Stanford

William Giardino

Assistant Professor (Research) of Psychiatry and Behavioral Sciences (Sleep Medicine)

Psychiatry and Behavioral Sciences - Sleep Medicine

Curriculum Vitae available Online

Bio

BIO

Dr. Giardino is an Assistant Professor in the Department of Psychiatry and Behavioral Sciences, Principal Investigator of the Giardino Laboratory, and faculty member of the Wu Tsai Neurosciences Institute and Center for Sleep and Circadian Sciences at the Stanford University School of Medicine. He completed postdoctoral training at Stanford after earning a Ph.D. in Behavioral Neuroscience from Oregon Health & Science University and a B.Sc. in Psychology from the University of Washington.

Dr. Giardino's research program aims to uncover the neurobiological mechanisms driving maladaptive changes in stress reactivity and sleep/wake architecture that increases susceptibility for substance use disorders, currently funded by an NIH/NIAAA R01 award. He previously received an NIH K99/R00 Pathway to Independence career development award and F32 & F31 NIH NRSA postdoctoral & predoctoral fellowships to fund training on the neural circuit mechanisms of peptide signaling molecules in stress and addiction. Dr. Giardino serves as an academic and research mentor for several postdoctoral, graduate level, and undergraduate trainees, and is active in teaching neuroscience coursework at Stanford. In addition, he serves as faculty co-chair of the Curriculum committee for the Stanford Neurosciences PhD program.

The Giardino Laboratory aims to decipher the neural mechanisms underlying psychiatric conditions of stress, addiction, and sleep disturbances. To accomplish this, our work is distinguished by expert proficiency with physiological, neuroanatomical, viral, genetic, pharmacological, and computational approaches. We leverage these strategies to monitor, manipulate, and map the neural circuits, synapses, and signaling mechanisms that underlie sleep/wake regulation, the stress response, approach/avoidance behaviors, drug-seeking, food intake, and social dynamics. We are especially focused on the behavioral functions of modulatory neuropeptide molecules acting throughout the circuitry of the extended amygdala, particularly in a heterogeneous brain region called the bed nucleus of the stria terminalis (BNST).

ACADEMIC APPOINTMENTS

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

PROFESSIONAL EDUCATION

- PhD, Oregon Health and Science University , Behavioral Neuroscience
- BS, University of Washington , Psychology

LINKS

- Giardino Laboratory: https://giardinolab.org
- Google Scholar: http://scholar.google.com/citations?user=AG8_N7kAAAAJ&hl=en

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

The Giardino Laboratory is based in the Department of Psychiatry and Behavioral Sciences and Wu Tsai Neurosciences Institute at the Stanford University School of Medicine. We aim to decipher the neural mechanisms underlying psychiatric conditions of stress, addiction, and sleep/circadian dysregulation. Our work uses genetic, pharmacological, physiological, anatomical, optical, and computational approaches in freely-behaving mice to monitor, manipulate, and map the neural circuits, synapses, and receptor signaling mechanisms that regulate sleep/wake, the stress response, approach/avoidance behaviors, drug-seeking, food intake, and social dynamics.

Research Topics:

Sleep/Wake and Circadian Rhythms

Stress & Reward

Alcohol and Psychostimulant Use Disorders

Neuropeptide Release & Signaling

Sex Differences & Hormonal Modulation

Feeding & Metabolism

Research Approaches:

Neuromodulation (chemogenetics, optogenetics, transcranial magnetic stimulation)

Neurophysiological recordings (fiber photometry, EEG/EMG, calcium imaging)

Neuroanatomy (viral circuit tracing, immunohistochemistry, in situ hybridization, confocal)

Neuropharmacology (alcohol & drug self-administration, receptor signaling mechanisms)

Computation (neural circuit modeling, ML analysis of behavioral & physiological datasets)

Neurogenetics (Cre/loxP recombination, viral gene transfer, mouse genetics)

Behavior and Evolution (rodent model organisms, cross-species comparisons)

Translation (interdisciplinary collaborations, mental health treatment development)

Teaching

COURSES

2025-26

- The Neuroscience of Stress and Reward: Emotions, Behavior, and Neurocircuit Mechanisms: PSYC 152 (Aut, Spr)

2024-25

- The Neuroscience of Stress and Reward: Emotions, Behavior, and Neurocircuit Mechanisms: PSYC 152 (Win)

2022-23

- The Neuroscience of Stress and Reward: Circuit Fundamentals of Emotional Arousal: PSYC 52N (Aut)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Lavonna Mark

Postdoctoral Faculty Sponsor

Brittany Bush, Ivy Hoang

Doctoral Dissertation Advisor (AC)

Allison Morningstar

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (Phd Program)

Publications

PUBLICATIONS

- **Sex-Specific Effects of Hypocretin Receptor Signaling in Corticotropin-Releasing Factor Neurons on Alcohol Drinking, Anxiety, and Extended Amygdala Neuronal Excitability.** *Biological psychiatry global open science*
  Ma, Y., Sardar, H., Benabou, M. E., Yu, A. C., Morningstar, A. R., Fajardo, R. N., Kandil, I. F., Rogers, E. T., Vassalli, A., Kauer, J. A., Giardino, W. J.
  2026; 6 (1): 100617

- **A Distinct Subpopulation of Extended Amygdala Neurons Drives Food Intake.** *bioRxiv : the preprint server for biology*
  Kandil, I. F., Rogers, E. T., Morningstar, A. R., Giardino, W. J.
  2025

- **Early life stress modulates behavioral sensitivity to alcohol and promotes escalation of alcohol drinking.** *bioRxiv : the preprint server for biology*
  Morningstar, A. R., Ledbury, O. S., Yu, A. C., Sardar, H., Rogers, E. T., Kandil, I. F., Fajardo, R. N., Benabou, M. E., Giardino, W. J.
  2025

- **Mapping the cellular etiology of schizophrenia and complex brain phenotypes.** *Nature neuroscience*
  Duncan, L. E., Li, T., Salem, M., Li, W., Mortazavi, L., Senturk, H., Shahverdizadeh, N., Vesuna, S., Shen, H., Yoon, J., Wang, G., Ballon, J., Tan, et al
  2025

- **Neural circuit mechanisms of the cholecystokinin (CCK) neuropeptide system in addiction.** *Addiction neuroscience*
  Ma, Y., Giardino, W. J.
  2022; 3

- **Extended Amygdala Neuropeptide Circuitry of Emotional Arousal: Waking Up on the Wrong Side of the Bed Nuclei of Stria Terminalis.** *Frontiers in behavioral neuroscience*
  Giardino, W. J., Pomrenze, M. B.
  2021; 15: 613025

- **Parallel circuits from the bed nuclei of stria terminalis to the lateral hypothalamus drive opposing emotional states.** *Nature neuroscience*
  Giardino, W. J., Eban-Rothschild, A., Christoffel, D. J., Li, S., Malenka, R. C., de Lecea, L.
  2018

- **Control of chronic excessive alcohol drinking by genetic manipulation of the Edinger-Westphal nucleus urocortin-1 neuropeptide system** *TRANSLATIONAL PSYCHIATRY*
  Giardino, W. J., Rodriguez, E. D., Smith, M. L., Ford, M. M., Galili, D., Mitchell, S. H., Chen, A., Ryabinin, A. E.
  2017; 7: e1021

- **Hypocretin (orexin) neuromodulation of stress and reward pathways** *CURRENT OPINION IN NEUROBIOLOGY*
  Giardino, W. J., de Lecea, L.
  2014; 29: 103-108

- **Dissociation of corticotropin-releasing factor receptor subtype involvement in sensitivity to locomotor effects of methamphetamine and cocaine** *PSYCHOPHARMACOLOGY*
  Giardino, W. J., Mark, G. P., Stenzel-Poore, M. P., Ryabinin, A. E.
  2012; 219 (4): 1055-1063

- **Developing a reverse translational model of low-intensity rTMS in alcohol use disorder: The influence of theta burst stimulation protocols on binge alcohol drinking in mice.** *Transcranial magnetic stimulation (2024)*
  Dhungana, A., McCalley, D. M., Heath, A. M., Kraybill, E. P., Mojabi, F. S., Morales, J. M., Morningstar, A. R., Davis, A. K., Padula, C. B., Giardino, W. J., McNerney, M. W.
  2025; 4

- **Midbrain ghrelin receptor signalling regulates binge drinking in a sex specific manner.** *Nature communications*
  Pearl, A. J., Maddern, X. J., Pinares-Garcia, P., Ursich, L. T., Anversa, R. G., Shesham, A., Brown, R. M., Reed, F. M., Giardino, W. J., Lawrence, A. J., Walker, L. C.
  2025; 16 (1): 2568

- **Amygdala neurocircuitry at the interface between emotional regulation and narcolepsy with cataplexy** *FRONTIERS IN NEUROSCIENCE*
  Sardar, H., Goldstein-Piekarski, A. N., Giardino, W. J.
  2023; 17

- **Gray areas: Neuropeptide circuits linking the Edinger-Westphal and Dorsal Raphe nuclei in addiction.** *Neuropharmacology*
  Pomrenze, M. B., Walker, L. C., Giardino, W. J.
  2021: 108769

- **Zooming into the Lab: Perspectives on Maintaining Undergraduate Biological Research through Computationally Adapted Remote Learning in Times of Crisis.** *Journal of microbiology & biology education*
  Parrington, B. A., Giardino, W. J.
  2021; 22 (1)

- **Arousal-state dependent alterations in VTA-GABAergic neuronal activity.** *eNeuro*
  Eban-Rothschild, A. n., Borniger, J. C., Rothschild, G. n., Giardino, W. J., Morrow, J. G., de Lecea, L. n.
  2020

- **High-Resolution Spectral Sleep Analysis Reveals a Novel Association Between Slow Oscillations and Memory Retention in Elderly Adults.** *Frontiers in aging neuroscience*
  Kawai, M. n., Schneider, L. D., Linkovski, O. n., Jordan, J. T., Karna, R. n., Pirog, S. n., Cotto, I. n., Buck, C. n., Giardino, W. J., O'Hara, R. n.
  2020; 12: 540424

- **The nucleus accumbens and alcoholism: a target for deep brain stimulation** *NEUROSURGICAL FOCUS*
  Ho, A. L., Salib, A. N., Pendharkar, A., Sussman, E. S., Giardino, W. J., Halpern, C. H.
  2018; 45 (2): E12

- **Optical Probing of Orexin/Hypocretin Receptor Antagonists.** *Sleep*
  Li, S. B., Nevárez, N. n., Giardino, W. J., de Lecea, L. n.
  2018

- **To sleep or not to sleep: neuronal and ecological insights.** *Current opinion in neurobiology*
  Eban-Rothschild, A., Giardino, W. J., de Lecea, L.
  2017; 44: 132-138

- **Contribution of Urocortin to the Development of Excessive Drinking** *ROLE OF NEUROPEPTIDES IN ADDICTION AND DISORDERS OF EXCESSIVE CONSUMPTION*
  Ryabinin, A. E., Giardino, W. J.
  edited by Thiele, T. E.
  2017; 136: 275–91

- **Hypocretins and Arousal.** *Current topics in behavioral neurosciences*
  Li, S., Giardino, W. J., de Lecea, L.
  2016

- **VTA dopaminergic neurons regulate ethologically relevant sleep-wake behaviors.** *Nature neuroscience*
  Eban-Rothschild, A., Rothschild, G., Giardino, W. J., Jones, J. R., de Lecea, L.
  2016; 19 (10): 1356-1366

- **Resting easy with a sleep regulator** *ELIFE*
  Giardino, W. J., de Lecea, L.
  2015; 4

- **CRF1 Receptor Signaling Regulates Food and Fluid Intake in the Drinking-in-the-Dark Model of Binge Alcohol Consumption** *ALCOHOLISM-CLINICAL AND EXPERIMENTAL RESEARCH*
  Giardino, W. J., Ryabinin, A. E.
  2013; 37 (7): 1161-1170

- **Stress-Related Neuropeptides and Addictive Behaviors: Beyond the Usual Suspects** *NEURON*
  Schank, J. R., Ryabinin, A. E., Giardino, W. J., Ciccocioppo, R., Heilig, M.
  2012; 76 (1): 192-208

- **Urocortins: CRF's siblings and their potential role in anxiety, depression and alcohol drinking behavior** *ALCOHOL*
  Ryabinin, A. E., Tsoory, M. M., Kozicz, T., Thiele, T. E., Neufeld-Cohen, A., Chen, A., Lowery-Gionta, E. G., Giardino, W. J., Kaur, S.
  2012; 46 (4): 349-357

- **Characterization of genetic differences within the centrally projecting Edinger-Westphal nucleus of C57BL/6J and DBA/2Jmice by expression profiling** *FRONTIERS IN NEUROANATOMY*
  Giardino, W. J., Cote, D. M., Li, J., Ryabinin, A. E.
  2012; 6

- **Corticotropin-releasing factor: innocent until proven guilty.** *Nature reviews. Neuroscience*
  Giardino, W. J., Ryabinin, A. E.
  2012; 13 (1): 70-?

- **Urocortin-1 within the Centrally-Projecting Edinger-Westphal Nucleus Is Critical for Ethanol Preference** *PLOS ONE*
  Giardino, W. J., Cocking, D. L., Kaur, S., Cunningham, C. L., Ryabinin, A. E.
  2011; 6 (10)

- **Dissection of corticotropin-releasing factor system involvement in locomotor sensitivity to methamphetamine** *GENES BRAIN AND BEHAVIOR*
  Giardino, W. J., Pastor, R., Anacker, A. M., Spangler, E., Cote, D. M., Li, J., Stenzel-Poore, M. P., Phillips, T. J., Ryabinin, A. E.
  2011; 10 (1): 78-89

- **Activation of the kappa opioid receptor in the dorsal raphe nucleus mediates the aversive effects of stress and reinstates drug seeking** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Land, B. B., Bruchas, M. R., Schattauer, S., Giardino, W. J., Aita, M., Messinger, D., Hnasko, T. S., Palmiter, R. D., Chavkin, C.
  2009; 106 (45): 19168-19173