

Stanford



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Bio

LINKS

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

Professional

PROFESSIONAL INTERESTS

How do glia sculpt neural circuits and how does dysregulation of glia contribute to disease? Glia make up more than half of the cells in the human brain, but we are just beginning to understand the complex and multifactorial role glia play in health and disease. Glia are decidedly dynamic in form and function. Understanding the mechanisms underlying the dynamic nature of glia is imperative to developing novel therapeutic strategies for diseases of the nervous system that involve aberrant gliogenesis.

The Gibson Lab, starting in early 2020 in the Department of Psychiatry and Behavioral Sciences and the Stanford Center for Sleep Sciences and Medicine, studies the cellular and molecular mechanisms modulating glia. One molecular mechanism that affords cells a dynamical nature is the circadian clock. While much is known about how the circadian clock influences neurons and peripheral cells throughout the body, little is known about how this core molecular mechanism regulates glia. We study how the circadian clock system regulates glial function to better understand diseases of the nervous system in which both circadian/sleep and glial dysfunction are prominent, such as autism, multiple sclerosis, and chemotherapy-related cognitive impairment.

- What cellular processes in glia are regulated by the circadian system?
- What is the function of the circadian clock system during myelination?
- How does the circadian clock machinery influence myelin-forming cell structure and function?
- How does disruption in the circadian clock affect diseases of dysregulated myelination?
- How do circadian disruptions mediated by environmental changes (i.e. jet lag, shift work, light at night) affect brain form and function in health and disease?

Publications

PUBLICATIONS

- **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*
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2019

- **How to tackle the childcare-conference conundrum** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
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2018; 115 (12): 2845–49
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- **Methotrexate Chemotherapy Induces Persistent Tri-gial Dysregulation that Underlies Chemotherapy-Related Cognitive Impairment.** *Cell*
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- **Myelin plasticity in the central nervous system.** *Neuropharmacology*
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- **Neuronal Activity Promotes Glioma Growth through Neuroligin-3 Secretion** *CELL*
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2014; 344 (6183): 487-?
- **Effect of cancer therapy on neural stem cells: implications for cognitive function** *CURRENT OPINION IN ONCOLOGY*
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- **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.
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- **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*
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- **Alterations in RFamide-related peptide expression are coordinated with the preovulatory luteinizing hormone surge** *ENDOCRINOLOGY*
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