

# Steven J. Granger, Ph.D.

## Curriculum Vitae

(814) 574-5104  
McLean Hospital  
115 Mill Street, Belmont, MA 02478  
sgranger@mclean.harvard.edu

---

Postdoctoral Research Fellow  
Center for Depression, Anxiety and Stress Research  
McLean Hospital  
Harvard Medical School

### **Education**

University of California, Irvine	2016-2022
GPA: 3.93	
Ph.D. Conferred 09/07/2022 (Advisor: Michael A. Yassa)	
Barrett The Honors College at Arizona State University	2013-2016
GPA: 3.88	
Psychology B. S.	
The Pennsylvania State University	2012-2013
GPA: 3.91	
Psychology B. S.	
State College Area High School	2008-2012
GPA: 3.88	

### **Publications**

#### **Published Manuscripts**

**Granger, S. J.**, Colon-Perez, L., Larson, M. S., Phelan, M., Keator, D. B., Janecek, J. T., Sathishkumar, M. T., Smith, A. P., McMillan, L., Greenia, D., Corrada, M. M., Kawas, C. H., & Yassa, M. A. (2022). Hippocampal dentate gyrus integrity revealed with ultrahigh resolution diffusion imaging predicts memory performance in older adults. *Hippocampus*, 10.1002/hipo.23456. Advance online publication.

**Granger, S. J.**, Adams, J. G., Kark, S. M., Sathishkumar, M. T., Chen, I. Y., Benca, R. M., McMillan, L., Janecek, J. T., & Yassa, M. A. (2022). Latent anxiety in clinical depression is associated with worse recognition of emotional stimuli. *Journal of affective disorders*, 301, 368–377.

**Granger, S. J.**, Glynn, L. M., Sandman, C. A., Small, S. L., Obenaus, A., Keator, D. B., Baram, T. Z., Stern, H., Yassa, M. A., & Davis, E. P. (2021). Aberrant Maturation of the Uncinate Fasciculus Follows Exposure to Unpredictable Patterns of Maternal Signals. *Journal of Neuroscience*, 41(6), 1242–1250.

**Granger, S. J.**, Leal, S. L., Larson, M. S., Janecek, J. T., McMillan, L., Stern, H., & Yassa, M. A. (2021). Integrity of the uncinate fasciculus is associated with emotional pattern separation-related fMRI signals in the hippocampal dentate

and CA3. *Neurobiology of Learning and Memory*, 177, 107359.

Kark, S. M., Adams, J. G., Sathishkumar, M., **Granger, S.J.**, McMillan, L., Baram, T. Z., Yassa, M. A. (2022) Why Do Mothers Never Stop Grieving for Their Deceased Children? Enduring Alterations of Brain Connectivity and Function. *Front in Human Neurosci*, 16.

Matin, M. J., Li, D., Peterson, J., Taylor, M. K., Laurent, H. K., Lucas, T., **Granger, S. J.**, Granger, D. A., and Granger, S. W. (2015). Measuring Nerve Growth Factor in Saliva by Immunoassay: A Cautionary Note. *Psychoneuroendocrinology*, 63: 235-237.

### **In Revision**

**Granger, S. J.**, Colon-Perez, L., Larson, M. S., Bennet, L. J., Phelan, M., Keator, D. B., Janecek, J. T., Sathishkumar, M. T., Smith, A. P., McMillan, L., Greenia, D., Corrada, M. M., Kawas, C. H., Yassa, M. A. Reduced structural connectivity of the medial temporal lobe including perforant path-related connectivity is associated with aging and memory impairment. *In review at Neurobiology of Aging*.

Rizvi, B., Sathishmukar, M., Marquez, F., **Granger, S. J.**, McMillan, L., Brickman, A. M., Tustison, N. J., Yassa, M. A. Associations between regional white matter hyperintensities, medial temporal lobe subregional volumes, and memory in older adults. *In review at Alzheimer's and Dementia: Diagnosis, Assessment and Disease Monitoring*.

### **In Preparation**

**Granger, S. J.**, Harhen, N., Bornstein, A. M., Yassa, M. A., A simplified neuro-computational framework for the influence of early life unpredictability on hedonic processing. *In preparation*.

### **Poster Abstracts**

Hiroi, R., Lavery, C.N., **Granger, S.J.**, Quihuis, A.M., Weyrich, G., Bimonte-Nelson, H.A. (2014). Sex differences, spatial cognition, and antidepressant treatment: Chronic citalopram administration in middle-aged rats improves memory retention in a sex-dependent manner, and impairs working memory in both sexes. Presented at Society for Neuroscience (2014)

Palmer, J.M., Hiroi, R., **Granger, S.J.**, Poisson, M., Berns-Leone, C., Kirby, D., Patel, S., Hadder, B., Ciaramitaro, V., Bimonte-Nelson, H. (2016). 17- $\beta$  estradiol versus conjugated equine estrogens: Differential interaction of androstenedione with two commonly used hormone therapy estrogens for spatial memory in mice. Presented at Society for Neuroscience (2016)

**Granger, S. J.**, Montchal, M. E. Haddad, E., Obenaus, A., Keator, D., Solodkin, A., Small, S. L., Stern, H. S., Sandman, C. A., Davis, E. P., Glynn, L., Baram, T. Z., Yassa, M.A. (2017) Emotional and pleasure circuit alterations associated with fragmented and unpredictable early-life sensory signals. Presented at Society for Neuroscience (2017)

**Granger, S.J.**, Leal, S. L., Murray, E. A. Yassa, M. A. (2018) Structural Integrity Deficits of Uncinate Fasciculus Predict Medial Temporal Lobe Subfield Activity During an Emotional Pattern Separation Task. Presented at Cognitive Neuroscience Society (2018)

**Granger, S.J.**, Leal, S. L., Murray, E. A. Yassa, M. A. (2018) Structural Integrity Deficits of Uncinate Fasciculus Predict Medial Temporal Lobe Subfield Activity During an Emotional Pattern Separation Task. Presented at Conte Center at UC Irvine Annual Symposium (2018)

**Granger, S.J.**, Leal, S. L., Murray, E. A. Yassa, M. A. (2018) Structural Integrity Deficits of Uncinate Fasciculus Predict Medial Temporal Lobe Subfield Activity During an Emotional Pattern Separation Task. Presented at the Annual Conference of the National Institute of Physiological Sciences (NIPS), Okazaki, Japan (2018)

**Granger, S. J.** M.S. Larson, M.T. Sathishkumar, R.J. Jirsaraie, A.P. Smith, L. Mcmillan, D. Greenia, M.M. Corrada, C.H. Kawas, M.A. Yassa. (2019) Ultrahigh Resolution Diffusion Imaging Reveals Abnormal Medial Temporal Lobe Integrity and Predicts Poor Performance on RAVLT Delayed Recall in the Oldest Old. Presented at Society for Neuroscience (2019)

**Granger, S. J.**, Glynn, L. M., Sandman, C. A., Small, S. L., Obenaus, A., Keator, D. B. Baram, T. Z., Stern, H., Yassa, M. A., Davis, E. P. (2019) Accelerated Maturation of the Uncinate Fasciculus After Early-Life Unpredictable Patterns of Maternal Signals. Presented at Conte Center Annual Symposium (2019)

**Granger, S. J.**, Adams, J. G., Kark, S. M., Sathishkumar, M. T., Chen, I. Y., Benca, R., McMillan, L., Janecek, J. T., Yassa, M. A. (2021). Latent anxiety in clinical depression is associated with worse recognition of emotional stimuli. Presenting at Society for Neuroscience (2021)

Adams, J. G., Kark, S., Sathishkumar, M., McMillan, L., **Granger, S. J.**, Baram, T. Z., Yassa, M. A. (2021) Enduring maternal grief impacts cognitive functioning and alters related resting-state functional connectivity. Cognitive Neuroscience Society (2021)

Kark, S., Adams, J., Sathishkumar, M., McMillan, L., **Granger, S. J.**, Baram, T. Z., Yassa, M. A. (2021) Enduring maternal grief following adult child loss alters resting connectivity of the paraventricular thalamic nucleus. Cognitive Neuroscience Society (2021)

Rizvi, B., Sathishmukar, M., Marquez, F., **Granger, S. J.**, McMillan, L., Brickman, A. M., Tustison, N. J., Yassa, M. A. (2021) Regional white matter hyperintensities are associated with reduced medial temporal lobe regional volumes in older adults. Society for Neuroscience (2021)

Kark, S. M., **Granger, S. J.**, Adams, J. G., McMillan, L., Chen, I., Benca, R. M., Yassa, M. A. (2021) Sex-specific effects of paraventricular thalamic nucleus functional connectivity on depressed and anxiety symptoms in humans. Society for Neuroscience (2021)

### **Oral Presentations**

- “17- beta-estradiol versus conjugated equine estrogens: Differential interaction of androstenedione with two commonly used hormone therapy estrogens for spatial memory in mice”
  - Honors Thesis Colloquium, Barrett the Honors College at Arizona State University 2016
- “Diffusion Weighted Imaging: A Comprehensive Guide”
  - Presented at Program in Exercise Biochemistry, University of Tsukuba, 2018
- “Guided Activity: What is the most connected Brain Region?”
  - Guest lecture Advanced Neurobiology N115, 2019 (Professor: Georg Striedter)
- “Uncinate Fasciculus structural and functional integrity predicts dentate gyrus activity during discrimination of similar emotional scenes”
  - Park City Winter Conference 2018
- “In-vivo microdissection of MTL subfields using ultrahigh-resolution diffusion imaging in the oldest old”
  - 2019 Center for the Neurobiology of Learning and Memory Conference
- “Emotional and Pleasure circuit alterations associated with early life fragmentation and unpredictability of environmental signals”
  - Neurobiology and Behavior Data Blitz, 2017
- “Associations between white matter integrity and fragmentation of prenatal maternal mood in female children.”
  - Neurobiology and Behavior Data Blitz, 2018
- “Ultrahigh Resolution Diffusion Imaging Reveals Abnormal Medial Temporal Lobe Integrity and Predicts Poor Performance on RAVLT Delayed Recall in the Oldest Old”
  - Neurobiology and Behavior Data Blitz, 2019
- “Latent anxiety in clinical depression is associated with worse recognition of emotional stimuli”
  - Neurobiology and Behavior Data Blitz, 2020

### **Research Experience/Employment**

Research Assistant to John Peterson, PhD, Salimetrics, LLC, Carlsbad, CA

- 06/2011-09/2011, 06/2012-09/2012

*My work here challenged a widely held understanding and established that the off-purpose use of an assay for Neuronal Growth Factor (NGF) might have significant cross-reactivity when attempting to measure from saliva. My work resulted in a publication.*

#### Undergraduate Researcher with Janae Neiderhiser, PhD, Pennsylvania State University

○ 02/2013-05/2013

*Worked predominantly in administration contacting high schools to participate in a state-wide twin study for gene x environment research.*

#### Undergraduate Researcher with Heather Bimonte-Nelson, PhD, Arizona State University

○ 10/2013-06/2016

*Conducted research on memory function among women undergoing menopause and contributed to a study that showed significantly different responses based on sex. In this lab I completed my Honors Thesis via the Honors Thesis Seminar Series and Fellowship. My responsibilities included conducting various animal behavioral paradigms related to memory functioning and depressive-like behavior, animal ovariectomy surgery preparation and recovery, drug preparation and administration, and immunohistochemistry preparation (cryostat). My work in the lab resulted in two posters as well as the completion of my honors thesis.*

#### Research Assistant to Michael Yassa, PhD, University of California, Irvine

○ 06/2014-08/2014, 06/2015-08/2015

*Worked as an undergraduate research assistant where my primary responsibilities were data entry as well as working on the implementation of a skin conductance device for research purposes. I also was involved in participant recruitment, consenting, and running preliminary behavioral experiments.*

#### Graduate Student Researcher with Michael Yassa, PhD, University of California, Irvine

○ 08/2016-Present

*As a graduate student researcher my interest primarily lies in emotional memory systems. I work collaboratively across several large research institutes at UC Irvine including the Conte Center at UC Irvine, UCI MIND, and the Center for the Neurobiology of Learning and Memory. I implement analysis techniques including graph theoretical analysis using Diffusion weighted imaging (DSI Studio/FSL), task-based fMRI (high resolution; AFNI), and assay memory performance using a variety of mnemonic discrimination tasks. My work in the lab thus far has resulted in two published first-author research articles involving the structural integrity of the uncinatus fasciculus. Two first-author research articles are in review. Two additional first-author publications will be submitted in the coming months.*

#### Consultant: Hoag Hospital

○ July 2021- January 2022

*Worked with Dr. David Keator at UC Irvine (Operations Director of the UCI Neuroscience Imaging Center) to design a fully automated Diffusion Weighted Imaging processing software for clinical usage. The software creates an html report for each patient of quality metrics, connectometry analyses, and graph theoretical measures derived from multimodal MRI data*

### **Honors/Awards**

#### Paterno Fellows Program, Pennsylvania State University (2012)

○ Honors program that requires advanced undergraduate coursework

#### Dean's List, Pennsylvania State University (2012-2013)

○ Maintained a 3.5 GPA or higher

Dean's List, Barrett Honors College at Arizona State (2013-2016)

- Maintained a GPA of 3.5 or higher

Honors Thesis Sequence Fellowship/Series, Barrett Honors College at Arizona State (2016)

- Accepted to an Honor Thesis Fellowship Program that supplied financial aid, required advanced statistical coursework, undergraduate student research, and the completion of an approved Honors Thesis topic

Renée Harwick Advanced Graduate Student Award (2021)

- Award is given to a graduate student of a Fellow of the Center for the Neurobiology of Learning and Memory who shows outstanding scientific promise as evidence by research accomplishments as well as the quality of his/her advancement document

James L. McGaugh Award for Excellence in Graduate Research (2021)

- Award is given to a graduate student of a Fellow of the Center for the Neurobiology of Learning and Memory based on the quality of in-press or published research

### **Extracurricular/Volunteer/Mentoring Experience**

CNLM Brain Awareness Day/Week (currently)

- Educate and organize activities for Elementary school students to learn about the brain

CNLM Ambassador Program

- Co-chair of Communications Committee (2019-present)

Conte Center Jr Researchers Meeting

- Organizer/Co-organizer 2019-present

ASU Brain Fair for Children (2013-present)

- Educate Elementary school students about neuroanatomy

Brain Awareness (2013-present)

- Educate Elementary school students about college and the brain

ASU Night of the Open Door

- Educate local community about science and the brain (2014, 2015)

Hebb Club

- Center for the Neurobiology of Learning and Memory (2016-present)

REU Student Research Experiences for Undergraduates

- Co-mentor (lead mentor Dr. Luis Colon-Perez)

### **Relevant Training/Courses**

Teacher Assistantship in Neurobiology (N113L)

- Independent instruction and grading of an introductory neuroscience laboratory course consisting of approx. 30 undergraduate students

HPC's Computing Facility Training Course

- An introduction to working with the High Performance Computing Cluster at UCI, taught by Dr. Harry Mangalam.

Analysis of Functional Neuroimages (AFNI) Bootcamp

- Full week instruction at NIH with Dr. Bob Cox and Colleagues

MRI Operator Certification (UC Irvine)

- Obtained at the Neuroscience Imaging Center at UC Irvine
- UC Irvine Data Science Initiative Python Training Course
- Introductory courses in coding in python
- Programming for Neuroscience Research
- Python course taught by Dr. Craig Stark for the analysis of rodent behavioral data
- Activate to Captivate
- 8-week communication certificate program taught by Bri McWorter of Graduate Division at UCI

## **Noteworthy Neuroimaging and Analytical Skills**

FSL (<https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/FSL>)

DSI-Studio (<http://dsi-studio.labsolver.org>)

DIPY (<https://dipy.org>)

Advanced Normalization Tools (<http://stnava.github.io/ANTs/>)

Analysis of Functional Neuroimaging (AFNI) experience (<https://afni.nimh.nih.gov>)

ASHS: Automated Segmentation of Hippocampal Subfields

(<https://www.nitrc.org/projects/ashs>)

R programming (<https://www.r-project.org>)

Python (<https://www.python.org>)

Shell scripting