

## NIKKI CROWLEY, PH.D.

Assistant Research Professor

Department of Biobehavioral Health | Penn State University

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### EDUCATION

|      |                                                                                      |
|------|--------------------------------------------------------------------------------------|
| 2015 | <b>University of North Carolina Chapel Hill</b><br>Ph.D. in Neurobiology             |
| 2011 | <b>University of North Carolina Wilmington</b><br>M.A. in Psychology                 |
| 2008 | <b>James Madison University</b><br>B.S. in Psychology (major) and Statistics (minor) |

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### PROFESSIONAL POSITIONS

|             |                                                                                                                       |
|-------------|-----------------------------------------------------------------------------------------------------------------------|
| 2018 –      | Assistant Research Professor, Department of Biobehavioral Health, PSU                                                 |
| 2019 –      | Faculty Affiliate, Neuroscience PhD Program, PSU                                                                      |
| 2019 –      | Faculty Affiliate, The Huck Institutes of the Life Sciences, PSU                                                      |
| 2019 –      | Faculty Affiliate, College of Medicine, PSU                                                                           |
| 2018 –      | Faculty Affiliate, Center for the Molecular Investigation of Neurological Disorders, PSU                              |
| 2016 – 2018 | Postdoctoral Fellow, Department of Biology, Penn State University                                                     |
| 2009 – 2011 | Post-baccalaureate Intramural Research Training Award Fellow, National Institute on Alcohol Abuse and Alcoholism, NIH |
| 2008        | Post-baccalaureate Intramural Research Training Award Fellow, National Institute on Environmental Health Science, NIH |

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### PUBLICATIONS

[Find me on PubMed](#)

- [20] Torruella-Suarez, Vandenberg, Cogan, Tipton, Teklezghi, Dange, Patel, McHentry, Hardaway, Kantak, **Crowley**, DiBerto, Faccidomo, Hodge, Stuber, & McElligott (2019) Manipulation of central amygdala neurotensin neurons alter the consumption of rewarding fluids in mice. *Journal of Neuroscience*
- [19] Dao, Brockway, & **Crowley** (2019). Novel characterization of peptidergic release from prefrontal cortical somatostatin neurons. *Neuroscience*
- [18] **Crowley**, Magee, Bourcier, Dao, & Lowery-Gionta (2019). Animal models of alcohol use disorders and the brain: from casual drinking to dependence. *Translational Issues in Psychological Sciences*
- [17] Feng, **Crowley**, Patel, Guo, Bugni, & Luscher (2019). Reversal of a treatment-resistant, depression-related brain state with the Kv7 channel opener retigabine. *Neuroscience*
- [16] **Crowley**, Magee, Feng, Jefferson, Morris, Dao, Brockway, & Luscher (2019). An antidepressant dosage of ketamine normalizes binge drinking-induced defects in glutamatergic synaptic transmission

and ethanol drinking behavior. *Neuropharmacology*

- [15] Lowery-Gionta\*, **Crowley\*** [Co-First Authorship], Bukalo\*, Silverstein, Holmes, & Kash (2018). Chronic stress dysregulates amygdalar output to the prefrontal cortex. *Neuropharmacology*
- [14] Caruso, **Crowley**, Reiss, Caulfield, Luscher, Cavigelli, & Kamens (2018). Adolescent social stress increases anxiety-like behavior and alters synaptic transmission, without influencing nicotine responses, in a sex-dependent manner. *Neuroscience*
- [13] **Crowley**, Bloodgood, Hardaway, Kendra, McCall, Al-Hasani, McCall, Yu, Schools, Krashes, Lowell, Whistler, Bruchas, & Kash (2016). Dynorphin controls the gain of an amygdalar anxiety circuit. *Cell Reports*
- [12] Al-Hasani, McCall, Shin, Gomez, Schmitz, Bernardi, Pyo, Park, Marcinkiewicz, **Crowley**, Krashes, Lowell, Kash, Rogers, & Bruchas (2015). Distinct subpopulations of nucleus accumbens dynorphin neurons drive aversion and reward. *Neuron*
- [11] Pleil, Lowery-Gionta, **Crowley**, Li, Marcinkiewicz, McCall, Maldonado-Devicci, Morrow, & Kash (2015). Effects of chronic ethanol exposure on neuronal function in discrete regions of the prefrontal cortex and extended amygdala. *Neuropharmacology*
- [10] Vardy, Robinson, Li, Olsen, DiBerto, Sassano, Huang, Zhu, Urban, Rittiner, **Crowley**, Pleil, Song, Kash, Malanga, Krashes, & Roth (2015). A DREADD for multiplexing chemogenetic interrogation of neural circuits. *Neuron*
- [9] **Crowley** & Kash (2015). Kappa opioid receptor signaling throughout the brain: Involved circuitry and implications for treatment. *Progress in Neuro-psychopharmacology and Biological Psychiatry*
- [8] Hardaway\*, **Crowley\*** [Co-First Authorship], Bulik, & Kash (2015). Integrated circuits and molecular components for stress and feeding: Implications for eating disorders. *Genes, Brains, and Behavior*.
- [7] Kash, Pleil, Marcinkiewicz, Lowery-Gionta, **Crowley**, Mazzone, Sugam, Hardaway, & McElligott (2014). Neuropeptide signaling in the BNST. *Molecules and Cells*
- [6] Masneuf\*, Lowery-Gionta\*, Colacicco, Pleil, Li, **Crowley**, Stamatakis, Flynn, Holmes, & Kash (2014). Glutamatergic mechanisms associated with stress-induced amygdala excitability and anxiety related behavior. *Neuropharmacology*
- [5] DePoy, Daut, Wright, Camp, **Crowley**, Noronha, Lovinger, & Holmes (2014). Chronic alcohol alters reward behaviors and striatal plasticity. *Addiction Biology*
- [4] Parisiadou, Yu, Sgobio, Xie, Lui, Sun, Gu, Lin, **Crowley**, Lovinger, & Cai (2014). LRRK2 regulates synaptogenesis and dopamine receptor activation of striatal projection neurons through modulation of PKA activity. *Nature Neuroscience*

- [3] **Crowley**, Cody, Davis, Lovinger, & Mateo (2013). Chronic methylphenidate exposure during adolescence reduces striatal synaptic responses to ethanol. *European Journal of Neuroscience*
- [2] Depoy, Daunt, Brigman, MacPherson, **Crowley**, Gunduz-Cinar, Pickens, Cinar, Saksida, Kunos, Lovinger, Bussey, Camp, & Holmes (2013). Chronic alcohol produces neuroadaptations to prime striatal learning. *Proceedings of the National Academy of Sciences*
- [1] Mathur, **Capik**, Alvarez, & Lovinger (2011). Serotonin-mediated competitive long-term depression at corticostriatal synapses. *Journal of Neuroscience* // paper published under maiden name

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## **PUBLICATIONS – SUBMITTED OR IN REVISION**

- [2] McSweeney, **Crowley**, Deng, Jian, Zou, Shi, Vitale, Liu, Luscher, & Mao (in revision). An exon junction complex factor, RBM8a, is required for normal interneuron development.
- [1] Swarhari, Nakamura, Stroud, Plestant, **Crowley**, Lowery-Gionta, Flowers, Liang, Kurtz, He, Sethupathy, Moy, Kash, Anton, Greenberg, & Deshmukh (in revision). MicroRNA-29 is an essential regulator of DNA methylation during brain maturation.

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## **FUNDING**

### **Current Funding**

#### **NARSAD Young Investigator's Award**

*January 2019 – January 2021*

Role: PI

#### **National Institute on Alcohol Abuse and Alcoholism**

*August 2019-August 2021*

National Institutes of Health LRP Awardee

*Investigation of Key Pathways Modulated by Juvenile chronic variable social stress*

Role: PI

#### **Consortium to Combat Substance Abuse**

*June 2019-June 2021*

*Investigation of key opioid pathways modulated by adolescent chronic variable social stress*

Role: PI

### **Submitted Funding**

#### **National Institute of Alcohol Abuse and Alcoholism**

R21 (PI: Crowley) A0 Priority Score: 21

*Investigation of a novel prelimbic cortical peptidergic population in binge drinking behavior*

Role: PI

#### **The Whitehall Foundation**

Letter of Intent // selected for full submission February 2020

Role: PI

*Elucidating somatostatin signaling in the bed nucleus of the stria terminalis*

**National Institutes of Health**

R01 (PI: Mao)

*Dissecting the molecular control for CTNNB1 syndrome*

Role: Co-I

**National Institutes of Health**

R01 (PI: Cavigelli). AO: not discussed

*Allergic asthma: effects on neurobiological development*

Role: Co-I

**Completed Funding**

**College of Health and Human Development**

*January 2016-January 2018*

**PSU Institutional Grant**

**National Institute on Alcohol Abuse and Alcoholism**

*August 2017-August 2019*

National Institutes of Health LRP Awardee

*Investigation of Key Pathways Modulated by Juvenile chronic variable social stress*

Role: PI

**Pennsylvania State University**

*August 2016-August 2019*

Social Science Research Institute Level 2 Award

*Investigation of the role of somatostatin neurons in alcohol consumption*

Role: PI

**UNC School of Medicine**

*August 2015-December 2015*

**Dissertation Completion Fellowship**

Awarded at the recommendation of the Graduate School for Excellence in Research

Role: Fellow

**National Institute on Alcohol Abuse and Alcoholism**

*June 2013-December 2015*

Ruth L. Kirschstein NRSA

*Alcohol Regulation of kappa opioid receptor systems in the extended amygdala. (Priority Score: 10)*

Role: Fellow

**National Institute on Alcohol Abuse and Alcoholism**

*June 2009-August 2011*

Intramural Research Training Award

Role: Fellow

**National Institute of Environmental Health Sciences**

*May 2008-September 2008*

Intramural Research Training Award

Role: Fellow

**James Madison University Department of Psychology**

*January 2008-May 2008*

Undergraduate Research Grant

*Saccharin concentration impact on consumption and preference within the Chronic Mild Stress procedure*

Role: PI

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**INVITED SYMPOSIA**

**Crowley (2020)** Penn State Addiction Center for Translation, Hershey, PA

**Crowley (2019)** Integrative Neuroscience Research Center Seminar, Marquette University, Milwaukee WI

**Crowley (2019)** Department of Anatomy and Neurobiology at the University of Maryland School of Medicine, Baltimore MD

**Crowley (2019)** Department of Biology, Pennsylvania State University, University Park, PA

**Crowley (2018)** Binge drinking and the brain: the role of synaptic balance in the prefrontal cortex. Department of Biobehavioral Health, University Park, PA.

**Crowley (2018)** Alcohol and the brain. Guest speaker at Westfield High School, Chantilly, VA.

**Crowley & Luscher (2017)** An antidepressant dosage of ketamine normalizes binge drinking-induced defects in glutamate synaptic transmission and ethanol drinking behavior. Center for the Investigation of Neurological Disorders Annual Retreat, University Park, PA.

**Crowley & Luscher (2016)** Genetic models of major depressive disorder and alcohol use disorder comorbidity. Symposium at the Second Annual Penn State Addiction Symposium, Hershey, PA.

**Crowley & Luscher (2016)** Comorbid mechanisms underlying alcoholism and major depressive disorder. Center for the Investigation of Neurological Disorders Annual Retreat, University Park, PA.

**Crowley (2016)** Dynorphin controls the gain of an amygdala anxiety circuit. Center for the Investigation of Neurological Disorders Symposia, University Park, PA.

**Crowley & Kash (2015)** Chronic intermittent ethanol exposure (CIE) modulates BNST GABA and glutamate transmission and social behavior in a kappa opioid receptor (KOR) dependent manner. Symposium at the annual meeting on the Therapeutic Potential of Kappa Opioids in Pain and Addiction, Chapel Hill, NC.

**Crowley (2014)** Using Optogenetics to Alter Neural Signaling in the Amygdala: Novel Targets for the Treatment of Anxiety Disorders. Invited presentation, Arizona State University, Phoenix, AZ.

**Crowley & Kash (2014)** Extended amygdala circuits and behavior. Nanosymposium, Annual Meeting for the Society for Neuroscience, Washington, DC.

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## CONFERENCE PRESENTATIONS (POSTERS – FIRST AUTHOR ONLY)

- Crowley** & Luscher (2017) Assessing the contribution of somatostatin-positive interneurons in the Drinking in the dark binge-like ethanol consumption model. Research Society on Alcoholism, Denver, CO.
- Crowley** & Luscher (2017) Assessing the contribution of somatostatin-positive interneurons in the Drinking in the dark binge-like ethanol consumption model. Alcohol and Stress: A Framework for Future Treatment Strategies, Volterra, Italy
- Crowley** & Luscher (2016). Comorbid mechanisms underlying alcoholism and major depressive disorder. Center for the Investigation of Neurological Disorders Annual Retreat, University Park, PA
- Crowley**, McCall, Al-Hasani, McCall, Kendra#, Lopez#, Schools#, Krashes, Lowell, Bruchas, & Kash (2014). Dynorphin controls the gain of an amygdala anxiety circuit. Poster presentation at the inaugural Gordon Research Conference for Alcohol and the Nervous System, Galveston, TX.
- Crowley**, McCall, Al-Hasani, McCall, Kendra#, Lopez#, Schools#, Krashes, Lowell, Bruchas, & Kash (2014). Kappa opioid receptors modulate basolateral amygdala projections to the bed nucleus of the stria terminalis. Poster presented at annual conference Alcoholism and Stress: A Framework for Future Treatment Strategies, Volterra, Italy.
- Crowley**, McCall, Al-Hasani, McCall, Kendra, Lopez, Bruchas, & Kash (2014). Dynorphin controls the gain of an amygdala anxiety circuit. Kappa opioid receptors modulate basolateral amygdala projections to the bed nucleus of the stria terminalis.
- Capik**, McCall, Kendra, & Kash (2013). Kappa opioid receptors modulate basolateral amygdala projections to the bed nucleus of the stria terminalis. Poster presented at the annual meeting on the Therapeutic Potential of Kappa Opioids in Pain and Addiction, Boston, MA.
- Capik**, Lopez#, McCall, & Kash (2012). Differential modulation of glutamate and gaba via the kappa opioid receptor in the extended amygdala. Poster presented at the annual meeting for the Society of Neuroscience, Washington, DC.
- Capik**, Lopez#, McCall, & Kash (2012). Differential modulation of glutamate and gaba via the kappa opioid receptor in the extended amygdala. Poster presented at the annual meeting for the Research Society on Alcoholism, San Francisco, CA.
- Capik**, Lovinger, & Mateo (2010). Chronic adolescent methylphenidate administration causes behavioral alternations and synaptic changes in the striatum of C57BL/6J mice. Poster presented at the Society for Neuroscience Annual Meeting, San Diego, CA.
- Capik**, Lovinger, & Mateo (2010). Adolescent exposure to Ritalin modifies the striatal neuronal response to ethanol in adult rat. Poster accepted for presentation at the annual meeting of the Research Society on Alcoholism, San Antonio, TX, and the NIH/DHHS Spring Research Festival, Bethesda, MD.
- Capik**, Revri, Coleman, & Donlin (2010). The effects of random ratio shock on food consumption in a behavioral economics paradigm. Poster accepted for presentation annual meeting of the Association for Behavior Analysis, San Antonio, TX.
- Capik**, Revri, & Donlin, (2009). Examining punishment in a behavioral economics paradigm. Poster presented at the annual meeting of the Southeastern Association for Behavior Analysis, Wilmington, NC.
- Capik**, Key, McIntyre, Rosato, Welborn, & Donlin (2009). The validity of various smoking abstinence measures used in contingency management. Poster presented at the annual meeting of the Virginia Association for Behavior Analysis, Harrisonburg, VA.

- Capik**, Okada, Gianfranco, Salvador, Marczak, & Lazarus (2008). The effects of various mu-opioid antagonists on handling-induced convulsions in DBA/2J Mice. Poster presented at the annual meeting of the Southeastern Association for Behavior Analysis, Atlanta, GA.
- Capik**, Robertson#, & Serdikoff (2008). The Effects of Valerian Root on Anxiety in an Animal Model using the Elevated Plus Maze. Poster presented at the annual meeting of the Association of Behavior Analysis, Chicago, IL.
- Capik**, Robertson, Egan, Kopp, Hoffman, & Serdikoff (2007). The effects of saccharin concentration on saccharin consumption and preference: Implications for research involving the Chronic Mild Stress procedure. Poster presented at the annual meeting of the Southeastern Association for Behavior Analysis, Athens, GA.

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## AWARDS & HONORS

- |      |                                                                                                                                                                                                                                                                                                                                                    |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2019 | <b>NIH Center for Scientific Review</b><br>Early Career Reviewer Program (NAL – October 2019)<br><b>Neuroscience</b><br>Journal cover art selection ( <i>Issue #419C</i> )                                                                                                                                                                         |
| 2018 | <b>NARSAD Young Investigator Award</b><br>Brain and Behavior Research Foundation ( <i>funding 01/2019-01/2021</i> )                                                                                                                                                                                                                                |
| 2017 | <b>Nominee, 2017 Dean's Climate and Diversity Award</b><br>Awarding Organization: Eberly College of Science, Penn State University                                                                                                                                                                                                                 |
| 2014 | <b>Best Poster Award</b><br>Awarding Organization: <i>International Congress on Alcoholism and Stress</i>                                                                                                                                                                                                                                          |
| 2013 | <b>Student Merit Award</b><br>Awarding Organization: <i>Research Society on Alcoholism</i><br><b>Ruth L. Kirschstein National Research Service Award</b><br>Awarding Organization: <i>National Institute on Alcohol Abuse and Alcoholism</i>                                                                                                       |
| 2012 | <b>Student Merit Award</b><br>Awarding Organization: <i>Research Society on Alcoholism</i>                                                                                                                                                                                                                                                         |
| 2010 | <b>Graduate Research Award</b><br>Awarding Organization: <i>University of North Carolina – Wilmington</i><br><b>Student Merit Award</b><br>Awarding Organization: <i>Research Society on Alcoholism</i>                                                                                                                                            |
| 2008 | <b>Award for Outstanding Undergraduate Scholarship</b><br>Awarding Organization: <i>James Madison University Department of Psychology</i><br><b>Travel Award</b><br>Awarding Organization: <i>Association for Behavior Analysis – International</i>                                                                                                |
| 2007 | <b>Best Poster Award</b><br>Awarding Organization: <i>Eastern Psychological Association</i><br><b>Award for Outstanding Undergraduate Scholarship</b><br>Awarding Organization: <i>James Madison University Department of Psychology</i><br><b>Travel Award</b><br>Awarding Organization: <i>Association for Behavior Analysis – International</i> |
| 2006 | <b>Award for Outstanding Undergraduate Scholarship</b><br>Awarding Organization: <i>James Madison University Department of Psychology</i>                                                                                                                                                                                                          |

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## TEACHING AND MENTORING EXPERIENCE

### SUPERVISION OF STUDENT RESEARCH

#### Graduate Students (Primary Mentor)

|                 |                          |              |
|-----------------|--------------------------|--------------|
| Dakota Brockway | Neuroscience PhD Program | 2018-present |
|-----------------|--------------------------|--------------|

#### Graduate Students (Committee Member)

|                 |                   |              |
|-----------------|-------------------|--------------|
| Laurel Semiller | MCIBS PhD Program | 2019-present |
|-----------------|-------------------|--------------|

#### Undergraduate Student (Primary Mentor)

|                    |                                     |              |
|--------------------|-------------------------------------|--------------|
| Malini Nair        | Biology                             | 2018-present |
| Brody Moyer        | Biochemistry and Molecular Biology  | 2018-present |
| Veronica Sendao    | Chemistry                           | 2018-present |
| Sarah Magee        | Biology (Millennium Scholar)        | 2016-2019    |
| Alexandre Bourcier | Biology (Schreyer's Honors College) | 2016-2019    |

#### Title and source: student supported grants

#### Total

|                                  |         |
|----------------------------------|---------|
| Student Engagement Network (SEN) | \$1,000 |
|----------------------------------|---------|

Awarded to Malini Nair (Crowley: faculty mentor)

|                                                     |       |
|-----------------------------------------------------|-------|
| Anita M. Collins Undergraduate Research Fund (2019) | \$478 |
|-----------------------------------------------------|-------|

Awarded to Malini Nair (Crowley: faculty mentor)

|                                            |         |
|--------------------------------------------|---------|
| Rock Ethics Institute Rise Up Award (2019) | \$1,000 |
|--------------------------------------------|---------|

Awarded to Alexandre Bourcier (Crowley: faculty mentor)

|                                                     |         |
|-----------------------------------------------------|---------|
| Anita M. Collins Undergraduate Research Fund (2018) | \$1,800 |
|-----------------------------------------------------|---------|

Awarded to Alexandre Bourcier (Crowley: faculty mentor)

|                                                      |         |
|------------------------------------------------------|---------|
| Schreyer Honor's College Summer Research Fund (2018) | \$1,800 |
|------------------------------------------------------|---------|

Awarded to Alexandre Bourcier (Crowley: faculty mentor)

|                                            |         |
|--------------------------------------------|---------|
| Edward C. Hammond Jr. Memorial Scholarship | \$2,000 |
|--------------------------------------------|---------|

Awarded to Alexandre Bourcier (Crowley: faculty mentor)

### TEACHING EXPERIENCE

#### Recent Guest Lectures

Penn State University BIO/BBH 469: *Formation and Elimination of Synapses*. Fall 2016

Penn State University BIO/BBH 470: *Electrophysiology* Spring 2017

Penn State University BIO/BBH 470: *Reward, Motivation, and Addiction* Spring 2017

Penn State University BIO/BBH 470: *Animal Models of Alcoholism* Spring 2017

Penn State University BIO/BBH 470: *Opioids* Spring 2017



### Teaching Assistant

James Madison University: PSYC 180 Introduction to Behavior Analysis

James Madison University: PSYC 211 Psychological Research Methods

James Madison University: PSYC 390 Psychology of Learning

### *Graduate students*

- BBSP First Year Mentor: Faculty Supervisor: Dr. Christopher Mack 2012-13. University of North Carolina (Biological and Biomedical Sciences Program)
- BBSP First Year Mentor: Faculty Supervisor: Dr. Donita Robinson 2013-14. University of North Carolina (Biological and Biomedical Sciences Program)

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## **SERVICE & OUTREACH**

|              |                                                                                                                              |
|--------------|------------------------------------------------------------------------------------------------------------------------------|
| 2019         | Early Career Reviewer, NIH Center for Scientific Review (Study Section: NAL)                                                 |
| 2017         | Guest speaker, Westfield High School, Chantilly Virginia                                                                     |
| 2017         | PSU Smoke Free Task Force ( <i>silent observer</i> )                                                                         |
| 2017         | PSU Communications and Onboarding Working Group (Research Computing and Cyberinfrastructure Advisory Council to the Provost) |
| 2016-Present | PSU Program for Translation Research on Adversity and Neurodevelopment (P-TRAN)                                              |
| 2016-Present | PSU Undergraduate Neighbor-Neighbor Outreach                                                                                 |
| 2010-2015    | UNC Biological & Biomedical Science's Student Liaison Committee                                                              |
| 2013         | UNC Perl Prize Committee                                                                                                     |
| 2012-2015    | UNC School of Medicine Graduate Student Recruitment                                                                          |
| 2009-2010    | NIH Scientific Careers Community Outreach                                                                                    |

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## **PROFESSIONAL ACTIVITIES**

### **NIH CSR**

2019 Early Career Reviewer – NAL

### **Journal Reviewer**

Frontiers in Molecular Neuroscience

### *Ad Hoc Reviewer*

Psychopharmacology

Alcohol

Neurobiology of Stress

|              |                                                                 |
|--------------|-----------------------------------------------------------------|
| 2019-present | <i>Member</i> , Society for Biological Psychiatry               |
| 2011-present | <i>Member</i> , International Congress on Alcoholism and Stress |
| 2010-present | <i>Member</i> , Society for Neuroscience                        |
| 2010-present | <i>Member</i> , Research Society on Alcoholism                  |
| 2006-2009    | <i>Member</i> , Association for Behavior Analysis               |
| 2009-2010    | <i>Member</i> , Society for Research in Child Development       |
| 2006-2009    | <i>Member</i> , Eastern Psychological Association               |