

Amanda Bolbecker

Curriculum Vitae

Department of Psychological and Brain Sciences
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Education

- 2005 **Doctor of Philosophy, Psychology**, Purdue University, West Lafayette.
Psychobiology
- 2001 **Master of Science, Psychology**, Purdue University, West Lafayette.
Psychobiology
- 1995 **Bachelor of Arts (magna cum laude), Psychology**, Missouri State University, Springfield.

Professional Positions

- 2009–present **Associate Research Scientist**, *Department of Psychological and Brain Sciences*, Indiana University, Bloomington.
- 2007–2008 **Director of Clinical Research & Policy**, *Mental Health Association of Indiana*.
- 2007–2008 **Executive Director**, *Indiana Psychological Association*.
- 2005–2007 **Postdoctoral Research Fellow**, *Department of Psychological and Brain Sciences*, Indiana University, Bloomington.
- Spring, 2003 **Graduate Instructor**, *Department of Psychology*, Purdue University, West Lafayette.
 - Elementary Psychology
- 1998–2005 **Teaching Assistant**, *Department of Psychology*, Purdue University, West Lafayette.
 - Introduction to Research Methods in Psychology, Lab instructor
 - Brain and Behavior: Motivation and Interactive Processes
 - Motivation
 - Brain and Behavior: An Introduction
 - Brain and Behavior: Sensation and Arousal
 - Brain Research Laboratory: Electrophysiological Techniques
 - Elementary Psychology
 - Introduction to Cognitive Psychology

Honors

- 2016 **ERP Boot Camp Fellowship, UC Davis**.
- 2011 & 2007 **NARSAD Young Investigator Award**.
- 2006 **Bipolar Disorder Career Development Institute Award**.
- 2005–2006 **Bilsland Dissertation Fellowship**.
- 2004 **Joint Steering Committee for Science and Public Policy Travel Grant**.
- 2001 & 2003 **Purdue Research Foundation Summer Research Grant**.
- 2001 **American Psychological Association/COGDOP Graduate Research Fellowship**.
- 2001 **Neuroscience Program Training Grant—Travel Fellowship**.
- 1999 **Purdue University Summer Fellowship**.

Professional Memberships

- 2009–present **Society for Research in Psychopathology**.
- 2005–2013 **Society for Psychophysiological Research**.

- 1999–2005 **Society For Neuroscience.**
2005–2007 **American Academy for the Advancement of Science.**
2005–2008 **American Psychological Association 2005-2008.**
2007–2008 **Indiana Psychological Association.**

Professional Service

- Reviewer**, *Psychiatry Research*.
Reviewer, *Schizophrenia Research*.
Reviewer, *Journal of Cannabis Research*.
Reviewer, *Schizophrenia Bulletin*.
Reviewer, *Journal of Motor Behavior*.
Reviewer, *Bipolar Disorders*.

June, 2009 **NIH Special Reviewer**, *Biobehavioral & Behavioral Processes*.

Publications

Journal Articles

- 2022 L. Sepe-Forrest, D. J. Kim, P. D. Quinn, **A. R. Bolbecker**, K. M. Wisner, W. P. Hetrick, and B. F. O'Donnell. Evidence of familial confounding of the association between cannabis use and cerebellar-cortical functional connectivity using a twin study. *Neuroimage Clin*, volume 36, page 103237, 2022.
- 2022 E. N. Herms, **A. R. Bolbecker**, and K. M. Wisner. Emotion regulation and delusion-proneness relate to empathetic tendencies in a transdiagnostic sample. *Front Psychiatry*, volume 13, page 992757, 2022.
- 2021 **A. R. Bolbecker**, D. Apthorp, L. A. Bartolomeo, B. F. O'Donnell, and W. P. Hetrick. Postural sway in first-degree relatives of individuals with schizophrenia. *Schizophr Res*, volume 228, pages 319–321, February 2021.
- 2021 A. B. Moussa-Tooks, A. J. Bailey, **A. R. Bolbecker**, R. J. Viken, B. F. O'Donnell, and W. P. Hetrick. Bifactor structure of the schizotypal personality questionnaire across the schizotypy spectrum. *J Pers Disord*, volume 35, pages 513–537, August 2021.
- 2021 N. B. Lundin, D. J. Kim, R. L. Tullar, A. B. Moussa-Tooks, J. S. Kent, S. D. Newman, J. R. Purcell, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. Cerebellar activation deficits in schizophrenia during an eyeblink conditioning task. *Schizophr Bull Open*, volume 2, page sgab040, January 2021.
- 2020 J. Mitroi, L. P. Burroughs, A. B. Moussa-Tooks, **A. R. Bolbecker**, N. B. Lundin, B. F. O'Donnell, and W. P. Hetrick. Polarity- and intensity-independent modulation of timing during delay eyeblink conditioning using cerebellar transcranial direct current stimulation. *Cerebellum*, volume 19, pages 383–391, June 2020.
- 2020 B. L. Leonhardt, J. L. Vohs, L. A. Bartolomeo, A. Visco, W. P. Hetrick, **A. R. Bolbecker**, A. Breier, P. H. Lysaker, and B. F. O'Donnell. Relationship of metacognition and insight to neural synchronization and cognitive function in early phase psychosis. *Clin EEG Neurosci*, volume 51, pages 259–266, July 2020.
- 2020 D. J. Kim, A. B. Moussa-Tooks, **A. R. Bolbecker**, D. Apthorp, S. D. Newman, B. F. O'Donnell, and W. P. Hetrick. Cerebellar-cortical dysconnectivity in resting-state associated with sensorimotor tasks in schizophrenia. *Hum Brain Mapp*, volume 41, pages 3119–3132, August 2020.
- 2020 J. S. Kent, D. J. Kim, S. D. Newman, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. Investigating cerebellar neural function in schizophrenia using delay eyeblink conditioning: A pilot fMRI study. *Psychiatry Res Neuroimaging*, volume 304, page 111133, October 2020.

- 2020 L. A. Bartolomeo, Y. W. Shin, H. J. Block, **A. R. Bolbecker**, A. F. Breier, B. O'Donnell, and W. P. Hetrick. Prism adaptation deficits in schizophrenia. *Schizophr Bull*, volume 46, pages 1202–1209, March 2020.
- 2019 A. B. Moussa-Tooks, D. J. Kim, L. A. Bartolomeo, J. R. Purcell, **A. R. Bolbecker**, S. D. Newman, B. F. O'Donnell, and W. P. Hetrick. Impaired effective connectivity during a cerebellar-mediated sensorimotor synchronization task in schizophrenia. *Schizophr Bull*, volume 45, pages 531–541, April 2019.
- 2019 L. A. Bartolomeo, A. M. Wright, R. E. Ma, T. A. Hummer, M. M. Francis, A. C. Visco, N. F. Mehdiyoun, **A. R. Bolbecker**, W. P. Hetrick, U. Dydak, J. Barnard, B. F. O'Donnell, and A. Breier. Relationship of auditory electrophysiological responses to magnetic resonance spectroscopy metabolites in early phase psychosis. *Int J Psychophysiol*, volume 145, pages 15–22, November 2019.
- 2019 D. Apthorp, **A. R. Bolbecker**, L. A. Bartolomeo, B. F. O'Donnell, and W. P. Hetrick. Postural sway abnormalities in schizotypal personality disorder. *Schizophr Bull*, volume 45, pages 512–521, April 2019.
- 2018 **A. R. Bolbecker**, D. Apthorp, A. S. Martin, B. Tahayori, L. Moravec, K. L. Gomez, B. F. O'Donnell, S. D. Newman, and W. P. Hetrick. Disturbances of postural sway components in cannabis users. *Drug Alcohol Depend*, volume 190, pages 54–61, September 2018.
- 2018 A. M. Schnakenberg Martin, L. Bartolomeo, J. Howell, W. P. Hetrick, **A. R. Bolbecker**, A. Breier, G. Kidd, and B. F. O'Donnell. Auditory feature perception and auditory hallucinatory experiences in schizophrenia spectrum disorder. *Eur Arch Psychiatry Clin Neurosci*, volume 268, pages 653–661, October 2018.
- 2017 B. A. Seitzman, M. Abell, S. C. Bartley, M. A. Erickson, **A. R. Bolbecker**, and W. P. Hetrick. Cognitive manipulation of brain electric microstates. *Neuroimage*, volume 146, pages 533–543, February 2017.
- 2017 A. M. Schnakenberg Martin, B. F. Donnell, J. B. Millward, J. L. Vohs, E. Leishman, **A. R. Bolbecker**, O. Rass, and S. L. Morzorati. Acute phencyclidine alters neural oscillations evoked by tones in the auditory cortex of rats. *Neuropsychobiology*, volume 75, pages 53–62, 2017.
- 2016 **A. R. Bolbecker**, I. T. Petersen, J. S. Kent, J. M. Howell, B. F. O'Donnell, and W. P. Hetrick. New insights into the nature of cerebellar-dependent eyeblink conditioning deficits in schizophrenia: A hierarchical linear modeling approach. *Front Psychiatry*, volume 7, page 4, 2016.
- 2015 E. Leishman, B. F. O'Donnell, J. B. Millward, J. L. Vohs, O. Rass, G. P. Krishnan, **A. R. Bolbecker**, and S. L. Morzorati. Phencyclidine disrupts the auditory steady state response in rats. *PLoS One*, volume 10, page e0134979, 2015.
- 2015 H. Cheng, S. D. Newman, J. S. Kent, **A. Bolbecker**, M. J. Klaunig, B. F. O'Donnell, A. Puce, and W. P. Hetrick. White matter abnormalities of microstructure and physiological noise in schizophrenia. *Brain Imaging Behav*, volume 9, pages 868–877, December 2015.
- 2015 H. Cheng, S. Newman, J. i, J. S. Kent, J. Howell, **A. Bolbecker**, A. Puce, B. F. O'Donnell, and W. P. Hetrick. Nodal centrality of functional network in the differentiation of schizophrenia. *Schizophr Res*, volume 168, pages 345–352, October 2015.
- 2014 **A. R. Bolbecker**, D. R. Westfall, J. M. Howell, R. J. Lackner, C. A. Carroll, B. F. O'Donnell, and W. P. Hetrick. Increased timing variability in schizophrenia and bipolar disorder. *PLoS One*, volume 9, page e97964, 2014.
- 2014 **A. R. Bolbecker**, J. S. Kent, I. T. Petersen, M. J. Klaunig, J. K. Forsyth, J. M. Howell, D. R. Westfall, B. F. O'Donnell, and W. P. Hetrick. Impaired cerebellar-dependent eyeblink conditioning in first-degree relatives of individuals with schizophrenia. *Schizophr Bull*, volume 40, pages 1001–1010, September 2014.

- 2014 J. A. Micoulaud-Franchi, W. P. Hetrick, L. Boyer, **A. Bolbecker**, M. Aramaki, S. Ystad, R. Richieri, A. El-Kaim, C. Faget, M. Faugere, M. Cermolacce, R. Kronland-Martinet, C. Lancon, and J. Vion-Dury. Validation of the French sensory gating inventory: a confirmatory factor analysis. *Psychiatry Res*, volume 220, pages 1106–1112, December 2014.
- 2014 J. A. Micoulaud-Franchi, W. P. Hetrick, M. Aramaki, **A. Bolbecker**, L. Boyer, S. Ystad, R. Kronland-Martinet, R. Richieri, C. Faget, M. Faugere, A. El-Kaim, M. Cermolacce, C. Lancon, and J. Vion-Dury. Do schizophrenia patients with low P50-suppression report more perceptual anomalies with the sensory gating inventory? *Schizophr Res*, volume 157, pages 157–162, August 2014.
- 2014 D. J. Kim, J. S. Kent, **A. R. Bolbecker**, O. Sporns, H. Cheng, S. D. Newman, A. Puce, B. F. O'Donnell, and W. P. Hetrick. Disrupted modular architecture of cerebellum in schizophrenia: a graph theoretic analysis. *Schizophr Bull*, volume 40, pages 1216–1226, November 2014.
- 2014 R. M. Dominelli, J. M. Boggs, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and C. A. Brenner. Affect modulated startle in schizophrenia: subjective experience matters. *Psychiatry Res*, volume 220, pages 44–50, December 2014.
- 2013 D. J. Kim, **A. R. Bolbecker**, J. Howell, O. Rass, O. Sporns, W. P. Hetrick, A. Breier, and B. F. O'Donnell. Disturbed resting state EEG synchronization in bipolar disorder: A graph-theoretic analysis. *Neuroimage Clin*, volume 2, pages 414–423, 2013.
- 2013 J. S. Kent, D. Michael Bailey, J. M. Vollmer, S. D. Newman, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. A magnetic resonance imaging-safe method for the study of human eyeblink conditioning. *J Neurosci Methods*, volume 216, pages 16–21, May 2013.
- 2013 J. W. Kam, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and C. A. Brenner. Resting state EEG power and coherence abnormalities in bipolar disorder and schizophrenia. *J Psychiatr Res*, volume 47, pages 1893–1901, December 2013.
- 2012 O. Rass, J. K. Forsyth, **A. R. Bolbecker**, W. P. Hetrick, A. Breier, P. H. Lysaker, and B. F. O'Donnell. Computer-assisted cognitive remediation for schizophrenia: a randomized single-blind pilot study. *Schizophr Res*, volume 139, pages 92–98, August 2012.
- 2012 J. S. Kent, S. L. Hong, **A. R. Bolbecker**, M. J. Klaunig, J. K. Forsyth, B. F. O'Donnell, and W. P. Hetrick. Motor deficits in schizophrenia quantified by nonlinear analysis of postural sway. *PLoS One*, volume 7, page e41808, 2012.
- 2012 J. K. Forsyth, **A. R. Bolbecker**, C. S. Mehta, M. J. Klaunig, J. E. Steinmetz, B. F. O'Donnell, and W. P. Hetrick. Cerebellar-dependent eyeblink conditioning deficits in schizophrenia spectrum disorders. *Schizophr Bull*, volume 38, pages 751–759, June 2012.
- 2011 **A. R. Bolbecker**, A. B. Steinmetz, C. S. Mehta, J. K. Forsyth, M. J. Klaunig, E. K. Lazar, J. E. Steinmetz, B. F. O'Donnell, and W. P. Hetrick. Exploration of cerebellar-dependent associative learning in schizophrenia: effects of varying and shifting interstimulus interval on eyeblink conditioning. *Behav Neurosci*, volume 125, pages 687–698, October 2011.
- 2011 **A. R. Bolbecker**, S. L. Hong, J. S. Kent, M. J. Klaunig, B. F. O'Donnell, and W. P. Hetrick. Postural control in bipolar disorder: increased sway area and decreased dynamical complexity. *PLoS One*, volume 6, page e19824, 2011.
- 2011 **A. R. Bolbecker**, S. L. Hong, J. S. Kent, J. K. Forsyth, M. J. Klaunig, E. K. Lazar, B. F. O'Donnell, and W. P. Hetrick. Paced finger-tapping abnormalities in bipolar disorder indicate timing dysfunction. *Bipolar Disord*, volume 13, pages 99–110, February 2011.
- 2011 A. B. Steinmetz, P. D. Skosnik, C. R. Edwards, **A. R. Bolbecker**, J. E. Steinmetz, and W. P. Hetrick. Evaluation of bidirectional interstimulus interval (ISI) shift in auditory delay eye-blink conditioning in healthy humans. *Learn Behav*, volume 39, pages 358–370, December 2011.
- 2011 J. W. Kam, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and C. A. Brenner. Prospective predictors of mood episodes in bipolar disorder. *J Affect Disord*, volume 135, pages 298–304, December 2011.

- 2011 W. Y. Ahn, O. Rass, D. J. Fridberg, A. J. Bishara, J. K. Forsyth, A. Breier, J. R. Busemeyer, W. P. Hetrick, **A. R. Bolbecker**, and B. F. O'Donnell. Temporal discounting of rewards in patients with bipolar disorder and schizophrenia. *J Abnorm Psychol*, volume 120, pages 911–921, November 2011.
- 2010 J. K. Forsyth, **A. R. Bolbecker**, C. S. Mehta, M. J. Klaunig, J. E. Steinmetz, B. F. O'Donnell, and W. P. Hetrick. Cerebellar-dependent eyeblink conditioning deficits in schizophrenia spectrum disorders. *Schizophrenia Bulletin*, volume 38, pages 751–759, December 2010.
- 2009 **A. R. Bolbecker**, C. S. Mehta, C. R. Edwards, J. E. Steinmetz, B. F. O'Donnell, and W. P. Hetrick. Eye-blink conditioning deficits indicate temporal processing abnormalities in schizophrenia. *Schizophr Res*, volume 111, pages 182–191, June 2009.
- 2009 **A. R. Bolbecker**, C. Mehta, J. K. Johannesen, C. R. Edwards, B. F. O'Donnell, A. Shekhar, J. I. Nurnberger, J. E. Steinmetz, and W. P. Hetrick. Eyeblink conditioning anomalies in bipolar disorder suggest cerebellar dysfunction. *Bipolar Disord*, volume 11, pages 19–32, February 2009.
- 2009 **A. R. Bolbecker**, C. C. Lim-Kessler, J. Li, A. Swan, A. Lewis, J. Fleets, and G. S. Wasserman. Visual efference neuromodulates retinal timing: in vivo roles of octopamine, substance P, circadian phase, and efferent activation in Limulus. *J Neurophysiol*, volume 102, pages 1132–1138, August 2009.
- 2009 **A. R. Bolbecker**, W. P. Hetrick, J. K. Johannesen, B. F. O'Donnell, J. E. Steinmetz, and A. S. Shekhar. Secretin effects on cerebellar-dependent motor learning in schizophrenia. *Am J Psychiatry*, volume 166, pages 460–466, April 2009.
- 2008 C. C. Lim-Kessler, **A. R. Bolbecker**, J. Li, and G. S. Wasserman. Visual efference in Limulus: in vitro temperature-dependent neuromodulation of photoreceptor potential timing by octopamine and substance P. *Vis Neurosci*, volume 25, pages 83–94, 2008.
- 2008 C. C. Lim-Kessler, **A. R. Bolbecker**, J. Li, and G. S. Wasserman. Osmotic properties of Limulus seawaters and organ cultures: an unrecognized issue. *Vis Neurosci*, volume 25, pages 103–105, 2008.
- 2007 **A. R. Bolbecker**, A. R. Lewis, A. A. Swan, K. Carlson, J. R. Fleet, K. E. Beck, and G. S. Wasserman. Stable bellows cup electrode demonstrates low-frequency properties of long-term electroretinographic recordings in the Limulus lateral eye. *J Neurosci Methods*, volume 159, pages 252–260, January 2007.
- 2003 **A. R. Bolbecker**, Z. Cheng, and G. S. Wasserman. Time versus size: which characteristic of a neural response carries more information? *Biol Cybern*, volume 88, pages 73–78, January 2003.

Review Articles

- 2022 B. F. Bloomer, J. J. Morales, **A. R. Bolbecker**, D. J. Kim, and W. P. Hetrick. Cerebellar structure and function in autism spectrum disorder. *J Psychiatr Brain Sci*, volume 7, 2022. Mini Review.
- 2015 J. S. Kent, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. Eyeblink conditioning in schizophrenia: A critical review. *Front Psychiatry*, volume 6, page 146, 2015.
- 2011 G. S. Wasserman, **A. R. Bolbecker**, J. Li, and C. C. M. Lim-Kessler. A top-down and bottom-up component of visual attention. *Cogn Comput*, volume 3, page 294–302, 2011.
- 2002 **A. R. Bolbecker**, Z. Cheng, G. Felsten, K. L. Kong, C. C. Lim, S. J. Nisly-Nagele, L. T. Wang-Bennett, and G. S. Wasserman. Two asymmetries governing neural and mental timing. *Conscious Cogn*, volume 11, pages 265–272, June 2002.

Book Chapters

- 2012 **A. R. Bolbecker** and A. Shekhar. Muscarinic agonists and antagonists in schizophrenia: recent therapeutic advances and future directions. In A. Fryer, A. Christopoulos, and N. Nathanson, editors, *Muscarinic Receptors*, volume 208 of *Handbook of Experimental Pharmacology*, pages 167–190. Springer, Berlin, Heidelberg, 2012.

In Conference Proceedings

- 2010 G. S. Wassermann, A. R. **Bolbecker**, Jia Li, and C. C. M. Lim-Kessler. No retinal efference in humans: An urban legend. In *Proceedings of the 26th Annual Meeting of the International Society for Psychophysics (Fechner Day)*, pages 257–262, Padua, Italy, October 2010. <https://proceedings.fechnerday.com/index.php/proceedings/article/view/573>.

Invited Commentary

- 2011 G. S. Wassermann, **A. R. Bolbecker**, J. Li, and C. C. Lim-Kessler. Octopamine affects the timing of retinal responses in *Limulus* as well as their amplitudes. *Front Integr Neurosci*, volume 5, page 1, 2011.

Theses

- 2005 **A. R. Bolbecker**. *Electroretinographic investigation of circadian efferent neuromodulation of photoreceptor timing in the lateral eye of the horseshoe crab, Limulus polyphemus*. PhD thesis, West Lafayette, Indiana, 2005.
- 2001 **A. R. Bolbecker**. Time versus size: Which characteristic of a neural response carries more information? Master's thesis, West Lafayette, 2001.

Symposia

- 2015 **A. R. Bolbecker**, I. T. Petersen, O'Donnell B. F., and W. P. Hetrick. New insights into the nature of cerebellar-dependent eyeblink conditioning deficits in schizophrenia: A hierarchical linear modeling approach. In *Australasian Schizophrenia Conference*, Melbourne, Australia, 2015.
- 2012 **A. R. Bolbecker**, W.P. Hetrick, B.F. O'Donnell, Shekhar Johanneson, J.K., C.R. A., Goodlett, and A. Breier. Cerebellar-dependent eyeblink conditioning: A translational biomarker for cerebellar dysfunction in schizophrenia. In *Society for Psychophysiological Research conference*, New Orleans, LA, 2012.
- 2010 G. S. Wassermann, A. R. **Bolbecker**, Jia Li, and C. C. M. Lim-Kessler. No retinal efference in humans: An urban legend. In *Annual Meeting of the International Society for Psychophysics (Fechner Day)*, Padua, Italy, October 2010.

Invited Talks

- 2022 M.S. McHenry, **A. R. Bolbecker**, J. J. Morales, and W. P. Hetrick. A new cognitive neuroscience lab in western kenya: Understanding neurocognitive function in children born to mothers with hiv. In *Neuroscience Stakeholder Workshop*, Moi University, Eldoret, Kenya, 2022.
- 2005 **A. R. Bolbecker**. Substance P and octopamine modulate photoreceptor response timing and amplitude in the lateral eye of *Limulus polyphemus*. Indiana University, Bloomington, 2005.
- 2005 **A. R. Bolbecker**. Internal desynchronization of efferently released neuromodulators of photoreceptor response amplitude and timing in *Limulus polyphemus*. Indiana University Medical Center, Indianapolis, 2005.
- 2005 **A. R. Bolbecker**. In vivo neuromodulation of receptor potentials following injections of octopamine and substance P in the lateral eye of the horseshoe crab *Limulus polyphemus*. Saint Louis University, St. Louis, MO, 2005.
- 2005 **A. R. Bolbecker**. Circadian efferent neuromodulation of neural timing in the lateral eye of the horseshoe crab *Limulus polyphemus*. Washington University, St. Louis, MO, 2005.

Poster Presentations

- 2022 **A. R. Bolbecker**, B. F. Bloomer, E. R. Larson, R. L. Tullar, K. M. Wisner, D. Aphthorp, B. F. O'Donnell, and W. P. Hetrick. Increased postural sway in chronic cannabis users and behavioral correlates. In *Annual meeting of the Society for Research in Psychopathology*, Philadelphia, PA, 2022.

- 2022 J. J. Morales, B. F. Bloomer, R. L. Tullar, E. R. Larson, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and K. M. Wisner. Schizotypy mediates effects of cannabis use on alexithymia. In *Annual meeting of the Society for Research in Psychopathology*, Philadelphia, PA, 2022.
- 2022 E. R. Larson, A. B. Moussa-Tooks, R. L. Tullar, H. M. King, B. Bloomer, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and K.M. Wisner. Interactions between early life adversity and cannabis use. In *Annual meeting of the Society for Research in Psychopathology*, Philadelphia, PA, 2022.
- 2022 E. Herms, **A. R. Bolbecker**, and K. M. Wisner. Impaired sleep mediates the relationship between interpersonal trauma and subtypes of delusional ideation. In *Annual meeting of the Society for Research in Psychopathology*, Philadelphia, PA, 2022.
- 2022 B. F. Bloomer, K. M. Wisner, **A. R. Bolbecker**, D. Apthorp, D. P. Kennedy, B. F. O'Donnell, and W. P. Hetrick. An examination of postural sway in adults with autism spectrum disorder. In *Annual meeting of the Society for Research in Psychopathology*, Philadelphia, PA, 2022.
- 2021 K. M. Wisner, B. F. Bloomer, E. R. Larson, R. L. Tullar, E.N. Herms, J. J. Morales, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. A multi-dimensional investigation of associations among interoceptive abilities, sensory gating, and risk for psychopathology. In *Annual meeting of the Society for Research in Psychopathology*, Online, 2021.
- 2021 L. Sepe-Forrest, D. J. Kim, P. D. Quinn, **A. R. Bolbecker**, K. M. Wisner, W. P. Hetrick, and B. F. O'Donnell. Evidence of familial confounding of the association between cannabis use and functional cerebellar-cortical connectivity using a twin study. In *Annual meeting of the Society for Research in Psychopathology*, Online, 2021.
- 2021 E. Herms, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and K. M. Wisner. The role of emotion regulation strategies and delusion proneness on empathic tendencies in a community sample. In *Annual meeting of the Society for Research in Psychopathology*, Online, 2021.
- 2021 B. Bloomer, E. Larson, R. Tullar, E. Herms, L. Sepe-Forrest, **A. R. Bolbecker**, B. F. O'Donnell, W. P. Hetrick, and K. M. Wisner. Alterations in sensory gating and interoception in cannabis users. In *Annual meeting of the Society for Research in Psychopathology*, Online, 2021.
- 2019 A. R. **Bolbecker**, D. Apthorp, L. Bartolomeo, B. F. O'Donnell, and W. P. Hetrick. Postural sway in first-degree relatives of individuals with schizophrenia. In *Annual meeting of the Society for Research in Psychopathology*, Buffalo, NY, 2019.
- 2018 J. Mitroi, L. P. Burroughs, **A. R. Bolbecker**, A. B. Moussa-Tooks, N. B. Lundin, A. C. Rejimon, B. F. O'Donnell, and B. F. Hetrick. Neurostimulation of the human cerebellum during associative learning. In *Annual meeting of the Society for Research in Psychopathology*, Indianapolis, IN, 2018.
- 2017 N. L. Lundin, D. J. Kim, J. S. Kent, S. D. Newman, A. B. Moussa-Tooks, J. Purcell, **A. R. Bolbecker**, L. A. Bartolomeo, B. F. O'Donnell, and W. P. Hetrick. Differential cerebellar activation in schizophrenia in the eyeblink conditioning paradigm. In *International Congress of Schizophrenia Research*, San Diego, CA, 2017.
- 2017 L. A. Bartolomeo, Y. W. Shin, H. J. Block, **A. R. Bolbecker**, A. F. Breier, B. F. O'Donnell, and W. P. Hetrick. Prism adaptation as a measure of cerebellar dysfunction in schizophrenia. In *Annual meeting of the Society for Research in Psychopathology*, Denver, CO, 2017.
- 2017 L. Bartolomeo, A. M. Wright, A. Hummer, M. M. Francis, A. C. Visco, N. Medhdiyoun, **A. R. Bolbecker**, W. P. Hetrick, U. Dydak, B. F. O'Donnell, and A. Breier. Relationship of auditory event related potentials with magnetic resonance spectroscopy metabolites in early-stage psychosis. In *Annual meeting of the Society for Neuroscience*, Washington, DC, 2017.
- 2015 C. C. Frank, D. R. Westfall, J. M. Howell, **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. Cerebellar-dependent task performance and cognitive function: Evidence of altered relationships in schizophrenia and bipolar disorder. In *Meeting of the American Psychological Society*, New York, NY, 2015.

- 2014 D. R. Westfall, J. West, B. McDonald, **A. R. Bolbecker**, B. F. O'Donnell, M. Francis, N. Mehdiyoun, W. P. Hetrick, A. Saykin, and A. Breier. Neuroanatomical correlates of EEG and cognitive deficits in first-episode psychosis. In *International Conference on Early Psychosis*, Tokyo, Japan, 2014.
- 2014 D. R. Westfall, J. West, B. McDonald, **A. R. Bolbecker**, B. F. O'Donnell, M. Francis, N. Mehdiyoun, W. P. Hetrick, A. Saykin, and A. Breier. Neuroanatomical correlates of EEG and cognitive deficits in first-episode psychosis. In *Annual meeting of the Society for Research in Psychopathology*, Evanston, IL, 2014.
- 2014 **A. R. Bolbecker**, N. Port, B. Redick, J. M. Howell, D. R. Westfall, B. F. O'Donnell, and W. P. Hetrick. Confirmation of the cerebellar model of schizophrenia by saccadic adaptation and smooth pursuit eye movement experiments. In *Annual meeting of the Society for Research in Psychopathology*, Evanston, IL, 2014.
- 2014 **A. R. Bolbecker**, B. F. O'Donnell, and W. P. Hetrick. Neuroanatomical correlates of EEG and cognitive deficits in first-episode psychosis. In *Annual meeting of the Society for Research in Psychopathology*, Evanston, IL, 2014.
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- 2002 **A. R. Bolbecker**, Z. Cheng, and G. S. Wasserman. The magnitude of a neural response feature transmits more information than its timing. In *Annual meeting of the Society for Neuroscience*, San Diego, CA, 2002.
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- 2002 **A. R. Lim**, C. C. M. and **Bolbecker**, R. Natajaran, K.A. Vester, and G. S. Wasserman. Clear temporal differences exist between day and night ERG waveforms in intact Limulus lateral eyes. In *Annual meeting of the Society for Neuroscience*, Orlando, FL, 2002.

Submitted NIH Grants

Risk factors for neurocognitive decline in adults living with HIV, Co-investigator, Author. This submitted R01 aims to determine the impact of HIV infection on neurophysiology and neurocognition in adults living with HIV and identify potential mediating sociodemographic and health/medical factors. Due to effective antiretroviral therapy (ART), people living with HIV (PLWH) live near-normal life spans, but they nevertheless experience earlier onset of functional and cognitive decline. HIV-associated neurocognitive disorder (HAND) affects ~50% PLWH worldwide, with older age, advanced stage of illness, CD4 count, and depression increasing risk.⁴ In terms of sheer numbers affected by this public health challenge, sub-Saharan Africa is vastly overrepresented, with over 2/3 of all PLWH residing in this region. We will determine whether deleterious neurophysiological and cognitive effects of HIV are exacerbated by factors including age, inflammation, historical and current HIV-related variables (nadir and current CD4 levels, stage of illness), depression, and trauma in sub-Saharan Africa. We propose to characterize ERP responses and their relationship to cognitive function in adults living with HIV compared to uninfected adults (n=20 per group per age band, 4 age bands, ranging from 18–60 years old) to develop a model to determine factors predictive of poor neurophysiological and cognitive outcomes.

Severe Malaria And Risk to The Brain (SMART Brain), Co-investigator, Author.

The objectives of this R01 submitted to the National Institute of Neurological Disease and Stroke are to: (1) identify central nervous system (CNS) risk factors for neurodevelopmental impairment (NDI) after cerebral malaria or severe malarial anemia in Ugandan children 6 months to 4 years old using EEG/ERP, trans-cranial doppler, and MRI approaches; (2) Establish how CNS and systemic factors interact to lead to NDI in cerebral malaria or severe malarial anemia by evaluating CNS factors along with clinical and host response risk factors for NDI (e.g. coma duration, acute kidney injury, intestinal injury, endothelial dysregulation). Novel statistical models will be used which are designed to incorporate interaction and mediation pathways between CNS and systemic factors to predict NDI.

We were recently advised that this proposal received a score of 28, putting it at the 11th percentile. We have not yet received a funding decision.

Current Research Support

08/01/2021 **Advancing the science of neurocognitive physiology in adolescents living with HIV**,
-07/31/2023 *\$131,659 direct costs*, R21-PAR-18-836, Co-investigator, Author.

The specific objectives of the proposed project are to: (1) determine the impact of HIV infection on neurophysiology and neurocognition in perinatally-infected adolescents and identify potential mediating factors; and (2) build capacity for interdisciplinary neurophysiological research in sub-Saharan Africa by supporting intensive training for faculty development and tiered mentoring in neurophysiological methodological techniques. The proposed work is significant because it will be the first comprehensive neurophysiological study of ALHIV in sub-Saharan Africa, and Moi University will be the only Kenyan academic centre with sustainable capacity for research in neurophysiology.

4/01/2019 **Cerebellar biobehavioral markers in cannabis users**, *\$1,996,604 direct costs*, R01-PA-18-484,
-3/31/2024 Co-investigator, Lead Author.

The proposed research will: (1) measure resting state fMRI connectivity between cerebellum sub-regions and established cortical resting state brain networks; (2) determine whether cerebellar fMRI activation during cerebellar-dependent tasks is reduced in cannabis users; and (3) test the sensitivity of a set of cerebellar-dependent behavioral tasks to cannabis use. Findings from this research will likely identify whether and which cerebellar paradigms and measures which are most affected in current CB users. If the strongly founded predictions are borne out, this set of measures could then be utilized in a wide range of studies, including direct administration of cannabis compounds in humans and studies of comparable measures in animal models of cannabis use and consequences.

Completed Research Support

7/01/2019 **Cerebellar Dysfunction in Autism**, *\$275,000 direct costs*, R21 PA-18-400 , Co-Investigator,
-6/31/2021 Lead Author.

This grant will investigate whether altered cerebellar structural and functional MRI connectivity to cortical and subcortical brain regions is associated with behavioral symptoms of the disorder.

11/01/2012 **Cerebellar Timing Dysfunction in Schizophrenia**, *\$1,250,000 direct costs*, R01 PA-10-067
-10/31/2017 (Hetrick PI), Co-Investigator, Lead Author.

This grant proposal is a renewal of our previous R01. We propose to investigate the functional connectivity of the cerebellum in schizophrenia and first-degree relatives using temporal processing, associative learning and cognitive tasks designed to probe cerebellum and related circuits.

03/01/2014 **Cerebellar Dysfunction in Autism**, *\$10,000*, Indiana CTSI Core Pilot Grant, Co-Investigator,
-02/28/2016 Lead Author.

We propose to investigate cerebellar functional connectivity both during resting state and using eyeblink conditioning as a functional probe. Structural DTI connectivity will also be collected and analyzed as a primary dependent measure.

07/01/2011 **Effect of Secretin on Cerebellar Function and Cortical Synchronization in Schizophrenia**,
-6/30/2013 *\$60,000 direct costs*, NARSAD Young Investigator Award (Bolbecker PI), Principal Investigator.

This study examines the effects of secretin on cerebellar-dependent eyeblink conditioning and frontal EEG gamma synchronization in schizophrenia.

- 02/01/2012 **Identifying Effects of Chronic Cannabis Abuse on Associative Learning and Neuroplasticity,**
 -1/31/13 *\$72,874 direct costs*, IU Collaborative Research Grant (Goodlett/Mackie PIs), Co-Investigator,
 Lead Author.
 The proposed research will examine the effects of the 2 primary components of *cannabis sativa*, specifically
 THC and cannabidiol, on associative learning in rats.
- 04/01/2010 **Behavioral and Electrophysiological Biomarkers of Bipolar Disorder,** *\$25,000 direct costs*
 -03/30/2011 *(Canadian)*, UBC Martha Piper Research Fund (Brenner PI), Co-Investigator.
 This grant support is offered to support collaborations between faculty at University of British Columbia
 and international researchers. The objective of this 6-month longitudinal study is to quantify behavioral
 (activity patterns) and electrophysiological (EEG) variability using traditional and nonlinear dynamical
 systems analysis to better understand what factors are predictive of impending mood episodes in bipolar
 disorder.
- 03/01/2009 **Translational Evaluation of Secretin's Effects on Cerebellar Function,** *\$75,000 direct*
 -02/28/2010 *costs*, Indiana Clinical and Translational Sciences Institute (ICTSI) Collaboration in Translational
 Research (CTR) Pilot Grant Program (Goodlett PI), Co-Investigator, Lead Author.
 This study examined behavioral and mechanistic effects of secretin on cerebellar function in rats to provide
 pilot data for a future R01 application using parallel, translational studies to investigate secretin's effects
 on cerebellar-mediated tasks and cognition in schizophrenia and rats.
- 07/01/2007 **Investigation of Neural Timing Circuit in Bipolar Disorder using Eyeblink Conditioning**
 -06/30/2009 **Methodology,** *\$60,000 direct costs*, NARSAD Young Investigator Award (Bolbecker PI), Principal
 Investigator.
 This study examined cerebellar timing circuits in bipolar disorder using classical eyeblink conditioning
 methodology.