

## Michael A. McDannald

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Boston College  
 Department of Psychology & Neuroscience  
 McGuinn Hall 430B  
 Chestnut Hill, MA 02467

Email: [michael.mcdannald@bc.edu](mailto:michael.mcdannald@bc.edu)

Web: [mcdannaldlab.org](http://mcdannaldlab.org)

Publications: 48 Citations: 2275 h-index: 26

## Education

2008 PhD, Johns Hopkins University, Baltimore, MD  
 2003 BA, University of Illinois at Urbana-Champaign, Urbana, IL

## Positions

2020- Associate Professor, Boston College, Chestnut Hill, MA  
 2014-2020 Assistant Professor, Boston College, Chestnut Hill, MA  
 2011-2014 Postdoctoral Fellow, National Institute on Drug Abuse, Baltimore, MD  
 2008-2011 Postdoctoral Fellow, University of Maryland School of Medicine, Baltimore, MD  
 2003-2008 Graduate Student, Johns Hopkins University, Baltimore, MD

## Active Grants

2023-2028 R01-MH117791, Brainstem-forebrain networks and threat computation  
 Role: PI  
 2023-2025 R21-MH133003, An A8 dopamine-ventral pallidum threat circuit  
 Role: PI

## Completed Grants

2018-2023 R01-MH117791, Early life stress, neuron-type function and a raphe-amygdala circuit for threat estimation  
 Role: PI  
 2017-2019 R21-MH113053, Retrorubral field control of fear  
 Role: PI  
 2014-2018 R00-DA034010, Neural encoding of reward and safety  
 Role: PI  
 2012-2014 K99-DA034010, Neural encoding of reward and safety  
 Role: PI  
 2008-2011 T32-NS07375, Cellular and integrative neuroscience  
 Role: Postdoctoral Trainee  
 2005-2008 F31-MH075302, Functional anatomy of appetitive and aversive conditioning  
 Role: PI

## Completed Mentee Grants

2018-2021 NSF 5106201, Neural circuitry of threat probability in Pavlovian fear conditioning  
 PI: Kristina Wright, Graduate Student  
 2019-2020 F31 MH118801, Ventrolateral periaqueductal gray to central amygdala circuit for fear updating via prediction error  
 PI: Rachel Walker, Graduate Student

## Awards &amp; Activities

2023	Ad hoc Reviewer, National Science Foundation
2023-pres	Editorial Board Member, Learning & Memory (CSH Press)
2022	Reviewer, Human Frontiers Science Program
2022	Ad hoc Member, Neurobiology of Motivated Behavior Study Section
2020-pres	Pavlovian Society Member
2019-pres	Consulting Editor, Behavioral Neuroscience
2019-pres	External Reviewer, Canada Research Chairs Program
2019-pres	Ad hoc Reviewing Editor, eLife
2019-pres	Grant Reviewer, Netherlands Organisation for Scientific Research
2018-pres	Faculty Advisor, Nu Rho Psi Epsilon Chapter
2013	Grant Reviewer, French National Research Agency
2004-pres	Society for Neuroscience Member

## Peer Reviewer

Addictive Behaviors Reports, Behavioural Brain Research, Behavioral Neuroscience, Biological Psychiatry, Cerebral Cortex, Cerebral Cortex Communications, Current Biology, eLife, eNeuro, Frontiers in Human Neuroscience, Genes, Brains and Behavior, Journal of Experimental Psychology: General, Journal of Neurophysiology, Journal of Neuroscience, Journal of Neuroscience Research, Learning & Memory, Molecular Psychiatry, Nature Communications, Neurobiology of Learning and Memory, Neuropsychopharmacology, Neuroscience, Physiology & Behavior, Psychopharmacology, Science Advances, Scientific Reports, Translational Psychiatry

## Teaching

PSYC2285	Behavioral Neuroscience
PSYC3390	Neurobiology of Psychiatric Disorders
PSYC5587	Cellular Perspectives on Motivated Behavior

## Publications &amp; Preprints

McDannald MA (2023). Pavlovian fear conditioning is more than you think it is. *Journal of Neuroscience*.

Wright KM, Cieslewski S, Chu A, McDannald MA (2023). Optogenetic inhibition of the caudal substantia nigra inflates behavioral responding to uncertain threat and safety. *Behavioral Neuroscience*.

Wright KM, Kantor CE, Moaddab M, McDannald MA (2023). Timing of behavioral responding to long duration Pavlovian fear conditioned cues. *bioRxiv*. doi.org/10.1101/2023.01.25.525456.

Strickland JS, McDannald MA (2022). Brainstem networks construct threat probability and prediction error from neuronal building blocks. *Nature Communications* 13, 6192.



Cooch N, Stalnaker TA, Chaudry S, McDannald MA, Liu TZ, Wied H, Schoenbaum G (2015). Orbitofrontal lesions eliminate signaling of biological significance in cue-responsive ventral striatal neurons. *Nature Communications* 6: 7195.

McDannald MA (2015). Serotonin: Waiting but Not Rewarding. *Current Biology* 25(3): R103-104.

McDannald MA, Esber GR, Wegener MA, Wied H, Liu TL, Stalnaker TA, Jones JL, Trageser J and Schoenbaum G (2014). Orbitofrontal neurons acquire responses to 'valueless' Pavlovian cues during unblocking. *eLife* 10.7554/eLife.02653.

Berg BA, Schoenbaum G and McDannald MA (2014). The dorsal raphe nucleus is integral to negative prediction errors in Pavlovian fear. *European Journal of Neuroscience* 40: 3096-3101.

Stalnaker TA, Cooch NK, McDannald MA, Liu T, Wied H and Schoenbaum G (2014). Orbitofrontal neurons infer the value and identity of predicted outcomes. *Nature Communications* 5: 3926.

McDannald MA, Jones JL, Takahashi Y and Schoenbaum G (2014). Learning theory: a driving force in understanding orbitofrontal function. *Neurobiology of Learning and Memory* 108: 22-27.

McDannald MA, Setlow B and Holland PC (2013). Effects of ventral striatal lesions on first- and second-order appetitive conditioning. *European Journal of Neuroscience* 38: 2589-2599.

Jones JL, Esber GR, McDannald MA, Gruber AJ, Hernandez A, Mirenzi A, Schoenbaum G (2012). Orbitofrontal Cortex Supports Behavior and Learning Using Inferred but not Cached Values. *Science* 338(6109): 953-956.

McDannald MA, Takahashi Y, Lopatina N, Pietras B, Jones JL and Schoenbaum G (2012). Model-based learning and the contribution of the orbitofrontal cortex to the model-free world. *European Journal of Neuroscience* 35: 991-996.

Chang SE, McDannald MA, Wheeler DS, Holland PC (2012). The effects of basolateral amygdala lesions on unblocking. *Behavioral Neuroscience* 126 (2): 279-289.

Purgert RJ, Wheeler DS, McDannald MA, Holland PC (2012). Role of amygdala central nucleus in aversive learning produced by shock or by unexpected omission of food. *Journal of Neuroscience* 32 (7): 2461-2472.

Schoenbaum G, Liu TL, Takahashi Y, McDannald MA (2011). Does the orbitofrontal cortex signal value?

McDannald MA (2010). Contributions of the amygdala central nucleus and ventrolateral periaqueductal grey to freezing and instrumental suppression in Pavlovian fear conditioning. *Behavioural Brain Research* 211(1): 111-117.

Galarce EM, McDannald MA, and Holland PC (2010). The basolateral amygdala mediates the effects of cues associated with meal interruption on feeding behavior. *Brain Research* 1350: 112-122.

McDannald MA and Schoenbaum G (2009). Towards a model of impaired reality testing in rats. *Schizophrenia Bulletin* 35(4) 664-667.

McDannald MA, Saddoris M, Gallagher M, and Holland PC (2005). Lesions of orbitofrontal cortex impair rats' differential outcome expectancy learning but not CS-potentiated feeding. *Journal of Neuroscience* 25 (18): 4626-4632.

McDannald M, Kerfoot E, Gallagher M and Holland PC (2004). Amygdala central nucleus function is necessary for learning but not expression of conditioned visual orienting. *European Journal of Neuroscience* 20 (1): 240-8.

Changizi MA, McDannald MA and Widders D (2002). Scaling of differentiation in networks: Nervous systems, organisms, ant colonies, ecosystems, businesses, universities, cities, electr0.279 0 As



Saddoris M, McDannald MA, Holland PC, Gallagher M. Gustatory cortex and basolateral amygdala show different patterns of expression for the representations of rewarding taste outcomes using the immediate early genes Arc and Homer1a. Program No. 934.29. 2007 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2007. Online.

McDannald MA, Lee JH, Petrovich GD, Haberman RP, Gallagher M, Holland PC. Distinct populations of basolateral amygdala neurons are activated by appetitive and aversive Stimuli. Poster No. 7. Bethesda, MD: National Institute of Mental Health Predoctoral Research Festival, 2006.

Saddoris MP, McDannald M, Gallagher M, Holland PC. Lesions of orbitofrontal cortex interfere with differential-outcome expectancy learning but not CS-potentiated feeding of rats. Program No. 771.9. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online.

McDannald M, Groshek F, Holland PC. The amygdala and dopaminergic modulation of conditioned orienting in rats. Program No. 206.9. 2004 Abstract Viewer/Itinerary Planner. Washington, DC: Society for Neuroscience, 2004. Online.

### Talks

- 2023 Nov “(Unintentional) Contrarion neural and behavioral mechanisms for threat learning”. The University of Vermont, Burlington, Vermont, USA.
- 2021 Oct “The brainstem strikes back: threat computation in traditional fear output regions”. The Center for Depression, Anxiety and Stress Research, McLean Hospital, Belmont, Massachusetts, USA.
- 2021 Apr “Expanding the threat network”. Department of Biological Sciences, Konkuk University, Seoul, South Korea.
- 2020 Sept “Mapping neural circuits for threat”. Department of Psychological Sciences, Purdue University, West Lafayette, Indiana, USA.
- 2020 Jan “Retrorubral field is a hub for diverse threat and aversive outcomes signals”. 53<sup>rd</sup> Annual Winter Conference on Brain Research. Big Sky, Montana, USA.
- 2019 June “Threat estimation in the ventrolateral periaqueductal gray and retrorubral field”. 28th Annual International Behavioral Society Neuroscience Meeting, Cairns, Australia.
- 2018 May “Fear and reward intersect: Ventral striatal / ventral pallidal contributions to accurate and rapid fear discrimination”. 12th Annual Canadian Neuroscience Meeting, Vancouver, British Columbia, Canada.
- 2018 Mar “Ventral striatum, but not orbitofrontal cortex, is necessary for rapid fear discrimination”. 22<sup>nd</sup> Associative Learning Symposium, Gregynog, Wales, UK.
- 2017 Apr “A causal role for the ventrolateral periaqueductal gray in aversive, positive prediction error signaling”. 21<sup>st</sup> Associative Learning Symposium, Gregynog, Wales, UK.
- 2016 May “The dorsal raphe, early life stress and fear reduction via prediction errors”. Le Centre de recherche en neurosciences de l’Université du Québec à Montréal, Montreal, Quebec, Canada.
- 2016 Mar “Alcohol gains access to appetitive learning through adolescent heavy drinking.” Symposium on Reward Seeking. Eastern Psychological Association 2016 Meeting. New York City, New York, USA.
- 2015 Aug “The dorsal raphe, early adversity and fear reduction via prediction errors”. Computational Neuroscience Program, Brandeis University, Waltham, Massachusetts, USA.
- 2015 June “The dorsal raphe, early adversity and fear reduction via prediction errors”. The Center for Depression, Anxiety and Stress Research, McLean Hospital, Belmont, Massachusetts, USA.
- 2014 Nov “A central role for the dorsal raphe nucleus in overcoming fear”. Psychology Department, University of California – Berkeley, Berkeley, California, USA.

PhDs Supervised

2015-2020 Rachel A. Walker, Ph.D., NRSA Fellow  
2016-2021 Madelyn H. Ray, Ph.D., Dean of Summer Session Teaching Fellowship 2020  
2016-2021 Kristina M. Wright, Ph.D., NSF Fellow, WIL Graduate Woman in Learning 2019  
2019- Amanda Chu, WIL Graduate Woman in Learning 2022  
2021-