

Deranda B. Lester, Ph.D.

Curriculum Vitae

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EDUCATION

- 2011** **Ph.D., Experimental Psychology**
The University of Memphis, Department of Psychology
Research Area: Behavioral Neuroscience
Dissertation: Neural Pathways and Receptor Mechanisms Mediating Striatal Dopamine Release:
Relevance to Deep Brain Stimulation as a Treatment for Parkinson's Disease
Chair: Charles D. Blaha, Ph.D.
- 2007** **M.S., General Psychology**
The University of Memphis, Department of Psychology
Thesis: Behavioral and Neurochemical Analysis of Two Novel Mutant Mouse Strains
Hyporesponsive to Cocaine
- 2004** **B.S., Psychology**
Millsaps College, Jackson, MS
Minors: Biology, Chemistry

ACADEMIC EXPERIENCE

- 2015-present** **Research Assistant Professor**
Psychology Department, The University of Memphis
Research Interests: The circuitry of neurotransmitter systems in relation to autism, movement disorders, ADHD, and addiction.
Research Techniques: In vivo fixed potential amperometry and behavioral tests for rodents.
- 2015-present** **Visiting Assistant Professor**
Psychology Department, The University of Memphis
Research Interests: The circuitry of neurotransmitter systems in relation to autism, movement disorders, ADHD, and addiction.
Research Techniques: In vivo fixed potential amperometry and behavioral tests for rodents.
- 2011-2015** **Postdoctoral Research Associate**
Developmental Neurobiology Department, St. Jude Children's Research Hospital
Research Interests: The role of genetics and environment in neurodegeneration, particularly as it relates to Parkinson's disease.
Research Techniques: Immunohistochemistry, stereology, western blots, regular and real-time PCR, behavioral tests for mice, and in vivo fast scan cyclic voltammetry.
Primary Investigator: Richard J. Smeyne, Ph.D.
- 2004-2011** **Graduate Research Assistant**
Psychology Department, The University of Memphis
Research Interests: The neurochemistry of the mesoaccumbens and nigrostriatal dopaminergic systems in relation to addiction and Parkinson's disease.
Research Techniques: In vivo fixed potential amperometry, behavioral tests for rodents.

CLINICAL EXPERIENCE

- 2014-2015** **Clinical Observer in the Psychology Department, St. Jude Children's Research Hospital**
Clinical Observations: Neuropsychological testing and test interpretations of brain tumor patients.
Supervisor: Heather Conklin, Ph.D.
- 2006** **Clinical Research Collaborator with the Neurosurgical Unit at the Mayo Clinic, Rochester, MN**
Clinical Observations: Neurosurgical implantations of Deep Brain Stimulation electrodes and post-operation examinations of patients with Parkinson's disease and Tourette's syndrome
Supervisor: Kendall Lee, M.D., Ph.D.

TEACHING EXPERIENCE**Instructor (all at The University of Memphis)**

- 2015-present Behavioral Neuroscience (graduate), 4 Semesters, Class size = 20
 2011-present Physiological Psychology (undergraduate), 8 Semesters, Class size = 45
 2008-present Online and in-class: General Psychology (undergraduate), 15 Sems, Class size = 20-60
 2012-present Online: Alcohol, Drugs, and Behavior (undergraduate), 15 Semesters, Class size = 25
 2016 Neuropsychopharmacology (graduate), 1 Semester, Class size = 15
 2010-2014 Online: Physiological Psychology (undergraduate), 8 Semesters, Class size = 25

Teaching Assistant (all at The University of Memphis)

- 2005-2007 Research Methods (undergraduate), 4 Semesters, Class size = 30
 2005 Advanced Statistics I (graduate), 1 Semester, Class size = 30

MENTORING EXPERIENCE**Current Students**

<u>Name</u>	<u>Degree</u>	<u>Anticipated Graduation Date</u>	<u>Role</u>
Mary Estes	MS/PhD	MS Dec 2018, PhD May 2021	Thesis Chair / Major Professor
Daniel Gabriel	MS/PhD	MS Dec 2018, PhD May 2021	Thesis Committee
Sarah Blackmore	MS	May 2019	Thesis Committee
Kevin Honeywell	MS	May 2019	Thesis Co-Chair / Lab Supervisor
Hunter Nolen	MS	May 2019	Thesis Co-Chair / Lab Supervisor
Nick Paige	MS	Aug 2019	Thesis Chair / Major Professor
Josiah Comstock	MS	May 2020	Honors Thesis Chair / Major Professor
Abigail Chaffin	BA	May 2019	Honors Thesis Chair / Major Professor
Megan McWain	BA	May 2019	Thesis Chair / Major Professor
Robyn Pennella	BA	May 2019	Honors Thesis Chair / Major Professor
Bennett Brown	BA	May 2019	Thesis Co-Chair
Madison Mills	BA	Dec 2019	Thesis Chair / Major Professor
Roa Salah	BA	Dec 2019	Thesis Chair / Major Professor
Shelby Towers	BA	May 2020	Honors Thesis Chair / Major Professor
Aaron Byrn	BS	May 2020	Honors Thesis Chair / Major Professor

Past Students

<u>Name</u>	<u>Degree</u>	<u>Graduation Date</u>	<u>Role</u>
Malli Swamy	BS	May 2016	Lab Supervisor
Josiah Comstock	BA	May 2017	Honors Thesis Chair / Major Professor
Megan Beane	BA	Dec 2017	Thesis Chair / Major Professor
Jasric Bland	BA	May 2018	Honors Thesis Chair / Major Professor
Kenya Ector	BA	May 2018	Honors Thesis Chair / Major Professor

William Prater	BS	May 2018	Lab Supervisor
Tim Freels	PhD	May 2018	Dissertation Committee / Lab Supervisor
Zade Holloway	PhD	Aug 2018	Dissertation Co-Chair / Lab Supervisor
Nick Paige	BA	Aug 2018	Thesis Chair / Major Professor

PEER- REVIEWED PUBLICATIONS

- Holloway, Z., Freels, T.F., Comstock, J.F., Nolen, H.G., Sable, H.J. & **Lester, D.B.** (2018). Comparing phasic dopamine dynamics in the striatum, nucleus accumbens, amygdala, and medial prefrontal cortex. *Synapse*. Advance online publication. doi: 10.1002/syn.22074
- Powell, D.W., Blackmore, S.E., Puppa, M., **Lester, D.B.**, Murray, N.G., Reed-Jones, R.J., & Xia, R. (2018). Deep brain stimulation enhances movement complexity during gait in individuals with Parkinson's disease. *Neuroscience Letters*. Advance online publication. doi: 10.1016/j.neulet.2018.05.010
- Prater, W.T., Swami, M., Beane, M.D., & **Lester, D.B.** (2018). Examining the effects of common laboratory methods on the sensitivity of carbon fiber electrodes in amperometric recordings of dopamine. *Journal of Behavioral and Brain Science*, 8, 117-125.
- Powell, D.W., Szekely, B., Blackmore, S.E., Nelson, A., Schallert, A., **Lester, D.B.**, Murray, N.G., & Puppa, M. (2018). Effects of sampling rate and movement frequency on entropic measures of regularity. *Journal of Nature and Science*, 5, e504.
- Dickson, P.E., Rogers, T.D., **Lester, D.B.**, Miller, M.M., Matta, S.G., Chesler E.J., Kobor, M.S., Goldowitz, D., Blaha, C.D., & Mittleman, G. (2011). Genotype-dependent effects of adolescent nicotine exposure on dopamine functional dynamics in the nucleus accumbens shell in male and female mice: a potential mechanism underlying the gateway effect of nicotine. *Psychopharmacology*, 215, 631-642.
- Lester, D.B.**, Rogers, T.D., & Blaha, C.D. (2010). Acetylcholine-dopamine interactions in the pathophysiology and treatment of CNS disorders. *CNS Neuroscience & Therapeutic*, 16, 137-162.
- Lester, D.B.**, Miller, A.D., & Blaha, C.D. (2010). Muscarinic receptor blockade in the ventral tegmental area attenuates cocaine enhancement of laterodorsal tegmentum stimulation-evoked accumbens dopamine efflux in the mouse. *Synapse*, 64, 216-223.
- Schmidt, L.S., Miller, A.D., **Lester, D.B.**, Bay-Richter, C., Schulein, C., Frikke-Schmidt, H., Wess, J., Blaha, C.D., Woldbye, D., Fink-Jensen, A., & Wortlein, G. (2010). Increased amphetamine-induced locomotor activity, sensitization, and accumbal dopamine release in M5 muscarinic knockout mice. *Psychopharmacology*, 207, 547-558.
- Lester D.B.**, Rogers, T.D., Garris P.A., Lee, K.H., Mohseni P., & Blaha C.D. (2009) Neuronal pathways involved in deep brain stimulation of the subthalamic nucleus for the treatment of Parkinson's disease. *Proceedings of the Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 1, 3302-3305.
- Lee, K.H., Blaha, C.D., Garris, P.A., Mohseni, P., Horne, A.E., Bennet, K.E., Agnesi, F., Bledsoe, J.M., **Lester, D.**, Kimble, C., Min, H., Kim, Y., & Cho, Z. (2009). Evolution of deep brain stimulation: human electrometer and smart devices supporting the next generation of therapy. *Neuromodulation*, 12, 85-103.
- Lester, D.B.**, Miller, A.D., Pate, T.D., & Blaha, C.D. (2008). Midbrain acetylcholine and glutamate receptors modulate accumbal dopamine release. *NeuroReport*, 19, 991-995.

BOOK CHAPTERS

- Jackson-Lewis V., **Lester, D.B.**, Kozina, E., Przedborski, S., & Smeyne R.J. (2014). MPTP, Neurotoxin and Viral (Exogenous) Models of PD. In M. LeDoux (Ed.), *Movement Disorders: Genetics and Models* (2nd Edition). Elsevier Publishing.
- Miller, A.D., Forster, G.L., **Lester, D.B.**, & Blaha, C.D. (2008). Mesopontine cholinergic and glutamatergic modulation of mesoaccumbens dopaminergic neurotransmission. In H.N. David (Ed.), *The Nucleus Accumbens: Neurotransmitters and Related Behaviours* (pp. 111-136). Philadelphia, PA; Old City Publishing.

Blaaha, C.D., **Lester, D.B.**, Ramsson, E.S., Lee, K.H., & Garris, P.A. (2008). Striatal dopamine release evoked by subthalamic stimulation in intact and 6-OHDA-lesioned rats: Relevance to deep brain stimulation in Parkinson's Disease. In P. Phillips, S. Sandberg, S. Ahn, & A. Phillips (Eds.), *Monitoring Molecules in Neuroscience* (pp. 395-397). Vancouver, Canada.

SUBMITTED MANUSCRIPTS

Freels, T.F., Lester, D.B., & Cook, M.N. (in revisions). Arachidonoyl Serotonin (AA-5-HT) modulates general fear-like behavior and inhibits mesolimbic dopamine release. *Neuropharmacology*.
 Estes, M.K., Freels, T.F., Prater, W.D., Swamy, M., & **Lester, D.B.** (submitted). Chronic oxytocin administration alters mesolimbic dopamine transmission in mice. *Neuroscience*.

MANUSCRIPTS IN PREPARATION

Freels, T.F., Gabriel, D.B.K., **Lester, D.B.**, & Simon, N.W. (in preparation). Risky decision-making predicts behavioral and dopaminergic phenotypes associated with addiction vulnerability.
 Estes, M.K., Bland, J., Ector, K., Puppa, M., Powell, D., & **Lester, D.B.** (in preparation). High-fat vs. vegan diet: Effects on nucleus accumbens dopamine release in mice.
 Paige, N., Sable, H.J., & **Lester, D.B.** (in preparation). Autoreceptor inhibition of dopamine release in the nucleus accumbens is altered by D2 antagonism and dopamine transporter inhibition.

PODIUM PRESENTATION

2014 "Loss of GSTpi Induces Behavioral and Neurochemical Phenotypes Associated with Parkinson's Disease in A30P Alpha-Synuclein Transgenic Mice". Abstract chosen for oral presentation at the St. Jude Postdoctoral Professional Development Retreat at Rhodes College

SELECTED CONFERENCE PRESENTATIONS (of 52 total)

Holloway, Z., Freels, T.F., Comstock, J.F., Nolen, H.G., Sable, H.J. & **Lester, D.B.** (2018). Comparing phasic dopamine dynamics in the striatum, nucleus accumbens, amygdala, and medial prefrontal cortex. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Honeywell, K., Freels, T., Chaffin, A., McWain, M., Nolen, H., Sable, H., **Lester, D.B.** (2018). Examining the chronic effects of indirect and direct cannabinoid receptor agonists on dopamine transmission in the nucleus accumbens of mice. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Paige, N., Sable, H.J., & **Lester, D.B.** (2018). Autoreceptor inhibition of dopamine release in the nucleus accumbens is altered by D2 antagonism and dopamine transporter inhibition. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Estes, M.K., Bland, J., Ector, K., & **Lester, D.B.** (2018). High-fat vs. vegan diet: Effects on nucleus accumbens dopamine release in mice. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Freels, T.F., **Lester, D.B.**, & Cook, M.N. (2018). Arachidonoyl Serotonin (AA-5-HT) modulates general fear-like behavior and inhibits mesolimbic dopamine release. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Woods, A., Freels, T., Gabriel, D., Joyner, H., Morrison, S., **Lester, D.B.**, & Simon, N. (2018). Risky decision-making predicts behavioral and dopaminergic phenotypes associated with addiction vulnerability. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
 Estes, M.K., Freels, T.F., Prater, W.D., & **Lester, D.B.** (2018). Chronic oxytocin administration alters mesolimbic dopamine transmission in mice. Poster presented at the Conference titled: Understanding the Neuroregulatory Actions of Oxytocin and Its Potential Clinical Applications, Italy.

- Paige, N., & **Lester, D.B.** (2018). Autoreceptor inhibition of dopamine release in the nucleus accumbens is altered by D2 antagonism. Poster presented at the Student Research Forum at the University of Memphis. Student won 1st place in the undergraduate division.
- Holloway, Z., Freels, T.F., & **Lester, D.B.** (2018). Comparing phasic dopamine dynamics in the striatum, nucleus accumbens, and amygdala. Poster presented at the Student Research Forum at the University of Memphis. Student won 1st place in the graduate division.
- Simon, N.W., Freels, T.F., Gabriel, D.B.K., & **Lester, D.B.** (2017). Risky decision-making predicts behavioral and dopaminergic phenotypes associated with addiction vulnerability. Poster presented at the American College of Neuropsychopharmacology Conference, Palm Springs, CA.
- Estes, M.K., Freels, T.F., Prater, W.D., & **Lester, D.B.** (2017). Chronic oxytocin administration alters mesolimbic dopamine transmission in mice. Poster presented at Society for Neuroscience Conference, Washington D.C.
- Freels, T.F., Gabriel, D.B.K., **Lester, D.B.**, Cook, M.N., & Simon, N.W. (2017). Cannabinergic modulation of risky decision-making and mesolimbic dopamine release in rodents. Poster presented at the Society for Neuroscience Conference, Washington D.C.
- Prater, W.T., Swami, M., Beane, M.D., & **Lester, D.B.** (2016). Examining the effects of common laboratory methods on the sensitivity of carbon fiber electrodes in amperometric recordings of dopamine. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
- Pani, A.K., **Lester, D.**, Korff, A., Jiao, Y., Sample, K., Said, K., & Smeyne, R.J. (2015) Effect of Aging on Monoamine and Purine Levels in the Basal Ganglia of Mice Carrying A53T and A30P Alpha-Synuclein Mutations. Poster presented at the International Society for Neurochemistry Conference, Cairns, Australia.
- Lester, D.B.**, Sample, K.J., & Smeyne, R.J. (2014). Alterations in stimulation-evoked dopamine release and associated behaviors in mice lacking GSTpi and transgenic mice carrying the A53T alpha-synuclein mutation. Poster presented at the Society for Neuroscience Conference, Washington D.C.
- Lester, D.B.**, Korff, A., Jiao, Y., Pani, A., Sample, K.J., Nussbaum, R., & Smeyne, R.J. (2013). Absence of GSTpi induces behavioral and neurochemical changes in A30P, but not A53T alpha synuclein transgenic mice. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
- Lester, D.B.**, Pani, A.K. Blaha, C.D., & Smeyne, R.J. (2012). Alterations in stimulation-evoked dopamine release in mice carrying a R1441G mutation in the LRRK2 gene. Poster presented at the Society for Neuroscience Conference, New Orleans, LA.
- Rogers, T.D., **Lester, D.B.**, Dickson, P.E., Miller, M.M., Heck, H., Goldowitz, D., Mittleman, G., & Blaha, C.D. (2010). Connecting the dots of the autism disconnection hypothesis: Neural pathways for cerebellar modulation of dopamine release in the prefrontal cortex. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
- Lester, D.B.**, Rogers, T.D., Mohseni, P., Garris, P.A., Lee, K.H., & Blaha, C.D. (2009). Neuronal pathways and subthalamic nucleus receptor subtypes involved in striatal dopamine release evoked by stimulation of the pedunculopontine tegmental nucleus. Poster presented at the Society for Neuroscience Conference, Chicago, IL.
- Lester, D.B.**, Miller, A.D., Dickson, P.E., Mittleman, G., & Blaha, C.D. (2007). Effects of acute muscarinic receptor blockade on cocaine-induced elevations in laterodorsal tegmentum stimulation-evoked accumbens dopamine levels. Poster presented at the Society for Neuroscience Conference, San Diego, CA.
- Brewer, D.L.**, Mittleman, G., Goldowitz, D., Miller, A.D., & Blaha, C.D. (2005). Behavioral and neurochemical analysis of two novel mutants hyporesponsive to cocaine: an update from the TMGC consortium. Poster presented at the Society for Neuroscience Conference, Washington D.C.

GRANTS FUNDED

- 2018** **Psi Chi, The International Honor Society in Psychology, Faculty Advisor Research Grant**
 “Examining the Ability of Oxytocin to Rescue Potentially Dysfunctional Dopamine Transmission following Social Isolation in Adolescent Mice”
Principal Investigator: Deranda Lester
Total Funds: \$2000.00

- 2018 The University of Memphis, Faculty Research Grant**
 “Dopamine Dysfunction in the Medial Prefrontal Cortex in Two Rodent Models of ADHD”
Co-Principal Investigator: Deranda Lester
Total Funds: \$10000.00
- 2018 Psi Chi, The International Honor Society in Psychology, Undergraduate Research Grant**
 “Examining the effects of social interaction and nicotine exposure on mesolimbic dopamine functioning”
Undergraduate Student: Robyn Pennella, *Mentor:* Deranda Lester, Ph.D.
 Total Funds: \$3000.00
- 2017 Psi Chi, The International Honor Society in Psychology, Undergraduate Research Grant**
 “Comparing the effects of chronic cannabinoid agonists on nucleus accumbens dopamine release”
Undergraduate Student: Abigail Chaffin, *Mentor:* Deranda Lester, Ph.D.
 Total Funds: \$3000.00
- 2017 Psi Chi, The International Honor Society in Psychology, Undergraduate Research Grant**
 “Examining the effect of diet on mesolimbic dopamine release and psychostimulant addiction”
Undergraduate Student: Jasric Bland, *Mentor:* Deranda Lester, Ph.D.
 Total Funds: \$3000.00
- 2017 Psi Chi, The International Honor Society in Psychology, Graduate Research Grant**
 “The effects of oxytocin administration on mesolimbic dopamine transmission”
Graduate Student: Mary Estes, *Mentor:* Deranda Lester, Ph.D.
 Total Funds: \$1500.00
- 2016 Psi Chi, The International Honor Society in Psychology, Faculty Advisor Research Grant**
 “Examining the Effect of Oxytocin on Midbrain Dopamine Release”
Principal Investigator: Deranda Lester
Total Funds: \$2000.00
- 2009 Graduate Research Grant from Psi Chi National Honor Society**
 “Neuronal pathways involved in mediating dopamine release evoked by stimulation of the subthalamic nucleus for the treatment of Parkinson’s disease”
Principal Investigator: Deranda Lester, *Mentor:* Charles D. Blaha, Ph.D.
Total Funds: \$1131.40

GRANTS NOT FUNDED

- 2017 R03 “Risky Decision Making as a Model for Addiction”**
Co-Principal Investigators: Nick Simon, Ph.D. and Deranda Lester, Ph.D.
- 2017 Michael J. Fox Foundation for Parkinson's Research Grant**
Co-Principal Investigators: Douglas Powell, Ph.D., Melissa Puppa, Ph.D., and Deranda Lester, Ph.D.

UNIVERSITY SERVICE

- 2017-present Director of Psychology Honors Program at the University of Memphis**
Involvement: Interviewing and accepting students for the Psychology Honors Program, overseeing that students meet requirements for program completion, and reviewing all honor theses.

2015-present Faculty Advisor of Psi Chi Chapter at the University of Memphis

Involvement: Generating interest from students to revive our chapter in Psi Chi, the International Honor Society in Psychology. Since taking over, our chapter has gone from 0 active members to 41 active members.

COMMUNITY SERVICE

2018-present Member and Volunteer for Faculty for Undergraduate Neuroscience (FUN)

Involvement: FUN is a national organization dedicated to neuroscience teaching and research. I review articles for the Journal for Undergraduate Neuroscience Education, put out by FUN. I volunteer at the FUN booth at Society for Neuroscience Conference and attend the yearly social.

2016-present Founder and Leader of Memphis Brain Awareness Week

Involvement: Organizing yearly event in conjunction with the national program set up by the DANA foundation and the Society for Neuroscience. University of Memphis students and I go to local public schools and provide learning activities about the brain.

2014-2015 Volunteer with Career Connections Program through St. Jude Research Hospital

Involvement: Gave seminars on behavioral neuroscience and career advice to local students interested in science and psychology.