

JESSICA M. PHILLIPS

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SKILLS

- Design and execution of neuroscience research projects with nonhuman primates (NHPs)
 - *In vivo* electrophysiology
 - Alert, behaving animals and anesthetized preparations
 - Diffusion MRI-guided surgical targeting of interconnected cortical and subcortical network sites, laminar cortical recordings, signal processing
 - Neuromodulation techniques
 - Intracortical microstimulation, cryogenic cortical deactivation
 - Electroencephalography
 - Event-related potentials, spectral analyses
 - Neuroimaging
 - Structural MRI, diffusion MRI and probabilistic tractography
- NHP surgery and anesthesia
 - Induction, cranial implants, craniotomies
- Handling and behavioral training of NHPs
 - Pole-and-collar chair technique, laboratory acclimatization, conditioning for performance of complex cognitive video games
- Development of study protocols, laboratory documents and data processing pipelines
- Management of large datasets
- Articulate ideas, methodologies and scientific information to audiences with diverse backgrounds

EDUCATION & ACADEMIC CAREER

Unit Head Scientific Protocol Implementation Unit Wisconsin National Primate Research Center University of Wisconsin-Madison	2024-present
Scientific Unit Co-Head Scientific Protocol Implementation Unit Wisconsin National Primate Research Center, University of Wisconsin-Madison	2022-2024
Associate Scientist Saalman Lab Department of Psychology, University of Wisconsin-Madison	2022
Assistant Scientist Saalman Lab Department of Psychology, University of Wisconsin-Madison	2017–2022
Postdoctoral Associate Saalman Lab Department of Psychology, University of Wisconsin-Madison	2014–2017

Postdoctoral Researcher Laboratory for Neural Circuits and Cognitive Control Department of Physiology and Pharmacology, University of Western Ontario	2013–2014
PhD (<i>Neuroscience</i>), University of Western Ontario	2008–2013
MSc (<i>Neuroscience</i>), University of Western Ontario	2006–2008
BSc (<i>Physiology & Psychology</i>), University of Western Ontario	2002–2006

PEER-REVIEWED PUBLICATIONS

1. M.J. Redinbaugh, M. Afrasiabi, **J.M. Phillips**, N.A. Kambi, S. Mohanta, A. Raz, Y.B. Saalman. Thalamic deep brain stimulation as a paradigm to reduce consciousness: implications for cortico-striatal dynamics, absence epilepsy and consciousness studies. *PLOS Computational Biology*. 18(7): e1010294.
2. S. Mohanta, M. Afrasiabi, C. Casey, S. Tanabe, M.J. Redinbaugh, N.A. Kambi, **J.M. Phillips**, D. Polyakov, W. Filbey, J.L. Austerweil, R.D. Sandesr, Y.B. Saalman. Predictive feedback, early sensory representations and fast responses to predicted stimuli depend on NMDA receptors (2021). *The Journal of Neuroscience*. 41(49),10130-10147.
3. **J.M. Phillips**, N.A. Kambi, M.J. Redinbaugh, S. Mohanta, Y.B. Saalman. Disentangling the influences of multiple thalamic nuclei on prefrontal cortex and cognitive control (2021). *Neuroscience & Biobehavioral Reviews*. 128, 487-510.
4. M. Afrasiabi*, M.J. Redinbaugh*, **J.M. Phillips**, N.A. Kambi, S. Mohanta, A. Raz, Y.B. Saalman. Integrated network of parietal cortex, striatum and thalamus predicts level of consciousness (2021). *Cell Systems*. 12(4), 363-373. * denotes equal contribution
5. M.J. Redinbaugh, **J.M. Phillips**, N.A. Kambi, S. Mohanta, S. Andryk, G.L. Dooley, M. Afrasiabi, A. Raz, Y.B. Saalman. Thalamus modulates consciousness via layer-specific control of cortex (2020). *Neuron*. 106(1), 66-75.
6. **J.M. Phillips**, L.R. Fish, N.A. Kambi, S. Mohanta, M.J. Redinbaugh, S.R. Kecskemeti, Y.B. Saalman. Topographic organization of connections between prefrontal cortex and mediodorsal thalamus: evidence for a general principle of indirect thalamic pathways between directly connected cortical areas (2019). *NeuroImage*. 189, 832-846.
7. **J.M. Phillips***, N.A. Kambi*, Y.B. Saalman. A subcortical pathway for rapid, goal-driven, attentional filtering (2016). *Trends in Neurosciences*. 39(2), 49-51. * denotes equal contribution
8. **J.M. Phillips**, S. Everling. Event-related potentials associated with performance monitoring In non-human primates (2014). *NeuroImage*. 97, 308-20.
9. **J.M. Phillips**, M. Vinck, S. Everling, T. Womelsdorf. A long-range fronto-parietal 5-10 Hz network predicts 'top-down' controlled guidance in a task-switch paradigm (2014) *Cerebral Cortex*. 24(8), 1996-2008.
10. **J.M. Phillips**, S. Everling. Neural activity in the primate putamen associated with saccadic eye movement and behavioural outcome (2012). *PLoS ONE*. 7(12), e51596.

11. **J.M. Phillips**, K. Johnston, S. Everling. Effects of anterior cingulate microstimulation on pro and anti-saccades in nonhuman primates (2011). *Journal of Cognitive Neuroscience*. 23(2), 481-90.

Manuscripts under review/in preparation:

1. **J.M. Phillips**, M. Afrasiabi, N.A. Kambi, M.J. Redinbaugh, Y.B. Saalman. Primate thalamic nuclei select abstract rules and shape prefrontal dynamics.
2. N.A. Kambi, M. Afrasiabi, **J.M. Phillips**, D.M. Cleveland, M.J. Redinbaugh, S. Mohanta, Y.B. Saalman. Spatial and mnemonic representations in primate retrosplenial cortex.
3. M.J. Redinbaugh, **J.M. Phillips**, M. Afrasiabi, Y.B. Saalman. Characterizing the neural correlates of sleep transitions in diverse subcortical nuclei of primates and cats.
4. D.M. Cleveland*, **J.M. Phillips***, M. Afrasiabi, Wang, L., Saalman, Y.B. Network dynamics of hierarchical processing in the prefrontal cortex during task abstraction.

*denotes equal contribution

HONOURS AND AWARDS

Society for Neuroscience Trainee Professional Development Award	2016
Ontario Graduate Scholarship	2011-2012
Western Graduate Research Scholarship	2006–2012
Ontario Graduate Scholarship in Science & Technology	2010-2011
Schulich Scholarship for Medical Research	2007-2008
WGRS, Science and Technology	2006-2007
University of Western Ontario (UWO) Dean's Honor List	2003–2006

INVITED TALKS

Separate nuclei in primate thalamus select and maintain abstract rules <i>Wisconsin National Primate Research Center (WNPRC) Neuroscience Working Group Seminar</i> <i>Madison, WI, USA</i>	2023
Playing by the rules: Thalamocortical dynamics in cognitive control <i>WNPRC Neuroscience Working Group Seminar</i> <i>Madison, WI, USA</i>	2019
Prefrontal cortico-thalamic interactions underlying cognitive control <i>Department of Psychology, University of Wisconsin-Madison (UW-Madison)</i> <i>Madison, WI, USA</i>	2019
Striking a balance: Exploring the neural basis of action selection in primates <i>Department of Psychology, UW-Madison</i> <i>Madison, WI, USA</i>	2013

Exploring the neural basis of top-down guided action in monkeys <i>Movement Disorders Centre, Lawson Health Research Institute, London, ON, Canada</i>	2013
Neural activity in the primate putamen associated with saccadic eye-movement and behavioural outcome <i>Sobell Department of Motor Neuroscience and Movement, University College London, London, UK</i>	2012
Effect of microstimulation of macaque anterior cingulate cortex on pro- and anti-saccades following a task-switch <i>Group on Action and Perception (GAP) Retreat Ingersoll, ON, Canada</i>	2008
Effect of microstimulation of macaque anterior cingulate cortex on the performance of anti-saccades <i>GAP Retreat, Ingersoll, ON, Canada</i>	2007

GUEST LECTURER

Hierarchical organization of prefrontal cortex: Theories and controversy <i>Department of Psychology, UW-Madison Madison, WI, USA</i>	2019
Neural Dynamics in Cognitive Control <i>Department of Psychology, UW-Madison Madison, WI, USA</i>	2014

CONFERENCE PRESENTATIONS

1. D.M. Cleveland, **J.M. Phillips**, S. Chen, S. Mohanta, M. Boly, L. Wang, Y.B. Saalman. Network dynamics of hierarchical processing in the prefrontal cortex during task abstraction. *Annual meeting of the Society for Neuroscience, Abstr.* (Talk) 2022. San Diego, CA.
2. S. Mofakham, **J.M. Phillips**, C. Cui, K. Butler, M. Ajirak, J. Saadon, C. Mikell, P. Djuric, Y.B. Saalman. A computational model of the thalamocortical interactions in the mixed selectivity of prefrontal cortical cells. *Annual Computational Neuroscience Meeting, Abstr.* (Talk) 2022. Melbourne, Australia.
3. **J.M. Phillips**, N.A. Kambi, M.J. Redinbaugh, E.R. Johnson, S. Mohanta, Y.B. Saalman. Mediodorsal and ventroanterior thalamic neurons are selective for rules and goals. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2019. Chicago, IL.
4. D.M. Cleveland, **J.M. Phillips**, S. Chen, L. Wang, Y.B. Saalman. Neural dynamics across human prefrontal cortex supporting different levels of abstraction. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2019. Chicago, IL.

5. N.A. Kambi, **J.M. Phillips**, M.J. Redinbaugh, S. Mohanta, B. Wang, S. Channabasappa Kenchappa, Y.B. Saalman. Mnemonic and spatial representations in primate retrosplenial cortex. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2019. Chicago, IL.
6. M. Afrasiabi, M.J. Redinbaugh, N.A. Kambi, **J.M. Phillips**, S. Mohanta, A. Raz, A.M. Haun, Y.B. Saalman. Integrated information generated by cortico-striatal-thalamic circuits correlates with level of consciousness. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2019. Chicago, IL.
7. M.J. Redinbaugh, **J.M. Phillips**, N.A. Kambi, S. Mohanta, S. Andryk, G. Dooley, A. Raz, Y.B. Saalman. Central lateral thalamus causally influences states of consciousness by regulating neural interactions within and between areas in fronto-parietal cortex. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2019. Chicago, IL.
8. S. Mohanta, D. Polyakov, M.J. Redinbaugh, N.A. Kambi, **J.M. Phillips**, S. Tanabe, W. Filbey, J. Kildow, S. Twadell, J.L. Austerweil, R.D. Sanders, Y.B. Saalman. Predictive coding Depends on causal inference and NMDA receptor-mediated feedback in the brain. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2018. San Diego, CA.
9. M.J. Redinbaugh, **J.M. Phillips**, N.A. Kambi, S. Mohanta, A. Raz, Y.B. Saalman. Central lateral thalamus causally influences states of consciousness by regulating fronto-parietal cortical dynamics. *Annual meeting of the Society for Neuroscience, Abstr.* (Nanosymposium) 2018. San Diego, CA.
10. S. Mohanta, D. Polyakov, M.J. Redinbaugh, N. Kambi, **J.M. Phillips**, S. Tanabe, W. Filbey, J. Kildow, S. Twadell, J. Austerweil, R. Sanders, Y.B. Saalman. Predictive coding depends on causal inference, not just transitional probabilities, and NMDA recdeptor-mediated feedback in the brain. *Annual meeting of the society for mathematical psychology, Abstr.* (Talk) 2018. Madison, WI.
11. M.J. Redinbaugh, **J.M. Phillips**, N.A. Kambi, S. Mohanta, A. Raz, Y.B. Saalman. Stimulation of central lateral thalamus restores conscious processing under propofol and isoflurane anesthesia. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2017. Washington, DC.
12. N.A. Kambi, **J.M. Phillips**, Y.B. Saalman. Anterior thalamus regulates interactions between hippocampus and retrosplenial cortex based on memory demands. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 2017. Washington, DC.
13. N.A. Kambi, **J.M. Phillips**, Y.B. Saalman. Anterior thalamus regulates information transmission between hippocampus and retrosplenial cortex according to memory demands. *Context and Episodic Memory Symposium, Abstr.* (Poster) 2017. Philadelphia, PA.
14. T. Chang, N.A. Kambi, E. Kastar, **J.M. Phillips**, Y.B. Saalman, A. Rosenberg. Mapping the hierarchical neural network of 3D vision using diffusion tensor imaging. *Annual meeting of the Vision Sciences Society, Abstr.* (Poster) 2017. St Pete Beach, FL.
15. **J.M. Phillips**, N.A. Kambi, L. Fish, Y.B. Saalman. Prefrontal cortico-thalamic networks for cognitive control. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 081, 2016. San Diego, CA.

16. N.A. Kambi, **J.M. Phillips**, Y.B. Saalmann. Hippocampo-thalamo-cortical networks for episodic memory and spatial processing. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 639, 2016. San Diego, CA.
17. **J.M. Phillips**, N.A. Kambi, S.R. Kecskemeti, Y.B. Saalmann. Prefrontal cortico-thalamic network connectivity for cognitive control. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 531, 2015. Chicago, IL.
18. N.A. Kambi, **J.M. Phillips**, Y.B. Saalmann. Hippocampal-thalamo-cortical network connectivity for episodic memory and spatial processing. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 534, 2015. Chicago, IL.
19. **J.M. Phillips**, T. Womelsdorf, S. Everling. Automatic versus controlled choice behavior is predicted by preparatory beta band activity of macaque fronto-central cortex. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 272, 2011. Washington, DC.
20. **J.M. Phillips**, V. Sander, S. Everling. Event-related potentials in non-human primates associated with pro- and anti-saccades. *Annual meeting of the Society for Neuroscience, Abstr.* (Poster) 356, 2009. Chicago, IL.
21. **J.M. Phillips**, K. Johnston, S. Everling. Effect of microstimulation of macaque anterior cingulate cortex on reaction times and performance of pro- and anti-saccades after a task switch. *Society for Neuroscience, Abstr* (Poster) 398, 2007. San Diego, CA.
22. **J.M. Phillips**, K. Johnston, S. Everling. Effect of microstimulation of macaque anterior cingulate cortex on reaction times and performance of pro- and anti-saccades. *Canadian Association for Neuroscience, Abstr.* (Poster) 43, 2007. Toronto, ON.
23. **J.M. Phillips**, S.L. Ekstrom, S. Everling. Effect of observed gaze on saccadic reaction times of pro- and anti-saccades in a macaque. *Society for Neuroscience, Abstr.* (Poster) 2006. Atlanta, GA.

TEACHING EXPERIENCE

Mentor. Biology 152, Department of Biology, UW-Madison. Emily Johnson (Undergraduate student in Neurobiology).	2018-2019
Instructor. Drugs and behaviour, Department of Psychology, UWO.	2013
Instructor. Drugs and behaviour, Division of Psychology, Brescia University College, UWO.	2013
Teaching Assistant. Motor neurophysiology, Department of Physiology and Pharmacology (DPP), UWO.	2009–2011
Teaching Assistant. Principles of neuroscience (<i>Cellular & Molecular module</i>) Graduate Program in Neuroscience, UWO. Tutorial instructor.	2008–2011
Teaching Assistant. Introduction to human physiology, DPP, UWO. Tutorial instructor.	2007–2009
Teaching Assistant. Mammalian physiology, DPP, UWO. Laboratory demonstrator.	2006–2007

SCIENTIFIC PEER REVIEW

Journal of Neuroscience, Cerebral Cortex, Journal of Neurophysiology, Journal of Cognitive Neuroscience, Biological Psychiatry, European Journal of Neuroscience, NeuroImage.

DEPARTMENTAL/UNIVERSITY SERVICE

WNPRC Scientific Protocol Implementation Unit Resource Development Committee	2023-present
WNPRC Executive Committee	2022-present
College of Letters and Science and Vice Chancellor for Research and Graduate Education Centers Animal Care and Use Committee	2022-present
WNPRC Animal Allocation Committee	2022-present
Canadian Research Chair student selection committee (DPP, UWO)	2011

SOFTWARE EXPERIENCE/TRAINING

MRI Scanner Operation. Waisman Center, UW-Madison	2014
Neuroimaging Analyses. FSL, SPM, MRICron. UW-Madison	2014
Neurobehavioral Systems Presentation. UW-Madison	2014
Matlab Analysis FieldTrip Workshop. Organizers: Thilo Womelsdorf (York University), Robert Oostenveld (Donders Institute at Radboud University) and Martin Vinck (University of Amsterdam). (York University, Toronto, ON, Canada)	2013
Neuroinformatics. Organizers: Partha P. Mitra (Cold Spring Harbor Laboratory) and David Kleinfeld (University of California San Diego). (Marine Biological Laboratory, Woods Hole, MA, USA)	2011
Adobe Illustrator CS5 One-on-One. (Deke McClelland, O'Reilly Media)	2011
Computational Neuroscience I. Data Methods. (Graduate Program in Neuroscience, UWO)	2007

ADDITIONAL TRAINING

Manager's Role in Workplace Satisfaction (UW-Madison Continuing Studies)	2023
Communication Skills for Challenging Conversations (UW-Madison Continuing Studies)	2023

Leadership (<i>UW-Madison Continuing Studies</i>)	2022
The Art of Conflict Transformation (<i>UW-Madison Continuing Studies</i>)	2022
Building Effective Teams. (<i>UW-Madison Continuing Studies</i>)	2022
Surgical Techniques. (<i>Research Animal Resource Center, UW-Madison</i>)	2014
Veterinary Anesthesia. (<i>Wisconsin National Primate Research Center, UW-Madison</i>)	2014
Research Proposal for Operating Grant I & II. (<i>Graduate Program in Neuroscience, UWO</i>)	2009/11

PROFESSIONAL MEMBERSHIPS

Society for Neuroscience, Canadian Association for Neuroscience.