Lucas Y. Tian, Ph.D.

NINDS K99 Postdoctoral Associate

Laboratory of Neural Systems

The Rockefeller University

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EDUCATION

2012 - 2019	Ph.D. in Neuroscience, UC San Francisco, CA (Advisor: Michael Brainard)
2007 - 2011	B.A. with Honors in Biology, specializing in Neuroscience, University of Chicago, IL

RESEARCH

2020 - Present — **Postdoctoral Scholar, The Rockefeller University**, New York, NY
Advisor: Winrich Freiwald; Co-advisors: Josh Tenenbaum, Xiao-Jing Wang
Topic: Neural substrates of compositional generalization, in a macaque drawing task.

2019 (May-Dec) — **Visiting Postdoctoral Scholar, MIT**, Cambridge, MA
Advisor: Josh Tenenbaum; Co-advisors: Winrich Freiwald, Xiao-Jing Wang
Topic: Computational modeling of cognition in compositional generalization, in a human drawing task.

2012 - 2019 — **Graduate Student, UCSF**, San Francisco, CA
Advisor: Michael Brainard
Thesis: Neural mechanisms of motor skill flexibility in songbirds (link)

2009 - 2012 — **Research Technician, University of Chicago**, Chicago, IL
Advisor: Doug Bishop
Topic: Molecular genetics of meiotic recombination in baker's yeast.

PEER-REVIEWED PUBLICATIONS

Tian LY, Warren TL, Mehaffey WH, Brainard MS (2023). Dynamic top-down biasing implements rapid adaptive changes to individual movements. *eLife* 12:e83223. Link

Veit L, **Tian LY**, Monroy Hernandez CJ, Brainard MS (2021). Songbirds can learn flexible contextual control over syllable sequencing. *eLife* 10: e61610. Link

Tian LY, Ellis K, Kryven M, Tenenbaum JB (2020). Learning abstract structure for drawing by efficient motor program induction. *Advances in Neural Information Processing Systems*, 33. Link

Tian LY, Brainard MS (2017). Discrete circuits support generalized versus context-specific vocal learning in the songbird. *Neuron* 96, 1-10. Link, Commentary, News

PREPRINTS (UNDER REVIEW)

Tian LY, Garzón KU, Rouse AG, Eldridge MA, Schieber MH, Wang XJ, Tenenbaum JB, Freiwald WA (2025). Neural representation of action symbols in primate frontal cortex. *bioRxiv*. 2025.03.03.641276. Link

Representative presentations:

Poster (SfN 2024): link

Recorded talk (Cosyne 2025): link

FUNDING

2023 - Present	**NINDS K99/R00 Transition to Independence Award**
	Title: Investigating Symbolic Computation in the Brain: Neural Mechanisms of Compositionality (5K99NS131585) (PI: Tian, LY)
	Total Award Amount (including Indirect Costs): $268,542 (2-year K99 phase), $747,000 (3-year R00 phase, estimated, if activated)
2021 - Present	**Simons Foundation SCGB Pilot Award** (*key personnel – contributing co-author*)
	Title: Investigating Symbol-like Reasoning in the Brain: Neural Mechanisms of Compositional Action Planning (876120SPI) (PI: Freiwald, WA)
	Total Award Amount (including Indirect Costs): $770,000
2020 - 2023	**NIH BRAIN F32 NRSA Postdoctoral Fellowship**
	Title: The planning of new compositional action sequences guided by interpretation of ambiguous sensory data in a novel drawing task (F32MH125573) (PI: Tian, LY)
	Total Award Amount: $209,778

AWARDS AND HONORS

National/International

2023	NINDS K99/R00 Transition to Independence Award
2020	NIH BRAIN F32 NRSA Postdoctoral Fellowship
2009	Amgen Scholarship, Caltech (David Anderson lab)
2007	National Merit College-sponsored Scholarship

National/International (finalist)

| 2024 | SPiNES Extramural Postdoctoral Seminar Finalist, NYU |
| 2020 | LSRF Postdoctoral Fellowship Finalist |

Institutional/Regional

2025	Postdoctoral Association Career Development Award, Rockefeller
2016	Graduate Division Travel Award, UCSF
2014	Herbert W. Boyer PIBS Fellowship, UCSF
2011	Outstanding Thesis Award, UChicago (top two students in graduating class)
2011	Top Presentation in Biology, Chicago Area Undergraduate Research Symposium

Travel grants

| 2025 | COSYNE Presenters Travel Grant |

INVITED TALKS (SYMPOSIA)

Topic: Monkeys can learn abstract grammatical rules for action

| 2025 | Kavli Internal Symposium, Rockefeller, New York, USA |

Topic: Neural representation of action symbols in primate frontal cortex

| 2025 | Lipschultz Symposium, Icahn School of Medicine (Mt. Sinai), New York, USA |
| 2025 | The Social Brain Symposium, Rockefeller and Columbia, New York, USA |

Topic: Towards a mechanistic understanding of compositionality: a new macaque experimental paradigm

2023	Kavli Internal Seminar series, Rockefeller, New York, USA
2021	Center for Brains, Minds & Machines, MIT, Cambridge, USA ([Link to recording](#))
2021	Object Cognition Workshop, Yale, New Haven, USA (virtual)
2021	PDA Summer Seminar Series, Rockefeller, New York, USA

Topic: Discrete circuits support generalized versus context-specific vocal learning in the songbird

| 2018 | Birds Bats Brains Meeting, UC Berkeley, USA |
| 2016 | Asilomar Neuroscience Retreat, UC San Francisco, USA |

COMPETITIVELY SELECTED TALKS

2025	COSYNE Main Meeting (top 3% of submissions), Montreal, Canada
	([Link to recording](#))
	Title: Neural substrates of a symbolic action grammar in primate frontal cortex
2024	Ascona Circuits Meeting, Ascona, Switzerland ([Link to slides](#))
	Title: Action grammar components in primate frontal cortex
2020	NeurIPS (top 6% of accepted papers) ([Link to recording](#))
	Title: Learning abstract structure for drawing by efficient motor program induction

INVITED TALKS (LABS)

Topic: Neural representation of action symbols in primate frontal cortex

2025	Princeton, Tim Buschman
2025	NYU, Marcelo Mattar
2025	MIT, Ev Fedorenko
2025	Newcastle University, Stuart Baker (virtual)
2025	NYU, Michael Long

Topic: Towards a mechanistic understanding of compositionality: a new macaque experimental paradigm

2022	UCSF, Michael Brainard
2021	Yale, Ilker Yildirim (virtual)

Topic: Cognitive computational modeling of compositionality in human and macaque drawing

2020	NYU, Brenden Lake and Todd Gureckis (joint, virtual)
2020	MIT, Laura Schulz (virtual)

Topic: Discrete circuits support generalized versus context-specific vocal learning in the songbird

2016	UCSF, John Houde

SELECTED POSTERS

Topic: Structured representation of a symbolic action grammar across primate frontal cortex

2025	Society for the Neural Control of Movement, Panama City, Panama
2024	Society for Neuroscience, Chicago, IL ([Link to poster](#))
2024	Ascona Circuits Meeting, Ascona, Switzerland

Topic: Inter-area interaction encodes context-specific real-time biasing in motor skill learning

2020	COSYNE, Denver, CO

Topic: Discrete circuits support generalized versus context-specific vocal learning in the songbird

2016	Society for Neuroscience, San Diego, CA

SERVICE

2023 - Present	Peer-reviewed for: eLife, Cognitive Science Society, Cognitive Computational Neuroscience
2014 - 2019	Co-organizer, Systems Neuroscience Research in Progress Seminar Series, UCSF
2013 - 2019	Co-organizer, Special Topics Seminar Series, UCSF

MENTORSHIP

Research assistants

2024 - Present	**Daniel Hanuska**, research assistant, Rockefeller
2022 - 2024	**Kedar Garzón Gupta**, research assistant, Rockefeller
	(Current position: Ph.D. Student at Columbia)

Ph.D. rotation students

2024	**Siddhartha Sharma**, Freiwald lab, Rockefeller
2021	**Yanis Tazi**, Freiwald lab, Rockefeller
2018	**Eszter Kish**, Brainard lab, UCSF
2014	**Rachel Care**, Brainard lab, UCSF

Interns and other mentorship

2024 - 2025	**Valerie Calligy**, Shenoy Undergraduate Research Fellow (SURFiN), Simons Foundation, Rockefeller
2024 - 2025	**Xuan Ma**, Bard-Rockefeller intern, Rockefeller
2024	**Daniel Dolnik**, intern, Cornell Tech Master's Program
2024	**Thea Wu**, summer intern (Summer Undergraduate Research Fellowship, SURF), Rockefeller
2022	**Alejandra Urquieta**, summer intern, SURF, Rockefeller
2021	**Sam Coolsaet**, medical intern, Rockefeller
2021	**Alex Gu**, summer intern, SURF, MIT
2017	**Christian Jose Monroy Hernandez**, HHMI Exceptional Research Opportunities Program (EXROP), UCSF (co-mentor: Lena Veit)

OUTREACH

2024 - Present	Mentor, SURFiN, Rockefeller
	Mentee: Valerie Calligy
2021	Mentor, Neuromatch Academy (virtual)
	Mentees: Pulido Arias, Lourdes Baztan Bitopoulos, Joseph Gonzalez, May Xia, Mark Zarutin
2017	Mentor, HHMI EXROP, UCSF
	Mentee: Christian Jose Monroy Hernandez (co-mentor: Lena Veit)
2014	Judge, Synopsys Science and Technology Championship, San Jose, CA
2013	Invited speaker, PITCH, Center for Education Partnerships (CEP), UCSF

2013 - 2014	Mentor, Fairposium at Burton High School, CEP, UCSF

TEACHING

2014	TA, BMS117: Infection & Host Response (Neurophysiology unit), UCSF
2012 - 2013	Scientist-Teacher, Raul Wallenberg High School, Science and Health Education Partnership, UCSF
2012	English Teacher, San Gabriel Kindergarten, Los Nogales, Peru
2010	Teacher, Neuroscience of Illusions, Cascade!, University of Chicago

ADVANCED COURSES

2019	Methods in Computational Neuroscience, Marine Biological Laboratory, MA
2018	Jr. Workshop on Mechanistic Cognitive Neuroscience, Janelia Research Campus, VA
2018	Brains, Minds and Machines, Marine Biological Laboratory, MA
2017	Mining and Modeling of Neuroscience Data, Redwood Center, UC Berkeley, CA

REFERENCES

Winrich Freiwald, Ph.D.

Professor

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Michael Brainard, Ph.D.

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Joshua Tenenbaum, Ph.D.

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