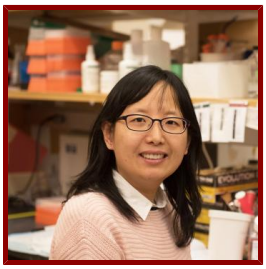
Stanford



Sui Wang, PhD

Associate Professor of Ophthalmology

CONTACT INFORMATION

- **ADMINISTRATIVE CONTACT**

  Cheyenne Michelle Neumann - Adm Svcs Admstr 1

  Email cheyneu@stanford.edu

  Tel (650) 497-1182

Bio

ACADEMIC APPOINTMENTS

- Associate Professor, Ophthalmology
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Department of Ophthalmology, Stanford University School of Medicine, (2017- present)

HONORS AND AWARDS

- Pathway to Stop Diabetes Career Initiator Award, American Diabetes Association (2016)
- McCormick and Gabilan Faculty Award, McCormick and Gabilan Foundation (2017)
- E. Matilda Ziegler Foundation for the Blind Award, E. Matilda Ziegler Foundation (2018)
- Doris Duke Pilot Funding, Doris Duke Foundation (2022)
- Stanford Diabetes Research Center Pilot and Feasibility Award, Stanford Diabetes Research Center (2025)

PROFESSIONAL EDUCATION

- Postdoc, Harvard Medical School , Genetics (2016)
- PhD, Vanderbilt University , Cell and Developmental Biology (2009)
- BS, Fudan University , Biological Sciences (2004)

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

Our research focuses on unraveling the molecular mechanisms underlying retinal development and diseases. We employ genetic and genomic tools to explore how various retinal cell types, including neurons, glia, and the vasculature, respond to developmental cues and disease insults at the epigenomic and transcriptional levels. In addition, we investigate their interactions and collective contributions to maintain retinal integrity.

1. Investigating retinal development:
We utilize genetic tools and methods such as in vivo plasmid electroporation and CRISPR to dissect the roles of cis-regulatory elements and transcription factors in controlling retinal development.

2. Understanding diabetes-induced cell-type-specific responses in the retina:
Diabetes triggers a range of multicellular responses in the retina, such as vascular lesions, glial dysfunction, and neurodegeneration, all of which contribute to retinopathy. We delve into the detailed molecular mechanisms underlying these diabetes-induced cell-type-specific responses and the pathogenesis of diabetic retinopathy.

3. Developing molecular tools for labeling and manipulation of specific cell types in vivo:
Cis-regulatory elements, particularly enhancers, play pivotal roles in directing tissue- and cell-type-specific expression. Our interest lies in identifying enhancers that can drive cell type-specific expression in the retina and brain. We incorporate these enhancers into plasmid or AAV-based delivery systems, enabling precise labeling and manipulation of specific cell types in vivo.

Teaching

COURSES

2024-25

- Cellular/Molecular Neuroscience Laboratory: NEPR 288 (Sum)

2023-24

- Cellullar/Molecular Neuroscience Laboratory: NEPR 288 (Sum)

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

Cheyanne Lewis, Ashley Yeh

Postdoctoral Faculty Sponsor

Boxiong Deng

Doctoral Dissertation Co-Advisor (AC)

Duo Sun

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Neurosciences (PhD Program)

Publications

PUBLICATIONS

- **Multi-tissue transcriptomic aging atlas reveals predictive aging biomarkers in the killifish.** *Nature aging*
  Costa, E. K., Chen, J., Guldner, I. H., Mboning, L., Schmahl, N., Tsenter, A., Nagvekar, R., Wu, M. R., Moran-Losada, P., Bouchard, L. S., Wang, S., Singh, P. P., Pellegrini, et al
  2026

- **Deep learning-guided design of cell type-specific AAV promoters.** *bioRxiv : the preprint server for biology*
  Wang, S. K., Deng, B., Nair, S., Ren, X., Li, J., Tijerina, J., Prakhar, P., Luo, Z., Nnebe, C., Kim, S. H., Zhou, Y., Shah, S. H., Davis, et al
  2026

- **New Insights Into Diabetes-Induced Cell-Type-Specific Responses in the Neural Retina via Single-Cell Transcriptomics: A Report on Research Supported by Pathway to Stop Diabetes.** *Diabetes*
  Deng, B., Nnebe, C., Prakhar, P., Ren, X., Sun, D., Sun, Y., Wang, S.
  2025

- **Morphological map of under- and overexpression of genes in human cells.** *Nature methods*
  Chandrasekaran, S. N., Alix, E., Arevalo, J., Borowa, A., Byrne, P. J., Charles, W. G., Chen, Z. S., Cimini, B. A., Deng, B., Doench, J. G., Ewald, J. D., Fritchman, B., Fuller, et al
  2025; 22 (8): 1742-1752

- **Motor learning drives region-specific transcriptomic remodeling in the motor cortex and dorsal striatum.** *bioRxiv : the preprint server for biology*
  Sun, Y., Roth, R. H., Hwang, F. J., Wang, S., Ding, J. B.
  2025

- **Multi-tissue transcriptomic aging atlas reveals predictive aging biomarkers in the killifish.** *bioRxiv : the preprint server for biology*
  Costa, E. K., Chen, J., Guldner, I. H., Mboning, L., Schmahl, N., Tsenter, A., Wu, M., Moran-Losada, P., Bouchard, L. S., Wang, S., Singh, P. P., Pellegrini, M., Brunet, et al
  2025

- **dCasMINI-mediated therapy rescues photoreceptors degeneration in a mouse model of retinitis pigmentosa.** *Science advances*
  Wang, Q., Xu, X., Chen, S., Lu, R., Li, L., Lo, C. H., Liu, Z., Ning, K., Li, T., Kowal, T. J., Wang, B., Hartnett, M. E., Wang, et al
  2024; 10 (51): eadn7540

- **Induction of a Müller glial-specific protective pathway safeguards the retina from diabetes induced damage.** *Diabetes*
  Lin, C. H., Wu, M. R., Tanasa, B., Prakhar, P., Deng, B., Davis, A. E., Li, L., Xia, A., Shan, Y., Fort, P. E., Wang, S.
  2024

- **Efficient Rescue of Retinal Degeneration in Pde6a Mice by Engineered Base Editing and Prime Editing.** *Advanced science (Weinheim, Baden-Wurttemberg, Germany)*
  Liu, Z., Chen, S., Davis, A. E., Lo, C. H., Wang, Q., Li, T., Ning, K., Zhang, Q., Zhao, J., Wang, S., Sun, Y.
  2024: e2405628

- **iGWAS: Image-based genome-wide association of self-supervised deep phenotyping of retina fundus images.** *PLoS genetics*
  Xie, Z., Zhang, T., Kim, S., Lu, J., Zhang, W., Lin, C. H., Wu, M. R., Davis, A., Channa, R., Giancardo, L., Chen, H., Wang, S., Chen, et al
  2024; 20 (5): e1011273

- **Dendritic mGluR2 and perisomatic Kv3 signaling regulate dendritic computation of mouse starburst amacrine cells.** *Nature communications*
  Acarón Ledesma, H., Ding, J., Oosterboer, S., Huang, X., Chen, Q., Wang, S., Lin, M. Z., Wei, W.
  2024; 15 (1): 1819

- **Gut-liver axis calibrates intestinal stem cell fitness.** *Cell*
  Kim, G., Chen, Z., Li, J., Luo, J., Castro-Martinez, F., Wisniewski, J., Cui, K., Wang, Y., Sun, J., Ren, X., Crawford, S. E., Becerra, S. P., Zhu, et al
  2024

- **EphB1 causes retinal damage through inflammatory pathways in the retina and retinal Muller cells.** *Molecular vision*
  Liu, L., Jiang, Y., Al-Shabrawey, M., Ren, X., Wang, S., Steinle, J. J.

2024; 30: 167-174

- **A positively tuned voltage indicator for extended electrical recordings in the brain.** *Nature methods*
  Evans, S. W., Shi, D., Chavarha, M., Plitt, M. H., Taxidis, J., Madruga, B., Fan, J. L., Hwang, F., van Keulen, S. C., Suomivuori, C., Pang, M. M., Su, S., Lee, et al
  2023; 20 (7): 1104-1113

- **α A-crystallin's role in the regulation of Muller cell trophic support**
  Gregolynskyj, A., Wang, S., Fort, P.
  ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2023

- **Postsynaptic synucleins mediate endocannabinoid signaling.** *Nature neuroscience*
  Albarran, E., Sun, Y., Liu, Y., Raju, K., Dong, A., Li, Y., Wang, S., Sudhof, T. C., Ding, J. B.
  2023

- **Mettl14-mediated m6A modification ensures the cell-cycle progression of late-born retinal progenitor cells.** *Cell Reports*
  Li, L., Sun, Y., Davis, A. E., Shah, S. H., Hamed, L. K., Wu, M., Lin, C., Ding, J. B., Wang, S.
  2023

- **Multiplexed genome regulation in vivo with hyper-efficient Cas12a.** *Nature cell biology*
  Guo, L. Y., Bian, J., Davis, A. E., Liu, P., Kempton, H. R., Zhang, X., Chemparathy, A., Gu, B., Lin, X., Rane, D. A., Xu, X., Jamiolkowski, R. M., Hu, et al
  2022

- **A protocol to inject ocular drug implants into mouse eyes.** *STAR protocols*
  Lin, C., Sun, Y. J., Lee, S. H., Mujica, E. M., Kunchur, C. R., Wu, M., Yang, J., Jung, Y. S., Chiang, B., Wang, S., Mahajan, V. B.
  2022; 3 (1): 101143

- **Identification of cis-regulatory modules for adeno-associated virus-based cell type-specific targeting in the retina and brain.** *The Journal of biological chemistry*
  Lin, C. H., Sun, Y., Chan, C. S., Wu, M. R., Gu, L., Davis, A. E., Gu, B., Zhang, W., Tanasa, B., Zhong, L. R., Emerson, M. M., Chen, L., Ding, et al
  2022: 101674

- **An intravitreal implant injection method for sustained drug delivery into mouse eyes.** *Cell reports methods*
  Sun, Y. J., Lin, C., Wu, M., Lee, S. H., Yang, J., Kunchur, C. R., Mujica, E. M., Chiang, B., Jung, Y. S., Wang, S., Mahajan, V. B.
  2021; 1 (8)

- **Foxo1 controls gut homeostasis and commensalism by regulating mucus secretion.** *The Journal of experimental medicine*
  Chen, Z., Luo, J., Li, J., Kim, G., Chen, E. S., Xiao, S., Snapper, S. B., Bao, B., An, D., Blumberg, R. S., Lin, C. H., Wang, S., Zhong, et al
  2021; 218 (9)

- **Cell type- and stage-specific expression of Otx2 is regulated by multiple transcription factors and cis-regulatory modules in the retina.** *Development (Cambridge, England)*
  Chan, C. S., Lonfat, N., Zhao, R., Davis, A. E., Li, L., Wu, M., Lin, C., Ji, Z., Cepko, C. L., Wang, S.
  2020

- **Enhancer transcription identifies cis-regulatory elements for photoreceptor cell types.** *Development (Cambridge, England)*
  Perez-Cervantes, C., Smith, L. A., Nadadur, R. D., Hughes, A. E., Wang, S., Corbo, J. C., Cepko, C., Lonfat, N., Moskowitz, I. P.
  2020

- **Neurog3-Independent Methylation Is the Earliest Detectable Mark Distinguishing Pancreatic Progenitor Identity.** *Developmental cell*
  Liu, J., Banerjee, A., Herring, C. A., Attalla, J., Hu, R., Xu, Y., Shao, Q., Simmons, A. J., Dadi, P. K., Wang, S., Jacobson, D. A., Liu, B., Hodges, et al
  2019; 48 (1): 49

- **The THO Complex Coordinates Transcripts for Synapse Development and Dopamine Neuron Survival.** *Cell*
  Maeder, C. I., Kim, J., Liang, X., Kaganovsky, K., Shen, A., Li, Q., Li, Z., Wang, S., Xu, X. Z., Li, J. B., Xiang, Y. K., Ding, J. B., Shen, et al
  2018

- **Synaptotagmin 4 Regulates Pancreatic beta Cell Maturation by Modulating the Ca2+ Sensitivity of Insulin Secretion Vesicles** *DEVELOPMENTAL CELL*
  Huang, C., Walker, E. M., Dadi, P. K., Hu, R., Xu, Y., Zhang, W., Sanavia, T., Mun, J., Liu, J., Nair, G. G., Tan, H., Wang, S., Magnuson, et al

2018; 45 (3): 347-+

- **Distributed hepatocytes expressing telomerase repopulate the liver in homeostasis and injury** *NATURE*
  Lin, S., Nascimento, E. M., Gajera, C. R., Chen, L., Neuhofer, P., Garbuzov, A., Wang, S., Artandi, S. E.
  2018; 556 (7700): 244-+
- **Distributed hepatocytes expressing telomerase repopulate the liver in homeostasis and injury.** *Nature*
  Lin, S. n., Nascimento, E. M., Gajera, C. R., Chen, L. n., Neuhöfer, P. n., Garbuzov, A. n., Wang, S. n., Artandi, S. E.
  2018
- **Detection and manipulation of live antigen-expressing cells using conditionally stable nanobodies** *ELIFE*
  Tang, J. C., Drokhlyansky, E., Etemad, B., Rudolph, S., Guo, B., Wang, S., Ellis, E. G., Li, J. Z., Cepko, C. L.
  2016; 5
- **Photoreceptor Fate Determination in the Vertebrate Retina** *INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE*
  Wang, S., Cepko, C. L.
  2016; 57 (5)
- **A Gene Regulatory Network Controls the Binary Fate Decision of Rod and Bipolar Cells in the Vertebrate Retina** *DEVELOPMENTAL CELL*
  Wang, S., Sengel, C., Emerson, M. M., Cepko, C. L.
  2014; 30 (5): 513-527
- **NeuroD Factors Regulate Cell Fate and Neurite Stratification in the Developing Retina** *JOURNAL OF NEUROSCIENCE*
  Cherry, T. J., Wang, S., Bormuth, I., Schwab, M., Olson, J., Cepko, C. L.
  2011; 31 (20): 7365-7379
- **Neurog3 gene dosage regulates allocation of endocrine and exocrine cell fates in the developing mouse pancreas** *DEVELOPMENTAL BIOLOGY*
  Wang, S., Yan, J., Anderson, D. A., Xu, Y., Kanal, M. C., Cao, Z., Wright, C. V., Gu, G.
  2010; 339 (1): 26-37
- **Sustained Neurog3 expression in hormone-expressing islet cells is required for endocrine maturation and function** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Wang, S., Jensen, J. N., Seymour, P. A., Hsu, W., Dor, Y., Sander, M., Magnuson, M. A., Serup, P., Gu, G.
  2009; 106 (24): 9715-9720
- **Myt1 and Ngn3 form a feed-forward expression loop to promote endocrine islet cell differentiation** *DEVELOPMENTAL BIOLOGY*
  Wang, S., Hecksher-Sorensen, J., Xu, Y., Zhao, A., Dor, Y., Rosenberg, L., Serup, P., Gu, G.
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- **Loss of Myt1 function partially compromises endocrine islet cell differentiation and pancreatic physiological function in the mouse** *MECHANISMS OF DEVELOPMENT*
  Wang, S., Zhang, J., Zhao, A., Hipkens, S., Magnuson, M. A., Gu, G.
  2007; 124 (11-12): 898-910
- **The fringe molecules induce endocrine differentiation in embryonic endoderm. by activating cMyt1/cMyt3** *DEVELOPMENTAL BIOLOGY*
  Xu, Y., Wang, S., Zhang, H., Zhao, A., Stanger, B. Z., Gu, G.
  2006; 297 (2): 340-349