

**THE LEADING EDGE OF THE NEUROSCIENCE OF NICOTINE ADDICTION AND TREATMENT:
YOUTH AND LIFESPAN SUCCESS FOR ALL CALIFORNIANS**

April 10, 2024, A TRDRP Convening

PARTICIPANT INFORMATION



Shervin Assari, M.D., M.P.H.

Associate Professor of Internal Medicine, Family
Medicine, and Public Health
Director of Research, Urban Public Health
Charles R. Drew University of Medicine & Science
Email: shervinassari@cdrewu.edu

**T32IR4735 Contextual, Cognitive, and Neural
Circuits that Predict Youth Tobacco Use
Trajectories in California**

This study will analyze existing data of the Adolescent Brain Cognitive Development (ABCD), the largest brain development study ever conducted. The unique aspects of the ABCD are very large, diverse, and longitudinal data with repeated brain imaging measures. We will use data on minority status, family socioeconomic status (SES), stress (across five domains), neuroimaging, and tobacco use initiation.



Kevin T. Beier, Ph.D.

Assistant Professor of Physiology & Biophysics
at the School of Medicine
University of California, Irvine
Email: kbeier@uci.edu

TRDRP New Investigator Award Beier (PI)
07/01/2020 – 06/30/2023; Elucidation of neural
circuits underlying nicotine reward and relapse 6.0
calendar months. We aim to identify the neural
circuit mechanisms by which varenicline reduces
cue-induced reinstatement of nicotine self-
administration.



Arthur L. Brody, M.D.

Professor of Psychiatry
University of California San Diego
Research Scientist,
Veterans Medical Research Foundation

**28IR-0064C - Brody - Neuroinflammation and
Smoking Cessation Treatment Response**

While there are well-studied clinical predictors of quitting, such as level of dependence on cigarettes, craving soon after smoking, and self-confidence, we anticipate that the PET scanning measure we are investigating in this study will provide additional ability to predict quitting, which could (in the long run) help personalize treatment for cigarette smokers.



TOBACCO-RELATED DISEASE RESEARCH PROGRAM



Raphael E. Cuomo, Ph.D., M.P.H.

Assistant Professor
Department of Anesthesiology
School of Medicine
University of California, San Diego
Email: racuomo@ucsd.edu

T32KT4896 - Cuomo - Adverse Events from Tobacco/Nicotine Dependence and Impacts on Cancer Patient Clinical Experiences

This study will investigate the associated risks of e-cigarette usage within California's population, and also the ramifications of nicotine use among cancer patients.



Christie D. Fowler, Ph.D.

Professor of Neurobiology and Behavior
School of Biological Sciences
University of California, Irvine
Email: cdfowler@uci.edu

T32IR4866 07/01/2022-06/30/2025

TRDRP

Cannabidiol as a therapeutic approach for tobacco and nicotine cessation

The goal of this study is to systematically examine whether cannabidiol (CBD) alters various aspects of nicotine dependence and whether the effectiveness of CBD is maintained with use of menthol-containing e cigarette nicotine products.



Olivier George, Ph.D.

Professor of Psychiatry, School of Medicine
University of California, San Diego
Email: ogearge@health.ucsd.edu

T32IR5384 Single-cell whole-brain imaging of nicotine dependence

The goal of this study is to identify activated neurons at single-cell resolution throughout the entire brain to identify the whole-brain functional networks that are associated with four fundamental phases in the development of tobacco use disorder: acute nicotine, chronic dependence, acute withdrawal, and protracted abstinence



TOBACCO-RELATED DISEASE RESEARCH PROGRAM



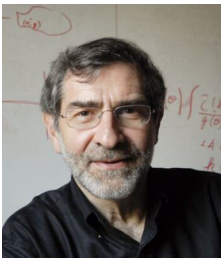
Brandon Henderson, Ph.D.

Associate Professor of Biomedical Sciences
Joan C. Edwards School of Medicine
Marshall University
Email: hendersonbr@marshall.edu



May Hui, M.S.

M.D./Ph.D. Medical Scientist Training Program
Department of Physiology and Biophysics
School of Medicine
University of California, Irvine
Email: mayh1@uci.edu



Henry Lester, Ph.D.

Professor of Biology
Division of Biology and Biological Engineering
California Institute of Technology
Email: lester@caltech.edu

**R01 - National Institute on Drug Abuse (NIDA)
Electronic cigarettes, adolescents, and changes in
neurobiology**

There is a fundamental gap in the understanding of how electronic nicotine delivery systems (ENDS) alter the adolescent brain. Adolescents are a high-risk population in regards to nicotine-containing products as prenatal or early exposure triggers significant changes in the prefrontal cortex. There is a critical need to understand how ENDS devices alter neurobiology to trigger addiction to nicotine

**T31DT1729 - Hui - Investigation of neural
ensembles underlying nicotine withdrawal-
induced hyperalgesia**

The goal of this study is to identify the neural circuits that govern withdrawal symptoms. In this project, I aim to 1) identify circuits encoding withdrawal-induced pain; 2) access these circuits prior to the onset of withdrawal symptoms; and 3) test the functional contribution of these cells towards withdrawal-induced behavior.

**27IP-0057 - Lester - Understanding Nicotine and
Smoking Cessation Drugs: Release from
Presynaptic Terminals**

We hypothesize that nicotine accumulates in specific organelles, called synaptic vesicles, of neurons. When neurons are stimulated, they then release nicotine together with the chemicals they normally release, such as acetylcholine or other neurotransmitters. This provides a transient source of nicotine during periods that far outlast the times nicotine can be detected in the fluid that surrounds the brain.



Shahrdad Lottipour, Ph.D., M.M.Sci.
Assistant Professor of Emergency Medicine,
Pharmaceutical Sciences,
Pathology and Laboratory Medicine
School of Medicine
University of California, Irvine
Email: shahrdad@uci.edu



Sandra Sanchez-Roige, Ph.D.
Associate Professor of Psychiatry
School of Medicine, Department of Medicine,
Division of Genetic Medicine
University of California, San Diego
Email: sanchezroige@ucsd.edu



Michael A. Taffe, Ph.D.
Professor of Psychiatry
University of California, San Diego
Email: mtaffe@ucsd.edu

T31IP1427C - Lotfipour - Functional Role of a Human Polymorphism in the Alpha6 NACHR Subunit in Adolescent Nicotine Seeking

The goal of this study is to understand the results from large-scale human candidate gene studies that revealed a common genetic variant in the alpha6 subunit of the nicotinic acetylcholine receptor subunit (nAChR) (encoded by the Chrna6C123G gene, rs2304297) plays a role in adolescent nicotine/tobacco use.

T29KT0526C - Sanchez-Roige - Elucidating the genetic basis of nicotine dependence by using electronic health records

The goal of this study is to understand the genetic factors that may influence an individual's susceptibility to nicotine dependence at multiple stages, including the decision to begin smoking, sensitivity to the subjective effects of the drug, development of tolerance, severity of drug withdrawal, inclination to quit, and ability to quit. It involves a large-scale genetic study to identify specific genes that confer risk for nicotine dependence.

T33IR6653 - Taffe - Lasting Consequences of Adolescent Electronic Cigarette Exposure to Nicotine and THC

The goal of this study is to develop a model of e-cigarette-based nicotine exposure in rats to determine the lasting consequences of adolescent nicotine inhalation for adult self-administration of nicotine via e-cigarette vapor inhalation. Additional studies will examine the impact of co-exposure to THC with nicotine during adolescence. This study follows from a TRDRP Pilot Award designed to develop models for assessment of lasting consequences of adolescent exposure to nicotine delivered by e-cigarette devices.