

BIOGRAPHICAL SKETCH

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NAME: Silveri, Marisa M.

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

POSITION TITLE: Associate Professor of Psychiatry, Director Neurodevelopmental Laboratory

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
Union College	B.S.	06/1995	Biology/Psychology
State University of New York at Binghamton	M.A.	10/1998	Behavioral Neuroscience
State University of New York at Binghamton	Ph.D.	11/2000	Behavioral Neuroscience
Harvard Medical School, McLean Hospital	Postdoc	01/2003	Neuroimaging and Substance Abuse POR

A. Personal Statement.

I am a behavioral neuroscientist with significant experience in designing research experiments, both preclinical behavioral studies and clinical neuroimaging, patient-oriented research (POR) investigations. In my preclinical work, I conducted acute and chronic challenge studies to characterize the ontogeny of alcohol sensitivity. In pursuit of conducting POR studies in addiction, I joined the McLean Imaging Center in 2001, and became involved in a variety of neuroimaging studies in patients with addictions and psychiatric illnesses. In recognition of my dedication to and career success in POR, I received a Clinical Loan Repayment Program Award and two renewals. In my current role as Director of the Neurodevelopmental Laboratory on Addictions and Mental Health, I have been applying over 15 years of clinical research experience in studying brain and cognitive maturation, and neurobiological correlates of alcohol and drug use during adolescence and emerging adulthood, via neuroimaging, and assessments of clinical and cognitive variables. I completed a K01 study documenting maturation of frontal lobe neurochemistry and cognition, an R01 examining neurochemical consequences of binge drinking in emerging adults, and an R21 documenting menstrual cycle-related differences in hippocampal brain GABA and associations with memory function. My current R01 employs multimodal neuroimaging and neuropsychological approaches to identify neurodevelopmental vulnerabilities associated with early and escalating alcohol use and manifestation of psychiatric symptoms (e.g., depression and anxiety) in adolescents. As a collaborator, I contribute to multimodal R01 studies examining adults with posttraumatic stress disorder (PI: Rosso), and adults with major depression undergoing a 12-week yoga treatment intervention (PI: Streeter), and an R21 (PI: Nickerson) applying elaborate statistical analysis techniques across multiple imaging measures from Human Connectome Project (HCP), in which I am provide support for integration of MR findings with clinical symptoms and cognitive measures; and as a consultant on a new R21 (PI: Blackford) investigating the role of the human BNST circuit in alcohol withdrawal. I have a strong track record of mentorship that includes direct mentoring of 24 individuals, including undergraduates, graduate students, medical students, research and clinical fellows, and psychiatry residents, and numerous research assistants; on F31, K01 and K23 grants, and a young investigator NARSAD. In conjunction with the Research Society on Alcoholism, I serve as a conference mentor and on the grantsmanship panel, and am the chair of the National Advocacy and Public Education committee. Collectively, these experiences have brought me into contact with many individuals across the research spectrum, from bench to clinic.

In addition to serving as a scientific mentor, an important adjunct to my career has been educational outreach. I have spoken extensively, over 100 presentations on the topic of adolescent brain development and the effects of alcohol and drug use on brain function, within my local communities, national presentations on behalf of the non-profit organization the Community of Concern, and nationally and internationally at professional

scientific meetings. Community audiences include teachers, guidance and adjustment counselors, psychologists, nurses, parents and students, as well as law enforcement agents and policy makers. I have given keynote addresses at Underage Drinking Prevention conferences organized by four different Massachusetts county DA offices. I also have given national key note webinars: Alcohol and High Risk Drinking through Campus Outreach Services Peer- and Parent-Connect, and adolescent brain development and alcohol and drug effects through SAMHSA's Center for the Application of Prevention Technologies and the 4-H. Finally, along with collaborators from the Massachusetts South Shore Hospital's Youth Health Connection program, we received a grant from the Sean McDonough Charitable Foundation, which supported a Leadership Conference entitled "How Are You Deciding" that provided education for teens that included peer-to-peer interaction, positive social norms, culture, identity building, and creative problem solving to discourage teen alcohol and substance abuse. My presentation was subsequently translated and presented to students in Nigeria through the Catholic Youth Organisation. Outreach has been a successful means of increasing public awareness about the vulnerability of the adolescent and emerging adult brain, as a prevention effort to discourage alcohol and drug use during adolescence, but also, to educate the public on the importance of the early identification of clinical and behavioral indicators of substance use and abuse, and psychiatric illness.

My relevant publications that highlight my experience and qualifications for this project include the following:

1. **Silveri MM**, Dager AD, Cohen-Gilbert JE, Sneider JT. Neurobiological signatures associated with alcohol and drug use in the human adolescent brain. Special Issue: Adolescent Brain, Neuroscience and Biobehavioral Reviews, 2016. [Epub ahead of print] PMID:27377691
2. **Silveri MM**. GABAergic contributions to alcohol responsivity during adolescence: Insights from preclinical and clinical studies. Pharmacology and Therapeutics, 2014; 143(2):197-216. PMID: 24631274
3. **Silveri MM**, Sneider JT, Crowley DJ, Covell MJ, Acharya D, Rosso IM, Jensen JE. Frontal lobe γ -aminobutyric acid levels during adolescence: Associations with impulsivity and response inhibition. Biological Psychiatry, 2013; 74(4):296-304. PMID: 23498139; PMCID: PMC3695052
4. **Silveri MM**. Adolescent brain development and underage drinking in the United States: Identifying risks of alcohol use in college populations [Perspective]. Harvard Review of Psychiatry, 2012; 20(4):189-200. PMID:22894728

B. Positions and Honors.

Positions and Employment

2001-2003	Research Fellow in Psychiatry, McLean Hospital, Harvard Medical School
2002	Lecturer, Psychology Department, Northeastern University, Boston, MA
2003-2006	Assistant Research Psychologist, McLean Hospital
2003-2005	Instructor in Psychiatry, Harvard Medical School
2005-2013	Assistant Professor in Psychiatry, Harvard Medical School
2007-	Associate Research Psychologist, McLean Hospital
2010-	Adjunct Assistant Professor of Psychiatry, Boston University School of Medicine
2011-	Director, Neurodevelopmental Laboratory on Addictions and Mental Health, McLean Hospital
2014-	Associate Professor in Psychiatry, Harvard Medical School, Boston, MA
2014-	Neuroscientist, McLean Hospital

Other Experience and Professional Memberships

2001-2003	Coordinator, Neuroscience Seminar Series, McLean Hospital, Belmont, MA
2005-	Reviewer, ZDA1 LXF 20 1 Section, NIH Clinical Loan Repayment Program, ad hoc reviewer
2009-2010	Reviewer, Special Emphasis Panel/Scientific Review Group ZAA1 DD (02) , ad hoc reviewer
2009-2010	Faculty Chair, Joint Committee on the Status of Women (JCSW), Harvard Medical School
2010	Reviewer, 2010/11 Neurotoxicology and Alcohol Study Section, NIH/NIAAA, ad hoc reviewer
2011	Research Society on Alcoholism, Membership Committee
2011	Reviewer, 2011/12 ZAA1 GG (21) Study Section, NIH/NIAAA, ad hoc reviewer
2011-2015	Member, Research Society on Alcoholism, Membership Committee
2012-	Member, 2012/13 AA-4 Neuroscience Review Study Section, NIH/NIAAA, member
2015-	Editorial Board Member, Alcohol and Alcoholism Journal
2015-	Co-Editor, Adolescent Brain Special Issue, Neuroscience and Biobehavioral Reviews
2016-	Chair, National Advocacy and Public Education Committee, Research Society on Alcoholism

Honors

1997-2000	Research Society on Alcoholism, Student Merit Award
1999-2000	International Society for Developmental Psychobiology, Student Travel Award

2000	State University of New York at Binghamton, Award for Excellence in Teaching
2001	Research Society on Alcoholism, Junior Investigator Award
2001	Cold Spring Harbor Laboratory, Selected Attendee, Cellular Biology of Addiction Course
2002	National Institute on Drug Abuse, Director's Travel Award
2003	College on Problems of Drug Dependence, Early Career Investigator Award
2003-2009	National Institutes of Health, Clinical Research Loan Repayment Program Award
2004	Research Society on Alcoholism, Junior Investigator Award
2005	Research Society on Alcoholism, Enoch Gordis Research Recognition Award
2008	International Society of Magnetic Resonance in Medicine and the NIH Travel Award
2010	The Community of Concern Leadership Award
2011	Research Society on Alcoholism, Young Investigator Award
2012	"Meet the Researcher" Profile, Addiction Technology Transfer Center education program
2014	Featured Faculty, Dimensions of Harvard Medical School
2015	Partners in Excellence Team Award, McLean Hospital, Partners Health Care
2016	Vision of Excellence, Presidential Award, McLean Hospital

C. Contributions to Science

- My early preclinical graduate work demonstrated that adolescence is a period of relative insensitivity to alcohol, which is extremely relevant given that alcohol use typically begins during this time, and that age of onset of alcohol use is a significant predictor of later abuse. These findings **implicate an immature GABA system in the relative resistance to alcohol effects and expression of alcohol-related tolerance during this age period**. Due to the ethical associated with administering alcohol to human youth, these preclinical data provide important insights into age differences in the responsiveness to alcohol action.
 - Silveri MM**, Spear LP. Decreased sensitivity to the hypnotic effects of ethanol early in ontogeny. *Alcoholism: Clinical and Experimental Research* 1998; 22:670-6. PMID: 9622449
 - Silveri MM**, Spear LP. Ontogeny of rapid tolerance to the hypnotic effects of ethanol. *Alcoholism: Clinical and Experimental Research* 1999; 23:1180-4. PMID: 10443983
 - Silveri MM**, Spear LP. Ontogeny of ethanol elimination and ethanol-induced hypothermia. *Alcohol* 2000; 20:45-53. PMID: 10680716
 - Silveri MM**, Spear LP. The effects of NMDA and GABA_A pharmacological manipulations on acute and rapid tolerance to ethanol during ontogeny. *Alcoholism: Clinical and Experimental Research*, 2004; 28(6):884-894. PMID: 15201631
- At completion of my graduate training, I transitioned from preclinical to clinical research in order to receive training to conduct patient-oriented research, utilizing non-invasive magnetic resonance techniques to investigate **neurobiological underpinnings in addiction and psychiatric illness**. This period was focused magnetic resonance spectroscopy (MRS) to investigate neurobiological changes in individuals with addiction (heroin, cocaine, marijuana), and in patients with psychiatric illness and associated interventions.
 - Silveri MM**, Pollack MH, Diaz CI, Nassar LE, Mendelson JH, Yurgelun-Todd DA, Renshaw PF, Kaufman MJ. Cerebral phosphorus metabolite and transverse relaxation time abnormalities in heroin-dependent subjects at onset of methadone maintenance treatment. *Psychiatry Research: Neuroimaging*, 2004; 131(3):217-26. PMID: 15465291
 - Yurgelun-Todd DA, **Silveri MM**, Gruber SA, Rohan ML, Pimentel PJ. White matter abnormalities observed in bipolar disorder: A diffusion tensor imaging study. *Bipolar Disorders*, 2007; 9(5):504-12. PMID: 17680921
 - Silveri MM**, Dikan J, Ross AJ, Jensen JE, Kamiya T, Kawada Y, Renshaw PF, Yurgelun-Todd DA. Citicoline enhances frontal lobe bioenergetics as measured by phosphorus magnetic resonance spectroscopy. *Nuclear Magnetic Resonance in Biomedicine*, 2008; 21(10):1066-75. PMID: 18816480
 - Mashhoon Y, Jensen JE, Sneider JT, Yurgelun-Todd DA, **Silveri MM**. Lower left thalamic myo-Inositol levels associated with greater cognitive impulsivity in marijuana-dependent young men: preliminary evidence from MRSI at 4T. *Journal of Addiction Research and Therapy*, 2013, S4: 009. PMID:24558635
- A consistent theme integrated with each area of my research, both preclinical and clinical, has been the **investigation of sex differences**. My publications in this area span cognition, brain structure, and risk for addiction. Our manuscript in preparation documents the first evidence of lower right hippocampal GABA in women examined during their luteal phase than in follicular phase and compared to men. Thus, menstrual cycle related changes in neurochemistry could confer a window of altered alcohol sensitivity that could

increase risk and vulnerability for relapse. We also are preparing a manuscript documenting virtual water maze and emotional Go NoGo task performance alterations associated with co-nicotine/alcohol challenges.

- a. **Silveri MM**, Tzilos GK, Pimentel PJ, Yurgelun-Todd DA. Trajectories of adolescent emotional and cognitive development: Effects of sex and risk for drug use. *Adolescent Brain Development: Vulnerabilities and Opportunities*, Annals of the New York Academy of Sciences, 2004; 1021:363-70. PMID: 15251911
 - b. **Silveri MM**, Rohan ML, Pimentel PJ, Gruber SA, Rosso IM, Yurgelun-Todd DA. Sex differences in the relationship between white matter microstructure and impulsivity in adolescents. *Magnetic Resonance Imaging*, 2006; 24(7):833-41. PMID: 16916700
 - c. **Silveri MM**, Tzilos GK, Yurgelun-Todd DA. Relationship between white matter volume and cognitive performance during adolescence: Effects of age, sex and risk for drug use. *Addiction*, 2008; 103:1509-1520. PMID: 18636995
 - d. Sneider JT, Hamilton DH, Cohen-Gilbert JE, Crowley DJ, Rosso IM, **Silveri MM**. Sex differences in spatial navigation and perception in human adolescents and emerging adults. *Behavioural Processes*, 2015; 111:42-50. PMID: 25464337
4. To capitalize on the methodological MRS and neuropsychology expertise gained during my K01, and to extend my dedication to research on the ***neurobiology of alcohol abuse***, I obtained R01 funding to apply MRS methods and neuropsychological assessment in populations that, to date, are not well represented in the available literature (e.g., emerging adults, ages 18-24 years old, when maturational processes are reaching a plateau). We published several papers from this work in emerging adult binge drinkers, including binge drinking effects on learning and memory and significantly lower frontal lobe GABA of emerging adult binge drinkers compared to demographically-matched light drinkers. We found neurochemical alterations associated with binge drinking were of a greater magnitude in binge drinkers who experienced an alcohol-induced blackout. These data suggest that a low-level neurochemical profile may increase vulnerability to experiencing blackouts. We also recently reported that family history of alcoholism is associated with a neurochemical profile that may influence normative age differences in glutamatergic metabolites and their association with impulse control, which together could confer greater genetic risk of addiction later in life. Ongoing R01 work is utilizing a longitudinal model to characterize adolescent brain development prior to onset of alcohol or drug use using multimodal imaging, to determine biomarkers of risk for initiation of use.
- a. Sneider JT, Cohen-Gilbert JE, Crowley DJ, Paul MD, **Silveri MM**. Differential effects of binge drinking on learning and memory in emerging adults. *Journal of Addiction Research and Therapy*, 2013, S7: 006. PMID: 24404407; PMCID: PMC3881421
 - b. Cohen-Gilbert JE, Jensen JE, **Silveri MM**. Contributions of magnetic resonance spectroscopy to understanding development: Potential applications in the study of adolescent alcohol use and abuse [Review]. *Development and Psychopathology*, 2014; 26(2):405-23.
 - c. Mashhoon Y, Czerkawski C, Crowley DJ, Cohen-Gilbert JE, Sneider JT, **Silveri MM**. Binge alcohol consumption in emerging adults: anterior cingulate cortical 'thinness' is associated with alcohol use patterns. *Alcoholism: Clinical and Experimental Research*, 2014; 38(7):1955-64. PMID: 24961871.
 - d. **Silveri MM**, Cohen-Gilbert JE, Crowley DJ, Rosso IM, Jensen JE, Sneider JT. Altered anterior cingulate neurochemistry in emerging adult binge drinkers with a history of alcohol-induced blackouts. *Alcoholism: Clinical and Experimental Research*, 2014; 38(4):969-79. PMID: 24512596

Complete List of Published Works in MyBibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/marisa.silveri.1/bibliography/40118472/public/?sort=date&direction=ascending>

D. Research Support

Ongoing Research Support

F31 AA025824 Oot (PI)

04/17 – 03/20

Identifying neurobiological predictors of alcohol use onset during adolescence

This study aims to examine neurobiological and behavioral markers that exist prior to initiation of alcohol use (in 13-14 yr old adolescents) and may be predictive of use onset during adolescence.

Role: Co-Sponsor

R21AA025385 Blackford (PI)

02/17 – 01/19

Investigating the Role of the Human BNST Circuit in Alcohol Withdrawal

The goal of this study is to investigate the role of the BNST in human addiction in adults with moderate-severe AUD who have been abstinent for one month.

Role: Consultant

R21 AA024565 Nickerson (PI) 08/16 – 07/18
Sex Differences in the Effects of Alcohol Use Disorder on Brain Circuitry using Existing Data
This study is using resting fMRI data to investigate relationships between DMN function and connections with key ToM brain circuits, social cognition measures, sex and AUD, by applying data fusion analysis.
Role: Co-Investigator

John Alden Trust Silveri (PI) 07/16 – 06/18
Adolescent Depression, Brain Chemistry and Yoga
This study is examining brain GABA levels in adolescents with depression, and whether a 12-week course of yoga will improve mood and increase brain GABA.
Role: Principal Investigator

K01 DA038207 Dager (PI) 07/15 – 06/19
Neurochemical and Functional Correlates of Memory in Emerging Adult Marijuana Users
This study integrates MRS and fMRI to better understand the neurobiological correlates of altered memory processing in emerging adult MJ users.
Role: Mentor

NARSAD Young Investigator (BBRF) Sneider (PI) 1/15 – 12/16
Brain Chemistry, Memory and Mood in Depressed Women
The major goals of the study are to examine brain chemistry, BOLD activation, and cognition relative to clinical mood measures in depressed and healthy women.
Role: Mentor

R01 AA022493 Silveri (PI) 09/14 – 08/19
Consequences of Adolescent Alcohol Use on Brain Development
This study employs multiple neuroimaging and neuropsychological approaches to identify neurodevelopmental vulnerabilities associated with early and escalating alcohol use during adolescence.
Role: Principal Investigator

K01 AA022392 Cohen-Gilbert (PI) 08/14 – 07/19
Neural and Cognitive Factors Predicting Adverse Outcomes in College Drinkers
This study integrates fMRI and MRS with behavioral and self-report measures in college students over two years to assess psychological well-being, emotion-related impulsivity and alcohol use.
Role: Primary Mentor

R01 DA037265 Nickerson (PI) 07/14 – 06/17
Multi-modal MRI Data Fusion to Assess Neurobiological Effects of Marijuana Use
The goal of this study is to use new analysis strategies of existing brain imaging data in marijuana users to investigate the effects of marijuana on brain structure and function and identify imaging markers of addiction.
Role: Collaborator

R01 AT007483 Streeter (PI) 08/12 – 07/17
The Treatment of Depression with Yoga and Walking
The aim is to examine Yoga meditation techniques for the treatment and management of depression and to correlate symptoms with brain GABA levels measured with magnetic resonance spectroscopy (MRS).
Role: Collaborator

K01 DA034028 Mashhoon (PI) 07/12 – 06/17
Early Onset Cigarette Smoking Effects on brain Structure, Function and Chemistry
This study integrates multimodal neuroimaging, neuropsychological and self-report assessments to develop a biological and cognitive profile of early- (age <16 yrs.) vs. late-onset (16+yrs.) nicotine-dependent adults.
Role: Mentor

K25 MH094612 Fava, Greenfield (MPI) 06/11 – 03/17
Fostering Research Mentorship and Training during Psychiatry Residency
This integrated research education program aims to train residents to become psychiatrist-scientists in basic, translational, and patient-oriented research, while increasing research literacy among all psychiatry residents.
Role: Advisory Committee

T32 DA015036 Lukas (PI) 07/02 – 06/17
Training in Drug Abuse and Brain Imaging
Role: Core Faculty

Pending Research Support

K24AA025977-01 Silveri (PI)

07/17 – 06/22

Mentoring in Patient-Oriented Neuroscience Research

The primary goals are to provide substantive mentoring of junior investigators in POR, and continue and extend POR to include adolescent comorbid psychopathology, clinical treatment, and epigenetics.

Role: Principal Investigator

Completed Research Support

R01 MH096987 Rosso (PI)

07/12 – 06/17

Cerebral GABA and Fear Conditioning in PTSD

The aim is to use magnetic resonance spectroscopy (MRS) to examine VMPFC and anterior insular cortex GABA levels, and fear extinction deficits in post-traumatic stress disorder (PTSD).

Role: Co-Investigator

Harvard Catalyst Teicher (PI)

05/15 – 04/16 [NCE]

Mechanisms Linking Childhood Maltreatment To Mood Dysregulation in Adolescence

This study examines epigenetic modification of genes regulating cortisol and BDNF; neuroinflammation; and sleep disturbance in youth enrolled in a longitudinal study of risk for substance abuse in maltreated individuals.

Role: Co-Investigator

R21 AA018724 Silveri (PI)

09/10 – 08/13 [NCE]

Sex differences in hippocampal neurochemistry and function: Implications for Alcoholism

Role: Principal Investigator

R01 AA018153 Silveri (PI)

01/10 – 6/15 [NCE]

Neurobiological Consequences of Binge Alcohol Consumption in Young Adults

Role: Principal Investigator

K01 AA014651 Silveri (PI)

09/04 – 08/10 [NCE]

Neurocognition, Brain GABA Levels and Adolescent Alcohol Use

Role: Principal Investigator