Stanford



Xiaoke Chen

Associate Professor of Biology

CONTACT INFORMATION

- **Administrative Contact**

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Bio

ACADEMIC APPOINTMENTS

- Associate Professor, Biology
- Member, Bio-X
- Member, Wu Tsai Neurosciences Institute

HONORS AND AWARDS

- Firmenich Next Generation Chair in Neuroscience, Stanford University (2017)
- David Huntington Dean's Faculty Scholars, Stanford University (2015)
- Scholar Award, Ajinomoto Innovation Alliance Program (2014)
- Terman Scholar, Stanford University (2014)
- Scholar Award, Whitehall Foundation (2013)

LINKS

- Chen_Lab: http://www.xiaokechenlab.com

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our goal is to understand how brain circuits mediate motivated behaviors and how maladaptive changes in these circuits cause mood disorders. To achieve this goal, we focus on studying the neural circuits for pain and addiction, as both trigger highly motivated behaviors, whereas, transitioning from acute to chronic pain or from recreational to compulsive drug use involves maladaptive changes of the underlying neuronal circuitry.

Teaching

COURSES

2026-27

- Advanced Neurobiology: Food, Sex, and Gaming: BIO 154 (Spr)

- Biology PhD Lab Rotation: BIO 299 (Aut, Win, Spr)
- Neuroplasticity: From Synapses to Behavior: BIO 204 (Spr)

2025-26

- Neuroplasticity: From Synapses to Behavior: BIO 204 (Win)

2024-25

- Advanced Neurobiology: Food, Sex, and Gaming: BIO 154 (Spr)

2023-24

- Neuroplasticity: From Synapses to Behavior: BIO 204 (Win)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Pia Alderman, Ying Hu, Allison Morningstar, Jun Song, Yandan Wang, Alina Xiao

Postdoctoral Faculty Sponsor

Sijia Fan, Wei Qi

Doctoral Dissertation Advisor (AC)

Qilin Zhao

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biology (School of Humanities and Sciences) (PhD Program)
- Neurosciences (PhD Program)

Publications

PUBLICATIONS

- **Deconstruction of a spino-brain-spinal cord circuit that drives chronic pain.** *Nature*
  Wang, Q., Lee, J. H., Nachtrab, G., Yuan, Y., Yuan, L., Qi, W., Mohr, M. A., Xiong, J., Horowitz, M. A., Chen, X.
  2026
- **A tissue-like neurotransmitter sensor for the brain and gut.** *Nature*
  Li, J., Liu, Y., Yuan, L., Zhang, B., Bishop, E. S., Wang, K., Tang, J., Zheng, Y., Xu, W., Niu, S., Beker, L., Li, T. L., Chen, et al
  2022; 606 (7912): 94-101
- **Orchestrating Opiate-Associated Memories in Thalamic Circuits.** *Neuron*
  Keyes, P. C., Adams, E. L., Chen, Z., Bi, L., Nachtrab, G., Wang, V. J., Tessier-Lavigne, M., Zhu, Y., Chen, X.
  2020
- **Dynamic salience processing in paraventricular thalamus gates associative learning.** *Science (New York, N.Y.)*
  Zhu, Y., Nachtrab, G., Keyes, P. C., Allen, W. E., Luo, L., Chen, X.
  2018; 362 (6413): 423–29
- **The coding of cutaneous temperature in the spinal cord.** *Nature neuroscience*
  Ran, C., Hoon, M. A., Chen, X.
  2016; 19 (9): 1201-1209
- **A thalamic input to the nucleus accumbens mediates opiate dependence** *NATURE*
  Zhu, Y., Wienecke, C. F., Nachtrab, G., Chen, X.
  2016; 530 (7589): 219-?
- **Valence processing in pons.** *Neuron*

Chen, X.
2023; 111 (9): 1353-1354

- **Plastic and stimulus-specific coding of salient events in the central amygdala.** *Nature*
  Yang, T., Yu, K., Zhang, X., Xiao, X., Chen, X., Fu, Y., Li, B.
  2023

- **Treatment of a genetic brain disease by CNS-wide microglia replacement.** *Science translational medicine*
  Shibuya, Y., Kumar, K. K., Mader, M. M., Yoo, Y., Ayala, L. A., Zhou, M., Mohr, M. A., Neumayer, G., Kumar, I., Yamamoto, R., Marcoux, P., Liou, B., Bennett, et al
  2022; 14 (636): eabl9945

- **An adaptive optics module for deep tissue multiphoton imaging in vivo.** *Nature methods*
  Rodriguez, C., Chen, A., Rivera, J. A., Mohr, M. A., Liang, Y., Natan, R. G., Sun, W., Milkie, D. E., Bifano, T. G., Chen, X., Ji, N.
  2021; 18 (10): 1259-1264

- **Modality specific modulation of temperature representations in the spinal cord after injury.** *The Journal of neuroscience : the official journal of the Society for Neuroscience*
  Ran, C., Kamalani, G. N., Chen, X.
  2021

- **Differential Co-release of Two Neurotransmitters from a Vesicle Fusion Pore in Mammalian Adrenal Chromaffin Cells.** *Neuron*
  Zhang, Q., Liu, B., Wu, Q., Liu, B., Li, Y., Sun, S., Wang, Y., Wu, X., Chai, Z., Jiang, X., Liu, X., Hu, M., Wang, et al
  2019; 102 (1): 173-183.e4

- **Probing the coding logic of thermosensation using spinal cord calcium imaging.** *Experimental neurology*
  Ran, C. n., Chen, X. n.
  2019

- **The coding of valence and identity in the mammalian taste system.** *Nature*
  Wang, L., Gillis-Smith, S., Peng, Y., Zhang, J., Chen, X., Salzman, C. D., Ryba, N. J., Zuker, C. S.
  2018; 558 (7708): 127-131

- **Neuronal delivery of Hedgehog directs spatial patterning of taste organ regeneration.** *Proceedings of the National Academy of Sciences of the United States of America*
  Lu, W. J., Mann, R. K., Nguyen, A. n., Bi, T. n., Silverstein, M. n., Tang, J. Y., Chen, X. n., Beachy, P. A.
  2018; 115 (2): E200–E209