Xiaolei Su

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RESEARCH GOAL

My overarching research goal is to understand signaling pathways mediating immune responses and to leverage this knowledge to the engineering of immune cells for cancer therapy. My current research program focuses on 1) understanding how phase separation regulates immune signaling; 2) reprogramming T cells and mast cells for cancer therapy.

APPOINTMENT & AFFILIATION

07/2024 - present Associate Professor, Department of Cell Biology, Yale School of Medicine;
Member of Yale Cancer Center, Yale Center for Immuno-Oncology,
Yale Stem Cell Center, and Yale Center for Systems & Engineering Immunology;
Faculty of Yale BBS Program – MCGD and BQBS track, and Yale PEB Program.
01/2018 - 06/2024 Assistant Professor, Department of Cell Biology, Yale School of Medicine.

EDUCATION

09/2006 - 05/2012 Ph.D., Cell and Developmental Biology, Harvard University
09/2002 - 07/2006 B.S., Biological Sciences, Peking University

RESEARCH TRAINING

01/2013 - 12/2017 Postdoctoral Fellow, University of California, San Francisco / Howard Hughes Medical Institute
Mentor: Ronald Vale
Topic: Mechanisms of T cell activation
06/2016 - 07/2016 Visiting scientist, HHMI Summer Institute, Marine Biological Laboratory
Topic: Creating cellular liquid phases by synthetic approaches
06/2015 - 07/2015 Visiting scientist, HHMI Summer Institute, Marine Biological Laboratory
Topic: Comparative understanding of T cell signaling and mast cell signaling
07/2014 - 08/2014 Visiting scientist, HHMI Summer Institute, Marine Biological Laboratory
Topic: T cell microcluster dynamics in a reconstituted actomyosin network
07/2013 - 08/2013 Visiting scientist, HHMI Summer Institute, Marine Biological Laboratory
Topic: 2-D protein phase separation
04/2007 - 05/2012 Graduate Student, Howard Hughes Medical Institute / Dana-Farber Cancer Institute, Harvard Medical School
Mentor: David Pellman

Topic: Regulation of microtubule dynamics by molecular motors

06/2009 - 08/2009 Student, Physiology Course, Marine Biological Laboratory
Instructor: Dyche Mullins & Clare Waterman
Mentor: Wallace Marshall / Gaudenz Danuser / Dan Fletcher
Topic: Post-mitotic cell symmetry / Modeling microtubule dynamics with depolymerases/ Mechanical properties of bacteria cytoskeleton

07/2004 - 07/2006 Research Assistant, Peking University
Advisor: Jianguo Chen & Junling Teng
Topic: Proteomic study of microtubule-associated proteins during brain development

GRANTS

2024 - 2026	NIH Exploratory/Developmental Bioengineering Research Grants (EBRG) (R21)
2024 - 2029	NIH Director's Transformative Research Award
2024 - 2026	NCI Clinical and Translational Exploratory/Developmental Studies Grant (R21)
2024 - 2025	Yale Liver Center Pilot Grant
2024 - 2024	Lion Heart Pilot Award
2023 - 2026	Pershing Square Sohn Prize for Cancer Research
2023 - 2026	Gabrielle's Angel Foundation for Cancer Research Grant
2022 - 2023	Yale Cancer Center Pilot Award
2022 - 2025	American Cancer Society Research Scholar Grant
2021 - 2024	Human Frontier Science Program Early-Career Research Grant
2021 - 2022	Yale Cancer Center Team Science Pilot Grant
2020 - 2025	NIGMS Maximizing Investigators' Research Award (MIRA) (R35)
2020 - 2022	Yale SPORE in Skin Cancer DRP Award
2020 - 2021	Frederick A. DeLuca Foundation Research Grant
2019 - 2024	Rally Foundation Childhood Cancer Research Grant
2019 - 2021	Charles H. Hood Foundation Child Health Research Awards
2019 - 2020	Gilead Sciences Research Scholars Program in Hematology/Oncology
2019 - 2020	B+ Foundation Research Grant
2018 - 2019	American Cancer Society Institutional Research Grant
2014 - 2017	Cancer Research Institute Irvington Postdoctoral Fellowship

AWARDS AND HORNORS

2018	FASEB Junior Investigator Travel Award
2015	Keystone Symposia Future of Science Fund Scholarship
2012	Richard J. Herrnstein Prize for dissertation, Harvard University
2009	Lola Ellis Robertson Endowed Scholarship, Marine Biological Laboratory
2006	Graduates with honors, Peking University
2004	Hewlett-Packard Scholarship
2002 - 2006	Mingde Scholarship, Peking University

PROFESSIONAL AFFILIATIONS

2024 - present American Heart Association

2022 – 2023	American Association of Immunologists
2019 - 2022	American Association for Cancer Research
2008 - present	American Society for Cell Biology

GRANT REVIEWER SERVICE

2025	NIH-CIC (Spring and Summer)
2025	ACS-IBCD
2024	NIH Special Emphasis Panel
2023	ACS-IBCD
2022	NSF-MCB
2021	ERC Advanced Grants
2020	NIH BBM

JOURNAL REVIEWER SERVICE

Biochemical Society Transactions, Cell, Cell Reports, Chinese Journal of Cell Biology, Current Opinion in Cell Biology, EMBO Journal, Frontiers in Plant Science, Frontiers in Physiology, Interface Focus, JCI Insight, Journal of Basic Microbiology, Journal of Cell Biology, Journal of Molecular Medicine, Matter, mBio, Molecular Biology of the Cell, Molecular Microbiology, Molecular Therapy, Nature Cancer, National Science Open, Neural Plasticity, Proceedings of the National Academy of Sciences, Protein & Cell, Science, Science Advances, Science Bulletin, Science China Life Sciences, Science Immunology, Science Signaling, Scientific Reports.

CONFERENCE&SEMINAR ORGANIZATION

ImmuneZoom (Apr 2020 – Oct 2024): Weekly online seminars for immunologists all over the world (Co-organized with Chuan Wu) https://immunezoom.github.io/
ASCB/EMBO 2024 annual meeting, Subgroup: Transendothelial Migration: A Romance of Leukocytes and Endothelium
ASCB/EMBO 2021 annual meeting, Subgroup 13: Immune Cell Biology and Immunotherapy (Co-organized with Meghan Morrissey and Marcus Taylor)
ASCB/EMBO 2019 annual meeting, Subgroup J: Visualizing Immune Cell Activation (Co-organized with Meghan Morrissey)
ASCB/EMBO 2018 annual meeting, Subgroup C: Cell Biology in Cancer Immunity (Co-organized with Enfu Hui)
ASCB/EMBO 2017 annual meeting, Subgroup C: Cell Biology in Adaptive Immune Response (Co-organized with Jonathon Ditlev)
ASCB 2016 annual meeting, Subgroup U: Understanding T cell activation, developing tools for cancer immunotherapy
PKU Bio-Net 2016 Symposium (Co-organized with PKU Bio Class 2002)
ASCB 2015 annual meeting, Subgroup M: nucleation phenomena in cell biology (Co-organized with Gary Brouhard and Cliff Brangwynne)

INVITED OR SELECTED TALKS

03/2025	The Hospital for Sick Children, Toronto, Canada
02/2025	Department of Chemistry, Purdue University, Online

10/2024 The 9th FIMSA Congress, Taipei
06/2024 GRC, Intrinsically Disordered Protein, Les Diablerets, Switzerland
06/2024 FASEB, Immunoreceptors and Immunotherapy, St. Paul, MN
10/2023 Department of Physiology, UT Southwestern Medical Center, Dallas, TX
08/2023 Molecular control of immune cell activation in health and disease, Lofoten, Norway
04/2023 2nd Community of Scholars Biomembranes Symposium, University of Tennessee, Knoxville, Knoxville, TN
02/2023 T-cell lymphoma hub, Online
07/2022 ImmuneZoom Seminar, Online
03/2022 Division in Biological Sciences, University of California, San Diego, San Diego, CA
03/2022 ACS Spring, Session of Mediation of Biological Processes by Membranes in Space, Time, and Force, San Diego, CA
03/2022 Department of Biochemistry and Molecular Biology, University of Chicago, Online
12/2021 ASCB/EMBO annual meeting, Subgroup 13, online
05/2021 AACR annual meeting, ED079, Phase Separation and Membraneless Organelles, online
01/2021 Phase Separation Subgroup, Biophysical Society of China, online
10/2020 Dept. of Biochemistry and Biophysics, University of North Carolina, Chapel Hill, online
12/2019 ASCB/EMBO annual meeting, Subgroup J, Washington, DC
11/2019 5th Annual Immune Imaging Symposium, Rochester, NY
07/2019 GRC, Molecular and Cellular Biology of Lipids, Waterville Valley, NH
06/2019 FASEB, The Signal Transduction in the Immune System, Western Shore, Canada
06/2019 PKU Bio-Net 2019 Symposium, Boston, MA
05/2019 CSHA Membrane Proteins: from Physiology to Pharmacology, Suzhou, China
04/2019 Molecular and Cellular Immunology Section, NIAID, Rockville, MD
01/2019 The Company of Biologists: Reconstitution of cell cytoskeleton in vitro, Wiston House, UK
12/2018 ASCB/EMBO annual meeting, Subgroup C, San Diego, CA
06/2018 FASEB, Immunoreceptors and Immunotherapy, Snowmass Village, CO
12/2017 ASCB/EMBO annual meeting, Minisymposium 18, Philadelphia, PA
12/2017 ASCB/EMBO annual meeting, Subgroup C, Philadelphia, PA
08/2017 Institute of Biochemistry and Cell Biology, Chinese Academy of Sciences
12/2016 ASCB annual meeting, Subgroup U, San Francisco, CA
09/2016 EMBO workshop: The Modularity of Signaling Proteins and Networks, Seefeld, Austria
09/2016 EMBO workshop: Membrane Contact Sites, Chia, Italy
08/2016 Institute of Immunology, Tsinghua University, Beijing, China
08/2016 School of Life Sciences, Peking University, Beijing, China
06/2016 Skirball Institute of Biomolecular Medicine, NYU Langone Medical Center, New York, NY
12/2015 ASCB annual meeting, Subgroup M, San Diego, CA
10/2015 Bay Area Meeting on Lymphocyte Cell Biology
01/2015 Keystone symposium, The Biological Code of Cell Signaling: A Tribute to Tony Pawson
12/2014 ASCB annual meeting, minisymposium, Philadelphia, PA
05/2014 EMBO Conference: Lymphocyte Signaling, Bertinoro, Italy
05/2014 Quantitative imaging in Cell Biology, Santa Clara, CA
04/2014 Great People & Sciences, University of California, San Francisco, CA
08/2013 Dana-Farber Cancer Institute, Boston, MA

05/2012	Department of Molecular Genetics and Cell Biology, University of Chicago, Chicago, IL
10/2011	School of Life Sciences, Peking University, Beijing, China
10/2011	Institute of Biophysics, Chinese Academy of Sciences, Beijing, China
09/2011	Boston Area Mitosis and Meiosis Meeting, Boston, MA
02/2011	Boston Area Yeast Meeting, Boston, MA
12/2009	ASCB annual meeting, minisymposium, San Diego, CA
10/2009	Cell-Bio Day, Harvard Medical School, Boston, MA

TEACHING

2025 Spring	CB 606	Advanced Topics in Cell Biology (Course director)
2024 Fall	CB 603	Seminar in Molecular and Cell Biology
2024 Fall	CB 602	Molecular Cell Biology
2024 Spring	CB 606	Advanced Topics in Cell Biology (Course director)
2023 Fall	CB 603	Seminar in Molecular and Cell Biology
2023 Fall	CB 602	Molecular Cell Biology
2023 Fall	MCDB 530	Biology of the Immune System
2023 Spring	CB 606	Advanced Topics in Cell Biology (Course director)
2022 Fall	CB 603	Seminar in Molecular and Cell Biology
2022 Fall	CB 602	Molecular Cell Biology
2022 Spring	CB 606	Advanced Topics in Cell Biology (Course director)
2022 Spring	MCDB 517	Methods and Logic in Interdisciplinary Research
2021 Fall	CB 603	Seminar in Molecular and Cell Biology
2021 Fall	CB 602	Molecular Cell Biology
2021 Spring	CB 606	Advanced Topics in Cell Biology (Course director)
2021 Spring	MCDB 517	Methods and Logic in Interdisciplinary Research
2020 Spring	CB 606	Advanced Topics in Cell Biology
2020 Spring	MCDB 517	Methods and Logic in Interdisciplinary Research
2019 Spring	CB 606	Advanced Topics in Cell Biology
2019 Spring	MCDB 517	Methods and Logic in Interdisciplinary Research

MENTORING

Undergraduate

Name	Year	Achievement in Su Lab	Position post Su Lab
Chengxuan Xie	2024		Undergraduate at Cambridge Univ.
Jiaqi Hu	2023		PhD student at Yale
Linjie Tong	2023		PhD student at Scripps Research
Fawzaan Hashmi	2022- present	Yale College Dean's Fellowship 2022 Yale College Dean's Fellowship 2023 Admission to the FlexMed Program (early assurance of medical school acceptance) at Mount Sinai	
Suzanna Yang	2021-2022		Yale College Student

Wei Li	2019	Yale College Dean's Fellowship 2019	Yale College Student
Hannah Triscott	2018-2019	Yale College Dean's Fellowship 2018	PhD student at Univ. Queensland
Kendra Libby	2018-2022	*Methods Mol Biol.* 2020 (1st author) *EMBO J.* 2020 *Biophysical Journal 2024* Yale College Dean's Fellowship 2018 Yale College Dean's Fellowship 2019 Goldwater Scholar 2020 NSF Graduate Research Fellow 2021 Yale MB&B Paul Sigler Prize 2022 Yale Y-Work Award 2022	PhD student at MIT

PhD Candidate

Name	Year	Achievement in Su Lab	Position post Su Lab
Jiaqi Hu	2025-present		
Ava Albis	2024-present		
Jianjian Guo	2020-present		
Walker Fuchs	2019-2022	*EMBO J.* 2020	MakerSpace Teacher & Director of Technology at Fraser Woods Montessori School

Postdoc and Associate Research Scientist

Name	Year	Achievement in Su Lab	Position post Su Lab
Jiang Lyu	2024-present		
Yiwei Xiong	2022-present	*Biophysical Journal 2024* (1st author)	
Elahe Kamali	2022-2023		Postdoc at Upenn
Kazuki Sato	2022-present	Daiichi Sankyo Foundation of Life Science Fellowship 2022	
Xinyan Zhang	2021-present	Leslie Warner Fellowship 2022 *Science Immunology* 2022	
Ron Orbach	2019-2021	*Front Immunol. 2020* (1st author)	Assistant Professor at Bar-Ilan University, Israel
Qian Xiao	2019-2021	*Science Immunology 2022* (1st author) *Nature Reviews Immunology 2022* (1st author) *Methods Mol biol. 2023* (1st author) *Bio Protocol 2023* (1st author) *J Proteome Res* 2022	Assistant Professor at Rutgers Center Institute of New Jersey
Longhui Zeng	2018-present	CRI-Irvington Fellowship 2021 *J Cell Biol. 2021* (1st author) *Methods Mol biol. 2023* (1st author) *Nature Cancer.* 2025	

		Cell Reports. 2025	

Rotation student

Bridget Tokiwa (MCGD 2025), Ken Lee (MD/PhD, 2024), Nathaniel Dwyer (Immunobiology, 2023), Miharu Iguchi (MCGD, 2023), Siyi Chen (MCGD, 2023), Jason Lin (MCGD, 2022), Christian Freniere (BQBS, 2021), Ceara McAtee (MCGD, 2020), Vincent Tran (MCGD, 2019), Mengwei Hu (MCGD, 2019), Neng Wan (BQBS, 2018).

PHD QUALIFYING EXAM COMMITTEE

Jaywon Lee (Cell Bio, 2024), Maya Deshmukh (Immunobiology 2023), Luojia Yang (Genetics, 2022), Ruifeng Sun (Immunobiology, 2022), William Chadwick (Cell Bio, 2021), Bruna Mafra de Faria (Cell Biology, 2020), Grace Swaim (Cell Biology, 2019), Mengwei Hu (Genetics, 2019), Bing Yang (Genetics, 2018), Ian Gonzalez (Cell Biology, 2018), Andres Guillen (Cell Biology, 2018).

PHD THESIS COMMITTEE

Jaywon Lee (Cell Bio, 2024 - present), Runfan Yang (University of North Carolina at Chapel Hill, 2023 – present), Maya Deshmukh (Immunobiology, 2023 - present), Luojia Yang (Genetics, 2022 - present), William Chakwick (Cell Biology, 2022 - present), Ruifeng Sun (Immunobiology, 2022 - present), Meng Tian (Cell Biology, 2021 – present), Sam Kerr (Pathology, 2020 – 2022), Grace Swaim (Cell Biology, 2019 – present), Ian Gonzalez (Cell Biology, 2018 – present).

OTHER SERVICE

2021 - present	Yale Cell Biology “Beyond the Bench” Committee
2021 – 2024	Yale Cell Biology Seminar Committee
2019 - 2020	Yale Cell Biology Faculty Recruitment Committee
2019 - 2021	Yale BBS program MCGD track Graduate Student Admission

PUBLICATIONS

Simon S, Bugos G, Prins R, Rajan A, Palani A, Heyer K, Stevens A, Zeng L, Thompson KA, Atilla PA, Price JP, Kluesner MG, Jaeger-Ruckstuhl CA, Shabaneh TB, Olson JM, **Su X**, Riddell SR.
Design of sensitive monospecific and bispecific synthetic chimeric T cell receptors for cancer therapy.
Nature Cancer. 2025 Mar 17. doi: 10.1038/s43018-025-00927-0.

Boraas LC, Hu M, Martino P, Thornton L, Vejnar CE, Zhen G, Zeng L, Parker DM, Cox AL, Giraldez AJ, **Su X**, Mayr C, Wang S, Nicoli S.
G3BP1 ribonucleoprotein complexes regulate focal adhesion protein mobility and cell migration.
Cell Reports. 2025 Feb 25;44(2):115237. doi: 10.1016/j.celrep.2025.115237.

Su X.
CAR-T entering a new "phase": Improving CAR-T function by harnessing phase separation.
Cancer Research. 2025 Jan 29. doi: 10.1158/0008-5472.CAN-25-0357.

Zeng L, Zhang X, Xiong Y, Sato K, Hajicek N, Sondek J, **Su X**.
Hyperactive PLCG1 drives non-canonical signaling to promote cell survival.
bioRxiv. 2024 Dec 18:2024.12.17.628879. doi: 10.1101/2024.12.17.628879. Preprint.

Xiong Y, Libby KA, **Su X.**
The Physical Landscape of CAR-T synapse.
Biophysical Journal. 2024 Aug 6;123(15):2199-2210. doi: 10.1016/j.bpj.2023.09.004.

Zhang X, Xiao Q, Zeng L, Hashmi F, **Su X.**
IDR-induced CAR condensation improves the cytotoxicity of CAR-Ts against low-antigen cancers.
bioRxiv. 2023 Oct 28:2023.10.02.560460. doi: 10.1101/2023.10.02.560460. Preprint.

Xiao Q, **Su X.**
Anti-tumor Efficacy of CD19 CAR-T in a Raji B Cell Xenografted Mouse Model.
Bio Protocol. 2023 Apr 20;13(8):e4655. doi: 10.21769/BioProtoc.4655.

Zeng L, **Su X.**
Biomolecular Condensation of SH2 Domain-Containing Proteins on Membranes.
Methods in Molecular Biology. 2023;2705:371-379. doi: 10.1007/978-1-0716-3393-9_20.

Xiao Q, **Su X.**
Imaging CAR-T Synapse as a Quality Control for CAR Engineering.
Methods in Molecular Biology. 2023;2654:503-512. doi: 10.1007/978-1-0716-3135-5_33.

Xiao Q, Zhang X, Tu L, Cao J Hinrichs CS, **Su X.**
Size-dependent activation of CAR-T cells.
Science Immunology. 2022 Aug 5. doi: 10.1126/sciimmunol.abl3995.

Griffith AA, Callahan KP, King NG, Xiao Q, **Su X,** Salomon AR.
SILAC Phosphoproteomics Reveals Unique Signaling Circuits in CAR-T Cells and the Inhibition of B Cell-Activating Phosphorylation in Target Cells.
Journal of Proteome Research. 2022 Feb 4;21(2):395-409. doi: 10.1021/acs.jproteome.1c00735.

Xiao Q, McAtee CK, **Su X.**
Phase separation in immune signalling.
Nature Reviews Immunology. 2022 Mar;22(3):188-199. doi: 10.1038/s41577-021-00572-5.

Zeng L, Palaia I, Šarić A, **Su X.**
PLCγ1 promotes phase separation of T cell signaling components.
Journal of Cell Biology. 2021 Jun 7;220(6):e202009154. doi: 10.1083/jcb.202009154.

Orbach R, **Su X.**
Surfing on membrane waves: microvilli, curved membranes, and immune signaling.
Frontiers in Immunology. 2020 Sep 11; doi: 10.3389/fimmu.2020.02187.

Dong R, Libby KA, Blaeschke F, Fuchs W, Marson A, Vale RD, **Su X.**
Rewired signaling network in T cells expressing the chimeric antigen receptor (CAR).
EMBO Journal. 2020 July 9; e104730. doi: 10.15252/embj.2020104730.

Libby KA, **Su X**.
Imaging Chimeric Antigen Receptor (CAR) Activation
Methods in Molecular Biology. 2020;2111:153-160. doi: 10.1007/978-1-0716-0266-9_13.

Ditlev JA, Vega AR, Köster DV, **Su X**, Tani T, Lakoduk AM, Vale RD, Mayor S, Jaqaman K, Rosen MK.
A composition-dependent molecular clutch between T cell signaling condensates and actin.
eLife. 2019 Jul 3;8. pii: e42695.

Carbone CB, Kern N, Fernandes RA, Hui E, **Su X**, Garcia KC, Vale RD.
In vitro reconstitution of T cell receptor-mediated segregation of the CD45 phosphatase.
Proc Natl Acad Sci U S A. 2017 Oct 31;114(44):E9338-E9345.

Arellano-Santoyo H, Geyer EA, Stokasimov E, Chen GY, **Su X**, Hancock W, Rice LM, Pellman D.
A Tubulin Binding Switch Underlies Kip3/Kinesin-8 Depolymerase Activity.
Developmental Cell. 2017 Jul 10;42(1):37-51.

Hui E, Cheung J, Zhu J, **Su X**, Taylor MJ, Wallweber HA, Sasmal DK, Huang J, Kim JM, Mellman I, Vale RD.
T cell costimulatory receptor CD28 is a primary target for PD-1-mediated inhibition.
Science. 2017 Mar 31;355(6332):1428-1433.

Su X, Ditlev JA, Rosen MK, Vale RD.
Reconstitution of TCR Signaling Using Supported Lipid Bilayers.
Methods in Molecular Biology. 2017;1584:65-76.

Su X, Ditlev JA, Hui E, Xing W, Banjade S, Okrut J, King DS, Taunton J, Rosen MK, and Vale RD.
Phase separation of signaling molecules promotes T cell receptor signal transduction
Science. 2016 Apr; 352(6285):595-9.

Su X, Arellano-Santoyo H, Portran D, Gaillard J, Vantard M, Thery M, and Pellman D.
Microtubule sliding activity of a kinesin-8 promotes spindle assembly and spindle length control.
Nature Cell Biology. 2013 Aug; 15(8): 948-57.

Su X, Ohi R, Pellman D.
Move in for the kill: motile microtubule regulators (Review).
Trends in Cell Biology. 2012 Nov;22(11):567-75.

Su X, Qiu W, Gupta ML Jr, Pereira-Leal JB, Reck-Peterson SL, Pellman D.
Mechanisms underlying the dual-mode regulation of microtubule dynamics by kip3/kinesin-8.
Molecular Cell. 2011 Sep 2;43(5):751-63.

Wang Q, Teng J, Shen B, Zhang W, Guo Y, **Su X**, Zhang C, Yu AC, Chen J.
Characterization of kinesin-like proteins in silkworm posterior silk gland cells.
Cell Research. 2010 Jun;20(6):713-27.