

# Sarah M. Neuner

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## EDUCATION

University of Tennessee Health Science Center, 2013-present

- GPA: 4.00/4.00
- PhD student, Integrated Biomedical Sciences program, Neuroscience track
- Mentor: Dr. Catherine Kaczorowski

Richard Stockton College of NJ, 2009-2012

- GPA: 3.94/4.00 – *Magna cum laude*
- B.S. in Biology, Minor in Chemistry
- Honors Program member

GRE scores (Dec 2012):

- Analytical Writing: 5.5/6.0, 97% Percentile
- Verbal Reasoning: 165/170, 95% Percentile
- Quantitative Reasoning: 159/170, 75% Percentile

## POSITIONS AND EMPLOYMENT

2013- Graduate Research Assistant, Dept. of Anatomy and Neurobiology, University of Tennessee Health Science Center, Memphis TN – Kaczorowski lab

2016- Graduate Research Assistant, The Jackson Laboratory – Kaczorowski lab

## HONORS AND AWARDS

2017 The Jackson Laboratory Scientific Symposium – Best Student Talk (\$500)

2016 UTHSC Neuroscience Institute Travel Award (\$500)

2016 UTHSC College of Graduate Health Sciences Travel Award (\$500)

2016 The Jackson Laboratory scholarship to attend the Workshop on Neurogenetic Tools: Using Mouse Models to Study Human Disease (\$500)

2015 NIH F31 National Research Service Award Individual Fellowship (\$172,480)

2015 Glenn/AFAR Scholarship for Research in the Biology of Aging (\$5,000)

2015 Neuroscience Institute Travel Award (\$500)

2015 UTHSC College of Graduate Health Sciences Travel Award (\$500)

2014 UTHSC College of Graduate Health Sciences nominee for Oak Ridge

Associated Universities Nobel Laureate Annual Meeting

2014 UTHSC Neuroscience Institute Travel Award (\$500)

2014 Best First Year Graduate Student Poster Presentation (\$100)

2014 March of Dimes Scholarship to attend The Jackson Laboratory 55<sup>th</sup> Annual Short Course on Medical & Experimental Mammalian Genetics (\$1,050)

2013- UTHSC Research Assistantship (\$25,000)

2013- Belz Family Scholarship (\$2,000)

2012 Graduate *magna cum laude* from RSC

2012 Who's Who Among Colleges and Universities

2011 Who's Who Among Colleges and Universities

2009 Dean's List (continued each semester in college)

2009 Accepted – Richard Stockton College Honors Program

2009-12 Stockton College Presidential Scholarship (\$72,000)

2009 Holy Spirit High School Top 3 graduate (Class of 225)

## MEMBERSHIP AND CERTIFICATIONS

2014- Society for Neuroscience Student Member

2014- UTHSC Biostatistics Club, Member

2014- Molecular and Cellular Cognition Society, Member

2014 Tennessee State Collaborative on Reforming Education (TN SCORE) Program  
UTHSC Representative

2009-12 Richard Stockton College Honors Program, Member  
2010-12 Zeta Tau Alpha Fraternity, President

## **PARTICIPATION IN SYMPOSIA, COURSES, AND CONFERENCES**

### **COURSES**

2017 – The Whole Scientist, The Jackson Laboratory  
2016 – Workshop on Neurogenetic Tools: Using Mouse Models to Study Human Disease, The Jackson Laboratory  
2014 – The Jackson Laboratory 55<sup>th</sup> Annual Short Course on Medical and Experimental Mammalian Genetics, The Jackson Laboratory

### **PRESENTATIONS**

2017 – The Jackson Laboratory Scientific Symposium  
Invited talk entitled: “Novel mouse transgenic reference panel for the study of Alzheimer’s disease”  
\* Awarded Best Student Talk

2017 – UTHSC Neuroscience Student Symposium  
Talk entitled: “*Hp1bp3 regulates cognitive function and neuronal excitability*”

2016 – UTHSC Graduate Student Research Day  
Talk entitled “*Integrative genomics identifies novel modulator of cognitive aging*”

2016 – UTHSC Neuroscience Student Symposium  
Talk entitled “*Integrative genomics identifies novel modulator of cognitive aging*”

2016 – Winter Conference on Neural Plasticity, Richard F. Thompson New Concepts Session  
Talk entitled “*Systems genetics approach to discovering modifiers of familial Alzheimer’s disease*”

2015 – Society for Neuroscience Annual Meeting  
Nanosymposium “*Systems genetics of ‘normal’ aging identifies novel candidates misregulated in Alzheimer’s disease*”  
\* Selected for Aging Press Conference feature (link: <http://cmcgq.com/Media/Stream/351024/010.mp4>)  
\* Selected for AlzForum feature (link: <http://www.alzforum.org/news/conference-coverage/can-common-genetic-variation-mice-nail-genes-aging-alzheimers>)

2015 – UTHSC Neuroscience Student Symposium  
Talk entitled: “*Novel approach to study of ‘normal’ aging identifies genes associated with late-onset Alzheimer’s disease*”

### **POSTERS**

Neuner SM, Ding S, O’Connell KM, Kaczorowski C.C. *Hp1bp3* regulates cognitive function and neuronal excitability. 44<sup>th</sup> Maine Biological and Medical Sciences Symposium. Mount Desert Island, ME. (2017)

Neuner SM, O’Connell KM, Kaczorowski CC. New mouse resource identifies genetic modifiers of susceptibility and resilience to Alzheimer’s disease. MODEL-AD Mini-Symposium. The Jackson Laboratory, Bar Harbor, ME. (2017)

Ding S, Neuner SM, O’Connell KM, Kaczorowski CC. Reduced hippocampal functional connectivity with prefrontal cortex during spatial task in an AD mouse model. MODEL-AD Mini-Symposium. The Jackson Laboratory, Bar Harbor, ME. (2017).

Ding S, Neuner SM, O’Connell KM, Kaczorowski CC. Reduced hippocampal functional connectivity with prefrontal cortex during spatial task in an AD mouse model. The Jackson Laboratory Scientific Symposium, The Jackson Laboratory, Bar Harbor, ME. (2017).

Neuner SM, Garfinkel BP, Wilmott LA, Ignatowska-Jankowska BM, Citri A, Orly J, Lu L, Overall RW, Mulligan MK, Kempermann G, Williams RW, O’Connell KM, Kaczorowski CC. Integrative genomics identifies novel modulator of cognitive aging. Society for Neuroscience: Maine Chapter Annual Meeting, The Jackson Laboratory, Bar Harbor, ME. (2016).

Neuner SM, Wilmott LA, Shapaker TS, Huentelman MJ, Kaczorowski CC. Novel murine resource to identify genetic modifiers of Alzheimer’s disease. Society for Neuroscience Annual Meeting. San Diego, CA. (2016).

Neuner SM, Kaczorowski CC. Genetic modifiers of non-cognitive symptoms of familial Alzheimer's disease in a novel transgenic murine panel. Society for Neuroscience Annual Meeting. San Diego, CA. (2016).

Ding S, Neuner SM, Wilmott LA, Shapaker TS, O'Connell KM, and Kaczorowski CC. Reduced hippocampal functional connectivity with prefrontal cortex during spatial task in an AD mouse model precedes overt memory deficits. Society for Neuroscience Annual Meeting. San Diego, CA. (2016)

Neuner SM, Kaczorowski CC. Genetic modifiers of non-cognitive symptoms of familial Alzheimer's disease in a novel transgenic murine panel. Molecular and Cellular Cognition Society Annual Meeting, San Diego, CA. (2016)

Neuner SM, Garfinkel BP, Wilmott LA, Ignatowska-Jankowska BM, Citri A, Orly J, Lu L, Overall RW, Mulligan MK, Kempermann G, Williams RW, O'Connell KM, Kaczorowski CC. Systems genetics identifies *Hp1bp3* as a novel modulator of cognitive aging. American Federation for Aging Research 29<sup>th</sup> Annual AFAR Grantee Conference. Santa Barbara, CA. (2016).

Neuner SM, Wilmott LA, Shapaker TS, Huentelman MJ, Kaczorowski CC. Novel murine resource to identify genetic modifiers of Alzheimer's disease. American Federation for Aging Research 29<sup>th</sup> Annual AFAR Grantee Conference. Santa Barbara, CA. (2016).

Wilmott LA, Ding S, Shapaker TS, Neuner SM, O'Connell KM, Kaczorowski CC. Proteomics to identify proteins associated with the onset of memory decline in an AD mouse model. American Federation for Aging Research 29<sup>th</sup> Annual AFAR Grantee Conference. Santa Barbara, CA. (2016).

Neuner SM, Garfinkel BP, Wilmott LA, Ignatowska-Jankowska BM, Citri A, Orly J, Lu L, Overall RW, Mulligan MK, Kempermann G, Williams RW, O'Connell KM, Kaczorowski CC. Integrative genomics identifies novel modulator of cognitive aging. UT Health Science Center Graduate Research Day. (2016).

Neuner SM, de Both M, Ingels J, Lu L, Williams R, Kempermann G, Huentelman M, and Kaczorowski CC. Multi-scale study of normal aging predicts novel genes associated with late-onset Alzheimer's disease. University of Tennessee-Kentucky Biomedical Research Infrastructure Network Bioinformatics Summit (2015)

Neuner SM, de Both M, Ingels J, Lu L, Williams R, Kempermann G, Huentelman M, and Kaczorowski CC. Multi-scale study of normal aging predicts novel genes associated with late-onset Alzheimer's disease. UT Health Science Center Graduate Research Day (2015).

Neuner SM\*, Hope KA\*, Wilmott L, and Kaczorowski CC. Cell-type specific enhancement of the post-burst afterhyperpolarization in hippocampus following contextual fear memory retrieval. Society for Neuroscience Annual Meeting. Washington, D.C. (2014) \*authors contributed equally

Kaczorowski CC, Hope K, Wilmott L, Shapaker T, O'Connell KM, Savio C., Neuner SM. Targeting TRPC3 prevents cognitive decline in a model of Alzheimer's disease. Society for Neuroscience Annual Meeting. Chicago, IL (2015)

Neuner SM, Wilmott L, Hope KA, Hoffman B, Chong J, Abramowitz J, Birnbaumer L, Greene A, Chan S, and Kaczorowski CC. TRPC3 channels regulate hippocampal excitability and contextual fear memory. The Jackson Laboratory 55<sup>th</sup> Annual Short Course on Medical and Experimental Mammalian Genetics (2014).

Neuner SM, Hoffman B, Abramowitz J, Birnbaumer, Chan S, Greene A, and Kaczorowski CC. Trpc3 channels critically shape memory formation. UT Health Science Center Graduate Research Day (2014)

Wilmott LA, Neuner SM, Hope KA, Shapaker TM, and Kaczorowski CC. Downregulation of Kv12.2 following contextual fear conditioning and implications for aging and Alzheimer's disease memory decline. Society for Neuroscience Annual Meeting. Washington, D.C. (2014).

## **PUBLICATIONS:**

Neuner SM, Wilmott LA, Hope KA, Hoffmann B, Chong JA, Abramowitz J, Birnbaumer L, O'Connell KM, Tryba AK, Greene AS, Chan CS, & Kaczorowski CC. (2015). TRPC3 channels critically regulate hippocampal neuronal excitability and contextual fear memory. *Behavioural Brain Research*. 281: 69-77. [PMID: 25513972]

Neuner SM, Wilmott LA, Hoffman BR, Mozhui K, Kaczorowski CC. (2016). Hippocampal proteomics defines pathways associated with memory decline and resilience in normal aging and Alzheimer's disease mouse models. *Behavioural Brain Research*. 322 (Pt B): 288-298. [PMID: 27265785]

Neuner SM, Garfinkel BP, Wilmott LA, Ignatowska-Jankowska BM, Citri A, Orly J, Lu L, Overall RW, Mulligan MK, Kempermann G, Williams RW, O'Connell KM, Kaczorowski CC. (2016). Systems genetics identifies *Hp1bp3* as a novel modulator of cognitive aging. *Neurobiology of Aging*. 46:58-67. [PMID: 27460150]

Garfinkel BP, Arad S, Neuner SM, Netser S, Wagner S, Kaczorowski CC, Rosen CJ, Gal M, Soreq H, Orly J. (2016). HP1BP3 expression determines maternal behavior and offspring survival. *Genes, Brain, and Behavior*. 15(7): 678-88. [PMID: 27470444]

Neuner SM, Wilmott LA, Burger C, Kaczorowski CC. (2017). Advances at the intersection of normal brain aging and Alzheimer's disease. *Behavioural Brain Research*. 322 (Pt B): 187-190. [PMID: 28231898]

## **ONGOING RESEARCH SUPPORT**

F31 AG050357                      Neuner (PI)                      07/01/2015 - 06/30/2019 (\$172,480 total costs)

*Identification of Genetic Modifiers of Neuronal Deficits and Memory Failure in Alzheimer's Disease*

This proposal will employ a novel approach that combines a well-characterized murine genetic reference panel with an established model of Alzheimer's disease to identify individual genetic variants that modify the onset and severity of disease in a diverse population. (Impact score: 30)

## **MENTORING EXPERIENCE**

2016 – John Butross, Christian Brothers University undergraduate, Memphis, TN

- Best Presentation, Tennessee Academy of Science annual meeting, Health Sciences Division
- Admitted to competitive Church Health Center Internship program at the University of Chicago

2017 – Journal club facilitator for The Jackson Laboratory Summer Student program

## **SKILLS & TECHNIQUES**

- Enzyme-linked immunosorbent assay (ELISA)
- Stereotaxic cannula surgery for injection of viral vectors into mouse brain
- Whole-cell current-clamp electrophysiological recording
- Mouse brain dissection and sectioning on vibratome and cryostat
- Behavioral assays in mice (fear conditioning, elevated plus maze, spontaneous alternation)
- Animal perfusion and tissue fixation
- RNA isolation, cDNA synthesis, and real-time quantitative PCR
- Basic mouse husbandry
- Fluorescence microscopy
- Immunohistochemistry
- Western blot
- Genotyping

## **MAJOR COURSEWORK**

- Biology: Biochemistry, Functional Neuroanatomy, Developmental and Molecular Neurobiology, Behavioral Neuroscience, Cellular Neuroscience, Neurobiology, Genetics, Biostatistics, Using R for Biostatistics I and II, Microbiology
- Chemistry: Chemistry I-IV (2 semesters organic) with lab work, Survey of Instrumentation (intro to various chemical laboratory techniques), Biochemistry