adversity confers a risk for executive dysfunction during menopause. I chose to stay at Penn because I could not imagine a more warm and supportive place to continue training that also has cutting-edge neuroimaging research and clinical opportunities.
Email: sheilash@pennmedicine.upenn.edu

William R. Smith M.D., Ph.D.

I am a PGY2 resident on the research track. I became interested in research during my time at NIH in the Department of Bioethics. I then completed my MD training at Emory and my PhD at Notre Dame, focusing on moral and political issues in healthcare resource allocation. I am continuing work on issues in resource allocation, but also interested in psychiatric nosology. Clinically, my chief interests are in psychosis, consultation, and in the interactions in severe, chronic mental illness and other social and economic issues in patient's lives.
Email: William.Smith@pennmedicine.upenn.edu