

R. BECKET EBITZ, PHD

Department of Neuroscience
Université de Montréal, Montréal, QC, Canada

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EDUCATION:

- 2013 **Ph.D. in Neurobiology**
Mentor: Dr. Michael Platt
Duke University, Neurobiology Department, Durham, NC
Certificate in Cognitive Neuroscience, Center for Cognitive Neuroscience
Dissertation: *Determinants of distraction in the rhesus macaque.*
- 2005 **B.A. (cum laude)**
Simon's Rock (Early) College, Great Barrington, MA
Concentrations: Biology, Psychology, Research Methods

POSITIONS:

- 2020- **Professeur Adjoint** (tenure-track Assistant Professor)
Université de Montréal, Montréal, QC, Canada
- 2017-2020 **Postdoctoral Researcher**, Mentor: Dr. Ben Hayden
University of Rochester, Brain and Cognitive Sciences, Rochester, NY
University of Minnesota, Department of Neuroscience, Minneapolis, MN
- 2015-2017 **CV Starr Fellow**, Mentors: Drs. Jon Cohen, Tim Buschman
Princeton University, Princeton Neuroscience Institute, Princeton, NJ
- 2013-2017 **Postdoctoral Fellow**, Mentor: Dr. Tirin Moore
Stanford University & HHMI, Neurobiology Department, Stanford, CA
- 2005-2007 **Research Assistant**, Mentor: Dr. Leslie Ungerleider
National Institutes of Health, Bethesda, MD

ACTIVE RESEARCH SUPPORT:

- 2020-2025 NSERC Discovery Grant, *Role: PI*
“Neurophysiological mechanisms for exploration and mistakes”
\$203,000 total across 5 years
- 2020-2024 Junior 1 Research Scholar, Fonds de Recherche du Quebec Santé, *Role: PI*
“Neurophysiologie cognitive et computationnelle de la prise de décision”
\$257,000 in salary support plus \$80,000 in direct costs across 4 years
- 2020-2023 Startup Operating Funds, Université de Montréal

\$450,000 across 3 years

2019-2021 NARSAD Young Investigator Grant, *Role: PI*
“Neuromodulatory interventions to regulate flexibility”
US\$70,000 direct costs across 2 years

AWARDS AND FELLOWSHIPS:

2019 Mistletoe Foundation Unfettered Research Grant (US\$10k direct costs)
2019 Ripple Promising Investigator Award (US\$60k in equipment)
2019 Presenters Travel Grant, Cosyne meeting
2018 Finalist, Ripple Innovation in Research and Technology Award
2018 Poster Spotlight/Travel Award, Cognitive Science Society Workshops
Understanding Exploration-Exploitation Trade-offs
2015-17 CV Starr Foundation Fellowship (salary and US\$20k budget/year)
2014, 2016 Travel awards, Gordon Conference, Neurobiology of Cognition
2014-17 NIMH National Research Service Award (F32; salary and US\$5k/year)
2013-14 Stanford Vision Training Program Fellowship (T32)
2009-10 Ruth K. Broad Foundation Fellowship, Duke University
2007-11 James B. Duke Fellowship, Duke University
2005-07 Intramural Research Training Award, NIMH
2003-05 Robert M. Hutchins Scholarship, Simon’s Rock College
2001-03 Acceleration to Excellence Scholarship, Simon’s Rock College
1999 8th place in the USA, Discovery Young Scientists Challenge

RESEARCH PAPERS:

Ebitz, R. B., Sleezer, B.J., Jedema, H.P., Bradberry, C.W., Hayden, B. Y. (2019). “Tonic exploration governs both flexibility and lapses.” *PLoS Comp. Bio* 15(11).

Ebitz, R. B., Albarran, E., & Moore, T. (2018). “Exploration disrupts choice predictive signals and alters population dynamics in prefrontal cortex.” *Neuron* 97 (2), 450-61. (**Cover**)

Ebitz, R. B., Moore, T. (2017). “Selective modulation of the pupil light reflex by microstimulation of prefrontal cortex.” *Journal of Neuroscience* 37 (19), 5008-18.

Ebitz, R. B., Platt, M. L. (2015). “Neuronal activity in primate dorsal anterior cingulate cortex signals task conflict and predicts adjustments in pupil-linked arousal.” *Neuron* 85(3), 628-40.

Ebitz, R. B., Pearson, J., Platt, M. L. (2014). “Pupil size and social vigilance in rhesus macaques.” *Frontiers in Neuroscience* 8(100).

Pearson, J., Watson, K. K., Klein, J., **Ebitz, R. B.,** & Platt, M. L. (2013). Individual differences in social information gathering revealed through Bayesian hierarchical models. *Frontiers in Neuroscience* 7(165).

Ebitz, R. B., Watson, K. K., & Platt, M. L. (2013). “Oxytocin reduces social vigilance in rhesus macaques.” *Proceedings of the National Academy of Sciences*, 110(28), 11630-5.

Chang, S. W., Barter, J. W., **Ebitz, R. B.,** Watson, K. K., & Platt, M.L. (2012). “Inhaled oxytocin amplifies both vicarious reinforcement and self reinforcement in rhesus macaques (Macaca mulatta).” *Proceedings of the National Academy of Sciences*, 109(3), 959-964.

REVIEWS AND COMMENTARIES:

Ebitz, R. B. & Moore, T. (2019). “Both a gauge and a filter: Cognitive modulations of pupil size.” *Frontiers in Neurology* 9, 1190.

Ebitz, R. B. & Hayden, B. (2016). “Dorsal anterior cingulate: A Rorschach test for cognitive neuroscience.” *Nature Neuroscience*, 19, 1278–79.

Ebitz, R. B. & Platt, M. L. (2013). “An evolutionary perspective on the behavioral consequences of exogenous oxytocin delivery.” *Frontiers in Behavioral Neuroscience* 2, 225.

PREPRINTS/WORKING PAPERS:

(*CONTRIBUTED EQUALLY)

Chen, C. S.*, **Ebitz, R. B.***, Bindas, S. R., Redish, A. D., Hayden, B. Y., & Grissom, N. M. (on bioRxiv/under review). “Divergent strategies for learning in males and females.”

Ebitz, R. B., Tu, J. C. & Hayden, B. Y. (on bioRxiv/under review). “Rule adherence warps decision-making.”

Ebitz, R.B., Smith, E. H., Horga, G., Schevon, C. A., Yates, M. J., McKhann, G. M., Botvinick, M. M., Sheth, S. A.*, Hayden, B. Y.* (on bioRxiv/under review). “Human dorsal anterior cingulate neurons signal conflict by amplifying task-relevant information”

TALKS:

2020 Cosyne meeting, workshop: “Structure learning: Graphs, manifolds, and geometries,” Breckenridge, CO, USA

2019 David LaBerge Seminar Series, Simon’s Rock College, Great Barrington, MA, USA
Society for Neuroscience Meeting, Nanosymposium, Chicago, IL, USA
Jacob’s Foundation Marbach Workshop, Öhningen, Germany
Rising Star Speaker Series, Google DeepMind, London, UK
International Behavioral Neuroscience Society, Cairns, Australia
Cosyne main meeting (selected talk), Lisbon, Portugal

2018 Department of Neurosciences, Université de Montréal, Montréal, QC, Canada
Society for Neuroscience Meeting, Nanosymposium, San Diego, CA, USA

- Ecology, Evolution and Behavior Dept., U of Minnesota, St Paul, MN, USA
 Biomedical Engineering Dept., U of Minnesota, Minneapolis, MN, USA
 Cognitive Science Society, workshop: “Exploration-Exploitation Trade-offs,”
 Madison, WI, USA
 Montreal Neurological Institute, McGill University, Montréal, QC, Canada
- 2017 Neuroscience and Social Decision Making, Princeton University, Princeton, NJ, USA
 Charles River Analytics, Cambridge, MA, USA
- 2016 Computational Neuroscience Initiative, U of Pennsylvania, Philadelphia, PA USA
 Gordon Seminar on the Neurobiology of Cognition, Newry, ME, USA
 Cosyne meeting, workshop: “Executive Flexibility”, Snowbird, UT, USA
 Cosyne main meeting (selected talk), Salt Lake City, UT, USA
- 2015 Maths, Monkeys, & Machines, Stanford University, Stanford, CA, USA
- 2014 Memory, Attention, and Decision-Making, Stanford University, Stanford, CA, USA
 Department of Neuroscience, Columbia University, New York, NY, USA
 Translational Oxytocin Research Group, Stanford University Medical School,
 Stanford, CA, USA
 Department of Brain and Cognitive Sciences, U of Rochester, Rochester, NY, USA
- 2012 Society for Neuroscience, Nanosymposium talk, New Orleans, LA, USA
 Neurobiology Department, Northwestern University, Chicago, IL, USA
 Decision Making Across the Disciplines Conference, Duke Center for
 Interdisciplinary Decision Sciences, Durham, NC, USA

RECENT MEETING ABSTRACTS/POSTERS:

Ebitz, R.B., Tu, J.C., Hayden, B.Y. “Rule adherence warps decision-making.” (February 2020). Cosyne, Denver, CO.

Ebitz, R.B., Hayden, B.Y., Moore, T. “Exploration via disrupted sensorimotor control dynamics.” (July 2018). Cognitive Science Society 2018 Workshop: Understanding Exploration-Exploitation Trade-offs. (**Spotlight Award Poster**)

Ebitz, R.B., Moore, T., Hayden, B.Y. “An intrinsic brain state improves the accuracy and efficacy of direct cortical microstimulation.” 6th Annual Neuromodulation Symposium, University of Minnesota, Minneapolis, MN.

Ebitz, R.B., Cohen, J.D., & Buschman, T. (November 2017). “Control mechanisms for flexibility in a changing world.” Society for Neuroscience, Washington, DC.

Ebitz, R.B., Buschman, T., & Moore, T. (June 2017). “Exploration via transient disruptions in prefrontal control.” Reinforcement Learning and Decision-Making, Ann Arbor, MI.

Ebitz, R.B., Moore, T., & Buschman, T. (February 2017). “Bottom-up salience drives choice during exploration.” Cosyne, Salt Lake City, UT.

Ebitz, R.B., Moore, T., & Buschman, T. (November 2016). “Altered balance between top-down and bottom-up control across exploration and exploitation.” Society for Neuroscience, San Diego, CA.

Ebitz, R.B., & Moore, T. (July 2016). “Altered balance between top-down and bottom-up saccade control across exploration and exploitation.” Gordon Research Conference on the Neurobiology of Cognition, Newry, ME.

OTHER PROFESSIONAL ACTIVITIES:

Invited Reviewer: *Journal of Neuroscience, Nature Neuroscience, eLife, Scientific Reports, Hormones and Behavior, PLOS One, Frontiers in Neuroscience, Frontiers in Neurology, Nature Human Behavior, Nature Communications, Trends in Cognitive Sciences, Science Advances; Cognitive, Affective and Behavioral Neuroscience;* Cosyne meeting

Professional Membership, *Society for Neuroscience*, 2005-present

2019 Mentor, Cosyne Undergraduate Travel Grant, Lisbon, Portugal

2016 Workshop organizer, co-chair, “Executive Flexibility”
Cosyne workshops, Snowbird, UT, USA

2014-15 Co-organizer, *Maths, Monkeys & Machines* interdisciplinary seminar series
Stanford University, Stanford, CA, USA

2014 Discussant, Gordon Research Seminar on Neurobiology of Cognition
Gordon Research Conferences, Newry, ME, USA

2013 Attendee, Bay Area Ophthalmology Course
Bay Area Ophthalmology Consortium, Stanford Medicine, Stanford, CA, USA

2010-13 Workshop leader and volunteer, Brain Awareness Week
Durham, NC & Raleigh, NC, USA

2011-12 Organizer, Social Neuroscience Journal Club
Duke University, Durham, NC, USA

2011 Consortium member, Neuroscience Graduate Student Consortium
Duke University, Durham, NC, USA

2011 Invited participant, Neuroscience, Juries, Decision-Making short course
Duke University Law School, Durham, NC, USA

COMMENTARIES & PRESS COVERAGE:

Binda, P. & Gamlin, P. D. (2017). “Renewed attention on the Pupil Light Reflex.” Commentary on “FEF microstimulation modulates the pupil light reflex.” *Trends in Neuroscience* Spotlight article.

Shenhav, A. & Botvinick, M. (2015). “Uncovering a Missing Link in Anterior Cingulate Research.” Commentary on “Neuronal activity in primate dorsal anterior cingulate cortex signals task conflict and predicts adjustments in pupil-linked arousal.” *Neuron* 85(3), 455-7.

“The Science of Love: What Are You Looking At?” Write-up of “Oxytocin reduces social vigilance in rhesus macaques.” in October 10, 2013 *Cell: Select* column. *Cell*, 155, 263.

TEACHING/MENTORING:

Co-supervising/Mentoring:

Cathy Chen (2018-present, currently a PhD student at the University of Minnesota, co-supervised with Dr. Nicola Grissom)

Cindy Tu (2017-2019, now a PhD student at Washington University in St. Louis)

Eddy Albarran (2013-2014, now a PhD student at Stanford University)

Instructor/Section Leader:

2016 Neuroscience Junior Tutorial (2 sessions), Princeton University

2011 Launch into Pharmacology (2 sessions, summer intensive), Duke University

2010 Biological Bases of Behavior (2 sections), Duke University

Guest Instructor:

2012 Principles of Cognitive Neuroscience (graduate course), Duke University

2010 Introduction to Biology, Guilford College, Greensboro, NC

2010 Sensory Systems, Guilford College, Greensboro, NC

Teaching Assistant/Course Organizer:

2009 Brain and Behavior, Duke University Medical School