



EDUCATION

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

PROFESSIONAL POSITIONS

- 2020 – Assistant Professor, Departments of Biology and Biomedical Engineering, Penn State

Current Affiliations:

- 2021 – Center for Neurotechnology in Mental Health Research, PSU
2021 – Center for Neural Engineering, PSU
2019 – Neuroscience PhD Program, PSU
2019 – The Huck Institutes of the Life Sciences, PSU
2019 – College of Medicine, PSU
2018 – Center for the Molecular Investigation of Neurological Disorders, PSU

Previous Positions:

- 2018 – 2020 Assistant Research Professor, Department of Biobehavioral Health, 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

PUBLICATIONS [PubMed](#) [Google Scholar](#)

- [25] Sicher, Duerr, Starnes, & **Crowley [corresponding author]** (2022). Adolescent alcohol and stress exposure rewires key cortical neurocircuitry. *Frontiers in Neuroscience*
- [24] **Crowley (co-corresponding author)** & Joffe (2021) Developing breakthrough psychiatric treatments by modulating G protein-coupled receptors on prefrontal cortex somatostatin interneurons. *Neuropsychopharmacology*
- [23] Dao, Brockway, Suresh Nair, Sicher, & **Crowley [corresponding author]** (2021). Somatostatin neurons control an alcohol binge drinking prelimbic microcircuit in mice. *Neuropsychopharmacology*
See also: Neuropsychopharmacology Research Highlight on this work:
<https://www.nature.com/articles/s41386-021-01103-5>
- [22] McSweeney, **Crowley**, Deng, Jian, Zou, Shi, Vitale, Liu, Luscher, & Mao (2020). An exon junction complex factor, RBM8a, is required for normal interneuron development. *Translational Psychiatry*
- [21] Brockway & **Crowley [corresponding author]** (2020). Turning the ‘tides on neuropsychiatric diseases: the role of peptides in the prefrontal cortex. *Frontiers in Behavioral Neuroscience*
- [21] Dao, Nair, Magee, Moyer, Sendao, Brockway, & **Crowley [corresponding author]** (2020). Forced Abstinence from alcohol induces sex-specific depression-like behavior and neural adaptations in somatostatin neurons in cortical and amygdalar regions. *Frontiers in Behavioral Neuroscience*
- [20] Torruella-Suarez, Vandenberg, Cogan, Tipton, Teklezghi, Dange, Patel, McHenry, Hardaway, Kantak, **Crowley**, DiBerto, Faccidomo, Hodge, Stuber, & McElligott (2020) Manipulation of central amygdala neurotensin neurons alter the consumption of rewarding fluids in mice. *Journal of Neuroscience*

- [19] Dao, Brockway, & **Crowley [corresponding author]** (2019). Novel characterization of peptidergic release from prefrontal cortical somatostatin neurons. *Neuroscience*
- [18] **Crowley [corresponding author]**, 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-Devincci, 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*

PUBLICATIONS – SUBMITTED/IN REVISION/PREPRINTS

- [1] Suresh Nair, Dao, Lopez Melean, Griffith, Duerr, Starnes, Moyer, Sicher, Brockway, & **Crowley**

[corresponding author] Activation of somatostatin neurons in the bed nucleus of the stria terminalis reduces binge drinking without altering anxiety-like behavior in mice. Invited submission, *Brain Research Bulletin*

FUNDING

CURRENT FUNDING

R01 NIAAA/NIH (Award #R01AA029403-01A1) 2022-2027 total: \$1,604,953

Prelimbic somatostatin peptide signaling in binge ethanol consumption

Role: PI (Co-I: Patrick Drew, PSU Engineering Science and Mechanics)

Benkovic Research Initiative 2022-2023 total year 1: \$150,000

Novel methods for non-invasive neuropeptide administration to the brain

Role: PI (Co-PI: Scott Medina, PSU Biomedical Engineering)

P50 NIAAA/NIH (Award #P50AA017823) 2021-2023 subaward total: \$140,700

Binghamton University Developmental Exposure to Alcohol Research Center

Title: Impact of Adolescent Alcohol on Prefrontal Circuits

Role: PI of PSU subaward (Binghamton on-site co-PI: David Jentsch)

R21 NIAAA/NIH (Award# AA028088-01) 2020-2022 total: \$392,244

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

Role: PI

NIH Office of the Director (Administrative Supplement #AA028088-02S1) 2021-2022 total: \$80,250

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

Role: PI

NIAAA/NIH 2019-2023

National Institutes of Health LRP (2nd renewal award)

Investigation of key pathways modulated by juvenile chronic variable social stress

Role: PI

GRADUATE STUDENT-LED FUNDING

Physiological Adaptations to Stress T32 Award

PI: Avery Sicher, Neuroscience PhD Student

Role: Sponsor

SUBMITTED – GRADUATE STUDENT-LED FUNDING

F31 NRSA (NIAAA)

Investigating the effects of adolescent binge drinking on prelimbic somatostatin circuitry

PI: Avery Sicher, Neuroscience PhD Program

Role: Sponsor. Co-Sponsor: Dr. Patrick Drew. Impact Score: 30. **Award Pending**

Cross-Disciplinary Neural Engineering T32 Training Fellowship (NINDS)

PI: Md Shakhawat Hossain, Biomedical Engineering PhD Program

Role: Co-Mentor. Primary Mentor: Dr. Patrick Drew

COMPLETED FUNDING

The Brain and Behavior Research Foundation 2019-2022

NARSAD Young Investigator Award (Award #27200) total: \$70,000

Title: Investigating the role of prelimbic somatostatin neurons in binge ethanol consumption

Role: PI

Penn State Consortium to Combat Substance Abuse 2019-2021

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

Role: PI

NIAAA/NIH 2017-2019

National Institutes of Health LRP Awardee

Investigation of Key Pathways Modulated by Juvenile chronic variable social stress

Role: PI

Penn State Social Science Research Institute 2016-2019

Investigation of the role of somatostatin neurons in alcohol consumption

Role: PI

UNC School of Medicine 2015

Dissertation Completion Fellowship

Role: Fellow

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

NIAAA/NIH NRSA (Award #1F31AA022280-01) 2013-2015

Ruth L. Kirschstein NRSA

Alcohol Regulation of kappa opioid receptor systems in the extended amygdala

Role: Fellow (Mentors: Dr. Thomas Kash, Dr. David Lovinger)

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

INVITED PRESENTATIONS, SEMINARS, ETC.

2022 (scheduled) Medical University of South Carolina Addiction Research Seminar Series (joint with Department of Neuroscience). Charleston, South Carolina, October 2022

Neuropeptide control over prefrontal cortex circuits Bernard B. Brodie Lectureship in Pharmacology. PSU College of Medicine, Hershey, PA March 2022

Neuropeptide control over prefrontal cortex circuits National Institute on Mental Health. Bethesda, MD March 2022

Neuropeptide control over prefrontal cortex circuits. Department of Biomedical Engineering seminar series. PSU University Park, PA February 2022

2021 *Neuropeptide control over prefrontal cortex circuits*

Uniformed Services University of the Health Sciences (US Army Medical School). Bethesda MD November 2021

Dissecting the neural circuitry of drug abuse Molecular, Cellular, and Integrative Biosciences Annual Retreat. Penn State University, August 2021

A Pint of Peptides: The Role of Neuropeptides in Alcohol Use Disorder. Center for Neural Engineering, Penn State University. April 2021

2020 *A pint of peptide: The role of SST peptide signaling in binge alcohol consumption.* Developmental Exposure Alcohol Research Center (DEARC) Binghamton University, Binghamton NY. November 2020

Novel peptidergic targets for Alcohol Use Disorder. University of Delaware Neuroscience Group. September 2020

Novel peptidergic targets for Alcohol Use Disorder. Penn State Addiction Center for Translation, Hershey, PA. January 2020

2019 *Novel peptidergic targets for Alcohol Use Disorder.* Integrative Neuroscience Research Center Seminar, Marquette University, Milwaukee WI. October 2019

Novel peptidergic targets for Alcohol Use Disorder. Department of Anatomy and Neurobiology at the University of Maryland School of Medicine, Baltimore MD (cancelled for weather, rescheduled seminar forthcoming)

Department of Biology, Pennsylvania State University, University Park, PA. November 2019.

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

Alcohol and the brain. Guest speaker at Westfield High School, Chantilly, VA. November 2018

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. June 2017

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

Comorbid mechanisms underlying alcoholism and major depressive disorder. Center for the Investigation of Neurological Disorders Annual Retreat, University Park, PA. 2016

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

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. 2015

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. 2014

Extended amygdala circuits and behavior. Nanosymposium, Annual Meeting for the Society for Neuroscience, Washington, DC. 2014

AWARDS & HONORS

2021 **American College on Neuropsychopharmacology (ACNP)**
Senior Investigator Travel Award Recipient (*provides financial support for 2021 meeting and allows for attendance at 2022-2025 meetings*)

2019 **NIH Center for Scientific Review**
Early Career Reviewer Program (NAL – October 2019)

Neuroscience

Journal cover art selection (*Issue #419C*)

2018 **NARSAD Young Investigator Award**

2017	Brain and Behavior Research Foundation (<i>funding 01/2019-01/2021</i>) Nominee, 2017 Dean's Climate and Diversity Award Awarding Organization: Eberly College of Science, Penn State University
2014	Best Poster Award Awarding Organization: <i>International Congress on Alcoholism and Stress</i>
2013	Student Merit Award Awarding Organization: <i>Research Society on Alcoholism</i> Ruth L. Kirschstein National Research Service Award Awarding Organization: <i>National Institute on Alcohol Abuse and Alcoholism</i>
2012	Student Merit Award Awarding Organization: <i>Research Society on Alcoholism</i>
2010	Graduate Research Award Awarding Organization: <i>University of North Carolina – Wilmington</i> Student Merit Award Awarding Organization: <i>Research Society on Alcoholism</i>
2008	Award for Outstanding Undergraduate Scholarship Awarding Organization: <i>James Madison University Department of Psychology</i> Travel Award Awarding Organization: <i>Association for Behavior Analysis – International</i>
2007	Best Poster Award Awarding Organization: <i>Eastern Psychological Association</i> Award for Outstanding Undergraduate Scholarship Awarding Organization: <i>James Madison University Department of Psychology</i> Travel Award Awarding Organization: <i>Association for Behavior Analysis – International</i>
2006	Award for Outstanding Undergraduate Scholarship Awarding Organization: <i>James Madison University Department of Psychology</i>

TEACHING AND MENTORING ACTIVITIES

SUPERVISION OF STUDENTS

Graduate Students (Primary Mentor)

Avery Sicher	Neuroscience PhD Program	2020-present
Dakota Brockway	Neuroscience PhD Program	2018-present

Graduate Students (Rotation Mentor)

Farzad Azarmi	Biomedical Engineering PhD Program (PI: Zhang)	2022
Kathleen Meeks	Neuroscience PhD Program (PI: Geier)	2021

Graduate Students (Dissertation Committee Member, etc.)

Md Shakhawat Hossain	Biomedical Engineering (PI: Drew) <i>(co-mentored by Crowley for CDNE T32 application)</i>	2021- present
Lauren Bellfy	MCIBS (PI: Kwapis)	2021- present
Tong Jiang	Biology (PI: Luscher)	2021-present
Laurel Seemiller	MCIBS (PI: Gould)	2020- present

Undergraduate Student (Primary Mentor)

Renee Laurenzana	Biological Sciences (SROP through Cal State San Marcos)	2022
Andrew Kacala	Biology (Schreyer Honors College)	2021-present
Nicole Lookfong	<i>summer student mentored with Dr. Yuval Silberman</i>	2021
Daniela Lopez Melean	Biology (Millennium Scholar)	2019-present
David Starnes	Biology (Schreyer Honors College)	2019-present
Corey Zimmer	Biobehavioral Health	2019-present
Brody Moyer	Biochemistry and Molecular Biology	2018-present
Veronica Sendao	Chemistry	2018-present
Malini Suresh Nair	Biology	2018-2019

Sarah Magee	Currently: medical student, Wake Forest Biology (Millennium Scholar)	2016-2019
Alexandre Bourcier	Currently: Neuroscience PhD Program, UNC Biology (Schreyer Honors College) Currently: medical student, UCLA	2016-2019

Other previous trainees

Nigel Dao	Research Technician Currently: NYU PhD program (PI: Adam Carter)	2018-2021
Malini Suresh Nair	Research Technician Currently: Wake Forest Medical School MD Program	2020-2021

High School Students (Health Professions Department, State College High School, Supervised in conjunction with Ms. Kathleen Seeland)

Lydia Fry		2020-2021
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UNDERGRADUATE STUDENT-LED FUNDING

2022	Schreyer Honor's College Summer Research Fund Awarded to David Starnes (Crowley: faculty mentor)	\$750
	Schreyer Honor's College Summer Research Fund Awarded to Andrew Kacala (Crowley: faculty mentor)	\$750
2021	Eberly Undergraduate Research Support (2021) Awarded to David Starnes (Crowley: faculty mentor)	\$1,000
	Erickson Award Awarded to Brody Moyer (Crowley: faculty mentor)	\$3,500
	Student Engagement Network Awarded to David Starnes (Crowley: faculty mentor)	\$2,000
	Schreyer Honor's College Summer Research Fund Awarded to David Starnes (Crowley: faculty mentor)	\$750
2019	Student Engagement Network (SEN) Awarded to Malini Suresh Nair (Crowley: faculty mentor)	\$1,000
	Anita M. Collins Undergraduate Research Fund Awarded to Malini Suresh Nair (Crowley: faculty mentor)	\$478
	Rock Ethics Institute Rise Up Award Awarded to Alexandre Bourcier (Crowley: faculty mentor)	\$1,000
	Anita M. Collins Undergraduate Research Fund Awarded to Alexandre Bourcier (Crowley: faculty mentor)	\$1,800
	Schreyer Honor's College Summer Research Fund Awarded to Alexandre Bourcier (Crowley: faculty mentor)	\$1,800
	Edward C. Hammond Jr. Memorial Scholarship Awarded to Alexandre Bourcier (Crowley: faculty mentor)	\$2,000

TEACHING EXPERIENCE

COURSE INSTRUCTOR OF RECORD

2021-2022	Neuro521 Systems Neuroscience Course Director & Instructor <i>Received 7/7 on all SRTE questions for 2021 course</i>
2020	Neuro521 Systems Neuroscience

GUEST LECTURES

- 2021 Engineering/Neuro 526 Cellular and Molecular Neuroscience
Graduate course, Instructor of record: Dr. Patrick Drew
- 2016-2021 BIO/BBH 469: Neurobiology
Undergraduate course, Instructors of record: Dr. Beni Luscher, Dr. Nina Lauharatanahirun
- 2016-2021 BIO/BBH 470: Functional and Integrative Neuroscience
Undergraduate course, Instructors of record: Dr. David Vandenbergh, Dr. Janine Kwapis

SERVICE & OUTREACH

EXTERNAL

- 2022 Reviewer, Swiss National Science Foundation
- 2021 NIH Reviewer (Study Section: NIAAA SEP-AA1)
- 2019 Early Career Reviewer, NIH Center for Scientific Review (Study Section: NAL)
- 2017 Guest speaker, Westfield High School, Chantilly Virginia
- 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

INTERNAL

- 2021 Biomedical Engineering Graduate Program Admissions Committee
- 2021 Biology Graduate Program Admissions Committee
- 2019 -present Neuroscience Graduate Program Admissions Committee
- 2021 Biology Department Graduate Admissions Committee
- 2017 PSU Smoke Free Task Force (*silent observer*)
- 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

DEI-RELATED TRAINING AND ACTIVITIES

- 2022 PSU Summer Research Opportunities Program Mentor
- 2021 Millennium Scholars Program Faculty Advisory Network
Penn State Safer People Safer Places: Transgender and Gender Inclusion 101
Penn State Safer People Safer Places: Foundations Workshop

PROFESSIONAL ACTIVITIES

Journal Reviewer

Frontiers in Molecular Neuroscience, Frontiers in Psychiatry

Ad Hoc Journal Reviewer Neuropsychopharmacology, Neuropharmacology, Psychopharmacology, Alcohol, Neurobiology of Stress, Physiology and Behavior, Journal of Neuroscience

Society Memberships Society for Biological Psychiatry (2019-present) International Congress on Alcoholism and Stress (2011-present) Society for Neuroscience (2010-present) Research Society on Alcoholism (2010-present) Society for Behavior Analysis (2006-2009), Eastern Psychological Association (2006-2009)