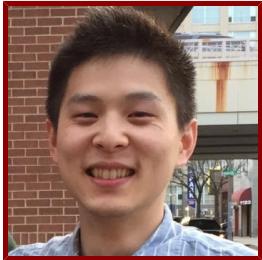


Stanford



Chris C.S. Hsiung

Instructor, Pathology

CLINICAL OFFICE (PRIMARY)

- Pathology

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Bio

BIO

I am a molecular biologist and laboratory medicine physician. I am interested in understanding how cells turn genes on or off, and engineering ways we can turn genes on or off for biological discovery and therapeutic benefit.

In my postdoctoral work advised by Dr. Luke Gilbert (Arc Institute), I developed multiAsCas12a (multiplexed transcriptional interference Acidaminococcus Cas12a), a new functional genomics platform capable of higher-order combinatorial chromatin targeting of multiple coding and non-coding genetic elements per cell, including in pooled 6-plex CRISPRi screens. I proposed a group testing experimental framework to efficiently survey higher-order combinatorial spaces of genetic perturbations. I applied this approach to discover new enhancer elements and dissect the combinatorial logic of cis-regulatory elements. This work is available as a preprint: <https://www.biorxiv.org/content/10.1101/2023.09.18.558350v2>

In my prior work as an MD-PhD student co-advised by Dr. Arjun Raj and Dr. Gerd Blobel at the Univ. of Pennsylvania, I led several studies focused on how gene regulatory information is maintained or altered through mitosis in mammalian cells, using epigenomics methods, single-molecule RNA imaging, and computational analysis.

CLINICAL FOCUS

- Coagulation laboratory
- Anatomic and Clinical Pathology

ACADEMIC APPOINTMENTS

- Instructor, Pathology

HONORS AND AWARDS

- K01 Mentored Research Scientist Development Awards, NHGRI, NIH (2023-2028)
- Prostate Cancer Foundation Young Investigator Award, Prostate Cancer Foundation (2023-2026)

PROFESSIONAL EDUCATION

- Medical Education: University of Pennsylvania School of Medicine (2017) PA
- Residency: Stanford University Department of Pathology (2020) CA
- M.D., Perelman School of Medicine, University of Pennsylvania , Medicine (2017)
- Ph.D., Perelman School of Medicine, University of Pennsylvania , Cell and Molecular Biology (2016)
- B.A., University of California, Berkeley , Molecular and Cell Biology (2009)

PATENTS

- "United States Patent Pending CAS12A SYSTEM FOR COMBINATORIAL TRANSCRIPTIONAL REPRESSION IN EUKARYOTIC CELLS"

Publications

PUBLICATIONS

- **Higher-order combinatorial chromatin perturbations by engineered CRISPR-Cas12a for functional genomics.** *bioRxiv : the preprint server for biology* Hsiung, C. C., Wilson, C. M., Sambold, N. A., Dai, R., Chen, Q., Misiukiewicz, S., Arab, A., Teyssier, N., O'Loughlin, T., Cofsky, J. C., Shi, J., Gilbert, L. A. 2024
- **Effects of sheared chromatin length on ChIP-seq quality and sensitivity.** *G3 (Bethesda, Md.)* Keller, C. A., Wixom, A. Q., Heuston, E. F., Giardine, B. n., Hsiung, C. C., Long, M. R., Miller, A. n., Anderson, S. M., Cockburn, A. n., Blobel, G. A., Bodine, D. M., Hardison, R. C. 2021
- **A hyperactive transcriptional state marks genome reactivation at the mitosis-G1 transition** *GENES & DEVELOPMENT* Hsiung, C., Bartman, C. R., Huang, P., Ginart, P., Stonestrom, A. J., Keller, C. A., Face, C., Jahn, K. S., Evans, P., Sankaranarayanan, L., Giardine, B., Hardison, R. C., Raj, et al 2016; 30 (12): 1423–39
- **Genome accessibility is widely preserved and locally modulated during mitosis** *GENOME RESEARCH* Hsiung, C., Morrissey, C. S., Udagama, M., Frank, C. L., Keller, C. A., Baek, S., Giardine, B., Crawford, G. E., Sung, M., Hardison, R. C., Blobel, G. A. 2015; 25 (2): 213–25
- **Comparative analysis of mitosis-specific antibodies for bulk purification of mitotic populations by fluorescence-activated cell sorting** *BIOTECHNIQUES* Campbell, A. E., Hsiung, C., Blobel, G. A. 2014; 56 (2): 90–+
- **Interrogating Histone Acetylation and BRD4 as Mitotic Bookmarks of Transcription.** *Cell reports* Behera, V. n., Stonestrom, A. J., Hamagami, N. n., Hsiung, C. C., Keller, C. A., Giardine, B. n., Sidoli, S. n., Yuan, Z. F., Bhanu, N. V., Werner, M. T., Wang, H. n., Garcia, B. A., Hardison, et al 2019; 27 (2): 400–415.e5
- **A new bookmark of the mitotic genome in embryonic stem cells** *NATURE CELL BIOLOGY* Hsiung, C., Blobel, G. A. 2016; 18 (11): 1124–25
- **Enhancer Regulation of Transcriptional Bursting Parameters Revealed by Forced Chromatin Looping** *MOLECULAR CELL* Bartman, C. R., Hsu, S. C., Hsiung, C., Raj, A., Blobel, G. A. 2016; 62 (2): 237–47
- **Dynamic enhancer-gene body contacts during transcription elongation** *GENES & DEVELOPMENT* Lee, K., Hsiung, C., Huang, P., Raj, A., Blobel, G. A. 2015; 29 (19): 1992–97
- **Native cysteine residues are dispensable for the structure and function of all five yeast mitotic septins** *PROTEINS-STRUCTURE FUNCTION AND BIOINFORMATICS* de Val, N., McMurray, M. A., Lam, L. H., Hsiung, C., Bertin, A., Nogales, E., Thorner, J.

