

Xin Jin, Ph.D.

Assistant Professor

Department of Neuroscience, Dorris Neuroscience Center

Scripps Research Institute

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Email: xinjin@scripps.eduLab Website: jin.scripps.eduAdministrative coordinator: Kayla Nestor, 858-784-9487, knestor@scripps.edu**Personal Statement**

My lab develops and applies novel technologies to uncover the molecular and mechanistic basis of neuropsychiatric illnesses. I was trained across disciplines including chemical biology and tool development (with Alice Ting and Feng Zhang), molecular genetic neuroscience (with Cori Bargmann), and developmental neurobiology (with Paola Arlotta). My postdoctoral work as a Junior Fellow combined genomic technology development, developmental neurobiology, and machine learning to develop *in vivo Perturb-seq*. This is a high-throughput approach to introduce pooled genetic perturbation through CRISPR-Cas9 genome editing and read out their perturbation effects with single-cell RNA analysis, performing in living tissues *in vivo*. I piloted this method to systematically characterize a panel of *de novo* risk genes implicated in autism spectrum disorders and identified recurrent, cell type-specific effects across cohorts of risk genes within this complex, developing neural tissue. In my newly established lab since 2021, we will continue the theme of developing and applying genomic and chemical biology tools to analyze cell type diversity and spatial organizations during brain aging and disease states.

Education and Training*B.Sc., Chemistry, minor in Biology, 2008-2010*

Massachusetts Institute of Technology

Cambridge, MA, USA

Ph.D., Biology, 2010-2016

The Rockefeller University,

New York, NY, USA

Advisor: Cori Bargmann

Junior Fellow, 2016-2021

Society of Fellows, Harvard University

Cambridge, MA, USA

Field of study: Neuroscience. Advisor: Feng Zhang and Paola Arlotta

Research and Professional Experience

2008-2010

Undergraduate research, Department of Chemistry, MIT

Mentor: Alice Y. Ting

- 2009 Summer research, Department of Chemistry, Scripps Research Institute
Mentor: Ben F. Cravatt
- 2010 Amgen undergraduate research, Department of Chemistry, MIT
Mentor: JoAnne Stubbe
- 2010-2016 HHMI International Predoctoral Fellow
Graduate research, The Rockefeller University
Mentor: Cori Bargmann
- 2014 Teaching Assistant of Matt Meselson, The Rockefeller University
Major Advances in Understanding Evolution and Heredity
- 2015 Teaching Assistant, Marine Biological Laboratory (MBL)
Neurobiology course, Woods Hole
- 2016-2021 Junior Fellow, Society of Fellow, Harvard University/Broad Institute
Mentor: Feng Zhang and Paola Arlotta
- 2021- Assistant Professor, Department of Neuroscience,
Dorris Neuroscience Center
Scripps Research
- 2024- Adjunct Professor, Department of Cognitive Sciences
The University of California, San Diego

Professional Service

a. Editorial

Adhoc reviewer for:

Cell, Neuron, Nature Biotechnology, Nature Neuroscience, eLife, Cell Report, Nature Communications, Neural Development, Biological Psychiatry.

b. Grant, Prize, and Association Committee Service

Adhoc grant reviewer for:

- 2021-2022 External reviewer, Swiss National Science Foundation
2022 External reviewer, US-Israel Binational Science Foundation
2023 External reviewer, Wellcome Trust Early Career Award

Institute evaluation:

- 2023 Advisory committee member
University of Zurich, Institute of Neuropathology

c. Conference organization

- 2024 Session Co-chair, Molecular Psychiatry Meeting

Symposia: Emerging Methods to Study Psychiatric Risk Genes across Time and Space

- 2025 Co-Vice chair, Gordon Research Conference (GRC)
Functional Genomics of Human Brain Development and Disease, GRC
- 2025 Co-chair
Dorris Neuroscience Symposium, Scripps Research
- 2027 Co-chair, Gordon Research Conference (GRC)
Functional Genomics of Human Brain Development and Disease, GRC

d. Honors and Awards

- 2024 Pew Biomedical Scholar
- 2023 Excellence in Scientific Research Leadership Award, Conrad Prebys Foundation
- 2023 Collaborative Innovation Award, Scripps Research
- 2022 '35 Innovators Under 35' by MIT Technology Review
- 2022 Klingenstein-Simons Fellowship Award in Neuroscience
- 2022 Larry L. Hillblom Foundation Start-up Award
- 2022 International Society of Autism Research INSAR Early Career Investigator Award
- 2022 Donald E. and Delia B. Baxter Foundation Young Investigator Award
- 2022 G. Harold and Leila Y. Mathers Foundation Award
- 2022 One Mind Rising Star Award
- 2021 Impetus Award
- 2020 Intersections Science Fellows
- 2020 Presidential Member Award, Genetics Society of America
- 2019 Allison Doupe Fellowship, McKnight Endowment Fund
- 2019 NARSAD Young Investigator Award, Brain and Behavior Research Foundation
- 2018 William F. Milton Award, Harvard University
- 2016 Junior Fellow, Harvard Society of Fellows, Harvard University
- 2016 Kaluza Prize finalist for graduate thesis, American Society of Cell Biology
- 2015 Trainee Professional Development Award, Society for Neuroscience
- 2013 Blackstone Presentation Award, Champalimaud Neuroscience Symposium
- 2012 HHMI International Student Predoctoral Fellowship
- 2011 Women and Science Fellowship, The Rockefeller University
- 2010 Outstanding Research Award, Department of Chemistry, MIT
- 2010 Novartis Fellowship for Research, MIT
- 2009 Lindau Meeting of Nobel Laureates participant, Germany
- 2009 American Chemical Society Fellowship, 239th ACS National Meeting
- 2009 Paul E. Grey Research Fellowship for Undergraduate Research, MIT
- 2007 National Scholarship, Ministry of Education of China
- 2007 L'Oreal Outstanding Women Future Scientist Award, L'Oreal China
- 2004-05 National Championships in Chemistry Olympiad, 37th International Chemistry Olympiad representative of China

Invited Departmental Seminars

2024

- Stanford University, Basic Science & Engineering (BASE) Initiative Seminar Series
- Allen Institute, Allen Institute of Neural Dynamics External Seminar Series

2023

- Karolinska Institute, Departmental seminar at Ming Wai Lau Centre for Reparative Medicine
- Scripps Research, Front Row Lecture
- RIKEN, Departmental seminar at Center for Brain Science, Japan
- COMPASS Pathways, Monthly External Seminar
- Emory University, Department of Human Genetics
- Harvard University, Society of Fellows reunion symposium
- UCSF, Biophysics and chemical biology seminar series
- Genentech, Genomic seminar series
- UCSD, Department of Cognitive Sciences

2022

- University of Virginia, Genomic Sciences Seminar Series
- Imperial College London, Neurogenomics Seminar Series
- Icahn School of Medicine at Mt Sinai, Seaver Autism Center Conference

2021

- UCSD Institute for Genomic Medicine, Genetics, Bioinformatics, and Systems Biology Colloquium
- Caltech, Biology and Biological Engineering Division
- Helmholtz Zentrum München, Departmental seminar, Pioneer Campus, Germany
- UCSD, Department of Bioengineering, Departmental Seminar Series
- UT Southwestern, Department of Molecular Biology, Department of Physiology, and Department of Neuroscience (job talk)
- Baylor College of Medicine, Department of Molecular Biology (job talk)
- UCSF, Gladstone Institute (job talk)
- Yale School of Medicine, Department of Genetics (job talk)
- Scripps Research, Departmental seminar (job talk)
- Wellcome Sanger Institute, Cellular Genetics Seminar, UK (job talk)
- Washington University in St. Louis School of Medicine, Department of Genetics (job talk)
- Harvard Medical School and Massachusetts General Hospital, Center for Genomic Medicine (job talk)

2020

- University of Wisconsin Madison, Departments of Genetics and Neuroscience (job talk)
- Institute of Systems Biology, Departmental seminar (job talk)
- Icahn School of Medicine at Mount Sinai, The Friedman Brain Institute, Departmental seminar (job talk)
- Boston Children's Hospital and Harvard Medical School, Program of Cellular and Molecular Medicine (job talk)
- UCSD, Jack Baskin School of Engineering, Departmental seminar
- Stanford University, Department of Developmental Biology and Department of Genetics (job talk)

- Johns Hopkins School of Medicine, Department of Neuroscience and Kennedy Krieger Institute (job talk)
- Duke University School of Medicine, Department of Cell Biology (job talk)
- Columbia University, Zuckerman Institute (job talk)

2019

- Harvard University, Quantitative Biology Seminar (QBS) series
- University of Alabama at Birmingham, Neurobiology Department Seminar

2018

- UCSF, Neuroscience Formal Seminar

Invited Conference Seminars**2024**

- CSH meeting Neurodegenerative Diseases: Biology & Therapeutics, CSHL, New York
- Advances in Genomic Technology Development Annual meeting, Jackson Lab for Genomic Medicine, Connecticut
- Molecular Psychiatry Meeting, Hawaii
- Translational Psychiatry Meeting, Salk Lake City, Utah
- Advances in Genome Biology and Technology (AGBT), Orlando, Florida

2023

- Developing Brains, Symposium, Karolinska Institute
- 10x Genomics Symposium, San Diego, California
- The 9th Annual BRAIN Initiative meeting, Bethesda, Maryland
- CZI Neurodegenerative Disease Network Challenge annual meeting, San Diego
- Gordon Research Conference: Molecular and Tissue Engineering for Understanding Human Brain in Health and Disease, Ventura, California

2022

- Society for Neuroscience SfN annual meeting, San Diego, California
Minisymposium: High-Throughput Interrogation of Neurons Using Barcoding-Based Strategies
- Boston-California Stem Cell Junior PI meeting, Cambridge, Massachusetts
- UC Irvine Center for Neural Circuit Mapping Conference, California
- GRC: Emerging Technologies to Study Nervous System Development, Function & Neurological Disease, Ventura, California
- GRC: Systemic Processes, Omics Approaches and Biomarkers in Aging, Grand Summit Hotel at Sunday River, Maine
- Japan Neuroscience Annual Meeting (Neuro2022)
- Simons Foundation Autism Research Initiative (SFARI) Investigator meeting, New York
- Molecular Psychiatry, Hawaii

2021

- World Congress of Psychiatric Genetics, International Society of Psychiatric Genetics Scientific Panel: Systems Genomic and Functional Approaches to Psychiatric Disorders (virtual)

- Genomics of Brain Disorders Conference, Wellcome Genome Campus (virtual)
- Virtual Science Day on Psychiatric Disorders, 10x Genomics (virtual)
- INSAR International meeting for Autism Research (virtual)
- Society of Neuroscience SfN Global Connectome (virtual)
- Intersections Science Fellow Symposium (virtual)

2020

- American College of Neuropsychopharmacology (ACNP)
Scientific panel: Systems Genomic and Functional Approaches to Psychiatric Disorders (virtual)
- International Common Disease Alliance (ICDA) Scientific Meeting (virtual)
- NeuroMatch Virtual Conference (virtual)
- NeuroLaunchpad seminar series (virtual)
- Neurotech 2020 Virtual Symposium, MIT (virtual)
- NeuroZoom seminar series (virtual)
- Advance Genomic Technology Development Meeting, NHGRI (virtual)
- Advances in Genome Biology and Technology (AGBT), Marco Island, Florida

2019

- Annual Meeting of the Scientific Advisory Board of Klarman Cell Observatory
- Cell Symposia: single cells-technology to biology, Singapore

Current Trainees**Postdoctoral Fellows (2)**

- | | |
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| 1. Zhilin Wang, Ph.D.
CIRM Postdoctoral Fellow | 2022- |
| 2. Jiwen Li, Ph.D. | 2023- |

Graduate Fellows (6)

- | | |
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| 1. Boli Wu
Mark Pearson Endowed Graduate Fellow | 2022- |
| 2. Patrick Thompson
Dorris Neuroscience Fellow 2023 | 2022- |
| 3. Xinhe Zheng
Dorris Neuroscience Fellow 2022
Frank J. Dixon Graduate Scholar 2023 | 2022- |
| 4. Jill Yuejia Liu
Dorris Neuroscience Fellow 2023 | 2022- |
| 5. Ellie Petty | 2023- |

- 6. Cassandra White**
Skaggs-Oxford Graduate Fellow

2024-

Research Technicians (2)

- 1. Graham Anderson**
2. Grace Clarke

2021-

2022-

Undergraduate Interns (5)

- 1. Abdullah Ashiq**
Ledell Family Research Scholar 2023
UCSD TRELS award 2022
- 2. Isha Desai**
UCSD TRELS award 2023
- 3. Coco Yu**
- 4. Chloe Samouhi**
- 5. Amber Selstad**

2021-

2021-

2024-

2024-

2024-

Former Trainees and Current Positions

Former Undergraduate Interns (4)

- 1. Joshua Park** **2020-2023**
NSF Graduate Research Fellowship
Current Position: Graduate Student, Biological and Biomedical Sciences
Harvard University
- 2. Anjali Srinivasan** **2022-2023**
Current Position: Graduate Student, Bioinformatics and Systems Biology
UCSD
- 3. Catherine Kuo** **2023**
Scripps SURF Summer Research Fellow
- 4. Rebecca Gin** **2021-2022**
Current Position: Undergraduate, UCSD

Former Rotation students (12)

- | | | |
|-----------------|-----------------------------------|------|
| 1. Alex Salazar | Scripps Research Graduate Student | 2021 |
| 2. Chongyang Wu | Scripps Research Graduate Student | 2021 |
| 3. Leyao Shen | Scripps Research Graduate Student | 2022 |
| 4. Zhiyi Li | Scripps Research Graduate Student | 2022 |

5. Nancy Ka Neng Cheong	Scripps Research Graduate Student	2022
6. Qing Zhao	Scripps Research Graduate Student	2022
7. Kiera Fleck	Scripps Research Graduate Student	2023
8. Brook Tran	UCSD Biology	2023
9. Mahdi Shafiei Neyestanak	Scripps Research Graduate Student	2023
10. Rachel Oshiro	UCSD MSTP	2023
11. Anna D McTigue	UCSD Neuroscience	2023
12. Jojo Wu	Scripps Research Graduate Student	2024

Full Bibliography

ORCID ID 0000-0003-2344-992X

Jin lab members in **bold**.

Equal contributions indicated with **hash #**. Corresponding author(s) indicated with **asterisks ***.

1. **Zheng X, Wu B, Liu JY**, Simmons SK, Kim K, **Clark G, Ashiq A, Park J**, Wang Z, Xu X, Levin JZ, **Jin X***. Massively parallel *in vivo* Perturb-seq reveals cell type-specific transcriptional networks in cortical development. *BioRxiv* 2023, DOI: 10.1101/2023.09.18.558077. PMID: 37790302. **Cell** in press.
2. Jokhi V, Domínguez-Iturza N, Kim K, Shetty A.S., Yuan W, Di Bella D, Abbate C, Oyler-Castrillo P, **Jin X**, Simmons SK, Levin J.Z., Brown J.R., Arlotta P. Neuronal-class specific molecular cues drive differential myelination in the neocortex, **BioRxiv** 2024.
3. Pigoni M, Uzquiano A, Paulsen B, Kedaigle A, Yang SM, Symvoulidis P, Adiconis X, Velasco S, Sartore R, Kim K, Tucewicz A, Tsafou K, **Jin X**, Barrett L, Chen F, Boyden E, Regev A, Levin JZ, Arlotta P. Cell-type specific developmental defects in PTEN-mutant cortical organoids converge on abnormal circuit activity. **Human Molecular Genetics**, 2023 ddad107. PMID: 37384417.
4. Li H#, Namburi P#, Olson JM#, Borio M, Lemieux M, Beyeler A, Calhoon GG, Hitora-Imamura N, Libster A, Bal A, **Jin X**, Choudhury SR, Shi X, Felix-Ortiz AC, Fuente V, Page V, King HO, Izadmehr EM, Batra K, Keyes L, Padilla N, McCulloch KM, Wichmann R, Ressler KJ, Fiete I, Zhang F, Tye KM. Neurotensin guides valence-specific plasticity, ensemble dynamics, and behavior. **Nature** 2022; 608, 586–592. PMID: 35859170.
5. Uzquiano A#, Kedaigle A#, Velasco S, Adiconis X, Pigoni M, Paulsen B, Kim K, Tucewicz A, Murray E, **Jin X**, Chen F, Regev A, Levin JZ, Arlotta P. Proper acquisition of cell class identity in organoids allows definition of fate specification programs of the human cerebral cortex. **Cell** 2022;185(20):3770-3788.e27. PMID: 36179669.
6. Kannan S#, Altae-Tran H#, **Jin X**, Madigan V, Oshiro R, Makarova KS, Koonin EV, Zhang F. New Cas13 family enables compact RNA base editors. **Nature Biotechnology**, 40, 194–197 (2022). PMID: 34462587.
7. Segel, M.; Lash, B.; Song, J.; Ladha, A.; Liu, C.C.; **Jin, X.**; Mekhedov, S.; Macrae, R.K.; Koonin, E.V.; Zhang, F. Mammalian retrovirus-like protein PEG10 packages its own mRNA and can be pseudotyped for intercellular mRNA delivery. **Science** 2021; 373, 882-889. PMID: 34413232.
8. Choi S, Zhang B, Ma S, Gonzalez-Celeiro M, Stein D, **Jin X**, Kim S, Kang Y-L, Besnard A, Rezza A, Grisanti L, Buenrostro J, Rendl M, Nahrendorf M, Sahay A, Hsu Y-C. Stress

hormone corticosterone governs hair follicle stem cell quiescence by suppressing a dermal niche activator Gas6. **Nature** 2021; 592:428–432. PMID: 33790465.

9. Qiu M#, Glass Z#, Chen J, Haas M, **Jin X**, Zhao X, Rui X, Ye Z, Li Y, Zhang F, Xu Q. Lipid nanoparticle-mediated delivery of Cas9 mRNA achieves organ-specific *in vivo* genome editing of *Angptl3*. **PNAS** 2021; 118(10): e2020401118. PMID: 33649229.
10. **Jin X***, Simmons S, Guo A, Shetty AS, Ko M, Nguyen L, Robinson E, Oyler P, Curry N, Deangeli G, Lodato S, Levin JZ, Regev A*, Zhang F*, Arlotta P*. *In vivo* Perturb-Seq reveals neuronal and glial abnormalities associated with Autism risk genes. *bioRxiv* doi: <https://doi.org/10.1101/791525>. **Science** 2020; 370 (6520):eaaz6063. PMID: 33243861.

Featured in: Nature Genetics, The Spectrum

11. Allen WE#, Altae-Tran H#, Briggs J#, **Jin X#**, McGee G#, Tedijanto C#, Raghavan R, Shi A, Kamariza M, Nova N, How We Feel Project, Zhang F, Lin X. Population-scale longitudinal mapping of COVID-19 symptoms, behaviour and testing. **Nat Hum Behav** 2020 4, 972-982. PMID: 32848231.
12. Petchsung M, Jantarug K, Pattama A, Aphicho K, Suraritdechachai S, ... **Jin X**, Gootenberg J, Abudayyeh O, Zhang F, Horthongkham N, Uttamapinant C. Clinical validation of a Cas13-based assay for the detection of SARS-CoV-2 RNA. **Nat Biomed Eng** 2020; 38, 870-874. PMID: 32848209.
13. Liu H, Yang W, Wu T, Duan F, Soucy E, **Jin X**, Zhang Y. Cholinergic sensorimotor integration regulates olfactory steering. **Neuron** 2018, 97(2), 390-405. PMID: 29290549.
14. Dennis EJ, Dobosiewicz M, **Jin X**, Duvall LB, Hartman PS, Bargmann CI, Vosshall LB. A natural variant and engineered mutation in a GPCR promote DEET resistance in *C. elegans*. **Nature** 2018; 562:119-23. PMID: 30258230.
15. **Jin X**, Pokala N, Bargmann CI. Distinct Circuits for the Formation and Retrieval of an Imprinted Olfactory Memory. **Cell** 2016; 164(4):632-43. PMID: 26871629.

Featured in: The Scientist, Current Biology, Neuron.

16. Abrahamsson S, Ilic R, Wisniewski J, Mehl B, Yu L, Chen L, Davanco M, Oudjedi L, Fiche J.B., Hajj B, **Jin X**, Pulupa J, Cho C, Mir M, El Beheiry M, Darzacq X, Nollmann M, Dahan M, Wu C, Lionnet T, Liddle JA, Bargmann CI. Multifocus microscopy with precise color multiphase diffractive optics applied in functional neuronal imaging. **Biomedical optics express** 2016; 7(3):855-69. PMCID: PMC4866461.
17. **Jin X#**, Uttamapinant C#, Ting AY. Synthesis of 7-aminocoumarin by Buchwald-Hartwig cross coupling for specific protein labeling in living cells. **ChemBiochem** 2011; 12(1):65-70. PMCID: PMC4857190.
18. Long JZ, LaCava M, **Jin X**, Cravatt BF. An anatomical and temporal portrait of physiological substrates for fatty acid amide hydrolase. **Journal of Lipid Research** 2011; 52(2):337-44. PMCID: PMC3023554.
19. Long JZ, **Jin X**, Adibekian A, Li W, Cravatt BF. Characterization of tunable piperidine and piperazine carbamates as inhibitors of endocannabinoid hydrolases. **Journal of Medicinal Chemistry** 2010; 53(4):1830-42. PMCID: PMC2828288.
20. Long JZ, Nomura DK, Vann RE, Walentiny DM, Booker L, **Jin X**, Burston JJ, Sim-Selley LJ, Lichtman AH, Wiley JL, Cravatt BF. Dual blockade of FAAH and MAGL identifies behavioral

- Mahdi Neyestanak
 - Reilly Mach
 - Hanbing Shen
 - Mia HeeYang Lee
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 - Nicholas Villarino
 - Marco Uytiepo
 - Jared Miller
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 - Ryan Pak
 - Yu Wang
- Ali Torkamani, Scripps
Shannon Miller, Scripps
Li Ye, Scripps
Anton Maximov, Scripps
Chris Parker, Scripps
Ardem Patapoutian, Scripps
Anton Maximov, Scripps
Luke Lairson, Scripps
Pejman Mohammadi, Scripps
Chris Glass & Nicole Coufal, UCSD
Courtney Miller, Scripps-FL
Sam Rodriques, Crick Institute UK
Ardem Patapoutian, Scripps
Li Ye & Ardem Patapoutian, Scripps

Service on External Graduate Thesis Committee

- Michael Florea
- Amy Wagers, Harvard University

External support and patents

Patents:

X Jin, P Arlotta, A Regev, F Zhang, S Simmons. *Methods of in vivo evaluation of gene function*. Provisional US Patent US20210172017A1.

X Jin, X Zheng. *High-content and high-resolution in vivo screen for analyzing gene functions*. Filed 2023/9/8.