

Anushree N. Karkhanis, Ph.D.

PERSONAL INFORMATION

Office Address

Department of Psychology
Binghamton University - SUNY
4400 Vestal Parkway East,
Binghamton, NY 13902

Contact details

Phone: 607-777-4876
Fax: 607-777-4890
E-mail: akarkhan@binghamton.edu
Room: Science IV – 264

EDUCATION

2006 – 2010

Ph.D. in Neuroscience

Graduate School of Biomedical Sciences
Rutgers, The State University of New Jersey, Newark, NJ
University of Medicine and Dentistry of New Jersey, Newark, NJ

Doctoral Thesis Advisor: Ralph M. Siegel, Ph.D.

Dissertation Title: An adaptive sensorimotor representation for reaching in the inferior parietal lobule of behaving monkeys.

2002 – 2006

B.A. in Psychology

Department of Psychology & Honors College
Rutgers University, Newark, NJ

Undergraduate Research Advisor: Ralph M. Siegel, Ph.D.

Honors Thesis Title: Effects of reversing prisms on 3D perception in primates.

Undergraduate Research Advisor: Kent Harber, Ph.D.

Research Topic: Effects of social ostracism on the perception and sensation of physical discomfort.

ACADEMIC POSITIONS

2018 – Present

Empire Innovation Assistant Professor

Department of Psychology,
Binghamton University – State University of New York, Binghamton, NY

2018 – Present

Adjunct Professor

Department of Physiology and Pharmacology,
Wake Forest School of Medicine, Winston-Salem, NC

2017 – 2018

Research Assistant Professor

Department of Physiology and Pharmacology,
Wake Forest School of Medicine, Winston-Salem, NC

2016 – 2017

Instructor

Department of Physiology and Pharmacology,
Wake Forest School of Medicine, Winston-Salem, NC

- 2012 – 2016 **Post-doctoral Fellow**
 Laboratory of Sara R. Jones, Ph.D.,
 Department of Physiology and Pharmacology,
 Wake Forest School of Medicine, Winston-Salem, NC
- 2010 – 2011 **Post-doctoral Fellow (PI moved unexpectedly)**
 Laboratory of Richard Krauzlis, Ph.D.,
 Salk Institute for Biological Studies, La Jolla, CA
- 06/09 – 08/09 **Visiting Scholar (Summer internship during Graduate School)**
 Laboratory of Ed Callaway, Ph.D.,
 Salk Institute for Biological Studies, La Jolla, CA

EXTERNAL RESEARCH SUPPORT

Current

K01 AA023874 (PI: Karkhanis) 06/01/2016 – 05/31/2021
 National Institute on Alcohol Abuse and Alcoholism
 The goal of this project is to investigate the effects of adolescent chronic stress on the kappa-opioid receptor modulation of dopamine and glutamate transmission in the nucleus accumbens and on ethanol consumption and seeking. The studies in this proposal will investigate the underlying mechanisms involved in potentiating alcohol use disorder following chronic stress in rats.
 Role: PI

Completed

P50 AA026117 (PI: Weiner) 12/10/2017 – 11/30/2022
 National Institute on Alcohol Abuse and Alcoholism
 The goal of the proposed project is to investigate the adolescent social isolation-induced alterations in the basolateral amygdala – nucleus accumbens circuit that potentially play a causal role in hypodopaminergic state and escalation in ethanol drinking endangered by models of alcohol use disorder vulnerability and dependence.
 Role: Co-Investigator; role and support ended due to institutional transfer

T32 AA007565 (PI: McCool) 11/01/2011 – 10/31/2014
 National Institute on Alcohol Abuse and Alcoholism
 Mentor: Sara R. Jones, Ph.D.
 The goal of this award was to receive postdoctoral training in *in vivo* microdialysis in freely moving rats. This project was aimed at studying the chronic early-life stress induced neurobiological alterations that increase the vulnerability to alcoholism.
 Role: Fellow

INTERNAL RESEARCH SUPPORT

Completed

Pilot grant (PI: Karkhanis) 06/01/2017 – 05/31/2018
 Center for the Neurobiology of Addiction Treatment
 National Institute on Drug Abuse funded P50 at Wake Forest School of Medicine

The goal of this project is to investigate the interaction between kappa opioid receptors and dopamine transporters, and to examine the therapeutic potential of a kappa opioid receptor antagonist in reducing cocaine self-administration.

Role: PI

HONORS AND AWARDS

- 2018 Association of Alcohol Researchers of Indian Origin (AARIO) Young Investigator Award, Research Society on Alcoholism 41st Annual Meeting, San Diego, CA.
- Abstract selected for “Breaking News” component, Gordon Research Conference: Alcohol & the Nervous System, Galveston, TX.
- International Brain Research Organization (IBRO) Young Investigator Award, Monitoring Molecules in Neuroscience, Oxford, UK.
- Travel Fellowship, Winter Conference on Brain Research, Whistler, British Columbia, Canada.
- Early Career Development Program for Women Fellowship, Wake Forest School of Medicine, Winston-Salem, NC
- 2017 Abstract selected for “Hot Topic Oral Presentation”, International Narcotics Research Conference, Chicago, IL.
- Travel Award, International Narcotics Research Conference, Chicago, IL.
- CTSI Translational Research Academy Scholar, Wake Forest School of Medicine, Winston-Salem, NC.
- Travel Award, Center for Research on Substance Use and Addiction, Wake Forest School of Medicine, Winston-Salem, NC.
- 2016 Chair Elect, Gordon Research Seminar (2018) on Alcohol and the Nervous System, Galveston, TX.
- Abstract selected for “Breaking News” component, Gordon Research Conference: Alcohol & the Nervous System, Galveston, TX.
- Gordon Research Conferences Travel Award, Gordon Research Conference: Alcohol & the Nervous System, Galveston, TX.
- Drug and Alcohol Dependence Top Reviewer Award.
- 2015 Toni Shippenberg Young Investigator Award, Kappa Therapeutics Conference 3rd Annual Meeting, Chapel Hill, NC.
- 2013 Junior Investigator Award, Research Society on Alcoholism 36th Annual Meeting, Orlando, FL.
- Best Poster Award, Graduate Student and Post-doctoral Research Day, Wake Forest School of Medicine, Winston-Salem, NC.
- 2009 Travel Award for Vision Sciences Society, Integrative Neuroscience Program, Rutgers University, Newark, NJ.
- 2008 Travel Award for Society for Neuroscience, Integrative Neuroscience Program, Rutgers University, Newark, NJ.
- Summer fellowship, Visual Neuroscience: From Spikes to Awareness, The European Summer School, Schloss Rauischholzhausen, Hessa, Germany.

2007	Travel Award for Society for Neuroscience, Integrative Neuroscience Program, Rutgers University, Newark, NJ.
2006 – 2010	Graduate Student Fellowship, Integrative Neuroscience Program, Rutgers University, NJ.
2002 – 2006	Provost Scholarship, Rutgers University, Newark, NJ. Honors Program, Rutgers University, Newark, NJ.

PUBLICATIONS

Peer Reviewed Journal Articles

1. **Karkhanis AN**, Leach AC, Yorgason JT, Uneri A, Barth S, Niere F, Alexander NJ, Weiner JL, McCool BA, Raab-Graham KF, Ferris MJ, Jones SR (2018) Chronic social isolation stress during peri-adolescence alters presynaptic dopamine terminal dynamics via augmentation in accumbal dopamine availability. *ACS Chemical Neuroscience*, doi: 10.1021/acscemneuro.8b00360. PMID: 30284806.
<https://www.ncbi.nlm.nih.gov/pubmed/30284806>
2. Rose JH, **Karkhanis AN**, Steiniger-Brach B, Jones SR (2016) Distinct effects of nalmefene on dopamine uptake rates and kappa opioid receptor activity in the nucleus accumbens following chronic intermittent ethanol exposure. *International Journal of Molecular Medicine*, 17(8). PMID: 27472317.
<https://www.ncbi.nlm.nih.gov/pubmed/27472317>
3. **Karkhanis AN**, Huggins KN, Rose JH, Jones SR (2016) Switch from excitatory to inhibitory actions of ethanol on dopamine levels following chronic exposure: Role of kappa opioid receptors. *Neuropharmacology*, 110(Pt A): 190-197. PMID: 27450094.
<https://www.ncbi.nlm.nih.gov/pubmed/27450094>
4. **Karkhanis AN**, Beveridge TJ, Blough BE, Jones SR, Ferris MJ (2016) The individual and combined effects of phenmetrazine and mGluR2/3 agonist LY379268 on the motivation to self-administer cocaine. *Drug and Alcohol Dependence*. PMID: 27394931.
<https://www.ncbi.nlm.nih.gov/pubmed/27394931>
5. Butler TR, **Karkhanis AN**, Jones SR, Weiner JL (2016) Adolescent social isolation as a model of heightened vulnerability to comorbid alcoholism and anxiety disorders. *Alcohol: Clinical and Experimental Research*, 40(6):1202-1214. PMID: 27154240.
<https://www.ncbi.nlm.nih.gov/pubmed/27154240>
6. **Karkhanis AN**, Rose JH, Weiner JL, Jones SR (2016) Early-life social isolation stress increases kappa opioid receptor responsiveness and downregulates the dopamine system. *Neuropsychopharmacology*, 41(9): 2263-2274. PMID: 26860203.
<https://www.ncbi.nlm.nih.gov/pubmed/26860203>
7. Rose JH, **Karkhanis AN**, Chen R, Gioia D, Lopez MF, Becker HC, McCool BA, Jones SR (2016) Supersensitive kappa opioid receptors mediate ethanol withdrawal-induced drinking and marble burying and reduced dopamine signaling in the nucleus accumbens. *International Journal of Neuropsychopharmacology*, 19(5). PMID: 26625893.
<https://www.ncbi.nlm.nih.gov/pubmed/26625893>
8. Yorgason JT, Calipari ES, Ferris MJ, **Karkhanis AN**, Fordahl SC, Jones SR (2016) Social isolation rearing increases dopamine uptake and psychostimulant potency in the striatum. *Neuropharmacology*, 101:471-479. PMID: 26525189.
<https://www.ncbi.nlm.nih.gov/pubmed/26525189>
9. ****Karkhanis AN**, Alexander NJ, McCool BA, Weiner JL, Jones SR (2015) Chronic social isolation during adolescence augments catecholamine response to acute ethanol in the basolateral amygdala. *Synapse*, 69(8):385-395. PMID: 25963724.
<https://www.ncbi.nlm.nih.gov/pubmed/25963724>

10. **Karkhanis AN**, Rose JH, Huggins KN, Kontantopoulos JK, Jones SR (2015) Chronic intermittent ethanol exposure reduces presynaptic dopamine neurotransmission in mouse nucleus accumbens. *Drug and Alcohol Dependence*, 150:24-30. PMID: 25765483.
<https://www.ncbi.nlm.nih.gov/pubmed/25765483>
11. **Karkhanis AN**, Locke J, Weiner JL, McCool BA, Jones SR (2014) Social isolation rearing increases nucleus accumbens dopamine and norepinephrine responses to acute ethanol in adulthood. *Alcohol: Clinical and Experimental Research*, 38(11): 2770-2779. PMID: 25421514.
<https://www.ncbi.nlm.nih.gov/pubmed/25421514>
12. **Karkhanis AN**, Heider B, Silva FM, Siegel RM (2014) Spatial effects of shifting prisms on properties of posterior parietal cortex neurons. *Journal of Physiology*, 592(16): 3625-3646. PMID: 24928956.
<https://www.ncbi.nlm.nih.gov/pubmed/24928956>
13. Heider B, ***Karnik A**, Ramalingam N, Siegel RM (2010) Neural representation of visually guided reaching in macaque posterior parietal cortex. *Journal of Neurophysiology*, 104(6): 3494-3509. PMID: 20844104.
<https://www.ncbi.nlm.nih.gov/pubmed/20844104>

***Karnik**: maiden name.

****Article featured on the journal cover.**

Invited Book Chapters

1. Siciliano CA, **Karkhanis AN**, Holleran KM, Melchoir JR, Jones SR (2018) Cross-species alterations in synaptic dopamine regulation after chronic alcohol exposure. *Handbook of Pharmacology: The Neural Circuitry of Alcohol*. Edited by Grant K and Lovinger D. PMID: 29675581.
<https://www.ncbi.nlm.nih.gov/pubmed/29675581>
2. **Karkhanis AN**, Holleran KM, Jones SR (2017) Dynorphin/kappa opioid receptor signaling in pre-clinical models of alcohol, drug and food addiction. *International Review of Neurobiology: The Role of Neuropeptides in Addiction and Disorders of Excessive Consumption*; 136:53-88. Edited by Thiele T, Publisher: Elsevier. PMID: 29056156.
<https://www.ncbi.nlm.nih.gov/pubmed/29056156>

Manuscripts in Preparation

1. **Karkhanis AN**, Albertson SE, Weiner JL, Jones SR. Adolescent social isolation stress increases cocaine seeking behaviors via a kappa opioid receptor mechanism.
2. **Karkhanis AN**, Leussen DJ, Weiner JL, Chen R, Bruchas MR, Jones SR. Chronic social adolescent stress-induced increase in ethanol intake is driven by kappa opioid receptors on dopamine neurons in the NAC.

INVITED ORAL PRESENTATIONS

Meetings

- | | |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 01/2019 | Adolescent Social Isolation Results in Perturbation of Kappa Opioid Receptor and Dopamine Transporter Interaction. Winter Conference on Brain Research, Snowmass, CO. |
| 11/2018 | Impact of Adolescent Social Isolation Stress on Kappa Opioid Receptor Function and Addictive Behaviors. NIDA-NIAAA Mini-Convention, Society for Neuroscience, San Diego, CA. |
| 06/2018 | Social Isolation Stress Increases Kappa Opioid Receptor Sensitivity in the Nucleus Accumbens of Rats. Research Society on Alcoholism Meeting, San Diego, CA. |
| 03/2018 | Adolescent Social Isolation Augments Kappa Opioid Receptor Function in the Nucleus Accumbens and Basolateral Amygdala of Rats. Monitoring Molecules in Neuroscience, Oxford, UK. |

- 03/2018 Social Isolation Stress Increases Kappa Opioid Receptor Function in the Nucleus Accumbens of Rats. Gordon Research Conference: Alcohol & Nervous System, Galveston, TX.
- 01/2018 Adolescent Stress-Potentiated Cocaine Seeking is Mediated by Dysregulation of the Interaction Between Kappa Opioid Receptors and Dopamine Transporters. Winter Conference on Brain Research, Whistler, B.C., Canada.
- 07/2017 Adolescent Social Isolation Increases Kappa Opioid Receptor Function in the Nucleus Accumbens and Basolateral Amygdala of Rats. International Narcotics Research Conference, Chicago, IL.
- 06/2017 Chronic Stress and Ethanol-Mediated Alterations in Norepinephrine Transmission in Mesolimbic Circuitry. Research Society on Alcoholism Meeting, Denver, CO.
- 05/2017 Social Isolation Stress Increases Kappa Opioid Receptor Function on Dopamine Terminals in the Nucleus Accumbens of Rats. Alcoholism and Stress: A Framework for Future Treatment Strategies, Volterra, Italy.
- 04/2017 Adolescent Social Isolation-Potentiated Kappa Opioid Receptor Function Augments Cocaine Seeking in Adulthood. Kappa Therapeutic Conference, Philadelphia, PA.
- 02/2016 Social Isolation Stress Increases Kappa Opioid Receptor Function in the Nucleus Accumbens. Gordon Research Conference: Alcohol & the Nervous System, Galveston, TX.
- 04/2015 Adolescent Social Isolation Sensitizes the Kappa Opioid Receptor System Affecting Dopamine Regulation in the Nucleus Accumbens. Kappa Therapeutic Conference, Chapel Hill, NC.

Departmental Seminars

- 04/2017 Adolescent Social Isolation-Potentiated Kappa Opioid Receptor Function Augments Cocaine Seeking in Adulthood. Department of Neurobiology & Anatomy, Drexel University College of Medicine, Philadelphia, PA.
- 11/2016 Early-Life Stress Induced Addictive Behaviors are Mediated by Upregulated Kappa Opioid Receptor System Function. Department of Biological Sciences, Tata Institute of Fundamental Research, Mumbai, India.
- 04/2016 Adolescent Social Isolation-Induced Increased Ethanol Intake is Reversed by Kappa Opioid Receptor Blockade by Normalizing Dopamine Transmission. Department of Biological Sciences, Winston-Salem State University, Winston-Salem, NC.
- 04/2014 Social Isolation Rearing Increases Dopamine and Norepinephrine Responses to Ethanol and κ -Opioid Receptor Activity in Nucleus Accumbens. Department of Physiology and Pharmacology, Wake Forest School of Medicine, Winston-Salem, NC.
- 03/2013 Social Isolation Stress Effects on Dopamine and Norepinephrine in the Nucleus Accumbens. Department of Physiology and Pharmacology, Wake Forest School of Medicine, Winston-Salem, NC.
- 09/2008 Spatial Effects of Shifting Prisms on Properties of Posterior Parietal Cortex Neurons. Department of Experimental Psychology, University of Oxford, UK.
- 09/2008 An Adaptive Sensorimotor Representation for Reaching in Inferior Parietal Lobule of Behaving Monkeys. Department of Physiology, University of Bologna, Italy.

CHAired/ORGANIZED SYMPOSIA AND SEMINARS

- 06/2018 Stress, alcohol, and the kappa opioid system: What's age got to do with it? Research Society on Alcoholism Meeting, San Diego, CA.
- 03/2018 A reversal of fortune for peptides and endocannabinoids: from poor cousins to rich regulators of brain microcircuits. Monitoring Molecules in Neuroscience, Oxford, UK.
- 03/2018 Gordon Research Seminar on Alcohol and the Nervous System. Gordon Research Conferences, Galveston, TX.
- 06/2017 Molecules, synapses and systems: Dissecting the neural circuitry of alcohol abuse. Research Society on Alcoholism Meeting, Denver, CO.
- 05/2017 Neurobiological differences and similarities between models of dependence and vulnerability to alcoholism. Alcoholism and Stress: A Framework for Future Treatment Strategies, Volterra, Italy.

SELECTED CONFERENCE ABSTRACTS (out of a total of 35)

1. Ewin SE, Albertson SE, Jones SR, Weiner JL, **Karkhanis AN** (2018) Early-life stress augments kappa opioid receptor function selectively on glutamate and dopamine terminals in caudal nucleus accumbens of female rats. Society for Neuroscience.
2. **Karkhanis AN**, Weiner JL, Jones SR (2017) Adolescent social isolation-induced increased ethanol intake is mediated by increased kappa opioid receptor function in the nucleus accumbens and basolateral amygdala of rats. American College of Neuropharmacology.
3. **Karkhanis AN**, Weiner JL, Jones SR (2017) Adolescent social isolation increases kappa opioid receptor function in the nucleus accumbens and basolateral amygdala of rats. Society for Neuroscience.
4. **Karkhanis AN**, Weiner JL, Jones SR (2017) Adolescent social isolation augments kappa opioid receptor function in the nucleus accumbens and basolateral amygdala. Gordon Research Conference and Seminar on Catecholamines.
5. **Karkhanis AN**, Weiner JL, Jones SR (2017) Adolescent social isolation increases kappa opioid receptor function in the nucleus accumbens and basolateral amygdala of rats. International Narcotics Research Conference.
6. **Karkhanis AN**, Jones SR (2017) Chronic stress and ethanol-mediated alterations in norepinephrine transmission in mesolimbic circuitry. Research Society on Alcoholism meeting.
7. **Karkhanis AN**, Leussen DJ, Weiner JL, Rong C, Jones SR (2017) Social isolation stress increases kappa opioid receptor function on dopamine terminals in the nucleus accumbens of rats. Alcoholism and Stress: A Framework for Future Treatment Strategies.
8. Holleran KM, **Karkhanis AN**, Rose JH, Siciliano CA, Grant K, Jones SR (2017) Regulation of dopamine and dynorphin/KOR function by chronic ethanol and withdrawal in mice and monkeys. Alcoholism and Stress: A Framework for Future Treatment Strategies.
9. **Karkhanis AN**, Albertson SE, Weiner JL, Jones SR (2017) Early life stress-potentiated cocaine seeking is mediated by upregulation of kappa opioid receptor function. The American Society for Pharmacology and Experimental Therapeutics meeting.
10. **Karkhanis AN**, Leussen DJ, Albertson SE, Weiner JL, Rong C, Jones SR (2017) Adolescent social isolation-potentiated kappa opioid receptor function augments cocaine seeking in adulthood. Kappa Therapeutic Conference.
11. **Karkhanis AN**, Rose JH, Weiner JL, Jones SR (2016) Social isolation stress increases kappa opioid receptor function in the nucleus accumbens and basolateral amygdala of rats. Gordon Research Conference on Alcohol and the Nervous System.

12. **Karkhanis AN**, Ferris MJ, Yorgason JT, Weiner JL, Jones SR (2015) Chronic early life social isolation stress alters presynaptic dopamine terminal dynamics in the nucleus accumbens of adult rats. Gordon Research Conference on Catecholamines.
13. **Karkhanis AN**, Rose JH, Weiner JL, Jones SR (2015) Social isolation stress increases k-opioid receptor activity in the nucleus accumbens shell and core. Research Society on Alcoholism meeting.
14. **Karkhanis AN**, Rose JH, Weiner JL, Jones SR (2015) Adolescent social isolation sensitizes the kappa opioid receptor system affecting dopamine regulation in the nucleus accumbens. Kappa Therapeutic Conference.
15. **Karkhanis AN**, Rose JH, McCool BA, Weiner JL, Jones SR (2014) Social isolation stress affects the kappa opioid receptor system in the nucleus accumbens and the basolateral amygdala. Society for Neuroscience meeting.
16. **Karkhanis AN**, McCool BA, Weiner JL, Jones SR (2014) Social isolation stress augments dopamine and norepinephrine responses to ethanol in the nucleus accumbens and the basolateral amygdala. Research Society on Alcoholism meeting.
17. **Karkhanis AN**, Konstantopoulos J, Locke J, Weiner JL, Jones SR (2013) Social isolation rearing increases dopamine and norepinephrine responses to ethanol and κ -opioid receptor activity in nucleus accumbens. Research Society on Alcoholism meeting.

PROFESSIONAL AFFILIATIONS

2017 – Present	<i>Member</i> , Office of Women in Medicine and Science
2016 – Present	<i>Member</i> , Center for Research on Substance Use and Addiction
2016 – Present	<i>Member</i> , Behavioral Pharmacology and Neuropharmacology Divisions, American Society for Pharmacology and Experimental Therapeutics
2013 – Present	<i>Member</i> , Research Society on Alcoholism
2006 – Present	<i>Member</i> , Society for Neuroscience
2006 – 2010	<i>Member</i> , Vision Sciences Society
2005 – Present	<i>Member</i> , PSI CHI – The International Honor Society of Psychology

SERVICE

Member of Review Board

2018 – Present	PSI CHI Evaluator Team
2018 – Present	PSI CHI Awards Committee

Ad-Hoc Reviewer for Peer-reviewed Journals

Scientific Reports; Neuropharmacology; ACS Chemical Neuroscience; Drug and Alcohol Dependence; Alcohol; Behavioral Brain Research; Current Neuropharmacology; Pharmacology, Biochemistry and Behavior; Psychopharmacology; Experimental Neurology

Ad-Hoc Reviewer for Fellowships, Training, and Grant Awarding Programs

2017	Graduate Women in Science National Fellowship Program
	Post-baccalaureate Research Education Program, Wake Forest School of Medicine

Judge for Poster Competitions

2018	Gordon Research Conference: Alcohol & the Nervous System, Galveston, TX
	Women's Health Research Day, Wake Forest School of Medicine, Winston-Salem, NC
2017	Behavioral Pharmacology division of American Society for Pharmacology and Experimental Therapeutics, Chicago, IL

Society Service

- 2018 Invited speaker at the National Institute on Alcohol Abuse and Addiction (NIAAA) sponsored Meet and Greet Event at the RSA 41st Annual meeting, San Diego, CA
Led the Women in Science Power Hour discussion at the Gordon Research Conference on Alcohol and the Nervous System, Galveston, TX

Institutional Committees & Service

- 2016 – 2018 Faculty Liaison for the Physiology & Pharmacology Graduate Student Committee, Wake Forest School of Medicine
2016 Departmental Faculty Retreat Organizing Committee, Department of Physiology & Pharmacology, Wake Forest School of Medicine

TEACHING EXPERIENCE

Instructor/Co-instructor

- 2017 – 2018 **Student Seminar**
Director, Graduate course, Wake Forest School of Medicine, Winston-Salem, NC
2013 – 2018 **Scientific Integrity**
Facilitator, Graduate course, Wake Forest School of Medicine, Winston-Salem, NC
2015 **Cognitive Neuroscience**
Instructor/Director, Undergraduate course, Winston-Salem State University, Winston-Salem, NC
2014 **Principles of Pharmacology**
Clinical Literature Core Director, Graduate course (Pre-medicine and Post-baccalaureate students), Wake Forest School of Medicine, Winston-Salem, NC
2007 **Critical Thinking in Neuroscience**
Coordinator, Graduate course, Rutgers University, Newark, NJ
2006 **Physiological Psychology**
Co-instructor, Undergraduate course, Rutgers University, Newark, NJ

Teaching Assistantships

- 2009 – 2010 **Neurobiology**
Teaching Assistant, Undergraduate writing intensive course, Rutgers University, Newark, NJ
2005 **Physiological Psychology**
Teaching Assistant, Undergraduate course, Rutgers University, Newark, NJ
2004 – 2005 **Principles of Psychology 101**
Teaching Assistant, Undergraduate course, Rutgers University, Newark, NJ

Guest Lectures

- 2017 **Current Topics in Drug Abuse**
Guest Lecturer (Involvement of Kappa Opioid Receptors in Drug and Alcohol Abuse), Graduate course, Wake Forest School of Medicine, Winston-Salem, NC

- 2014 **Anatomy and Physiology**
Guest Lecturer (Nervous Tissue), Undergraduate course, Winston-Salem State University, Winston-Salem, NC
- 2009 – 2010 **Neurobiology**
Guest Lecturer (Visual System), Undergraduate writing intensive course, Rutgers University, Newark, NJ

MENTORING AND VOLUNTEER EXPERIENCE

- 01/18 – 08/18 *Mentor*, Brianna George, Graduate student in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 01/18 – 05/18 *Mentor*, Amy C. Leach, Rotating Graduate student in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 2017 – 2018 *Mentor*, Paige Estave, Graduate student (MD/Ph.D.) in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 2016 – 2018 *Mentor*, Sarah E. Ewin, Graduate student in laboratory of Jeff L. Weiner, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 2016 – 2017 *Mentor*, Katherine M. Holleran, Ph.D., Post-doctoral fellow in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 2016 – 2017 *Mentor*, Madelyn Mauterer, Graduate student in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 2014 – 2018 *Organizer*, Brain awareness outreach event for high school and middle school students involved in the SciTech Program, Wake Forest School of Medicine, Winston-Salem, NC.
- 2012 – 2016 *Co-organizer and Volunteer*, Brain awareness outreach event focused on drug addiction education for high school and middle school students, in collaboration with Kernersville Cares for Kids, Wake Forest School of Medicine, Winston-Salem, NC.
- 2011 – 2015 *Mentor*, Jamie H. Rose, Ph.D., Graduate student in laboratory of Sara R. Jones, Ph.D., Wake Forest School of Medicine, Winston-Salem, NC.
- 06/15 – 08/15 *Mentor*, Chandler F. Cox III, Undergraduate Scholar in the Summer Research Fellowship program, Wake Forest School of Medicine, Winston-Salem, NC.
- 06/14 – 08/14 *Mentor*, Stephanie Saadeh, Undergraduate Scholar in the Excellence for Cardiovascular Sciences Fellowship program funded by the National Institutes of Health, Wake Forest School of Medicine, Winston-Salem, NC.
- 2011 – 2012 *Mentor*, Angelique Ciliberti, Undergraduate Independent Study student, Wake Forest School of Medicine, Winston-Salem, NC.
- 2009 – 2010 *Mentor*, Adam Butensky, Undergraduate research assistant, Rutgers University, Newark, NJ.
- 2007 – 2010 *Organizer*, Post-doctoral and Graduate Student Seminar Series, Rutgers University, Newark, NJ.