

Justin M. Moscarello, PhD

Assistant Professor

Department of Psychological & Brain Sciences

Institute for Neuroscience

Texas A&M University

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Education & Training

POSTDOCTORAL FELLOWSHIP

2010-14 **LeDoux Lab**
Center for Neural Science
New York University (NYU)
Mentor: Professor Joseph LeDoux

GRADUATE & UNDERGRADUATE DEGREES

2010 **PhD Psychology, emphasis in Neuroscience & Behavior**
Department of Psychological & Brain Sciences
University of California, Santa Barbara (UCSB)
Mentor: Professor Aaron Ettenberg

2003 **BA Physical Anthropology**
UCSB

HONORS & AWARDS

2011-14 Ruth L. Kirchstein National Research Service Award (postdoctoral)
2009 Harry J. Carlisle Award for Outstanding Graduate Student, Dept. of Psychology, UCSB
2008-09 Ruth L. Kirchstein National Research Service Award (predoctoral)
2007 Dean's Fellowship, College of Arts & Sciences, UCSB
2006 Advanced to PhD candidate with distinction
2003 Graduated magna cum laude and with distinction in major
2002-03 Dean's Honor List, College of Arts & Sciences, UCSB

THESIS & DISSERTATION

2010 Doctoral Dissertation
Title: The role of the medial prefrontal cortex and nucleus accumbens in motivation and reinforcement
2003 Undergraduate Honors Thesis
Title: The nature/nurture question is answered by heredity-environment interactions

Positions & Employment

FACULTY

2017-
present **Assistant Professor**
Department of Psychological & Brain Sciences
Institute for Neuroscience
Texas A&M University (TAMU)

PRIOR RESEARCH POSITIONS

2014-16 **Senior Research Scientist**
Center for Neural Science, New York University (NYU)

2010-14 **Postdoctoral Fellow**
Center for Neural Science, NYU

2004-10 **Graduate Student Researcher**
Department of Psychological & Brain Science, UCSB

2003-04 **Laboratory Technician**
Ettenberg Lab, Department of Psychological & Brain Science, UCSB

TEACHING EXPERIENCE

2018-
present **Instructor**
Department of Psychological & Brain Sciences, TAMU
Courses: Intro to Cognitive & Behavioral Neuroscience (PSYC/NRSC 235),
Neuroscience of Learning and Memory (PSYC/NRSC 332), Physiological Psychology
(PSYC/NRSC 609)
Role: Developed syllabi and all course materials, delivered all lectures

Prior experience as instructor, Summer term 2008 & 2009:

Department of Psychological & Brain Science, UCSB

Course: Psychopharmacology of Drugs of Abuse

Roles: Developed syllabi and all course materials, delivered all lectures

2004-09 **Laboratory Instructor**
Department of Psychological & Brain Science, UCSB
Courses: Neuroanatomy, Neuroendocrinology, Methods in Biopsychology, Animal
Learning
Role: Lead lab exercises, graded papers and exams, delivered guest lectures

2004-09 **Teaching Assistant**
Department of Psychological & Brain Science, UCSB
Courses: Neural Development, Neuropharmacology, Introduction to Biopsychology,
Motivation, Cognition, Psychopathology
Role: Graded papers and exams, delivered guest lectures, lead discussion sections.

DEPARTMENTAL & UNIVERSITY SERVICE

- 2019-present **Member, Graduate Student Recruiting & Admissions Committee**
Texas A&M Institute for Neuroscience, TAMU
- 2017-present **Area Representative, Graduate Studies & Admissions Committee**
Department of Psychological & Brain Sciences, TAMU
- 2018-19 **Secretary, Texas A&M LGBTQ Professional Network**
TAMU
- 2017-18 **Vice President, Texas A&M LGBTQ Professional Network**
TAMU
- 2006-09 **Graduate Student Member of Institutional Animal Care and Usage Committee**
UCSB

NATIONAL SERVICE

- 2020 **NIH Early Career Reviewer Program**
Reviewed grant applications submitted to the NIH BRAIN Initiative: Targeted Brain Circuits Study Section
- 2017-present **Ad Hoc Reviewer:** *Behavioural Brain Research; Brain Research; Biological Psychiatry; Current Biology; eLife; Emotion Review; Frontiers in Neuroscience; Hippocampus; JEP; Animal Learning & Cognition; Learning & Memory; Motivation & Emotion; Neuropsychopharmacology; Neuroscience & Biobehavioral Reviews; Neuroscience Letters; Pharmacology, Biochemistry, & Behavior; The Journal of Anxiety Disorders; Translational Psychiatry*

Research Funding

FUNDED AWARDS

- 2021-22 **R21**
National Institute of Mental Health (1R21MH126327-01A1)
Title: Dissecting the role of the bed nucleus of the stria terminalis in avoidant behavior
Total Award: \$405,628
Role: PI
- 2020 **T3**
President's Excellence Fund Initiative, TAMU
Title: Machine Learning Enabled Wireless Optogenetic Devices for the Treatment of Psychiatric Illness
Total Award: \$30,000
Role: Team Member

- 2019-21 **X-Grant**
 President's Excellence Fund Initiative, TAMU
 Title: Engineering brain health using an adaptive wireless optogenetic stimulator
 Total Award: \$1,497,862
 Role: Team Member
- 2018-19 **NARSAD Young Investigator Award**
 Brain & Behavior Foundation
 Title: Neural Mechanisms of Resilience
 Total Award: \$70,000
 Role: PI
- 2011-14 **Postdoctoral National Research Service Award (NRSA)**
 National Institute of Mental Health (F32MH094061)
 Title: The role of medial prefrontal cortex in active avoidance behavior
 Total award: \$155,466
 Role: PI
- 2008-09 **Predoctoral National Research Service Award (NRSA)**
 National Institute on Drug Abuse (F31DA024505)
 Title: Dopamine terminal regions interact as a function of motivation & reinforcement
 Total award: \$63,399
 Role: PI
- 2007 **Dean's Fellowship**
 College of Letters & Sciences, UCSB
 Total award: \$15,000

Invited Talks & Symposia

- 2021 **Winter Conference on the Neurobiology of Learning & Memory**
 Title: The Role of Threat Imminence in Active Avoidance
 Type: Symposium (virtual)
- 2020 **Department of Psychology – University of Texas**
 Title: The Role of Threat Imminence in Active Avoidance
 Type: Seminar (virtual)
- 2019 **Pavlovian Society Meeting – Vancouver, BC, Canada**
 Title: Fear, Anxiety, and Two-Way Active Avoidance
 Type: Symposium
- 2019 **Trauma, Anxiety, and Resilience Symposium – TAMU Health Sciences Center**
 Title: Neural Pathways of Active Avoidance
 Type: Symposium

- 2019 **Expert Meeting on Avoidance Behavior, Pain, & Fear – KU Leuven, Belgium**
 Title: The role of the BNST in active avoidance behavior
 Type: Symposium
- 2018 **Association for Psychological Science Annual Conference – San Francisco, CA**
 Title: When brain systems compete: prefrontal mechanisms resolve between conflicting defensive behaviors
 Type: Symposium
- 2017 **Department of Psychology – University of Texas**
 Title: Neural pathways of active avoidance behavior.
 Type: Seminar
- 2017 **Department of Neuroscience and Experimental Therapeutics – TAMU Health Sciences Center**
 Title: Neural pathways of active avoidance behavior.
 Type: Seminar
- 2017 **Winter Conference on Neural Plasticity – Grenada**
 Title: Avoidance learning recruits a PFC-nucleus reuniens pathway to suppress conditioned freezing
 Type: Symposium
- 2016 **Department of Psychology – NYU**
 Title: The associative structure of active avoidance memory in rat
 Type: Seminar
- 2016 **Pavlovian Society Meeting – Jersey City, NJ**
 Title: Investigating the associative structure of active avoidance memory
 Type: Symposium
- 2016 **Department of Psychology – TAMU**
 Title: Mastering fear: the neural substrates of signaled active avoidance behavior.
 Type: Job talk
- 2015 **Society for Neuroscience – Washington DC**
 Title: Active avoidance recruits a prefrontal-hippocampal circuit for the suppression of innate defensive reactions.
 Type: Nanosymposium

Publications

PEER-REVIEWED PAPERS

Oleksiak CR, Ramanathan KR, Miles OW, Perry SJ, Maren S, **Moscarello JM** (2021) Ventral hippocampus mediates the context dependence of two-way signaled avoidance in male rats. *Neurobiology of Learning & Memory*. In press.

- Moscarello JM** (2020) Prefrontal cortex projections to the nucleus reuniens suppress freezing following two-way signaled avoidance training. *Learning & Memory*, 27: 119-123.
- Kryptos AM, **Moscarello JM**, Sears RM, LeDoux JE, Galatzer-Levy I (2018) A principled method to identify individual differences and behavioral shifts in signaled active avoidance. *Learning & Memory*, 15(11): 564-568.
- Moscarello JM**, Maren S (2018) Flexibility in the face of fear: hippocampal-prefrontal regulation of fear and avoidance. *Current Opinion in Behavioral Sciences*, 19: 44-49. 3.422
- Moscarello JM**, Hartley CA (2017) Agency and the calibration of motivated behavior. *Trends in Cognitive Science*, 21(10): 725-735.
- Boeke E, **Moscarello JM**, LeDoux JE, Phelps E, Hartley C (2017) Active avoidance: neural mechanisms and attenuation of Pavlovian conditioned responding. *Journal of Neuroscience*, 37(18): 4808-18. 5.673
- LeDoux JE*, **Moscarello J***, Sears R, Campese V (2017) The birth, death, and resurrection of avoidance: a reconceptualization of a troubled paradigm. *Molecular Psychiatry*, 22: 24-36.
*denotes shared 1st authorship
- Ramirez F*, **Moscarello JM***, LeDoux JE, Sears RM (2015) Active avoidance requires a serial basal to nucleus accumbens circuit. *Journal of Neuroscience*, 35(8): 3470-77.
*denotes shared 1st authorship
- Campese V, Gonzaga R, **Moscarello JM**, LeDoux JE (2015) Modulation of instrumental responding by a conditioned threat stimulus requires lateral and basal amygdala. *Frontiers in Behavioral Neuroscience*, 9: 1-10.
- Moscarello JM**, LeDoux J (2014) Diverse effects of conditioned threat stimuli on behavior. *Cold Spring Harbor Symposia on Quantitative Biology*, 79: 11-19.
- Galatzer-Levy IR, **Moscarello JM**, Blessing EM, Klein J, Cain CK, LeDoux JE (2014) Heterogeneity in signaled active avoidance: substantive and methodological relevance of diversity in instrumental defensive responses. *Frontiers in Systems Neuroscience*, 8: 1-12.
- Moscarello JM**, LeDoux JE (2013) Active avoidance learning requires prefrontal suppression of amygdala mediated defensive reactions. *Journal of Neuroscience*, 33: 3815-23.
- Moscarello JM**, LeDoux JE (2013) The contribution of the amygdala to aversive and appetitive Pavlovian learning processes. *Emotion Review*, 5: 248-53.
- Martinez RCR, Gupta N, Lazaro-Munoz G, Sears RM, Kim S, **Moscarello JM**, LeDoux JE, Cain CK (2013) Active vs. reactive threat responding is associated with differential c-Fos expression in specific regions of the amygdala and prefrontal cortex. *Learning & Memory*, 20: 446-52.

Moscarello JM, Ben-Shahar O, Ettenberg A (2010) External incentives and internal states guide goal-directed behavior via the differential recruitment of the nucleus accumbens and medial prefrontal cortex. *Neuroscience*, 170: 468-77.

Moscarello JM, Ben-Shahar O, Ettenberg A (2009) Effects of food deprivation on goal-directed behavior, spontaneous locomotion, and c-Fos immunoreactivity in the amygdala. *Behavioural Brain Research*, 197: 9-15.

Guzman D, **Moscarello JM**, Ettenberg A (2009) The effects of medial prefrontal cortex infusions of cocaine in a runway model of drug self-administration: evidence for reinforcing but not anxiogenic effects. *European Journal of Pharmacology*, 605: 117-22.

Moscarello JM, Ben-Shahar O, Ettenberg A (2007) Dynamic interaction between medial prefrontal cortex and nucleus accumbens as a function of both motivational state and reinforcer magnitude. *Brain Research*, 1169: 69-76.

Ben-Shahar O, **Moscarello JM**, Ettenberg A (2006) One hour, but not six hours, of daily access to cocaine results in elevated levels of the dopamine transporter. *Brain Research*, 1095: 148-53.

Ben-Shahar O, **Moscarello JM**, Jacob B, Roarty MP, Ettenberg A (2005) Prolonged daily exposure to IV cocaine results in tolerance to its stimulant effects. *Pharmacology, Biochemistry, & Behavior*, 82: 411-6.

BOOK CHAPTERS

Campese VD, Sears RM, **Moscarello JM**, Diaz-Mataix L, Cain CK, LeDoux JE (2015) The neural foundations of reaction and action in aversive motivation. *Current Topics in Behavioral Neuroscience*, 8: 1-25.

Hartley CA, **Moscarello JM**, Quirk GJ, Phelps EA (2014) The cognitive neuroscience of fear and its control: from animal models to human experience. In: *The Cognitive Neurosciences*. Eds. Gazzaniga MS, Mangun GR. Cambridge: MIT Press.

PUBLISHED ABSTRACTS (Trainee's names underlined)

Guerra DP, **Moscarello JM** (2021) The BNST mediates the expression of two-way signaled avoidance in male rats. *2021 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Pacheco MR, Keppler LJ, **Moscarello JM** (2021) A systems consolidation-like process recruits the retrosplenial cortex to the long-term maintenance of signaled avoidance. *2021 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Kreitlow MR, Keppler L, **Moscarello JM** (2020) Time following initial acquisition is sufficient to make signaled active avoidance dependent on the retrosplenial cortex. *SfN Global Connectome*.

Oleksiak CR, Ramanathan KR, Miles OW, Maren S, **Moscarello JM** (2020) Ventral, but not dorsal, hippocampus mediates the context dependence of signaled active avoidance. *SfN Global Connectome*.

Guerra DP, **Moscarello JM** (2020) The role of the BNST in two-way signaled avoidance. *Pavlovian Society Meeting*.

Oleksiak CR, Ramanathan KR, Miles OW, **Moscarello JM**, Maren S (2020) Ventral, but not dorsal, hippocampus mediates the context-dependence of signaled active avoidance. *Pavlovian Society Meeting*.

Oleksiak CR, **Moscarello JM**, Maren S (2019) Signaled active avoidance performance is context-dependent. *2019 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Oleksiak CR, **Moscarello JM**, Maren S (2019) Signaled active avoidance performance is context-dependent. *Conference on Learning & Memory: UT Austin*.

Moscarello JM, LeDoux JE (2013) Instrumental learning alters the assessment of conditioned threats through a hippocampal mechanism. *Gordon Research Conference: Amygdala in Health & Disease*.

Moscarello JM, LeDoux JE (2012) Infralimbic prefrontal cortex suppresses amygdala-mediated fear reactions as a function of active avoidance learning. *2012 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Moscarello JM, LeDoux JE (2011) Opposite effects of ventromedial prefrontal cortex and central amygdala lesions on avoidance learning. *Gordon Research Conference: Amygdala in Health & Disease*.

Moscarello JM, Ben-Shahar O, Ettenberg A (2010) Dopamine antagonism in the medial prefrontal cortex and nucleus accumbens has differential effects on behavior as a function of motivational state and reinforcement schedule. *2010 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Moscarello JM, Ben-Shahar O, Ettenberg A (2009) Inactivation of prelimbic prefrontal cortex and nucleus accumbens core differentially impacts behavior as a function of motivational state and reinforcement schedule. *2009 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Moscarello JM, Beh-Shahar O, Szumlinski KK, Ettenberg A (2008) The effects of motivational state and food deprivation on glutamate and GABA release in the nucleus accumbens core. *2008 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

Moscarello JM, Ben-Shahar O, Ettenberg A (2007) Food presentation to hungry rats produces an immediate increase in DA and delayed reactions in GABA and glutamate within the medial prefrontal cortex. *2007 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.

- Ben-Shahar O, **Moscarello JM**, Keeley PW, Heston RN, Joyce MM, Ettenberg A (2005) Dopamine D₂ receptor density in the nucleus accumbens as a function of differential access to cocaine. *2005 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.
- Ben-Shahar O, **Moscarello JM**, Nyffeler M, Jacob B, Brake WG, Cook M, Roarty MP, Ettenberg A (2004) Upregulation of the dopaminergic transporter in the nucleus accumbens core after 1-hr but not 6-hr of daily access to cocaine. *2004 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.
- Guzman D, **Moscarello JM**, Ettenberg A (2004) Medial prefrontal cortex cocaine administration produces reinforcing but not anxiogenic actions in a runway model of self-administration. *2004 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.
- Ben-Shahar O, **Moscarello JM**, Jacob B, Roarty MP, Ettenberg A (2003) Differential lengths of daily exposure to IV cocaine result in different patterns of neuroadaptations. *2003 Abstract Viewer/Itinerary Planner*, Washington DC: Society for Neuroscience.