

Madelaine Wendzik

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EDUCATION

The University of Georgia

PhD, Neuroscience, Athens, GA

Spring 2017 - Spring 2021

- **GPA:** 4.0 / 4.0
- **GRE:** 319
- **Honors:** Graduate Assistantship Scholarship (full tuition and stipend), Regenerative Bioscience Center

The University of Georgia

B.S., Biology, Athens, GA

Fall 2013 - Fall 2016

- **GPA:** 3.0 / 4.0
- **Honors:** CURO Summer Scholarship and Fellowship, Regenerative Bioscience Center Fellow, Zell Miller Scholar

DOCTORAL RESEARCH

Stroke and traumatic brain injury are major causes of long-term disability worldwide. With no effective treatment to repair and replace damaged brain tissue, my research focuses on harnessing induced pluripotent stem cell-derived neural stem cells (iNSCs) as a tissue replacement therapeutic after neural injury. In the West lab, we utilize pig models to test our treatment strategies because the pig brain possesses greater anatomical and physiological similarities to the human brain compared to traditional rodent models. My specific research centers around using nanoparticles to move FDA-approved drugs past the blood brain barrier in hopes of arresting the secondary injury cascade that follows stroke in an adult porcine model. This mitigation precedes the transplantation of iNSCs, in hopes of increasing their long-term survivability and functional integration. My research particularly focuses on the M1/M2 inflammatory response after neural injury, in hopes of tailoring a more effective neural stem cell therapeutic to address the neural injury inflammatory response that has been shown to inhibit transplanted and endogenous cell survival and growth. The response to iNSC therapy in a translational pig model with increased predictive potential strongly supports that iNSCs may be the critically needed therapeutic for human patients.

LABORATORY SKILLS

Animal Behavior Testing (*Novel Object Recognition Testing, Open Field Testing, Social Recognition Testing, T-maze Testing*), ELISAs, Immunocytochemistry, Immunohistochemistry, In Vitro and Ex Vivo Fluorescent Imaging, Laboratory Animal Handling (*blood draws, placing catheters, etc*), Mammalian cell culture (*human, pig*), Media Preparation, Multiplexes, MRI analysis, Protein Isolation/Purification/Quantification, Research Animal Anesthesia, Research Animal Surgery utilizing Sterile Technique, ROS assays, Stereotaxic Cell Injections, Suturing, Tissue Handling/Processing (*paraffin, and fresh-frozen*), Tissue Cryosectioning

EQUIPMENT

Autoclave, Centrifuge, Continuous-Flow Anesthetic Machine, Cortical Controlled Impactor, Cryostat, Flex Station Plate Reader, DSU Confocal Microscope, Illuminex-2, Laminar Flow Hoods, Liquid Nitrogen Dewar, Lumina 200, Microinjector, Micropipettes, Nanodrop Spectroscopy, Phase Contrast Microscope, Sonicator, Stereotaxic Frame

COMPUTATIONAL SKILLS

Fiji (*moderate*), FreeSurfer (*basic*), GraphPad Prism (*basic*), ImagePro (*basic*), Java languages (*basic*), Microsoft Office (*moderate*), NeuroLucida (*basic*), Numbers/Keynote/Pages for Macintosh (*basic*), OsiriX (*advanced*), Softmax Pro (*moderate*), Statistical Analysis System (SAS; *moderate*)

RESEARCH EXPERIENCE

West Laboratory

Graduate Research Assistant, Athens, GA

January 2017-current

- Designs and implements large animal neural injury studies
- Optimizes, runs, and reads cytokine ELISAs, and ROS assays
- Optimizes, runs, and reads cytokine multiplex assays
- Optimizes, runs, and reads immunohistochemistry and immunofluorescent staining
- Collects and analyzes neuroimaging data, i.e. IVIS Lumina II
- Analyzes structural, DWI, and DTI MRI scans
- Conducts basic iPSC and iNSC cell culture methods
- Trains, tests, and analyzes pigs in behavior and neurological functioning tests, i.e. T-maze test, Novel Object Recognition
- Trains, tests, and analyzes pigs in biomechanical tests
- Collects and analyzes neurological functioning tests, i.e. the modified Rankin Score (mRS)
- Conduct multi-institutional collaborative research relevant to doctoral projects
- Mentors undergraduate researchers in the lab

Undergraduate Researcher, Athens, GA

May 2015-December 2016

- Analyzed structural and DWI MRI scans

- Ran and analyzed neural stem cell proliferation assays and lentiviral transductions
- Passaged iNSCs and nurtured cultures between passages
- Assisted in piglet surgeries and introduction of neural injuries
- Trained and tested piglets in a battery of social and behavior tests, i.e. T-maze test

Plant Genome Mapping Laboratory

Student Research Assistant, Athens, GA

May 2014-April 2015

- Operated and analyzed data collected by a NanoDrop spectrometer for sample viability
- Loaded and ran polyacrylamide gel electrophoresis
- Cared for and collected data on experimental fields
- Trained in basic and necessary lab processes, i.e. autoclaving

Manuscripts in Preparation

- Emily W. Baker§, Holly A. Kinder§, Silun Wang, Candace C. Fleischer, **Madelaine N. Wendzik**, Elizabeth W. Howerth, Kylee Jo J. Duberstein, Hui Mao, Simon R. Platt, and Franklin D. West. "Longitudinal Magnetic Resonance Imaging and Histological Assessment of Traumatic Brain Injury Pathology in a Piglet Model." To be submitted: J. Neurotrauma.
- Holly A. Kinder, Emily W. Baker, **Madelaine N. Wendzik**, Elizabeth W. Howerth, and Franklin D. West. "Cognitive, motor, and histological changes in a piglet traumatic brain injury model." To be submitted: J. Neurotrauma.

§ Authors contributed equally to this work

Symposiums & Conferences

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| Regenerative Bioscience Center Annual Symposium | April 2018 |
| <ul style="list-style-type: none"> • Delivered an oral presentation on the <i>Drug-Loaded Nanoparticles Mitigate the Inflammatory Response in Porcine Ischemic Stroke</i> in Athens, GA | |
| Annual Graduate Students and Postdoctoral Students Research Day | April 2018 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Drug-Loaded Nanoparticles Mitigate the Inflammatory Response in Porcine Ischemic Stroke</i> in Athens, GA | |
| Regenerative Medicine Workshop | March 2018 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Drug-Loaded Nanoparticles Mitigate the Inflammatory Response in Porcine Ischemic Stroke</i> in Charleston, SC | |
| Society for Neuroscience's Annual Conference | November 2017 |
| <ul style="list-style-type: none"> • <u>Awarded the University of Georgia Neuroscience Program's Travel Award to cover the costs of attendance</u> • Presented a poster on the <i>Characterization of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging and Histological Assessment</i> in Washington, DC | |
| University of Georgia's Neuroscience Symposium | November 2017 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Neural Injury Assessment Utilizing Non-Invasive Magnetic Resonance Imaging in a Porcine Model</i> in Athens, GA | |
| Southern Translational Education and Research Conference | September 2017 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Assessment of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging</i> in Augusta, GA | |
| Southern Developmental Biology's Southeast Regional Meeting | May 2017 |
| <ul style="list-style-type: none"> • <u>Won first prize for graduate student poster presentations</u> • Presented a poster on the <i>Characterization of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging and Histological Assessment</i> in Kennesaw, GA | |
| Developmental Biology Spring Retreat | May 2017 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Assessment of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging</i> in Athens, GA | |
| Annual Graduate Students and Postdoctoral Students Research Day | April 2017 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Neural Injury Assessment Utilizing Non-Invasive Magnetic Resonance Imaging in a Porcine Model</i> in Athens, GA | |
| Regenerative Bioscience Center Annual Symposium | April 2017 |
| <ul style="list-style-type: none"> • <u>Won first prize for graduate student poster presentations</u> • Presented a poster on the <i>Neural Injury Assessment Utilizing Non-Invasive Magnetic Resonance Imaging in a Porcine Model</i> in Athens, GA | |
| World Stem Cell Summit | December 2016 |
| <ul style="list-style-type: none"> • Presented a poster on the <i>Assessment of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging</i> in West Palm Beach, FL | |
| UGA Center for Undergraduate Research Summer Fellows Forum | July 2016 |
| <ul style="list-style-type: none"> • Gave an oral presentation on <i>MRI Assessment of Vascular Cognitive Impairment in an Adult Porcine Model</i> in Athena, GA | |
| Regenerative Bioscience Center Annual Symposium | April 2016 |

- Gave an oral presentation on the *Pathological Assessment of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging* in Athena, GA

UGA Center for Undergraduate Research Annual Symposium

April 2016

- Presented a poster on the *Pathological Assessment of a Piglet Model of Traumatic Brain Injury Utilizing Non-Invasive Magnetic Resonance Imaging* in Athena, GA

Other Abstracts

- Lilley Cushman, Elizabeth S. Waters, **Madelaine N. Wendzik**, Kimberly D. Haight, Kelly M. Scheulin, Monika Saini, Franklin D. West. *The Effect of Acute iNSCs Transplantation on BBB Integrity in a Novel Porcine Controlled Cortical Impact TBI Model*. Georgia Medical Ignite the Dream of Medicine Conference. 2018 February: Augusta, GA.
- Zachary T. Jones, Elizabeth S. Waters, **Madelaine N. Wendzik**, Kimberly D. Haight, Kelly M. Scheulin, Monika Saini, Franklin D. West. *Acute Induced Neural Stem Cell Transplantation May Reduce Blood Brain Barrier Permeability in a Porcine Traumatic Brain Injury Model*. Georgia Undergraduate Research Conference. 2017 October: Milledgeville, GA.
- Lily G. Francis, L, Erin E. Kaiser, **Madelaine N. Wendzik**, Simon R. Platt, Silun Wang, David C. Hess, Hui Mao, and Franklin D. West. *A Novel Porcine Model of Vascular Cognitive Impairment Demonstrates Changes in Cerebral Blood Flow, White Matter Integrity, and Cognitive Function*. Emory STEM Research and Career Symposium. 2017 October: Atlanta, GA.
- Kelly M. Scheulin, Emily W Baker, Holly A Kinder, Wang S, Fleischer C, **Madelaine N Wendzik**, Elizabeth Howerth, Kylee Duberstein, Hui Mao , Simon Platt, Franklin D West. *Longitudinal Magnetic Resonance Imaging and Histological Assessment of a Porcine Traumatic Brain Injury Model*. Southern Translational Education and Research Conference. 2017 September: Augusta, GA.
- Elizabeth S Waters, Kim Haight, **Madelaine N Wendzik**, Monika Saini, Franklin D West. *Longitudinal Magnetic Acute Induced Neural Stem Cell Transplantation Improves Blood Brain Barrier Stability in a Porcine Traumatic Brain Injury Model*. Southern Translational Education and Research Conference. 2017 September: Augusta, GA.
- Kimberly D. Haight, **Madelaine N. Wendzik**, Elizabeth S. Waters, Kelly Scheulin, Monika Saini, Franklin D. West. *Effect of Acute iNSC Transplantation on BBB Leakage in a Novel Porcine Controlled Cortical Impact TBI Model*. Merit-NIH National Veterinary Scholars Symposium. 2017 July. Bethesda, Maryland.
- Olivia R. Fuller, Neil A. Doshi, **Madelaine N. Wendzik**, Holly A. Kinder, Emily W. Baker, and Franklin D. West. *A Comprehensive Assessment of Cognitive and Motor Function Outcomes after Traumatic Brain Injury in a Porcine Model*. Center for Undergraduate Research Opportunities Symposium. 2017 April: Athens, GA.
- Kelly M. Scheulin, Anil Kumar, **Madelaine N. Wendzik**, Holly A. Kinder, Xueyuan Yang, Erin E. Kaiser, Emily W. Baker, Elizabeth S. Waters, Jen Xie and Franklin D. West *Nanoparticles Transport of FDA-Approved Drugs Across the Blood Brain Barrier in a Porcine Stroke Model*. Regenerative Bioscience Center Fellows Symposium. 2017 April: Athens, GA.
- Kelly M. Scheulin, Anil Kumar, **Madelaine N. Wendzik**, Holly A. Kinder, Xueyuan Yang, Erin E. Kaiser, Emily W. Baker, Elizabeth S. Waters, Jen Xie and Franklin D. West *Nanoparticles Transport of FDA-Approved Drugs Across the Blood Brain Barrier in a Porcine Stroke Model*. Center for Undergraduate Research Opportunities Symposium. 2017 April: Athens, GA.
- Lily G. Francis, Erin E. Kaiser, **Madelaine N. Wendzik**, Simon R. Platt, Silun Wang, David C. Hess, Hui Mao, and Franklin D. West. *A Novel Porcine Model of Vascular Cognitive Impairment Demonstrates Changes in Cerebral Blood Flow and White Matter Tracts*. Regenerative Bioscience Center Fellows Symposium. 2017 April: Athens, GA.
- Lily G. Francis, Erin E. Kaiser, **Madelaine N. Wendzik**, Simon R. Platt, Silun Wang, David C. Hess, Hui Mao, and Franklin D. West. *A Novel Porcine Model of Vascular Cognitive Impairment Demonstrates Changes in Cerebral Blood Flow and White Matter Tracts*. Center for Undergraduate Research Opportunities Symposium. 2017 April: Athens, GA.
- Kelly M Scheulin, **Madelaine N. Wendzik**, Anil Kumar, Holly A Kinder, , and Franklin D. West. *Nanoparticles Transport of FDA-Approved Drugs across the Blood Brain Barrier in a Porcine Stroke Model*. Regenerative Bioscience Center Annual Symposium. 2017 April: Athens, GA.
- Neil A. Doshi, **Madelaine N. Wendzik**, Holly A. Kinder, Emily W. Baker, and Franklin D. West. *A Comprehensive Assessment of Cognitive and Motor Function Outcomes after Traumatic Brain Injury in a Porcine Model*. Center for Undergraduate Research Opportunities Symposium. 2017 April: Athens, GA.
- Kimberly D. Haight, Erin E. Kaiser, **Madelaine N. Wendzik**, Simon R. Platt, Silun Wang, David C. Hess, Hui Mao, and Franklin D. West. *A Novel Porcine Model of Vascular Cognitive Impairment Demonstrates Changes in Cerebral Blood Flow, White Matter Tracts, Memory, and Motor Function*. Merit-NIH National Veterinary Scholar Program Symposium. 2016 July: Columbus, OH.
- Kayla M. Hargrove, Erin E. Kaiser, **Madelaine N. Wendzik**, Simon R. Platt, Silun Wang, David C. Hess, Hui Mao, and Franklin D. West. *A Novel Porcine Model of Vascular Cognitive Impairment*. College of Agricultural and Environmental Science Undergraduate Research Symposium. 2016 March: Athens, GA.

AWARDS

- UGA Neuroscience Department's Travel Award, *Society for Neuroscience Conference 2017* November 2017
- 1st Place for Poster Presentation, *Southern Developmental Biology's Southeast Regional Meeting* May 2017
- 1st Place for Poster Presentation, *Regenerative Bioscience Center Annual Symposium* April 2017

ACADEMIC & PROFESSIONAL AFFILIATIONS

- Science Policy Writer for the Athens Scientific Observer 2018-current
- Co-founder and Co-President, Graduate Student Association of the Regenerative Bioscience Center 2017-current
- Treasurer, Graduate Student and Postdocs in Science 2017-current
- co-chair/Vice President, Neuroscience Graduate Student Association 2017-current
- Member of the Society for Neuroscience (SfN) 2017-current
- Member of the Regenerative Engineering and Medicine (REM) 2017-current
- Student Liaison, Developmental Biology Graduate Student Association 2017

INTERESTS

Solo Violin, Politics, Cooking, Strategy Games

References

Available upon request