

CHRISTINE M. EMBURY

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RESEARCH BACKGROUND AND INTERESTS

Highly driven researcher, currently examining cognitive and motor processes in healthy and disease conditions including diabetes and dementia using neuroimaging techniques.

EDUCATION

University of Nebraska Omaha (UNO), Omaha, NE

Ph.D. Candidate in Neuroscience and Behavior Program

Expected 2021

Currently In Progress

University of Nebraska Omaha, Omaha, NE

M.A. in Neuroscience and Behavior Program

2019

Thesis: "The Impact of Type 1 Diabetes on Neurophysiology Serving Cognition"

University of Nebraska Omaha, Omaha, NE

B.S. in Psychology and Neuroscience

2012

Honors Thesis: "Dog Therapy as a Stress Buffer in an Induced Stress Event"

PUBLICATIONS

Taylor BK, Frenzel MR, Eastman JA, **Embury CM**, Wang YP, Stephen JM, Calhoun VD, Badura-Brack AS, & Wilson TW (2020). Subclinical Anxiety and Posttraumatic Stress Influence Cortical Thinning During Adolescence. *Journal of the American Academy of Child and Adolescent Psychiatry*.

Arif Y, Wiesman AI, O'Neill J, **Embury CM**, May P, Lew BL, Schantell M, Fox H, Swindells S, & Wilson TW (2020). The age-related trajectory of visual attention neural function is altered in adults living with HIV: A cross-sectional MEG study. *EBioMedicine*.

Arif Y, Spooner RK, Wiesman AI, **Embury CM**, Proskovec AL, & Wilson TW (2020). Modulation of Attention Networks Serving Reorientation in Healthy Aging. *Aging*.

Taylor BK, **Embury CM**, Heinrichs-Graham E, Frenzel MR, Eastman JA, Wiesman AI, Wang YP, Calhoun VD, Stephen JM, & Wilson TW (2020). Neural oscillatory dynamics serving abstract reasoning suggest robust sex differences in typically-developing children and adolescents. *Developmental Cognitive Neuroscience*, 42. doi: 10.1016/j.dcn.2020.100770

Koshy SM, Wiesman AI, Proskovec AL, **Embury CM**, Schantell M, Eastman JA, Heinrichs-Graham E, & Wilson TW (2020). Numerical working memory alters alpha-beta oscillations and connectivity in the parietal cortices. *Human Brain Mapping*. doi: 10.1002/hbm.25043

Stephen JM, Solis I, Janowich J, Stern M, Frenzel MR, Eastman JA, Mills MS, **Embury CM**, Coolidge NM, Heinrichs-Graham E, Mayer A, Liu J, Wang YP, Wilson TW, & Calhoun VD (2020). The Developmental Chronnecto-Genomics (Dev-CoG) study: A multimodal study on the developing brain. *Neuroimage*. doi: 10.1016/j.neuroimage.2020.117438

Hoffman R, Trevarrow MP, Bergwell HR, **Embury CM**, Heinrichs-Graham E, Wilson TW, & Kurz MJ (2020). Cortical oscillations that underlie working memory are altered in adults with cerebral palsy. *Clinical Neurophysiology*.

Badura-Brack AS, Mills MS, **Embury CM**, Khanna MM, Klanecky Earl A, Stephen JM, Wang YP, Calhoun VD, & Wilson TW (2020). Hippocampal and parahippocampal volumes vary by sex and traumatic life events in children. *Journal of Psychiatry & Neuroscience*. doi: 10.1503/jpn.190013

Koshy SM, Wiesman AI, Spooner RK, **Embury CM**, Rezich MT, Heinrichs-Graham E, & Wilson TW (2020). Multielectrode Transcranial Electrical Stimulation of the Left and Right Prefrontal Cortices Differentially Impacts Verbal Working Memory Neural Circuitry. *Cerebral Cortex*, 30(4), 2389-2400. doi: 10.1093/cercor/bhz246

Embury CM, Heinrichs-Graham E, Lord GH, Drincic AT, Desouza CV, & Wilson TW (2019). Altered motor dynamics in type 1 diabetes modulate behavioral performance. *Neuroimage Clinical*.

Mills MS, **Embury CM**, Klanecky AK, Khanna MM, Calhoun VD, Stephen JM, Wang YP, Wilson TW, & Badura-Brack AS (2019). Traumatic events are associated with diverse psychological symptoms in typically-developing children. *Journal of Child & Adolescent Trauma*.

- Embury CM**, Wiesman AI, Proskovec AL, Mills MS, Heinrichs-Graham E, Wang YP, Calhoun VD, Stephen JM, & Wilson TW (2019). Neural dynamics of verbal working memory processing in children and adolescents. *Neuroimage*, 185, 191-197. doi: 10.1016/j.neuroimage.2018.10.038
- Embury CM**, Wiesman AI, McDermott TJ, Proskovec AL, Heinrichs-Graham E, Lord GH, Brau KL, Drincic AT, Desouza CV, & Wilson TW (2019). The impact of type 1 diabetes on neural activity serving attention. *Human Brain Mapping*, 40(4), 1093-1100. doi: 10.1002/hbm.24431
- Embury CM**, Wiesman AI, Proskovec AL, Heinrichs-Graham E, McDermott TJ, Lord GH, Brau KL, Drincic AT, Desouza CV & Wilson TW (2018). Altered brain dynamics in patients with type 1 diabetes during working memory processing. *Diabetes*, 67(6), 1140-1148. doi: 10.2337/db17-1382
- Khanna MM, Badura-Brack AS, McDermott TJ, **Embury CM**, Wiesman AI, Shepherd A, Ryan TJ, Heinrichs-Graham E, & Wilson TW (2017). Veterans with post-traumatic stress disorder exhibit altered emotional processing and attentional control during an emotional Stroop task. *Psychol Med*, 1-11. doi: 10.1017/S0033291717000460
- Embury CM**, Dyavarshetty B, Lu Y, Wiederin JL, Ciborowski P, Gendelman HE, & Kiyota T (2016). Cathepsin B Improves β -Amyloidosis and Learning and Memory in Models of Alzheimer's Disease. *J NeuroImmune Pharmacol*, 1-13. doi: 10.1007/s11481-016-9721-6
- Dong W, **Embury CM**, Lu Y, Whitmire SM, Dyavarshetty B, Gelbard HA, Gendelman HE, & Kiyota T (2016). The mixed-lineage kinase 3 inhibitor URM-099 facilitates microglial amyloid- β degradation. *J Neuroinflammation*, 13, 184. doi: 10.1186/s12974-016-0646-z
- Kiyota T, **Morrison CM**, Tu G, Dyavarshetty B, Weir RA, Zhang G, Xiong H, & Gendelman HE (2015). Presenilin-1 familial Alzheimer's disease mutation alters hippocampal neurogenesis and memory function in CCL2 null mice. *Brain Behav Immun*, 49, 311-321. doi: 10.1016/j.bbi.2015.06.014
- Kiyota T, Zhang G, **Morrison CM**, Bosch ME, Weir RA, Lu Y, Dong W, & Gendelman HE (2015). AAV2/1 CD74 gene transfer reduces β -amyloidosis and improves learning and memory in a mouse model of Alzheimer's disease. *Mol Ther*, Advance online publication. doi: 10.1038/mt.2015.142

ABSTRACTS AND PRESENTATIONS

- Embury CM**, Lord GH, Drincic AT, Desouza CV, & Wilson TW (2019). Altered Motor Dynamics during Response Competition in Adults with Type 1 Diabetes [Abstract]. 26th Annual Meeting of the Cognitive Neuroscience Society, San Francisco, California.
- Embury CM**, Beadle JN, Lord GH, Drincic AT, Desouza CV, & Wilson TW (2019). The Impact of Type 1 Diabetes on Neural Dynamics [Abstract]. The University of Nebraska Omaha's 2019 Student Research and Creative Activity Fair.
- Embury CM**, McDermott TJ, Wiesman AI, Brau KG, Desouza CV, Drincic AT, & Wilson TW (2018). Altered Oscillatory Dynamics of Visual Selective Attention Processing in Patients with Type 1 Diabetes [Abstract]. The 21st International Conference on Biomagnetism, Philadelphia, Pennsylvania.
- Embury CM**, Wiesman AI, Proskovec AL, Heinrichs-Graham E, Wang YP, Calhoun VD, Stephen JM, & Wilson TW (2018). Sex and Developmental Differences in Neural Component Recruitment During Verbal Working Memory Processing [Abstract]. The 21st International Conference on Biomagnetism, Philadelphia, Pennsylvania.
- Embury CM**, McDermott TJ, Wiesman AI, Brau KG, Desouza CV, Drincic AT, & Wilson TW (2018). Altered Neural Dynamics During a Flanker Attention Task in Patients with Type 1 Diabetes [Abstract]. The American Diabetes Association 78th Scientific Sessions, Orlando, Florida.
- Embury CM**, Wiesman AI, Proskovec AL, Heinrichs-Graham E, Wang YP, Calhoun VD, Stephen JM & Wilson TW (2018). Sex Differences in the Oscillatory Dynamics Serving Visual Working Memory in Development: a MEG Study [Abstract]. 25th Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, USA.
- Mills MS, **Embury CM**, Warren DE, Robinson AM, Meredith CK, Manker BR, Khanna MM, Klanecky AK, Calhoun VD, Stephen JM, Wang YP, Wilson TW, & Badura-Brack AS. (2018). Amygdala, Hippocampal, and Parahippocampal Volumes Vary By Sex and Traumatic Life Events in Healthy Children. [Abstract] Association for Psychological Science (APS) Annual Convention 2018, San Francisco, CA, USA.
- Mills MS, **Embury CM**, Robinson AM, Meredith CK, Manker BR, Khanna MM, Klanecky AK, Brown JR, Calhoun VD, Stephen JM, Wang YP, Wilson TW, & Badura-Brack AS. (2018). Number of Traumatic Life Events Are Associated with Psychological Symptoms in a Community Sample of Healthy Children. [Abstract] APS Annual Convention 2018, San Francisco, CA, USA.

- Embury CM**, Proskovec AL, Heinrichs-Graham E, McDermott TJ, Wiesman AI, Lord GH, Brau KL, Drincic AT, Desouza CV, & Wilson TW (2017). Altered MEG Oscillatory Dynamics during Working Memory Processing in Patients with Type 1 Diabetes [Abstract]. 23rd Annual Meeting of the Organization for Human Brain Mapping, Vancouver, British Columbia, Canada.
- Embury CM**, Proskovec AL, Heinrichs-Graham E, McDermott TJ, Wiesman AI, Wang YP, Calhoun VD, Stephen JM, & Wilson TW (2017). Developmental Alterations in the Oscillatory Dynamics serving Visual Working Memory: A MEG Study [Abstract]. 23rd Annual Meeting of the Organization for Human Brain Mapping, Vancouver, British Columbia, Canada.
- Embury CM**, Brau KG, Wiesman AI, Desouza CV, Drincic AT, & Wilson TW (2017). Disease Duration Affects Brain Networks Serving Working Memory Function in Type I Diabetes Mellitus [Abstract]. American Diabetes Association's 77th Scientific Sessions, San Diego, CA.
- Brau KG, **Embury CM**, Drincic AT, Desouza CV, & Wilson TW (2017). Brain Abnormalities in Type I Diabetes: Magnetoencephalographic Evidence [Abstract]. 99th Annual Meeting of the Endocrine Society, Orlando, FL.
- Kiyota T, **Morrison CM**, Lu Y, Dong W, Dyavarshetty B, & Gendelman HE (2015). Modeling CD74 directed APP trafficking for Alzheimer's disease. [Abstract] 45th Annual Meeting of the Society for Neuroscience, Chicago, IL.
- Kiyota T, **Morrison CM**, Kurczy ME, Ivanisevic J, Zhang G, Epstein AA, Boska MD, Siuzdak G, & Gendelman HE (2015). Presenilin-1 familial Alzheimer's disease mutation alters hippocampal neurogenesis and memory function in CCL2 null mice. [Abstract] The 12th International Conference on Alzheimer's and Parkinson's Diseases, Nice, France.
- Kiyota T, Zhang G, **Morrison CM**, Bosch ME, Weir RA, Higgins EE, & Gendelman HE (2014). Amyloid reductions by AAV-mediated CD74 gene delivery in an Alzheimer's disease mouse model. [Abstract] 44th Annual Meeting of the Society for Neuroscience, Washington, DC.
- Kiyota T, **Morrison CM**, Zhang G, Weir RA, Boska MD, & Gendelman HE (2013). A synergistic effect of presenilin 1 mutant and CCL2 deficiency leads to cognitive dysfunction and brain atrophy in a mouse model of Alzheimer's disease. [Abstract] 43rd Annual Meeting of the Society for Neuroscience, San Diego, CA.
- Morrison CM**, Fields N, & Strasser R (2013). Human-Animal Interactions Can Attenuate Salivary Cortisol Levels in College Students Exposed to an Induced Stress Event. [Abstract and Poster] 22nd Annual International Society for Anthrozoology Conference, Chicago, IL.
- Morrison CM** (2012). Dog Therapy as a Stress Buffer in an Induced Stress Event. [Poster] 2012 Joint Nebraska Psychological Society and the Association for Psychological and Educational Research in Kansas Convention, Hastings, NE.
- Fields N, **Morrison CM**, & Strasser R (2012). The Effects of Stress Reduction Techniques on Stress Reactivity and Cortisol Levels. [Presentation] UNO Honors Symposium, Omaha, NE.
- Fields N, Buttner AP, **Morrison CM**, & Plachter E (2011). Assessing Social Attachment Variables in a Biting Dog Population. [Poster] UNO Research & Creative Activity Fair, Omaha, NE.
- Morrison CM**, Plachter E, Fields N, & Buttner AP (2011). Assessment of Training Factors on Dog Bites. [Poster] UNO Research & Creative Activity Fair, Omaha, NE.

AWARDS

- UNO Graduate Research and Creative Activity (GRACA) Grant
- UNO Funding for Undergraduate Scholarly Experience (FUSE) Grant
- UNO Dean's List (Undergraduate)
- UNO Regent's Scholarship (Undergraduate)

RELEVANT EMPLOYMENT HISTORY*Institute for Human Neuroscience, DICO N Lab*

Boys Town National Research Hospital

Graduate Research Assistant**January 2021 – Present**

- Performed data analysis using BESA software and Matlab-based toolboxes and scripts including SPM, further stats performed in SPSS, JASP, and R
- Developed measures to be used in studies

Department of Neurological Sciences, Center for MEG

University of Nebraska Medical Center

Graduate Research Assistant**June 2016 – January 2021**

- Acquired data on Elekta 306-sensor MEG with direct participant contact from consent to completion
- Performed data analysis using BESA software and Matlab-based toolboxes and scripts including SPM, further stats performed in SPSS, JASP, and R
- Developed measures to be used in studies
- Involved in participant recruitment and organization of callbacks for sub-studies

Department of Pharmacology and Experimental Neuroscience

University of Nebraska Medical Center

Research Technologist/Laboratory Manager**November 2012 – June 2016**

- Performed all laboratory work duties including:
 - Morris Water Maze (MWM) and Radial Arm Water Maze (RAWM) behavioral testing
 - IHC/IF staining, microscopy, and stereological analysis
 - Extraction and maintenance of murine primary neurons, neural progenitor cells and microglia
 - DNA/RNA extraction and PCR/rt-qPCR; Western Blot; ELISA
 - AAV and adenoviral treatment in cell culture and in our mouse model of Alzheimer's
- Developed and implemented new protocols and techniques for the lab
- Taught lab procedures and techniques to high school and undergraduate summer students and volunteers, graduate students, post-docs and technicians
- Other duties include laboratory upkeep, restocking, and safety management

Neurological Sciences Floor

The Nebraska Medical Center

Clerk/Patient Care Technician**November 2009 – November 2012**

- Exposure to patient population within research interests
- Provided care and assistance with activities of daily living (ADLs) for patients
- Other responsibilities included monitoring epileptic patients during EEG study, entering doctor orders, training new employees, and other duties under the direction of nurses and doctors

Department of Psychology

University of Nebraska at Omaha

Researcher**Volunteer: November 2010 – August 2012****Paid: August 2011 – December 2011**

- Completed thesis research project under direction of advising professor with financial support from the FUSE grant
- Analyzed salivary cortisol levels of participants before, during and following an induced stress event by ELISA and measured self-reported stress levels by validated stress surveys
- Performed data analyses by StatView and SPSS
- Administered cognitive tests examining the recognition speed of words and non-words in student participants
- Assessed correlations between dog bite incidences and training or social factors using surveys given by Nebraska Humane Society officers

