

Susan Ferguson, Ph.D.
5/02/2021

PERSONAL DATA:

Birth Date: 08-13-1975
Birthplace: *Cleveland, Ohio*
Citizenship: *USA*

ADDRESS: *1900 Ninth Ave., Seattle, WA 98101*

EDUCATION:

1993 - 1997 *University of Michigan, Ann Arbor, MI, B.S. in Biopsychology and Cognitive Sciences, 1997*
1999 - 2004 *University of Michigan, Ann Arbor, MI, Ph.D. in Neuroscience, 2004*

POSTGRADUATE TRAINING:

2004 - 2009 *Postdoctoral Fellowship, University of Washington, Seattle, WA*

FACULTY POSITIONS HELD:

2017 - present *Associate Professor, Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA.*
 Faculty in Graduate Program in Neuroscience
 Faculty in Graduate Program in Molecular and Cellular Biology
 Principal Investigator, Center for Integrative Brain Research, Seattle Children's Research Institute (SCRI)
 Member of the Center for Excellence in Neurobiology of Addiction, Pain and Emotion (NAPE)

2019 – present *Director, Addictions, Drug and Alcohol Institute (ADAI), University of Washington, Seattle, WA*
 -Position covers 0.5 salary FTE

2017 – 2019 *Faculty Liaison, Office of Teaching, Education and Research, SCRI*

2011 - 2017 *Assistant Professor, Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA.*
 Faculty in Graduate Program in Neuroscience
 Principal Investigator, Center for Integrative Brain Research, SCRI
 Member of Center for Drug Addiction Research (now NAPE)

2009 - 2011 *Acting Assistant Professor, Department of Psychiatry and Behavioral Sciences, University of Washington, Seattle, WA*
 Member of Center for Drug Addiction Research (now NAPE)

HONORS:

2016 *NIDA-NIAA Early Career Investigator Showcase Travel Award, Frontiers in Addiction Research Mini-Convention, San Diego, CA*
2016 *Travel Award, Addiction, In Theory Meeting, Gatsby Institute, London, UK*
2014 *New Investigator Science in Medicine Lecture, University of Washington, Seattle, WA*
2014 *Winter Conference on Brain Research Travel Fellowship, Steamboat Springs, CO*

2013	<i>Honorable Mention Poster Prize, Winter Conference on Brain Research, Breckenridge, Co</i>
2008	<i>ACNP Young Investigator Memorial Travel Award, Scottsdale, AZ</i>
2005	<i>NIDA Satellite Meeting to the 67th CPDD Conference Travel Award, Orlando, FL</i>
2004	<i>Rackham Travel Grant, University of Michigan, Ann Arbor, MI</i>
2003	<i>Hewlett International Travel Grant, University of Michigan, Ann Arbor, MI</i>
2003	<i>Gordon Research Conference on Catecholamines Travel Fellowship, Oxford, UK</i>
2003	<i>University of Michigan Outstanding Student Publication Award, Ann Arbor, MI</i>
2002	<i>Rackham Travel Grant, University of Michigan, Ann Arbor, MI</i>
2002	<i>Dopamine 2002 Conference Travel Fellowship, Portland, OR</i>
2001	<i>Rackham Travel Grant, University of Michigan, Ann Arbor, MI</i>

BOARD CERTIFICATION: N/A

MEDICAL LICENSURE: N/A

PROFESSIONAL ORGANIZATIONS:

2014 - present	<i>American College of Neuropsychopharmacology</i>
2014 - present	<i>European Behavioural Pharmacology Society</i>
2015 - present	<i>Federation of European Neuroscience Societies</i>
2003 - present	<i>Molecular and Cellular Cognition Society</i>
2000 - present	<i>Society for Neuroscience</i>
2014	<i>Association for Psychological Science</i>

TEACHING RESPONSIBILITIES:

2019 – present	<i>Addiction: Mechanisms, Treatment, Prevention (Conj 556), Course Director</i>
2018 - present	<i>Neural Circuits in Drug Addiction (Neuro 511), Instructor</i>
2015-2020	<i>Addiction module of Introductory Neuroscience (Neuro 527), Instructor</i>
2008- present	<i>Molecular Basis of Addictive Drug Action (Phcol 534), Instructor</i>
2015	<i>Decision Neuroscience (Neuro 511A), Instructor</i>
2013	<i>Biomedical Research Integrity Program, Discussion Leader</i>
2007	<i>Neurobiology of Love, Attraction and Addiction (Biol 485), Instructor</i>

Current pre-doctoral trainees

Zackari Murphy, 2019-

R01 Diversity Supplement submitted to NIDA for support 2021-2024

Former pre-doctoral trainees

Timothy O'Neal, 2017-2021

NRSA Predoctoral Fellow (NIDA), 2018-2021

Current Position: Postdoctoral Researcher, University of Minnesota

Elizabeth Crummy, Ph.D. 2017-2020

Graduate Student Fellowship (NSF), 2017-2020

Current Position: Postdoctoral Researcher, University of Pittsburgh

Britahny Baskin, 2018-2020

Current Position: Graduate Student, University of Washington

Kanichi Nakata, Ph.D. 2014-2019

R01 Diversity Supplement (NIDA), 2015-2019

Current Position: Research Specialist, Kaiser Permanente Washington Health Research Institute

Aaron Garcia, Ph.D. 2013-2018

Current Position: Postdoctoral Researcher, University of Washington

Amanda Wunsch, Ph.D. 2012-2016

Current Position: Postdoctoral Researcher, Oregon Health Sciences Institute

Current post-doctoral trainees

Aaron Garcia, Ph.D. 2020-

Former post-doctoral trainees

Kerry Kerstetter, Ph.D., 2012-2015

NRSA Postdoctoral Fellow (NIDA), 2013-2015

Current Position: Data and Research Analyst, Concur

Lindsay Yager, Ph.D., 2014-2016

Awarded NRSA Postdoctoral Fellow (NIDA) in 2016 but declined for new position

Current Position: Senior Research Scientist, State University of New York Buffalo

Shilpa Ravinder, Ph.D., 2013-2016

Current Position: Data Analyst, Amazon

Doctoral supervisory committees

Current

David Bergkamp (Neuroscience)

Anthony English (Pharmacology)

Brian Kim (Psychology)

Nastacia Goodwin (Neuroscience)

Andrew Luskin (Neuroscience)

Arena Manning (Neuroscience)

Phillip Silva (Neuroscience)

Rhiana Simon (Neuroscience)

Carrie Stine (Molecular and Cellular Biology)

Rapheal Williams (Neuroscience)

Previous

Alec Gibson (Neuroscience), 2019

Mi-Seon Kong (Psychology)

Wambura C. Fobbs, Neuroscience, 2016

Christina A. Sanford (nee Akers), Pharmacology, 2016

Katie Liu, Ph.D in Neurobiology & Behavior, 2014

Melissa Reilly, Behavioral Neuroscience (Psychology), 2014

Training grant affiliations

T32 DA007278: Training in the Molecular Pharmacology of Abused Drugs (NIH/NIDA; PI: Phillips)

EDITORIAL/REVIEWER RESPONSIBILITIES:

2017- present Member, Biobehavioral Regulation, Learning and Ethology Study Section (NIH)

Ad-hoc grant reviewer:

Molecular Neuropharmacology and Signaling Study Section (NIH) (6/2016)

SEP Panel for U01s on Genetics of SUDs (NIH) (2/2020, 6/2020, 11/2020, 6/2021)

CEBRA R21 Study section (6/2020, 11/2020)

NIDA Career Development and Education SEP (11/2020)

NINDS Brain Diversity K99 SEP (9/2020)

Garvey Institute for Brain Health Solutions (UW) (2020)

Alcohol and Drug Abuse Institute (UW) (2010-2019)

Royalty Research Fund (UW) (2018, 2020)

Mary Gates Undergraduate Research Applications (UW) (2018-2020)

2021- present Associate Editor, Addiction Neuroscience (new Elsevier Gold Open Access (GOA) journal)

2008- present *Ad-hoc peer-review publication reviewer:
Reviewer for 15+ neuroscience-related journals including Journal of
Neuroscience, Nature journals, Neuropsychopharmacology, Biological Psychiatry*

SPECIAL NATIONAL RESPONSIBILITIES:

2014- 2020 *American College of Neuropsychopharmacology
Public Information Committee (2018-2020)
Women’s Task Force (2014-2016)*

2014- 2019 *Winter Conference on Brain Research
Executive Committee (2017-2019), Board of Directors (2014-2019),
Education Outreach Chair (2014-2018), Program Committee (2013), Travel
Award Mentor (2016, 2019)*

SPECIAL LOCAL RESPONSIBILITIES:

2020- present *Garvey Institute of Brain Health Solutions Workgroup Member, Psychiatry, UW*

2020- present *Graduate Program in Neuroscience Graduate Training Committee, UW*

2020- present *UW Addictions Diversity, Equity and Inclusion Committee, UW*

2020- present *UW Medicine Allies program Ally, UW*

2020- present *Graduate Program in Neuroscience Graduate Training Committee, UW*

2019- present *Psychiatry and Behavioral Sciences Dept. Leadership Council, UW*

2019- present *ADAI Diversity, Equity and Inclusion Committee, UW*

2017-2020 *Graduate Program in Neuroscience Executive Committee, UW*

2015- 2020 *Graduate Program in Neuroscience Admissions Committee, UW
Committee Chair (2017-2019)*

2014- present *Seattle Children’s Research Institute IACUC Member
IACUC Chair Designee, 2016-present*

2018- 2019 *Faculty Liaison, Office of Teaching, Education and Research, Seattle Children’s
Research Institute*

Outreach Activities

2020 *WA State House Commerce and Gaming Commission Presenter on cannabis-related
research at UW, held via Zoom*

2020 *Panel member for the UW Undergraduate Society Grey Matter’s annual “Evening with
Neuroscience” community event, held via Zoom*

2020 *Part of an Arte documentary “Screen generation, sick generation?” by Raphael Hitier*

2019 *Northwest Science Writers Association Panel on Opioids, Seattle, WA*

2019 *Interview for King 5 on heroin addiction and brain circuit changes*

2019 *WA State House Commerce and Gaming Commission Presenter on cannabis-related
research at UW Olympia, WA*

2016 *Panel member for the UW Undergraduate Society Grey Matter’s annual “Evening with
Neuroscience” community event*

2016 *Panel member on ‘Grants Panel’ sponsored by the Seattle Children’s Research
Institute Office for Teaching, Education and Research*

2016 *Panel member on ‘Careers in Science’ Panel for the Seattle Children’s Research
Institute Scholars Program*

2016 *Participant in Seattle Children’s Research Institute Discovery Portal public open house*

2015 *Interview for 2015 KOMO 4 news special: Inside the Brain*

2015 *Presentations for Pacific Science Center Eastside and Queen Anne “Science Cafes”:
The Neuroscience of Addiction*

2015 *Panel member and speaker at Pacific Science Center Evening of Science community
event*

2015 *Interview for Neuroscience of Addiction college teaching video series*
2014 *Panel member and speaker at Seattle Children's Research in Action community event: Technology's Impact on Research*
2014 *Participant in 8th Annual College Success Foundation Career Institute Networking Fair for low-income, high-potential students*
2013 *Participant in Seattle Children's Saturday Night Science community event*
2008-2014 *Neuroscience teaching visits to area schools, Seattle, WA*
John Stanford International Elementary School (3rd grade), 2013, 2014
McDonald International Elementary School (4th grade), 2014
The Cottage School at Harborview (Pre-K), 2008

RESEARCH FUNDING:

Current:

R01 DA047107 (NIH/NIDA), PI: Ferguson, 2019-2024, \$280,000/year

"Characterization of cortical neuronal subtypes in cocaine self-administration"

R21 DA048632 (NIH/NIDA), PI: Smith, 2019-2021, \$275,000 total (Co-I)

"Purification of cell-type specific synaptic material using virally-expressed tags"

P30 DA048736 (NIH/NIDA), PI: Chavkin, 2019-2024, (Co-I: 5% salary + \$117,000 Y1 pilot project).

"University of Washington Center for Excellence in Opioid Addiction Research"

R01 HL151389 (NIH/NHLBI), PI: Ramirez, 2020-2025 (Co-I: 5% salary)

"Neuroglial interactions underlying the generation of the sigh"

U54 HD083091 (NIH/NICHD), PI: Guralnick, 2018-2023, (Co-I: 5% salary)

"Intellectual and Developmental Disabilities Research Center"

Internal SCRI Award, PI: Ferguson, 2020-2022, \$250,000 total

"Joint project with WSU to study behavioral and neurobiological effects of sensory stimulation during development"

Pending:

R01 DA054317 (NIH/NIDA), Multi-PIs: Stuber & Ferguson, 2021-2026, \$450,000/year

"Transcriptional, functional, and circuit profiling at single cell resolution of neuronal ensembles engaged by heroin relapse"

Received 6%, NOA Pending; 6/01/2021 expected start date.

Submitted:

R61/R33 DA054590 (NIH/NIDA), Multi-PIs: Banta-Green & Ferguson, 2021-2026, \$300,000/year Years 1-2; \$500,000/year Years 3-5

"Assessing patterns of polysubstance use among people who use opioids and methamphetamine to guide development of rat self-administration models for the study of addiction behavior and neural circuits"

R01 DA053739 (NIH/NIDA), PI: Ferguson, 2021-2026, \$300,000/year

"Characterizing the role of striatal medium spiny neurons in addiction-like behavior using a rat heroin self-administration model"

Completed:

R01 DA036582 (NIH/NIDA), PI: Ferguson, 2014-2019, \$250,000/year

"Role of specific cortico-basal ganglia pathways in animal models of addiction"

R01 DA038599 (NIH/NIDA), PI: Flagel, 2015-2020, 394,000/year, (Co-I: 10% salary)

"Dynamic control of cue-driven behavior via the paraventricular thalamic nucleus"

R01 DA039952 (NIH/NIDA), PI: Becker, 2015-2020, \$257,000/year, (Co-I: \$22K/year in years 3-5)
"Neural mechanisms of propensity for drug taking"

R01 DA035838 (NIH/NIDA), PI: Turner, 2014-2019, \$209,000/year, (Co-I: 10% salary)
"Functional studies of the medial habenula in models of reward and mood disorders"

R01 MH093667 (NIH/NIMH), PI: Turner, 2015-2019, \$250,000/year, (Co-I: 10% salary)
"New models of lateral habenula function in pathways regulating anxiety and mood"

National Center for Responsible Gaming (NCRG), PI: Ferguson, 2017-2018, \$30,000
Characterization of subtypes of cortical neurons in impulsivity

Alcohol and Drug Abuse Institute (University of Washington), PI: Ferguson, 2016-2017, \$30,000
"Role of specific cortico-basal ganglia pathways in animal models of addiction"

R21 DA036343 (NIH/NIDA), PI: Ferguson, 2013-2015, \$131,000/year
"Development of novel viral vector tools for pathway specific targeting of CreTTC"

R00 DA024762 (NIH/NIDA), PI: Ferguson, 2011-2014, \$249,000/year
"Role of striatopallidal neurons in drug-induced neural plasticity and behavior"

K99 DA024762 (NIH/NIDA) 04/10/2009-03/31/2011
NIH/NIDA, Mentor: Dr. John Neumaier, University of Washington, 2009-2011, \$90,000/year
"Role of striatopallidal neurons in drug-induced neural plasticity and behavior"

Brain Research Foundation/NARSAD Young Investigator Award, PI: Ferguson, 2011-2013, \$30,000/year
"Parsing out the contributions of direct and indirect pathways in behavioral inhibition"

Alcohol and Drug Abuse Institute Small Grants Program, PI: Ferguson, 2012-2013, \$30,000/year
"Role of cortical inputs into the striatum in the rewarding effects of cocaine"

F32 DA021009 (NIH/NIDA), PI: Ferguson (Mentor Dr. John Neumaier), University of Washington, 2006-2009, \$50,000/year
"Role of 5-HT₆ receptors in drug reward"

F31 DA014737 (NIH/NIDA), PI: Ferguson (Mentor: Dr. Terry Robinson), University of Michigan, 2001-2004, \$30,000/year
"Drugs, context and gene expression"

BIBLIOGRAPHY:

Complete List of Published Work in MyBibliography:

<https://www.ncbi.nlm.nih.gov/sites/myncbi/susan.ferguson.1/bibliography/41161193/public/?sort=date&direction=ascending>

a) Peer-reviewed articles

- 1. Ferguson SM, Brodtkin JD, Lloyd GK, Menzaghi F (2000) Antidepressant-like effects of the subtype-selective nicotinic acetylcholine receptor agonist, SIB-1508Y, in the learned helplessness rat model of depression. Psychopharmacology 152(3):295-303.*
- 2. Uslaner JM, Crombag HS, Ferguson SM and Robinson TE (2003) Cocaine-induced psychomotor activity is associated with its ability to induce c-fos mRNA expression in the subthalamic nucleus: effects of dose and repeated treatment. European J Neuroscience 17:2180-2186.*
- 3. Ferguson SM, Norton CS, Watson SJ, Akil H and Robinson TE (2003) Amphetamine-evoked c-fos mRNA expression in the caudate-putamen: the effects of DA and NMDA receptor antagonists vary as a function of neuronal phenotype and environmental context. J Neurochemistry 86(1):33-44.*
- 4. Ferguson SM, Thomas MJ and Robinson TE (2004) Morphine-induced c-fos mRNA expression in*

striatofugal circuits: modulation by dose, environmental context and drug history. Neuropsychopharmacology. 29(9):1664-74.

5. Samaha A-N, Mallet N, Ferguson SM, Gonon F, Robinson TE (2004) The rate of cocaine administration alters gene regulation and behavioural plasticity: implications for addiction. *J Neuroscience* 24(28):6362-70.
6. Ferguson SM and Robinson TE (2004) Amphetamine-evoked gene expression in striatopallidal neurons: regulation by corticostriatal afferents and the ERK/MAPK signaling cascade. *J Neurochemistry* 91(2):337-48.
7. Ferguson SM, Fasano S, Yang P, Brambilla R, Robinson TE (2006) Knockout of ERK1 enhances cocaine-evoked immediate early gene expression and behavioral plasticity. *Neuropsychopharmacology* 31:2660-8.
8. Barot SK, Ferguson SM, Neumaier JF (2007) 5-HT_{1B} receptors in nucleus accumbens efferents enhance both rewarding and aversive effects of cocaine. *European J Neuroscience* 25(10):3125-31.
9. Ferguson SM, Mitchell ES, Neumaier JF (2008) Increased expression of 5-HT₆ receptors in the nucleus accumbens blocks the rewarding but not psychomotor activating properties of cocaine. *Biological Psychiatry* 63(2):207-13.
10. Ferguson SM, Sandygren NA, Neumaier JF (2009) Pairing mild stress with increased serotonin-1B receptor expression in nucleus accumbens increases susceptibility to amphetamine. *European J Neuroscience* 30(8):1576-84
- *11. Ferguson SM, Eskenazi D, Ishikawa M, Wanat MJ, Phillips PEM, Dong Y, Roth BL, Neumaier JF (2011) Transient neuronal inhibition reveals opposing roles of indirect and direct pathways in sensitization. *Nature Neuroscience* 14(1):22-4.
12. Ferguson SM and Neumaier JF (2011) Grateful DREADDs: Engineered receptors reveal how neural circuits regulate behavior. *Neuropsychopharmacology* 37(1):296-7.
- *13. Ferguson SM, Phillips PEM, Roth BL, Wess J, Neumaier JF (2013) Direct-pathway striatal neurons regulate the retention of decision-making strategies. *J Neuroscience* 33(28):11668-11676.
14. Quina LA, Tempest L, Ng L, Harris J, Ferguson SM, Jhou T, Turner EE (2014) Efferent pathways of the mouse lateral habenula. *J Comparative Neurology*. 523(1):32-60.
15. Ferguson SM and Neumaier JF (2015) Using DREADDs to investigate addiction behaviors. *Curr Opin Behavioral Science* 2:69-72.
16. Yager L, Garcia A, Wunsch AM, Ferguson SM (2015) The ins and outs of the striatum: Role in drug addiction. *Neuroscience: Invited Forefront review* 301:529-41.
17. Ravinder S, Donckels EA, Ramirez JSB, Christakis DA, Ramirez J-M, Ferguson SM (2016) Excessive sensory stimulation during development alters neural plasticity and vulnerability to cocaine in mice. *eNeuro* 3(4):1-11. PMID: PMC4994069.
18. Kerstetter KA, Wunsch AM, Nagata K, Donckels T, Neumaier JF, Ferguson SM (2016) Corticostriatal afferents modulate responsiveness to psychostimulant drugs and drug-associated stimuli *Neuropsychopharmacology* 41(4):1128-1137.
19. Wunsch AM, Yager LM, Donckels EA, Le CT, Neumaier JF, Ferguson SM (2017) Chemogenetic inhibition reveals midline thalamic nuclei and thalamo-accumbens projections mediate cocaine-seeking in rats. *European J Neurosci* 46(3):1850-1862.
20. Garcia AF, Nakata KG, Ferguson SM (2018) Viral strategies for targeting cortical circuits that control cocaine-taking and cocaine-seeking in rodents. *Pharmacology Biochemistry Behavior* 174:33-41.
21. Yager LM, Donckels EA, Garcia A, Ferguson SM (2017) Chemogenetic inhibition of direct pathway

striatal neurons normalizes pathological, cue-induced reinstatement of drug-seeking in rats. Addiction Biology DOI:10.1111/adb.12594.

22. Christakis DA, Ramirez JSB, Ferguson SM, Ravinder S, Ramirez J-M (2018) How early media exposure may affect cognitive function: A review of results from observations in humans and experiments in mice. *Proceedings National Academy Sciences (PNAS)* 115(40):9851-9858.
- *23. Crummy EA, Donckels EA, Baskin BM, Bentzley BS, Ferguson SM (2019) The impact of cocaine and heroin drug history on motivation and drug craving in a rat model of polydrug abuse. *Psychopharmacology* DOI: 10.1007/s00213-019-05349-2.
24. Campus P, Covelo IR, Kim Y, Parsegian A, Kuhn BN, Lopez SA, Neumaier JF, Ferguson SM, Solberg Woods LC, Sarter M, Flagel SB (2019) The paraventricular thalamus is a critical mediator of top-down control of cue-motivated behavior in rats. *eLife* Sept. 10;8:e49041.
25. Anastasio NC, Stutz SJ, Price AE, Davis-Reyes BD, Sholler DJ, Ferguson SM, Neumaier JF, Moeller FG, Hommel JD, Cunningham KA (2019) Convergent neural connectivity in motor impulsivity and high-fat food binge-like eating in male Sprague-Dawley rats. *Neuropsychopharmacology* DOI: 10.1038/s41386-019-0394-8.
26. Crummy EA, O'Neal TJ, Baskin BM, Ferguson SM (2020) One is not enough: Understanding and modeling polysubstance use. *Frontiers in Neuroscience*. 14:569.
- *27. O'Neal TJ, Nooney MN, Thien K, Ferguson SM (2020) Chemogenetic modulation of accumbens direct or indirect pathways bidirectionally alters reinstatement of heroin-seeking in high- but not low-risk rats. *Neuropsychopharmacology* 45(8):1251-1262.

**Article was highlighted on the cover; image from article part of the cover art (<https://www.nature.com/npp/volumes/45/issues/8>); Research Highlight was written on the article (<https://www.nature.com/articles/s41386-020-0615-1>); UW issued press release on work

28. Garcia AF, Webb IG, Yager LM, Seo MB, Ferguson SM (2020) Intermittent but not continuous access to cocaine produces individual variability in addiction susceptibility in rats. *Psychopharmacology* 237(10):2929-2941.

**Work featured on a neuroscience podcast on 10/14/2020: (<https://www.twitch.tv/firstpersonscience/video/761864052>)

- *29. Garcia AF, Crummy EA, Webb IG, Nooney MN, Ferguson SM (2021) Distinct populations of cortical pyramidal neurons mediate drug reward and aversion. *Nature Communications* 12(1):182.

b) Peer-reviewed book chapters

1. Ferguson SM, Neumaier JF (2013) Development of cell-type specific viral vectors to tease apart the neural circuitry that contributes to drug addiction. In: *Viral Vector Approaches in Neurobiology and Brain Diseases*, R Brambilla (Ed), Springer Press, New York.

c) None

d) Other publications

1. Ferguson SM (2004) On the mechanism underlying drug-evoked gene expression in striatopallidal neurons: Implications for psychomotor sensitization. Rackham Graduate School, University of Michigan. Ann Arbor, MI.
2. Garcia AF and Ferguson SM (2020) Psychopharmacology Journal Club: Intermittent but not continuous access to cocaine produces individual variability in addiction susceptibility in rats. *European Behavioural Pharmacology Society Newsletter*, Issue 10.

e) Submitted and in preparation manuscripts

1. O'Neal TJ, Bernstein MX, Ferguson SM (2021) A conditioned place preference to heroin is signaled by increases in dopamine and direct pathway activity and decreases in indirect pathway activity in the nucleus accumbens. Submitted to *Journal Neuroscience*.
2. Crummy EA, Murphy ZD, Durre R, Nooney M, MacDougall D, Richardson J, Baden G, Ferguson SM (2021) Orbitofrontal cortical projection neurons do not affect probabilistic decision-making, but differentially impact behavioral flexibility. Submitted to *eNeuro*.
3. Ramirez JSB, Ravinder S, Christakis DA, Leslie M, Hodge RD, Ramirez TKM, Ferguson SM, Ramirez J-M (2021) Development-dependent effects of sensory overstimulation on behavior, cognition and neurogenesis. Submitted to *Scientific Reports*.
4. Nakata KG, Yin E, Sutlief E, Ferguson SM (2021) Chemogenetic modulation reveals distinct roles of the subthalamic nucleus and its afferents in the regulation of locomotor sensitization to amphetamine in rats. Submitted to *Psychopharmacology*.
5. Garcia AF, Crummy EA, Ferguson SM (2021) Role of subtypes of cortical projection neurons in locomotor sensitization to cocaine. In preparation.
6. O'Neal TJ, Murphy ZD, Schindler A, Ferguson SM (2021) Sex differences in the behavioral effects of self-administered in rats. In preparation.
7. O'Neal TJ, Heavner W, Murphy ZD, Ferguson SM, Smith S (2021) Differential protein expression in direct and indirect pathway striatal neurons following heroin sensitization. In preparation.

f) Abstracts

1. Hama AT, Hittner JM, Whelan KT, Risbrough VB, Sternfeld SM, Lloyd GK, and Menzaghi F (1998) Antinociceptive effect of subtype selective nicotinic acetylcholine receptor agonists in rat models of pain. Abstracts of the 28th Annual meeting of the Society for Neuroscience.
2. Brodtkin J, Sternfeld SM, Stanley M, Lloyd GK, and Menzaghi F (1999) SIB-1508Y, A neuronal nicotinic agonist reverses learned helplessness in rats. Abstracts of the 29th Annual Meeting of the Society for Neuroscience.
3. Ferguson SM and Robinson TE (2000) Brief exposure to a novel environment prior to amphetamine administration at home promotes psychomotor sensitization. Abstracts of the 30th Annual Meeting of the Society for Neuroscience.
4. Ferguson SM, Norton CS, Watson SJ, Akil H and Robinson TE (2001) Environment modulates MK-801 blockade of amphetamine-induced c-fos mRNA expression in striatal cell populations. Abstracts of the 31st Annual Meeting of the Society for Neuroscience.
5. Ferguson SM, Norton CS, Watson SJ, Akil H and Robinson TE (2002) Amphetamine-induced c-fos mRNA expression in two striatal cell populations: Role of DA and NMDA Receptors. Abstracts of the Dopamine 2002 Conference, Portland OR.
6. Ferguson SM, Norton CS, Watson SJ, Akil H and Robinson TE (2002) Role of DA and NMDA receptors in amphetamine-evoked c-fos mRNA expression in two distinct striatal cell populations. Abstracts of the 32nd Annual Meeting of the Society for Neuroscience.
7. Yang P, Uslaner JM, Ferguson SM, Robinson TE (2003) Amphetamine-induced arc mRNA expression in the striatum: Interactions between dose, environment and neuronal phenotype. Abstracts of the 33rd Annual Meeting of the Society for Neuroscience.
8. Samaha A, Ferguson SM, Robinson TE (2003) Rapid intravenous administration potentiates the ability of cocaine to induce psychomotor sensitization and immediate early gene expression. Abstracts of the 33rd Annual Meeting of the Society for Neuroscience.
9. Samaha A, Ferguson SM, Robinson TE (2003) Rapid intravenous administration potentiates the ability of cocaine to induce psychomotor sensitization and engage the mesocorticolimbic system. Abstracts of

the Gordon Research Conference on Catecholamines, Oxford, England, UK.

10. Ferguson SM, Thomas MJ, Robinson TE (2003) *Environmental context and drug history modulate morphine-evoked psychomotor activation and gene expression in the neocortex and specific striatal cell populations. Abstracts of the Gordon Research Conference on Catecholamines, Oxford, England, UK.*
11. Ferguson SM, Thomas MJ, Robinson TE (2003) *Environmental context modulates morphine-induced c-fos mRNA expression in the neocortex and specific striatal cell populations. Abstracts of the 33rd Annual Meeting of the Society for Neuroscience.*
12. Ferguson SM, Yang P, Fasano S, Brambilla R, Robinson TE (2004) *Manipulation of the ERK/MAPK signaling cascade alters cocaine-evoked gene expression and the development of psychomotor sensitization. Abstracts of the 34th Annual Meeting of the Society for Neuroscience.*
13. Ferguson SM and Robinson TE (2005) *Glutamatergic regulation of amphetamine-evoked gene expression varies as a function of the striatal cell population engaged and the environmental context surrounding drug administration. NIDA-sponsored satellite meeting of the 67th Annual Scientific Meeting of the College on Problems of Drug Dependence. Invited.*
14. Mitchell ES, Ferguson SM, Neumaier JF (2006) *5-HT₆ receptors in dorsal and ventral striatum modulate reward motivated learning. Eli Lilly symposium*
15. Ferguson SM, and Neumaier JF (2006) *Overexpression of 5-HT₆ receptors in the nucleus accumbens blocks the rewarding but not psychomotor sensitizing properties of cocaine. Abstracts of the 36th Annual Meeting of the Society for Neuroscience.*
16. Ferguson SM, Sandygren NA, Neumaier JF (2007) *Increasing expression of 5-HT_{1B} receptors in the nucleus accumbens during stress exposure increases susceptibility to the psychomotor activating effects of amphetamine. Abstracts of the 46th Annual Meeting of the American College of Neuropsychopharmacology.*
17. Ferguson SM, Sandygren NA, Neumaier JF (2007) *Increasing expression of 5-HT_{1B} receptors in the nucleus accumbens during exposure to stress increases susceptibility to the psychomotor activating effects of amphetamine. Abstracts of the 37th Annual Meeting of the Society for Neuroscience.*
18. Ferguson SM and Neumaier JF (2008) *Viral-mediated gene transfer as a tool for transiently silencing striatopallidal neurons in vivo: Effects on amphetamine-induced gene expression and psychomotor activation. Abstracts of the 38th Annual Meeting of the Society for Neuroscience.*
19. Ferguson SM and Neumaier JF (2008) *Transient silencing of striatopallidal neurons using viral-mediated gene transfer: Effects on amphetamine-induced c-Fos expression and psychomotor sensitization. Abstracts of the 47th Annual Meeting of the American College of Neuropsychopharmacology.*
20. Ferguson SM, Roth BL and Neumaier JF (2009) *Transient silencing of the indirect and direct striatal pathways using viral-mediated gene transfer produces opposing effects on the development of psychomotor sensitization to amphetamine. Abstracts of the 39th Annual Meeting of the Society for Neuroscience.*
21. Ferguson SM, Eskenazi D, Roth BL and Neumaier JF (2009) *Transient silencing of indirect or direct pathway striatal neurons with "neoreceptors" reveals opposing effects on behavioral sensitization to amphetamine. Abstracts of the 48th Annual Meeting of the American College of Neuropsychopharmacology. Selected as a Basic Voice Poster for the E-poster website.*
22. Eskenazi D, Ferguson SM, Neumaier JF (2010) *Serotonin Signaling via striatal 5-HT₆ receptors: Impact on condition. Cold Spring Harbor Conferences Asia: Francis Crick Symposium on Neuroscience.*
23. Ferguson SM, Eskenazi D, Neumaier JF (2010) *Probing the role of the striatonigral pathway in operant behavior responding in rat using viral-mediated gene transfer of DREADD receptors in specific cell phenotypes. Abstracts of the 40th Annual Meeting of the Society for Neuroscience.*

24. Ferguson SM, Eskenazi D, Phillips PEM and Neumaier JF (2010) Elucidating the role of striatal pathways in operant responding and decision-making tasks using targeted viral-mediated gene transfer of DREADD receptors in rats. Abstracts of the 49th Annual Meeting of the American College of Neuropsychopharmacology.
25. Ferguson SM, Eskenazi D, Phillips PEM and Neumaier JF (2011) Using targeted viral-mediated gene transfer of DREADD receptors in rats to elucidate the role of 'direct' pathway neurons in reinforcement learning and decision making. Abstracts of the Winter Conference on Brain Research.
26. Ferguson SM, Phillips P, Neumaier JF (2011) DREADDed decision-making: Uncovering a role for the 'direct' pathway in reward choice. Abstracts of the 41th Annual Meeting of the Society for Neuroscience.
27. Ferguson SM, Phillips P, Neumaier JF (2011) DREADDed decision-making: Revealing a role for the 'direct' pathway in reward preference. Abstracts of the 50th Annual Meeting of the American College of Neuropsychopharmacology. Selected for presentation in the Data Blitz Basic Section and as a Basic Voice Poster for the E-poster website.
28. Ferguson SM, Newcomer DM, Neumaier JF (2012) Modulation of G-protein dependent signaling using viral-mediated gene transfer of DREADD receptors reveals an important role of the indirect pathway in behavioral inhibition. Abstracts of the 7th Brain Research Conference, Optogenetics and Pharmacogenetics in Neuronal Function and Dysfunction.
29. Smith RJ, Scofield MD, Ferguson SM, Neumaier JF, Keefe KA, McGinty JF, Kalivas Pw (2012) Fos activation in accumbens-pallidal and accumbens-nigral neurons during reinstatement of cocaine seeking. Abstracts of the 42nd Annual Meeting of the Society for Neuroscience.
30. Kerstetter K, Neumaier JF, Ferguson SM (2012) Viral-mediated transfer of DREADD receptors reveals a corticostriatal pathway involvement in motivation for cocaine self-administration. Abstracts of the 42nd Annual Meeting of the Society for Neuroscience.
31. Ferguson SM, Newcomer DM, Robbins TW, Neumaier JF (2012) Targeted viral-mediated gene transfer of DREADD receptors reveals an important role of G-protein dependent signaling in the indirect pathway in behavioral inhibition. Abstracts of the 42nd Annual Meeting of the Society for Neuroscience.
32. Ferguson SM, Newcomer DM, Robbins TW, Neumaier JF (2012) Understanding the role of G-protein dependent signaling in the indirect striatal pathway in behavioral inhibition using targeted viral-mediated gene transfer of DREADD receptors. Abstracts of the 51st Annual Meeting of the American College of Neuropsychopharmacology.
33. Kerstetter K, Neumaier JF, Ferguson SM (2013) DREADDed drug-seeking: Isolating the contribution of corticostriatal projections in motivation for cocaine self-administration. Abstracts of the Winter Conference on Brain Research. Selected for an honorable mention poster prize.
34. Wunsch A, Ferguson SM (2013) Role of Gi/o-signaling cascades in striatal subregions during delay discounting. Abstracts of the 43rd Annual Meeting of the Society of Neuroscience.
35. Kerstetter KA, Neumaier JF, Ferguson SM (2013) Viral-mediated transfer of DREADD receptors reveals a corticostriatal pathway involvement in reinstatement to cocaine seeking. Abstracts of the 43rd Annual Meeting of the Society of Neuroscience.
36. Kerstetter KA, Wunsch AM, Donckels E, Neumaier JF, Ferguson SM (2013) G-protein dependent signaling in corticostriatal afferents regulates locomotor sensitization, drug-taking and drug-seeking behaviors. Abstracts of the 52nd Annual Meeting of the American College of Neuropsychopharmacology.
37. Wunsch AM, Donckels EA, Neumaier JF, Ferguson SM (2014) Resolving the contribution of nucleus accumbens glutamatergic afferents during amphetamine sensitization using Gi/o-coupled DREADDs. Abstracts of the 44rd Annual Meeting of the Society of Neuroscience.
38. Ravinder S, Christakis DA, Ramirez JM, Ferguson SM (2014) Effects of sensory overstimulation in early life on vulnerability to cocaine addiction. Abstracts of the 44rd Annual Meeting of the Society of

Neuroscience.

39. Kerstetter KA, Stewart R, Neumaier JF, Ferguson SM (2014) Viral-mediated transfer of DREADDs reveals a differential role of the corticostriatal pathway in cocaine-taking and cocaine-seeking behavior. Abstracts of the 44rd Annual Meeting of the Society of Neuroscience.
40. Ravinder S, Christakis DA, Ramirez JM, Ferguson SM (2014) Impact of excessive non-normative sensory stimulation in early life on vulnerability to the effects of cocaine. Abstracts of the 52nd Annual Meeting of the American College of Neuropsychopharmacology.
41. Haight J, Fraser K, Akil H, Ferguson SM, Flagel SB (2014) Parsing the role of the paraventricular nucleus of the thalamus in mediating individual variation in incentive salience attribution. Abstracts of the 51st Annual Meeting of the American College of Neuropsychopharmacology.
42. Haight J, Fraser K, Akil H, Ferguson SM, Flagel SB (2015) Establishing a role for the paraventricular nucleus of the thalamus in Pavlovian conditioned approach behavior. Abstracts of the Winter Conference on Brain Research.
43. Garcia A, Yager LM, Ferguson SM (2015) Cocaine-induced alterations in calcium signaling in the striatum. Abstracts of the Winter Conference on Brain Research.
44. Wunsch AM, Donckels EA, Yager LM, Neumaier JF, Ferguson SM (2015) Determining the contribution of nucleus accumbens glutamatergic afferents during addiction-related behaviors using $G_{i/o}$ -coupled DREADDs. Abstracts of the 45th Annual Meeting of the Society of Neuroscience.
45. Rivero-Covelo I, Haight JL, Fraser KM, Kuhn BN, Ferguson SM, Flagel SB (2015) Chemogenetic manipulations of prelimbic inputs to the paraventricular nucleus of the thalamus alter sign- and goal-tracking behavior. Abstracts of the 45th Annual Meeting of the Society of Neuroscience.
46. Ravinder S, Ramirez JSB, Christakis D, Ramirez JM, Ferguson SM (2015) Too much, too early: Effects of sensory overstimulation in early life. Abstracts of the 45th Annual Meeting of the Society of Neuroscience.
47. Anastasio NC, Stutz SJ, Price AE, Ferguson SM, Neumaier JF, Cunningham KA (2015) Activation of the corticoaccumbens circuit attenuates inherent impulsivity and binge intake of high fat food. Abstracts of the 45th Annual Meeting of the Society of Neuroscience.
48. Garcia A, Ferguson SM (2016) Effect of cocaine self-administration pattern on reinstatement and corticostriatal activity. Abstracts of the Winter Conference on Brain Research.
49. Wunsch AM, Yager LM, Le C, Donckels EA, Neumaier JF, Ferguson SM (2016) Resolving the contribution of midline thalamic nuclei efferents during reinstatement of drug-seeking using $G_{i/o}$ -coupled DREADDs. Abstracts of the 46th Annual Meeting of the Society of Neuroscience.
50. Lopez SA, Covelo IR, Komaiha M, Ferguson SM, Flagel SB (2016) Time-course expression and locomotor effects of chemogenetic modulation of prelimbic projections to the paraventricular nucleus of the thalamus in the rat. Abstracts of the 46th Annual Meeting of the Society of Neuroscience.
51. Campus P, Kim Y, Parsegian A, Covelo IR, Ferguson SM, Sarter M, Flagel SB (2016) Effects of chemogenetic manipulations of prelimbic inputs to the paraventricular nucleus of the thalamus on dopamine release in the nucleus accumbens of sign-trackers and goal-trackers. Abstracts of the 46th Annual Meeting of the Society of Neuroscience.
52. Ravinder S, Gadiwalla S, Christakis D, Ferguson SM, Ramirez JM (2016) Consequences of excessive sensory stimulation during development on addiction, impulsivity and attention. Abstracts of the 46th Annual Meeting of the Society of Neuroscience.
53. Garcia A, Yager L, Ferguson SM (2017) Effect of cocaine self-administration pattern on reinstatement, sensitization and striatal activity. Abstracts of the Winter Conference on Brain Research.
54. O'Neal TJ, Ferguson SM (2017) Striatal medium spiny neurons regulate reinstatement of heroin-

seeking. Abstracts of the 47th Annual Meeting of the Society for Neuroscience.

55. Nakata KG, Yin E, Ferguson SM (2017) DREADD-mediated modulation of the subthalamic nucleus alters locomotor sensitization to amphetamine in rats. *Abstracts of the 47th Annual Meeting of the Society for Neuroscience.*
56. Garcia AF, Webb IG, Ferguson SM (2017) Role of PT-type cortical neurons in locomotor sensitization, conditioned place preference and reinstatement of drug-seeking to cocaine. *Abstracts of the 47th Annual Meeting of the Society for Neuroscience.*
57. Crummy E, Donckels EA, Ferguson SM (2017) Craving and addiction severity in rat models of heroin and cocaine sequential polydrug abuse. *Abstracts of the 47th Annual Meeting of the Society for Neuroscience.*
58. Rivero-Covelo I, Campus P, Kuhn BN, Lopez SA, Ferguson SM, Flagel SB (2017) Chemogenetic manipulations of prelimbic inputs to the thalamic paraventricular nucleus affect individual differences in response to a reward associated cue. *Abstracts of the 47th Annual Meeting of the Society for Neuroscience.*
59. O'Neal TJ, Richardson J, Ferguson SM (2018) Chemogenetic modulation of direct and indirect pathway striatal medium spiny neurons alters drug-seeking in a rat model of heroin addiction. *Abstracts of the 57th Annual Meeting of the American College of Neuropsychopharmacology.*
60. Crummy EA, Donckels EA, Baskin BM, Ferguson SM (2019) Effect of drug history on motivation and craving in a rat model of polydrug abuse. *Abstracts of the Winter Conference on Brain Research.*
61. Baskin BM, Luchini KA, Ferguson SM (2020) KCNQ3 overexpression differentially modulates cue-induced reinstatement of heroin-seeking in high- vs. low-risk rats. *Abstracts of the Winter Conference on Brain Research.*
62. O'Neal T, Murphy Z, Stuber G, Ferguson SM (2020) Female rats express a more addictive phenotype than male rats during intermittent-access heroin self-administration. *Abstracts of the Winter Conference on Brain Research.*
63. Crummy E, Garcia A, Webb I, Durre R, Ferguson SM (2020) Intratelencephalic and pyramidal tract neurons differentially mediate cocaine sensitization and conditioned taste aversion. *Abstracts of the Winter Conference on Brain Research.*
61. O'Neal T, Murphy, MacDougall D, Ferguson SM (2020) Female rats are more susceptible to high-risk addictive behaviors than male rats. *Abstracts of the 58th Annual Meeting of the American College of Neuropsychopharmacology.*
62. Murphy ZD, Crummy E, MacDougall D, Ferguson SM (2020) Chemogenetic inhibition of orbitofrontal cortex reveals distinct role of subtypes of cortical projection neurons in regulating decision-making in a probability discounting task in rats. *Abstracts of the 58th Annual Meeting of the American College of Neuropsychopharmacology.*

OTHER: *Local and National invitational lectures, etc.*

2021

European Behavioural Pharmacology Society (EBPS) Biennial Meeting, Maastricht, Netherlands
UW Psychiatry and Behavioral Sciences Grand Rounds, via Zoom
UW Psychiatry and Behavioral Sciences Research Retreat, via Zoom

2020

CUNY Neuroscience seminar series, via Zoom
University of Florida Center for Addiction Research and Education monthly seminar series, via Zoom
University of Washington Dept. of Oral Health Sciences seminar series, via Zoom
University of Washington MSTP monthly meeting, Seattle, WA

2019

Winter Conference on Brain Research, Snowmass, CO
Dept. of Neuroscience Seminar Series, University of Minnesota, Minneapolis, MN
58th Annual Meeting of the American College of Neuropsychopharmacology, Orlando, FL
Methamphetamine Summit, University of Washington, Seattle, WA
UW Neurobiology of Addiction, Pain and Emotion (NAPE) monthly symposium, Seattle, WA
Intellectual and Developmental Disabilities Research Center (IDDRC) symposium, Seattle, WA
UW Center for Aids Research (CFAR) Behavioral Science Core monthly meeting, Seattle, WA

2018

57th Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL
Dept. of Pharmacology Seminar Series, University of Buffalo, Buffalo, NY

2017

56th Annual Meeting of the American College of Neuropsychopharmacology, Palm Springs, CA
Psychiatry & Behavioral Sciences Dept. Grand Rounds, University of Washington, Seattle, WA
Winter Conference on Brain Research, Big Sky, MO

2016

Frontiers in Addiction Research Mini-Convention, San Diego, CA
UW Neuroscience Program Retreat, University of Washington, Seattle, WA
Neuroscience Seminar Series, Washington State University, Pullman, WA
Addiction, in Theory, London, UK

2015

54th Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL
Molecular Psychiatry Meeting, San Francisco, CA
What is needed to harness chemogenetics for the treatment of human brain disorders? Banbury Conference Center, Cold Spring Harbor, New York
EBBS-EBPS joint meeting, Verona, Italy
Spring Neuroscience Symposium: Frontiers in decision neuroscience, University of Washington, Seattle, WA
Refining the circuitry of addiction with cutting edge tools, National Institute on Drug Abuse, Rockville, MD
Winter Conference on Brain Research, Big Sky, MO
Oregon Health Sciences University Dept. of Pharmacology Seminar Series, Portland, OR

2014

UW Science in Medicine Lecture Series, New Investigator Lecture, Seattle, WA
Graduate Program in Neuroscience Seminar Series, University of Washington, Seattle, WA
Seattle Children's Hospital Pediatric Neurology Seminar Series, Seattle, WA
University of Utah Neuroscience Seminar Series, Salt Lake City, UT
Winter Conference on Brain Research, Steamboat Springs, CO

2013

University of Washington Behavioral Neuroscience Seminar Series, Seattle, WA
Gordon Research Conference on Catecholamines, West Dover, VT
Frontiers in Addiction Research, a satellite meeting of the Society for Neuroscience annual meeting, San Diego, CA (cancelled)

*Center for Integrative Neuroscience Symposium "Flipping the switch: The neurobiology of addiction",
University of Washington, Seattle, WA*

2011

Stress in Seattle, Seattle, WA

2009

Dept. of Psychiatry, University of Alabama at Birmingham, Birmingham, AL

48th Annual Meeting of the American College of Neuropsychopharmacology

Center for Integrative Brain Research, Seattle Children's Research Institute, Seattle, WA

2006

36th Annual Meeting of the Society for Neuroscience