

NIDA Predoctoral NRSA F31 (DA035620) 05/2013-03/2016
Role of Serotonin 5-HT_{2C} Receptor Signaling in Cocaine Cue Reactivity
PI: Sarah E. Swinford-Jackson
NIDA T32 Predoctoral Trainee (DA007287) 09/2012-04/2013
Pharmacological and Neural Mechanisms of Action of Drugs of Abuse
PI: Kathryn A. Cunningham, Ph.D.

MEMBERSHIP IN SCIENTIFIC SOCIETIES

International Behavioral Neuroscience Society (2020-)
European Behavioral Pharmacology Society/FENS (2019-)
Society for Neuroscience, Student Member (2009-2016); Postdoc Member (2016-2019); Member (2020-)
Philadelphia Chapter of Society for Neuroscience (2017-2020)
Society for Neuroscience Galveston Chapter (2011-2016); Vice President* (2011-2013)
International Society for Serotonin Research, Student Member (2011-2016)
College on Problems of Drug Dependence, Member In-Training (2013-2016)

SERVICE

Ad hoc reviewer: *Neuropsychopharmacology; Physiology and Behavior; PLOS One; Brain Research; Molecular Neurobiology, AIMS Neuroscience, Scientific Reports*

HONORS

Travel Award to European Behavioral Pharmacology Society Meeting, 2019
First place poster award, Philadelphia Chapter Society for Neuroscience Meeting, 2019
GSBS Associates Scholarship, UTMB, 2015
Jen Chieh and Katherine Huang Scholarship, UTMB, 2014
Dr. & Mrs. Seymour Fisher Academic Excellence Award in Neuroscience, UTMB, 2014
NIDA Director's Travel Award, College on Problems of Drug Dependence Meeting, 2014
Bohdan R. Nechay Scholarship, UTMB, 2013
Elected Student Representative, Neuroscience Graduate Program, UTMB, 2013-2015
The George Sealy Research Award in Neurology, UTMB, 2013
Michael Tacheeni Scott Endowed Scholarship Award, UTMB, 2012
Bromberg Scholar, UTMB, 2012-2013
NIDA Travel Award to the 25th Anniversary Meeting of the Serotonin Club, 2012
Leroy Olsen, Ph.D. Endowed Scholarship, UTMB, 2011
Frances Adoue Lynch Center for Addiction Research Endowment Award, UTMB, 2011
Travel Award, "Behavior, Biology, and Chemistry: Translational Research in Addiction", 2011, 2013
Presidential Scholar, UTMB, 2010-2015

MENTORING

Undergraduate Research Mentor to Sayed Khondaker, Fall 2023
Undergraduate Research Mentor to Shriya Satyavolu, Fall 2023
Aresty Undergraduate Research Program Mentor to Justin Yazigi, 2022-2023
Aresty Undergraduate Research Program Mentor to Sayed Khondaker, 2022-2023
Aresty Undergraduate Research Program Mentor to Shriya Satyavolu, 2022-2023
Undergraduate Research Mentor to Maya Abdelaziz, Fall 2022
Undergraduate Research Mentor to Dominick Gangemi, Spring 2022
Undergraduate Research Mentor to Harsh Rohilla, Spring 2022

Undergraduate Research Mentor to Tyler Sacko, Spring-Fall 2021
Aresty Undergraduate Research Program Mentor to Izabella Mus, 2020-2021
Aresty Undergraduate Research Program Mentor to Dominick Gangemi, 2020-2021
Undergraduate Research Mentor to Mateo Sarmiento, Fall 2019
Summer Undergraduate Research Mentor (SUIP) to Sara Saavedra, Summer 2019
Summer Undergraduate Research Mentor (PURM) to Ayanna Coleman, Summer 2018
Summer Undergraduate Research Mentor (PURM) to Mateo Sarmiento, Summer 2018
Undergraduate Research Mentor to Phillip Huffman, UPenn, Spring-Fall 2017
Undergraduate Research Mentor to Teodora Maftai, UPenn, Fall 2016
Presidential Scholar Mentor to Ashley Nilson UTMB, 2014-2015
Mentor to Alexey Bukreyev, Summer Undergraduate Research Program, UTMB, Summer 2014
Bench Tutorials Program Mentor; Ball High School student lab research mentor, UTMB, 2012-2013
Presidential Scholar Mentor to Julia Gerson, UTMB, 2012-2013
Presidential Scholar Mentor to David Briley, UTMB, 2011-2012

TEACHING EXPERIENCE

08/2007 – 05/2010 Math Tutor; K through college calculus and statistics
All Around Math Learning Center, Tempe, AZ
08/2017, 08/2018 “Neurocircuits in Addiction”
Addiction Summer Course; University of Utrecht
02/2019 “Attention Deficit Hyperactivity Disorder” – 1 lecture
Neurobiology of Disease, Temple University
03/2019-04/2019 “Introduction to Neuropharmacology” – 7 lectures and exam
University of the Sciences

INVITED PRESENTATIONS

07/21/2015: Webinar Speaker for ProteinSimple; Co-hosted with Noelle C. Anastasio, Ph.D.
“Neurobiological Markers of Cocaine Use Disorder”

02/25/2019: Seminar, Brain and Cognitive Sciences Program, Temple University
“DBS-like optogenetic stimulation of the nucleus accumbens attenuates cocaine reinstatement”

11/2/2023: Seminar, Department of Neuroscience, University of Florida
“Molecular mechanisms and neurocircuitry underlying psychostimulant intake and craving”

11/29/2023: Seminar, Department of Psychological and Brain Sciences, Texas A&M University
“Molecular mechanisms and neurocircuitry underlying psychostimulant intake and craving”

01/11/2024: Seminar, Department of Neurosciences, University of New Mexico
“Molecular mechanisms and neurocircuitry underlying psychostimulant intake and craving”

01/23/2024: Seminar, Department of Neuroscience, University of Texas at Dallas
“Molecular mechanisms and neurocircuitry underlying psychostimulant intake and craving”

01/30/2024: Seminar, Department of Behavioral Neuroscience, Oregon Health Science University
“Molecular mechanisms and neurocircuitry underlying psychostimulant intake and craving”

11/14/2024: Invited Talk, 10th Annual Brain Health Institute Symposium, Rutgers University
“Paternal methamphetamine intake enhances methamphetamine susceptibility in male rat offspring”

PUBLICATIONS

22. Mankame, S, Worobey, S.J., Sacko, T.J., Pierce, R.C., **Swinford-Jackson, S.E.** Differential effects of deep brain stimulation on reinstatement of cocaine seeking in male and female rats. *Neuroscience Letters*, 2024 Jun 28:137888. doi: 10.1016/j.neulet.2024.137888. Epub ahead of print. PMID: 38945352.
21. **Swinford-Jackson, S.E.**, Pierce, R.C. Deep brain stimulation for psychostimulant disorders. *Journal of Neural Transmission*, 2023. Epub ahead of print. DOI: 10.1007/s00702-023-02706-6. PMID: 37823965
20. Rich, M.T., **Swinford-Jackson, S.E.**, Pierce, R.C. Epigenetic inheritance of phenotypes associated with parental exposure to cocaine. *Advances in Pharmacology*, 99: 169-216, 2024. DOI: 10.1016/bs.apha.2023.10.004. PMID: 38467481
19. **Swinford-Jackson, S.E.**, Rich, M.T., Huffman, P.J., Knouse, M.C., Thomas, A.S., Mankame, S., Worobey, S.J., Pierce, R.C. Low frequency optogenetic deep brain stimulation of nucleus accumbens dopamine D1 or D2 receptor-containing neurons attenuates cocaine seeking selectively in male rats in part by reversing synaptic plasticity deficits. *Addiction Neuroscience*, 9(15), 2023. DOI: 10.1016/j.addicn.2023.100133. PMCID: PMC10836638
18. Rich, M.T., Worobey, S.J., Mankame, S., **Swinford-Jackson, S.E.**, Pang, Z.P., Pierce, R.C. Sex-dependent fear memory impairment in cocaine-sired rat offspring. *Science Advances*. Sci Adv. 2023 Oct 20;9(42):eadf6039. DOI: 10.1126/sciadv.adf6039. PMCID: PMC10584337
17. Pierce, R.C., Rich, M.T., **Swinford-Jackson, S.E.** Addiction neuroscience goes nuclear: a role for the transcription factor RXR α . *Neuron*, Preview, 111(9), 1351-1353, 2023. DOI: 10.1016/j.neuron.2023.04.002. PMID: 37141859
16. **Swinford-Jackson, S.E.**, Huffman, P.J., Knouse, M.C., Thomas, A.S., Rich, M.T., Mankame, S., Worobey, S.J., Sarmiento, M., Coleman, A., Pierce, R.C. High frequency DBS-like optogenetic stimulation of nucleus accumbens dopamine D2 receptor-containing neurons attenuates cocaine reinstatement in male rats. *Neuropsychopharmacology*. 48(3); 459-467, 2023. PMCID: PMC9852282
15. **Swinford-Jackson, S.E.**, Fant, B., Wimmer, M.E., Chan, D., Knouse, M.C., Sarmiento, M., Thomas, A.S., Huffman, P.J., Mankame, S., Worobey, S.J., Pierce, R.C. Cocaine-induced changes in sperm Cdkn1a methylation are associated with cocaine resistance in male offspring. *J. Neurosci*. 42(14); 2905-2916, 2022. PMCID: PMC8985859
14. **Swinford-Jackson, S.E.**, O'Brien, C.P., Kenny, P.J., Vanderschuren, L.J.M.J., Unterwald, E.M., Pierce, R.C. The persistent challenges of developing addiction pharmacotherapies. *Cold Spring Harb Perspect Med*. 11(11); a040311, 2021. PMCID: PMC8559539
13. Guercio, L.G., Wimmer, M.E, Schmidt, H.D., **Swinford-Jackson, S.E.**, Pierce, R.C., Vassoler, F.M. Deep brain stimulation of the infralimbic cortex attenuates cocaine priming-induced reinstatement of drug seeking. *Brain Research*, 1746; 147011, 2020. PMCID: PMC7484137
12. Qian, X., Su, Y., Adam, C.D., Deutschmann, A.U., Pather, S.R., Goldberg, E.M., Su, K., Li, S., Lu, L., Jacob, F., Nguyen, P., Huh, S., Hoke, A., **Swinford-Jackson, S.E.**, Wen, Z., Gu, X., Pierce, R.C., Wu, H., Briand, L.A., Chen, H.I., Wolf, J.A., Song, H., Ming G.-L. Sliced Human Cortical Organoids for Modeling Distinct Cortical Layer Formation. *Cell Stem Cell*, 26(5):766-781, 2020. PMCID: PMC7366517

11. Fant, B., Wimmer, M.E., **Swinford-Jackson, S.E.**, Maurer, J., Van Nest, D., Pierce, R.C. Preconception maternal cocaine self-administration increases the reinforcing efficacy of cocaine in male offspring. *Psychopharm*, 236(12), 3429-3437, 2019. PMID: PMC6895412
10. Wimmer, M.E., Fant, B., **Swinford-Jackson, S.E.**, Testino, A., Van Nest, D., Abel, T., Pierce, R.C. H3.3 barcoding of nucleus accumbens transcriptional activity identifies novel molecular cascades associated with cocaine self-administration in mice. *J. Neurosci.*, 39(27), 5247-5254, 2019. PMID: PMC6607753
9. **Swinford-Jackson, S.E.** & Pierce, R.C. Harmony and heresy of an L-type calcium channel inhibitor: suppression of cocaine seeking via increased dopamine transmission in the nucleus accumbens. *Neuropsychopharmacology*, Commentary, 43(12), 2335-2336, 2018. PMID: PMC6180032
8. Pierce, R.C., Fant, B., **Swinford-Jackson, S.E.**, Heller, E.A., Berrettini, W.H., Wimmer, M.E. Environmental, Genetic and Epigenetic Contributions to Cocaine Addiction. *Neuropsychopharmacology*, Review, 43, 1471–1480, 2018. PMID: PMC5983541
7. Guercio, L.A., Hofmann, M.E., **Swinford-Jackson, S.E.**, Sigman, J., Wimmer, M.E., Dell'Acqua, M.L., Schmidt, H.D., Pierce, R.C., A-Kinase Anchoring Protein 150 (AKAP150) Promotes Cocaine Reinstatement by Increasing AMPA Receptor Transmission in the Accumbens Shell. *Neuropsychopharmacology*, 43(6), pp.1395-1404, 2018. PMID: PMC5916366
6. **Swinford-Jackson, S.E.**, Anastasio, N.C., Fox, R.G., Stutz, S.J., Cunningham, K.A. Incubation of cocaine cue reactivity associates with neuroadaptations in the cortical serotonin (5-HT) 5-HT_{2C} receptor (5-HT_{2C}R) system. *Neuroscience*, 324, pp. 50-61, 2016. PMID: PMC4838519
5. Anastasio, N.C., Stutz, S.J., Fink, L.H.L., **Swinford-Jackson, S.E.**, Sears, R.M., DiLeone, R.J., Rice, K., Moeller, F.G., Cunningham, K.A. Serotonin (5-HT) 5-HT_{2A} receptor (5-HT_{2A}R):5-HT_{2C}R imbalance in medial prefrontal cortex associates with motor impulsivity. *ACS Chemical Neuroscience*, 6(7), pp. 1248-1258, 2015. PMID: PMC4811199.
4. Anastasio, N.C., Liu, S., Maili, L., **Swinford, S.E.**, Lane, S.D., Fox, R.G., Hamon, S.C., Nielsen, D.A., Cunningham, K.A., and Moeller, F.G. Variation within the serotonin (5-HT) 5-HT_{2C} receptor system aligns with vulnerability to cocaine cue reactivity. *Transl Psychiatry* 4, e369, 2014. PMID: PMC3966037.
3. Anastasio, N.C., Gilbertson, S.R., Bubar, M.J., Agarkov, A., Stutz, S., Jeng, Y-J., Bremer, N., Smith, T.D., Fox, R.G., **Swinford, S.E.**, Seitz, P.K., Charendoff, M., Craft Jr., J., Laezza, F., Watson, C.S., Briggs, J., Cunningham, K.A. Peptide inhibitors disrupt the serotonin 5-HT_{2C} receptor interaction with phosphatase and tensin homologue (PTEN) to allosterically modulate cellular signaling and behavior. *J. Neurosci.*, 13, 1615-1630, 2013. PMID: PMC3711763
2. Cunningham, K.A., Anastasio, N.C., Fox, R.G., Stutz, S.J., Bubar, M.J., **Swinford, S.E.**, Watson, C.S., Gilbertson, S.R., Rice, K.C., Rosenzweig-Lipson, S., Moeller, F.G. Synergism between a serotonin 5-HT_{2A} receptor (5-HT_{2A}R) antagonist and 5-HT_{2C}R agonist suggests new pharmacotherapeutics for cocaine addiction. *ACS Chemical Neuroscience*, 4(1), pp 110-121, 2013. PMID: PMC3547488
1. Pockros, L.A., Pentkowski, N.S., **Swinford, S.E.**, & Neisewander, J.L. Blockade of serotonin 2A (5-HT_{2A}) receptors in the medial prefrontal cortex attenuates reinstatement of cue-elicited cocaine-seeking behavior in rats. *Psychopharmacology*, 213(2), pp.307-320, 2011. PMID: PMC3072217

ABSTRACTS (ORAL PRESENTATIONS)

1. **Swinford, S.E.**, Anastasio, N.C., Stutz, S.J., Fox, R.G., Cunningham, K.A. Synergistic suppression of cocaine-evoked elevations in motility and cortical serotonin (5-HT) 2C Receptor (5-HT_{2C}R) expression by combined administration of a selective 5-HT_{2A}R antagonist plus a 5-HT_{2C}R agonist. 25th Anniversary Meeting of the Serotonin Club, Montpellier, France, 2012.
2. **Swinford, S.E.**, Anastasio, N.C., Fox, R.G., Stutz, S.J., Cunningham, K.A. Lower serotonin 2C receptor (5-HT_{2C}R) expression in the ventral tegmental area (VTA) associates with elevated cue reactivity following extended forced-abstinence from cocaine-taking. Behavior, Biology and Chemistry: Translational Research in Addiction, San Antonio, TX, 2013.
3. **Swinford-Jackson, S.E.**, Anastasio, N.C., Stutz, S.J., Fox, R.G., Cunningham, K.A. Differential modulation of cocaine-related behaviors consequent to knockdown of serotonin (5-HT) 5-HT_{2C} receptor (5-HT_{2C}R) in the nucleus accumbens shell (NAcSh) vs. ventral tegmental area (VTA). College on Problems of Drug Dependence, Phoenix, AZ, 2015.
***Co-Chair of “Marty’s Amines: Monoamines” Oral Communications Session**
4. **Swinford-Jackson, S.E.**, Rich, Matthew T., Huffman, P.J., Knouse, M.C., Thomas, A.S., Pierce, R.C. DBS-like optogenetic stimulation of accumbens dopamine D2 receptor-containing neurons attenuates cocaine reinstatement. European Behavioral Pharmacology Society, Braga, Portugal, 2019.

*Presented in both oral and poster formats for travel award

ABSTRACTS (POSTER)

(selected from over 30 first- and co-author)

1. **Swinford, S. E.**, McGinnis, A.G., Bremer, N.M, Anastasio, N.C., Shavkunov, A., Seitz, P.K., Agarkov, A., Veselenak, R.L., Natarajan, A., Bourne, Nigel, Laezza, F., Watson, C.S., Gilbertson, S.R., Cunningham, K.A. Peptide disruption of the serotonin (5-HT) 5-HT_{2C} receptor interaction with protein phosphatase and tensin (PTEN) is functionally important to the 5-HT_{2C}R signalosome. Annual Meeting of Behavior, Biology, and Chemistry: Translational Research in Addiction, San Antonio, TX, 2011.
2. **S.E. Swinford**, N.C. Anastasio, S.J. Stutz, R.G. Fox, K.A. Cunningham. Synergistic suppression of cocaine-evoked elevations in motility and cortical serotonin (5-HT) 2C Receptor (5-HT_{2C}R) expression by combined administration of a selective 5-HT_{2A}R antagonist plus a 5-HT_{2C}R agonist. Annual Meeting of College on Problems of Drug Dependence, Palm Springs, California, 2012.
3. **Swinford, S.E.**, Anastasio, N.C., Fox, R.G., Stutz, S.J., Cunningham, K.A. Lower serotonin 2C receptor (5-HT_{2C}R) expression in the ventral tegmental area (VTA) associates with elevated cue reactivity following extended forced-abstinence from cocaine-taking. College on Problems of Drug Dependence, San Diego, CA, 2013.
4. **Swinford-Jackson, S.E.**, Anastasio, N.C., Fox, R.G., Stutz, S.J., Cunningham, K.A. Loss of serotonin (5-HT) 2C receptor (5-HT_{2C}R) tone in the ventral tegmental area (VTA) modulates cocaine-related behaviors. College on Problems of Drug Dependence, San Juan, Puerto Rico, 2014.
5. **Swinford-Jackson, S.E.**, Anastasio, N.C., Stutz, S.J., Fox, R.G., Cunningham, K.A. Differential modulation of cocaine-related behaviors consequent to knockdown of serotonin (5-HT) 5-HT_{2C}

receptor (5-HT_{2C}R) in the nucleus accumbens shell (NAcSh) vs. ventral tegmental area (VTA). American College of Neuropsychopharmacology, Phoenix, AZ, 2014.

6. **Swinford-Jackson, S.E.**, Anastasio, N.C., Soto, C.A., Hartley, R.M., Watson, C.S., Cunningham, K.A. Dynamic regulation of synaptosomal serotonin (5-HT) 5-HT_{2C} receptor (5-HT_{2C}R) expression following acute cocaine administration. Society for Neuroscience, Chicago, IL, 2015.
7. **Swinford-Jackson, S.E.**, Hofmann, M.E., Huffman, P.J., Knouse, M.C., Thomas, A.S., Pierce, R.C. Mimicking DBS with optogenetics in rats to identify the specific nucleus accumbens neurocircuits underlying relapse to cocaine. Society for Neuroscience, Washington D.C., 2017.
8. **Swinford-Jackson, S.E.**, Fant, B., Wimmer, M.E., Knouse, M.C., Thomas, A.S., Pierce R.C. Epigenetic changes in sperm of cocaine-experienced sires confer cocaine resistance in male offspring. Neuroepigenetics and Neurotranscriptomics, Cancun, Mexico, 2018.
9. **Swinford-Jackson, S.E.**, Fant, B., Wimmer, M.E., Knouse, M.C., Thomas, A.S., Pierce R.C. Epigenetic changes in sperm of cocaine-experienced sires confer cocaine resistance in male offspring. Philadelphia Chapter of the Society for Neuroscience, Philadelphia, PA, 2018.
10. **Swinford-Jackson, S.E.**, Fant, B., Wimmer, M.E., Knouse, M.C., Thomas, A.S., Pierce R.C. A role for Cdkn1a in mediating the epigenetic inheritance of cocaine resistance in male offspring. Society for Neuroscience. San Diego, CA, 2018.
11. **Swinford-Jackson, S.E.**, Huffman, P.J., Knouse, M.C., Thomas, A.S., Pierce, R.C. DBS-like optogenetic stimulation of accumbens dopamine D2 receptor-containing neurons attenuates cocaine reinstatement. American College of Neuropsychopharmacology, Hollywood, FL, 2018.
12. **Swinford-Jackson, S.E.**, Huffman, P.J., Knouse, M.C., Thomas, A.S., Deutschmann, A.U., Briand, L.A., Pierce, R.C. DBS-like optogenetic stimulation of accumbens dopamine D2 receptor-containing neurons attenuates cocaine reinstatement. Philadelphia Chapter of the Society for Neuroscience, Philadelphia, PA, 2019.
*Won first place poster award in postdoc category.
13. **Swinford-Jackson, S.E.**, Rich, M.T., Huffman, P.J., Knouse, M.C., Thomas, A.S., Pierce, R.C. DBS-like optogenetic stimulation of accumbens dopamine D2 receptor-containing neurons attenuates cocaine reinstatement. European Behavioral Pharmacology Society, Braga, Portugal, 2019.
14. **Swinford-Jackson, S.E.**, Rich, M.T., Huffman, P.J., Knouse, M.C., Thomas, A.S., Pierce, R.C. DBS-like optogenetic stimulation of the nucleus accumbens attenuates cocaine reinstatement. International Behavioral Neuroscience Society, 2020.
*Was scheduled to be an oral presentation on an invited panel, changed due to pandemic.
15. **Swinford-Jackson, S.E.**, Jadali, A., Sarmiento, M., Mankame, S., Worobey, S.J., Kwan, K.Y., Hart, R.P., Pierce, R.C. Epigenetic mechanisms underlying susceptibility to methamphetamine self-administration in methamphetamine-sired male rats. NIDA Genetics and Epigenetics Cross-Cutting Research Team Meeting, 2022.

16. **Swinford-Jackson, S.E.**, Jadali, A., Sarmiento, M., Mankame, S., Worobey, S.J., Kwan, K.Y., Hart, R.P., Pierce, R.C. Epigenetic mechanisms underlying susceptibility to methamphetamine self-administration in methamphetamine-sired male rats. International Behavioral Neuroscience Society, Glasgow, Scotland, 2022.
17. **Swinford-Jackson, S.E.**, Jadali, A., Phan, B.N., Sarmiento, M., Zhu, Y., Mankame, S., Worobey, S.J., Sacko, T.J., Gangemi, D., Pfenning, A.R., Kwan, K.Y., Hart, R.P., Pierce., R.C. Multiomic single nuclei sequencing identifies potential molecular mechanisms for cocaine resistance and methamphetamine susceptibility in drug-sired male offspring. Society for Neuroscience, Washington DC, 2023.