Stanford

Erin Gibson

Assistant Professor of Psychiatry and Behavioral Sciences (Sleep Medicine)

Psychiatry and Behavioral Sciences - Sleep Medicine

Curriculum Vitae available Online

Bio

BIO

Dr. Gibson is an Assistant Professor in Psychiatry and Behavioral Sciences at Stanford University School of Medicine starting in January 2020. A long-term goal of her lab is to understand how glial cells sculpt neural circuits, focusing on the molecular modulators allowing glia their dynamic nature. She has a decades-long history of identifying difficult problems and applying novel approaches for investigation. This has resulted in numerous examples of scientific accomplishments, including discovering that circadian dysregulation decreases neural precursor cell proliferation and differentiation and consequent cognitive function (Gibson et al., 2010, PLoS ONE), demonstrating that neuronal activity modulates myelination in vivo (Gibson et al., 2014, Science), discerning the signaling mechanisms mediating myelin plasticity in health and aplasticity in disease (Geraghty, Gibson et al., 2019, Neuron), identifying tri-glial dysregulation driven by activated microglia as a fundamental cellular disruption associated with the neurological disorder following chemotherapy treatment (Gibson et al., 2019, Cell), and identifying the molecular circadian clock as a key molecular regulator of myelin-forming glia which in turn modulates sleep architecture (Rojo et al., 2023, Neuron). Her integrated research background studying myelin biology affords me a unique position to study the cell intrinsic and microenvironmental mechanisms of glial cell population dynamics in both normal development, aging, and disease models, specifically related to brain disorders that include myelin abnormalities like autism spectrum disorders, multiple sclerosis, and Alzheimer's disease. Her lab uses both mouse modeling and patient-derived iPSCs to study oligodendroglial maintenance and maturation during development and dys/demyelinating diseases.

ACADEMIC APPOINTMENTS

- Assistant Professor, Psychiatry and Behavioral Sciences - Sleep Medicine
- Member, Bio-X
- Member, Wu Tsai Human Performance Alliance
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Stanford Cancer Institute
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Member, Center for Sleep and Circadian Sciences, (2021- present)

HONORS AND AWARDS

- McKnight Brain Research Foundation Innovator Award in Cognitive Aging and Memory Loss, McKnight Brain Research Foundation/AFAR (2025)
- Ben Barres Early Career Accelerator Award, Chan Zuckerberg Initiative (2024)
- Daniel X. Freedman Award Honorable Mention, Brain and Behavior Research Foundation (2024)

- Junior Faculty Award, Society for Research on Biological Rhythms (2024)
- McCormick Gabilan Faculty Award, Stanford University School of Medicine (2022)
- Physician/Scientist Fellow, Doris Duke Charitable Foundation (2022)
- Chairman's Award – Community Commitment and Engagement, University/Department of Psychiatry and Behavioral Sciences (2021)

PROFESSIONAL EDUCATION

- Ph.D., University of California, Berkeley , Psychology/Neuroscience (2011)
- B.S., Duke University , Psychology/Neuroscience (2005)

LINKS

- My Lab Site: https://gibson-lab.org/

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am an Assistant Professor in Psychiatry and Behavioral Sciences at Stanford University School of Medicine starting in January 2020. A long-term goal of my lab is to understand how glial cells sculpt neural circuits, focusing on the molecular modulators allowing glia their dynamic nature. I have a decades-long history of identifying difficult problems and applying novel approaches for investigation. This has resulted in numerous examples of scientific accomplishments, including discovering that circadian dysregulation decreases neural precursor cell proliferation and differentiation and consequent cognitive function (Gibson et al., 2010, PLoS ONE), demonstrating that neuronal activity modulates myelination in vivo (Gibson et al., 2014, Science), discerning the signaling mechanisms mediating myelin plasticity in health and aplasticity in disease (Geraghty, Gibson et al., 2019, Neuron), identifying tri-glial dysregulation driven by activated microglia as a fundamental cellular disruption associated with the neurological disorder following chemotherapy treatment (Gibson et al., 2019, Cell), and identifying the molecular circadian clock as a key molecular regulator of myelin-forming glia which in turn modulates sleep architecture (Rojo et al., 2023, Neuron). My lab is also very interested in the mechanisms mediating human myelination as the majority of our knowledge is derived from imaging studies. To assess the functional myelin capacity of human oligodendrocytes, we developed an ex vivo myelin platform using organotypic brain slice cultures derived from shiverer mice that lack compact myelin in which we can seed human iPSC-derived oligodendrocytes that are then able to myelinate the axons of the shiverer slice (Tsarouchas et al. 2025). This platform allows for precise evaluation of human oligodendrocyte myelin capacity in a pseudo-intact microenvironment. My integrated research background studying myelin biology affords me a unique position to study the cell intrinsic and microenvironmental mechanisms of glial cell population dynamics in both normal development, aging, and disease models, specifically related to brain disorders that include myelin abnormalities like autism spectrum disorders, multiple sclerosis, and Alzheimer's disease. We use both mouse modeling and patient-derived iPSCs to study oligodendroglial maintenance and maturation during development and dys/demyelinating diseases.

Teaching

COURSES

2025-26

- Neuroscience Journal Club and Professional Development Series: NEPR 280 (Aut, Win, Spr)

2024-25

- Neuroscience Journal Club and Professional Development Series: NEPR 280 (Aut, Win, Spr)

2023-24

- Neuroscience Journal Club and Professional Development Series: NEPR 280 (Aut, Win, Spr)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Lehi Acosta-Alvarez, Jessica Arozqueta Basurto, Yoo Jin Genie Jung, Lauren Koepke, Karen Malacon, Ashley Moses, Kamsi Nwangwu, Nour Omar, Abigail Rogers

Orals Chair

Griffin Hartmann

Postdoctoral Faculty Sponsor

Rebecca Buchanan, Tess Dierckx, Molly (Xun) Tu

Doctoral Dissertation Advisor (AC)

Yohan Auguste, Jerry Cheng, Riley Merkel, Sarah Wilson

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Cancer Biology (Phd Program)
- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Disrupting BMAL1 enhances Temozolomide efficacy and abolishes circadian timing effects in pediatric high-grade gliomas**
  Nettnin, E., Garcia, C., Sayed, F., Guinle, M., Gibson, E., Prolo, L.
  OXFORD UNIV PRESS INC.2025: v340
- **Circadian rhythms in pediatric high-grade gliomas may contribute to treatment efficacy.** *Scientific reports*
  Nettnin, E. A., Garcia, C. A., Sayed, F. F., Schonfeld, E., Nguyen, T., Guinle, M. I., Petritsch, C. K., Gibson, E. M., Prolo, L. M.
  2025; 15 (1): 32010
- **The LncRNA MYRACL Regulates Human Oligodendrocyte Maturation and Myelination.** *Molecular therapy : the journal of the American Society of Gene Therapy*
  Tsarouchas, T. M., Vacante, F., Kazakou, N. L., Wagstaff, L., Bennett, M., Zoupi, L., Gibson, E. M., Baker, A. H., Williams, A.
  2025
- **Extended Amygdala Neural Circuits Linking Hormonal Influences on Body Temperature to Sleep and Circadian Rhythms**
  Bush, B., Sardar, H., Aloboudi, F., Hoang, I., Rogers, E., Morningstar, A., Ma, Y., Cengio, L., Buchanan, R., Gibson, E., Giardino, W.
  OXFORD UNIV PRESS INC.2025: A39
- **Enduring NREM sleep fragmentation following methotrexate chemotherapy in cancer-naïve mice.** *Sleep*
  Boyd, L., Berisha, A., Gomez, A. M., Gibson, E. M., Borniger, J. C.
  2025
- **Protocol for assessing myelination by human iPSC-derived oligodendrocytes in Shiverer mouse ex vivo brain slice cultures.** *STAR protocols*
  Tsarouchas, T. M., Zoupi, L., Williams, A., Gibson, E. M.
  2025; 6 (1): 103609
- **PEDIATRIC GLIOMAS EXPRESS CIRCADIAN GENES AND DEMONSTRATE CIRCADIAN REGULATION OF TEMOZOLOMIDE SENSITIVITY**
  Nettnin, E. A., Garcia, C. A., Schonfeld, E., Mehl, L. C., Guinle, M., Petritsch, C. K., Gibson, E. M., Prolo, L. M.
  OXFORD UNIV PRESS INC.2024
- **Precise timing of audiovisual stimulation conquers chemobrain.** *Trends in cancer*
  Mehl, L. C., Gibson, E. M.
  2024

- **Oligodendrocytes: Myelination, Plasticity, and Axonal Support.** *Cold Spring Harbor perspectives in biology*
  Simons, M., Gibson, E. M., Nave, K. A.
  2024

- **Next Directions in the Neuroscience of Cancers Arising outside the CNS.** *Cancer discovery*
  Amit, M., Anastasaki, C., Dantzer, R., Demir, I. E., Deneen, B., Dixon, K. O., Egeblad, M., Gibson, E. M., Hervey-Jumper, S. L., Hondermarck, H., Magnon, C., Monje, M., Na'ara, et al
  2024; 14 (4): 669-673

- **Review: therapeutic approaches for circadian modulation of the glioma microenvironment.** *Frontiers in oncology*
  Nettnin, E. A., Nguyen, T., Arana, S., Barros Guinle, M. I., Garcia, C. A., Gibson, E. M., Prolo, L. M.
  2023; 13: 1295030

- **Review: therapeutic approaches for circadian modulation of the glioma microenvironment** *Fronteirs in Oncology*
  Nettnin, E. A., Nguyen, T., Arana, S., Barros Guinle, M., Garcia, C. A., Gibson, E. M., Prolo, L. M.
  2023: 1295030

- **CIRCADIAN REGULATION OF NEUROINFLAMMATION DRIVING CANCER THERAPY-RELATED COGNITIVE IMPAIRMENT**
  Mehl, L., Gibson, E.
  OXFORD UNIV PRESS INC.2023

- **BMAL1 loss in oligodendroglia contributes to abnormal myelination and sleep.** *Neuron*
  Rojo, D., Dal Cengio, L., Badner, A., Kim, S., Sakai, N., Greene, J., Dierckx, T., Mehl, L. C., Eisinger, E., Ransom, J., Arellano-Garcia, C., Gumma, M. E., Soyk, et al
  2023

- **Timing matters: A protective role of astrocyte reactivity in neurodegeneration.** *Neuron*
  Rojo, D., Gibson, E. M.
  2023; 111 (15): 2277-2279

- **Beyond the Symptom: The Biology of Fatigue.** *Sleep*
  Raizen, D. M., Mullington, J., Anaclet, C., Clarke, G., Critchley, H., Dantzer, R., Davis, R., Drew, K. L., Fessel, J., Fuller, P. M., Gibson, E. M., Harrington, M., Lipkin, et al
  2023

- **Circadian Control of Glial Cell Homeodynamics.** *Journal of biological rhythms*
  Rojo, D., Badner, A., Gibson, E. M.
  2022: 7487304221120966

- **Microglia in brain development and regeneration.** *Development (Cambridge, England)*
  Mehl, L. C., Manjally, A. V., Bouadi, O., Gibson, E. M., Leng Tay, T.
  2022; 149 (8)

- **NF1 mutation drives neuronalactivity-dependent initiation of optic glioma.** *Nature*
  Pan, Y., Hysinger, J. D., Barron, T., Schindler, N. F., Cobb, O., Guo, X., Yalcin, B., Anastasaki, C., Mulinyawe, S. B., Ponnuswami, A., Scheaffer, S., Ma, Y., Chang, et al
  2021

- **Microglia in Cancer Therapy-Related Cognitive Impairment.** *Trends in neurosciences*
  Gibson, E. M., Monje, M.
  2021

- **How Support of Early Career Researchers Can Reset Science in the Post-COVID19 World.** *Cell*
  Gibson, E. M., Bennett, F. C., Gillespie, S. M., Guler, A. D., Gutmann, D. H., Halpern, C. H., Kucenas, S. C., Kushida, C. A., Lemieux, M., Liddelow, S., Macauley, S. L., Li, Q., Quinn, et al
  2020

- **Getting personal.** *Science (New York, N.Y.)*
  Gibson, E.
  2020; 367 (6475): 334

- **Treating cancer therapy-related cognitive impairment.** *Nature medicine*
  Gibson, E. M., Monje, M. n.
  2020
- **Emerging mechanistic underpinnings and therapeutic targets for chemotherapy-related cognitive impairment.** *Current opinion in oncology*
  Gibson, E. M., Monje, M.
  2019
- **Loss of Adaptive Myelination Contributes to Methotrexate Chemotherapy-Related Cognitive Impairment.** *Neuron*
  Geraghty, A. C., Gibson, E. M., Ghanem, R. A., Greene, J. J., Ocampo, A. n., Goldstein, A. K., Ni, L. n., Yang, T. n., Marton, R. M., Paşca, S. P., Greenberg, M. E., Longo, F. M., Monje, et al
  2019
- **How to tackle the childcare-conference conundrum** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Calisi, R. M., Working Grp Mothers Sci
  2018; 115 (12): 2845–49
- **Bad wrap: Myelin and myelin plasticity in health and disease** *DEVELOPMENTAL NEUROBIOLOGY*
  Gibson, E. M., Geraghty, A. C., Monje, M.
  2018; 78 (2): 123–35
- **Methotrexate Chemotherapy Induces Persistent Tri-glial Dysregulation that Underlies Chemotherapy-Related Cognitive Impairment.** *Cell*
  Gibson, E. M., Nagaraja, S. n., Ocampo, A. n., Tam, L. T., Wood, L. S., Pallegar, P. N., Greene, J. J., Geraghty, A. C., Goldstein, A. K., Ni, L. n., Woo, P. J., Barres, B. A., Liddelow, et al
  2018
- **Myelin plasticity in the central nervous system.** *Neuropharmacology*
  Purger, D., Gibson, E. M., Monje, M.
  2016; 110: 563-573
- **Neuronal Activity Promotes Glioma Growth through Neuroligin-3 Secretion** *CELL*
  Venkatesh, H. S., Johung, T. B., Caretti, V., Noll, A., Tang, Y., Nagaraja, S., Gibson, E. M., Mount, C. W., Polepalli, J., Mitra, S. S., Woo, P. J., Malenka, R. C., Vogel, et al
  2015; 161 (4): 803-816
- **Neuronal Activity Promotes Oligodendrogenesis and Adaptive Myelination in the Mammalian Brain** *SCIENCE*
  Gibson, E. M., Purger, D., Mount, C. W., Goldstein, A. K., Lin, G. L., Wood, L. S., Inema, I., Miller, S. E., Bieri, G., Zuchero, J. B., Barres, B. A., Woo, P. J., Vogel, et al
  2014; 344 (6183): 487-?
- **Effect of cancer therapy on neural stem cells: implications for cognitive function** *CURRENT OPINION IN ONCOLOGY*
  Gibson, E., Monje, M.
  2012; 24 (6): 672-678
- **Experimental 'Jet Lag' Inhibits Adult Neurogenesis and Produces Long-Term Cognitive Deficits in Female Hamsters** *PLOS ONE*
  Gibson, E. M., Wang, C., Tjho, S., Khattar, N., Kriegsfeld, L. J.
  2010; 5 (12): e15267
- **Proximate mechanisms driving circadian control of neuroendocrine function: Lessons from the young and old**
  Williams, W. P., Gibson, E. M., Wang, C., Tjho, S., Khattar, N., Bentley, G. E., Tsutsui, K., Kriegsfeld, L. J.
  OXFORD UNIV PRESS INC.2009: 519–37
- **Aging in the circadian system: Considerations for health, disease prevention and longevity**
  Gibson, E. M., Williams, W. P., Kriegsfeld, L. J.
  PERGAMON-ELSEVIER SCIENCE LTD.2009: 51–56
- **Age-related declines in exploratory behavior and markers of hippocampal plasticity are attenuated by prenatal choline supplementation in rats** *BRAIN RESEARCH*
  Glenn, M. J., Kirby, E. D., Gibson, E. M., Wong-Goodrich, S. J., Mellott, T. J., Blusztajn, J. K., Williams, C. L.

2008; 1237: 110-123

- **Alterations in RFamide-related peptide expression are coordinated with the preovulatory luteinizing hormone surge** *ENDOCRINOLOGY*
  Gibson, E. M., Humber, S. A., Jain, S., Williams, W. P., Zhao, S., Bentley, G. E., Tsutsui, K., Kriegsfeld, L. J.
  2008; 149 (10): 4958–69

- **Prenatal choline availability modulates hippocampal neurogenesis and neurogenic responses to enriching experiences in adult female rats** *EUROPEAN JOURNAL OF NEUROSCIENCE*
  Glenn, M. J., Gibson, E. M., Kirby, E. D., Mellott, T. J., Blusztajn, J. K., Williams, C. L.
  2007; 25 (8): 2473-2482