Yuan Gao, Ph.D.

ygao@cshl.edu
(507) 513 - 0882

Cancer Center
Cold Spring Harbor Laboratory

Current Position

Cold Spring Harbor Laboratory — Cold Spring Harbor, NY

Postdoctoral Fellow — 2018-present

Advisor: Christopher Vakoc, M.D., Ph.D.

Education

Mayo Clinic College of Medicine — Rochester, MN

Ph.D. in Biochemistry and Molecular Biology — 2012-2018

Advisor: Zhiguo Zhang, Ph.D.

University of Science and Technology of China — Hefei, China

B.S. in Biological Science — 2007-2011

Grants and Awards

2023 NCI K99/R00 Pathway to Independence Award

Project Title: Function and Targeting of ETV6 in Ewing Sarcoma

Project Start Date: 07/01/2023

2022 Blavatnik Awards for Young Scientists - Institutional Nominee

2018 CSHL Simons Cancer Research Fund

2011 Outstanding Undergraduate Student Thesis Project, University of Science and Technology of China

2009 Undergraduate Student Scholarship, University of Science and Technology of China

Research Experience

Postdoctoral Fellow, **Christopher Vakoc Lab**, Cold Spring Harbor Laboratory, NY. 2018-present

- Uncovered ETV6 as a unique dependency in Ewing sarcoma
- Epigenomic and biochemical analysis provided detailed mechanisms underlying ETV6 dependency
- Biochemical screening methods for ETV6 endogenous ligand discovery.

Graduate Student, **Zhiguo Zhang Lab**, Mayo Clinic College of Medicine, MN. 2012-2018

- Investigated mechanisms underlying nucleosome assembly and epigenetic inheritance.
- Determined the role of Asf1a in bivalent domain resolution during cell differentiation.

Undergraduate Student, **Changlin Tian Lab**, University of Science and Technology of China
2009-2011

- Structural studies of membrane-anchoring proteins using NMR

Publications

Peer-reviewed Publications

- **Gao, Y.**, He X., Wu, X., Huang Y., Toneyan S., Ipsaro, J., Ha, T., Koo, P., Joshua-Tor, L., Bailey, K., Egeblad, M., Vakoc, C. (2023) ETV6 dependency in Ewing sarcoma by antagonism of EWS-FLI1-mediated enhancer activation. ***Nature Cell Biology***. *25, 298–308* PMID: 36658219

  Featured as the Cover Story for Feb issue at Nat Cell Biol
  Highlighted by Prof. Elizabeth R Lawlor in Nat Cell Biol: PMID: 36658218.

- Wen, Q.*, Zhou, J.*, Tian, C.*, Li, X.*, Song, G.*, **Gao, Y.**, …, Gan, H. (2023) Symmetric inheritance of parental histones safeguards the fate of mouse embryonic stem cells during differentiation. ***Nature Genetics***;1–12. PMID: 37666989

- Tian, C.*, Zhou, J.*, Li, X.*, **Gao, Y.**, Wen, Q., Kang, X., Wang, N., Yao, Y., Jiang, J., Song, G., Zhang, T., Hu, S., Liao, J., Yu, C., Wang, Z., Liu, X., Pei, X., Chan, K., Liu, Z. & Gan, H. (2023) Impaired histone inheritance promotes tumor progression. ***Nature Communications*** 14, 3429 PMID: 37301892

- Li, X., Zhou, J., Zhao, W., Wen, Q., Wang, W., Peng, H., **Gao, Y.**, Bouchonville, KJ., Offer, SM., Chan, K., Wang, Z., Li, N., Gan, H. (2021) Defining Proximity Proteomics of Histone Modifications by Antibody-mediated Protein A-APEX2 Labeling. ***Genomics Proteomics Bioinformatics*** S1672-0229(21)00182-0. PMID: 34555496

- **Gao, Y.**, Gan, H., Lou, Z., and Zhang, Z. (2018) Asf1a resolves bivalent chromatin domains for the induction of lineage-specific genes during mouse embryonic stem cell differentiation. ***Proceedings of the National Academy of Sciences of the United States of America*** 115(27): E6162-E6171. PMID: 29915027

- Zhang, K. *, **Gao, Y.** *, Li, J., Burgess, R., Han, J., Liang, H., Zhang, Z. and Liu, Y. (2016) A DNA binding winged helix domain in CAF-1 functions with PCNA to stabilize CAF-1 at replication forks. ***Nucleic Acids Research*** 44(11): 5083-5094. PMID: 26908650

- Li, J. *, Shi, C. *, **Gao, Y.**, Wu, K., Shi, P., Lai, C., Chen, L., Wu, F. and Tian, C. (2012) Structural studies of Mycobacterium tuberculosis Rv0899 reveal a monomeric membrane-anchoring protein with two separate domains. ***Journal of Molecular Biology***. 415, 2 382–392. PMID: 22108166

Manuscript in Submission/Under Revision

- He, X., Ng, D., **Gao, Y.**, Albrengues, J., Adrover, J., Sun, L., Huang Y.H., Daßler-Plenker, J., Vakoc, C.R., Van Aelst, L., Egeblad, M. Chronic stress-induced neutrophil extracellular traps promote breast cancer progression. (under revision for invited resubmission to ***Cancer Cell***)

- **Gao, Y.**, Vakoc, C.R. Precision targeting of oncogenic chromatin complexes in human cancer patients. ***Current Opinion in Genetics & Development*** (under review; invited review for the special issue in honor of David Allis's contribution and championship to chromatin biology)

Selected Talks

- **2022 Mechanisms & Models of Cancer.** ETV6 dependency in Ewing sarcoma by antagonism of EWS-FLI1-mediated enhancer activation. Cold Spring Harbor, NY.

- **2022 CSHL Annual Cancer Center Symposium.** Function and targeting of ETV6 in Ewing Sarcoma. Cold Spring Harbor, NY.

- **2021 FusOnC2 (Fusion Oncoproteins in Childhood Cancer) Annual Program Meeting.** ETV6 dependency in Ewing sarcoma by antagonism of EWS-FLI1-mediated enhancer activation. (Virtual)

- **2021 Cold Spring Harbor Symposium: Biology of cancer: Microenvironment & Metastasis.** ETV6 dependency in Ewing sarcoma by antagonism of EWS-FLI1-mediated enhancer activation. Cold Spring Harbor, NY (virtual)

Selected Poster Presentations

2022	CSHL Annual Symposium	Cold Spring Harbor, NY
2021	CSHL Mechanisms of Eukaryotic Transcription	Virtual
2015	Midwest Chromatin and Epigenetics Meeting	Van Andel Institute, MI

Teaching and Mentoring Experiences

2023	Research mentor for Undergraduate Research Program (URP) student
2018 –	Research mentor for three rotation graduate students, Cold Spring Harbor Laboratory
2018 –	Research mentor for collaborator for CRISPR screening, epigenomic and transcriptomic analysis, Cold Spring Harbor Laboratory
2013 – 2018	Research mentor for two graduate students and one high school student, Mayo Clinic College of Medicine
2012	Teaching Assistant for CORE: Genome Biology, Mayo Clinic College of Medicine
2012	Teaching Assistant for CORE: Responsible Conduct of Research, Mayo Clinic College of Medicine

References

Postdoctoral Advisor
Christopher Vakoc, M.D., Ph.D.
Alan and Edith Seligson Professor
Cancer Center
Cold Spring Harbor Laboratory
1 Bungtown Road
Cold Spring Harbor, NY 11724
(516) 367-5045
vakoc@cshl.edu

Close Collaborator
Mikala Egeblad, Ph.D.
Bloomberg Distinguished Professor
Department of Cell Biology, School of Medicine
Department of Oncology, School of Medicine
Johns Hopkins University
725 N Wolfe St
Baltimore, MD 21205
mikala.egeblad@jhmi.edu

Graduate Advisor
Zhiguo Zhang, Ph.D.
Professor, Department of Genetics and Development
Columbia University Irving Medical Center
630 West 168th Street
New York, NY 10032
(887) 426-5637
zz2401@cumc.columbia.edu