

Christopher A Zimmerman, PhD

Postdoctoral Fellow
Princeton Neuroscience Institute
Princeton University, Princeton, NJ

Office: PNI 184E, 40 Woodlands Way
Email: czimmerman@princeton.edu
Website: <https://cazimmerman.github.io>

EDUCATION

2019 PhD, Neuroscience, University of California San Francisco
2016 MS, Neuroscience, University of California San Francisco
2013 BS, Neuroscience, University of Pittsburgh
2013 BSE, Bioengineering, University of Pittsburgh

POSITIONS

2019– Postdoctoral Fellow, Princeton Neuroscience Institute and HHMI
Advisor: Ilana B Witten, PhD
2013–2019 Graduate Student, UCSF Department of Physiology and HHMI
Advisor: Zachary A Knight, PhD
Thesis: The neural basis of thirst

HONORS AND AWARDS

2023 NIH BRAIN Initiative K99 Advanced Postdoctoral Career Transition Award
2022 McKnight Foundation Allison J Doupe Fellowship
2020 Helen Hay Whitney Foundation Postdoctoral Fellowship
2020 Donald B Lindsley Prize in Behavioral Neuroscience, Society for Neuroscience
2020 Eppendorf and *Science* Prize for Neurobiology, AAAS
2020 Harold M Weintraub Graduate Student Award, Fred Hutchinson Cancer Center
2020 Winter Conference on Brain Research Travel Fellowship
2017 NIH National Research Service Award Predoctoral Fellowship
2016 Genentech Foundation Predoctoral Fellowship
2015 UCSF Discovery Fellowship
2013 NSF Graduate Research Fellowship

PUBLICATIONS

Asterisks (*) denote co-first authors. Daggers (†) denote co-corresponding authors.

Research articles as first or corresponding author

Zimmerman CA, Pan-Vazquez A, Wu B, Keppler EF, Guthman EM, Fetcho RN, Bolkan SS, McMannon B, Lee J, Hoag AT, Lynch LA, Janarthanan SR, López Luna JF, Bondy AG, Falkner AL, Wang SSH, Witten IB. A neural mechanism for learning from delayed postingestive feedback. *bioRxiv*, 2023.

– Selected press: [The Transmitter](#)

Zhukovskaya A, Zimmerman CA[†], Willmore L, Pan-Vazquez A, Janarthanan SR, Lynch LA, Falkner AL, Witten IB[†]. Heightened lateral habenula activity during stress produces brainwide and behavioral substrates of susceptibility. *bioRxiv*, 2023.

Zimmerman CA, Huey EL, Ahn JS, Beutler LR, Tan CL, Kosar S, Bai L, Chen Y, Corpuz TV, Madisen L, Zeng H, Knight ZA. A gut-to-brain signal of fluid osmolarity controls thirst satiation. *Nature* 568, 98–102, 2019.

– Selected press: [UCSF](#), [HHMI](#), [NPR News](#), [Scientific American](#), [Nature Reviews Gastroenterology](#)

Leib DE*, Zimmerman CA*, Poormoghaddam A, Huey EL, Ahn JS, Lin YC, Tan CL, Chen Y, Knight ZA. The forebrain thirst circuit drives drinking through negative reinforcement. *Neuron* 96, 1272–1281, 2017.

Zimmerman CA, Lin YC, Leib DE, Guo L, Huey EL, Daly GE, Chen Y, Knight ZA. Thirst neurons anticipate the homeostatic consequences of eating and drinking. *Nature* 537, 680–684, 2016.

– Selected press: [UCSF](#), [BBC News](#), [Nature Podcast](#), [Nature](#), [Cell](#)

Research articles as contributing author

Cox J[†], Minerva AR, Fleming WT, [Zimmerman CA](#), Hayes C, Zorowitz S, Bandi A, Ornelas S, McMannon B, Parker NF, Witten IB[†]. A neural substrate of sex-dependent modulation of motivation. *Nature Neuroscience* 26, 274–284, 2023.

Bolkan SS*, Stone IR*, Pinto L, Ashwood ZC, Iravedra Garcia JM, Herman AL, Singh P, Bandi A, Cox J, [Zimmerman CA](#), Cho JR, Engelhard B, Pillow JW[†], Witten IB[†]. Opponent control of behavior by dorsomedial striatal pathways depends on task demands and internal state. *Nature Neuroscience* 25, 345–357, 2022.

Tan CL, Cooke EK, Leib DE, Lin YC, Daly GE, [Zimmerman CA](#), Knight ZA. Warm-sensitive neurons that control body temperature. *Cell* 167, 47–59, 2016.

Chen Y, Lin YC, [Zimmerman CA](#), Essner RA, Knight ZA. Hunger neurons drive feeding through a sustained, positive reinforcement signal. *eLife* 5, e18640, 2016.

Luongo FJ, [Zimmerman CA](#), Horn ME, Sohal VS. Correlations between prefrontal neurons form a small world network that optimizes the generation of multineuron sequences of activity. *Journal of Neurophysiology* 115, 2359–2375, 2016.

Review and commentary articles

[Zimmerman CA](#). Neuroscience: Secretin excites the thirst circuit. *Current Biology* 32, R1318–R1320, 2022.

[Zimmerman CA](#). The origins of thirst. *Science* 370, 45–46, 2020.

[Zimmerman CA](#), Knight ZA. Layers of signals that regulate appetite. *Current Opinion in Neurobiology* 64, 79–88, 2020.

[Zimmerman CA](#), Leib DE, Knight ZA. Neural circuits underlying thirst and fluid homeostasis. *Nature Reviews Neuroscience* 18, 459–469, 2017.

Leib DE, [Zimmerman CA](#), Knight ZA. Thirst. *Current Biology* 26, R1260–R1265, 2016.

CONFERENCE AND DEPARTMENTAL TALKS

Johns Hopkins Schizophrenia Center. Baltimore, MD. Jan 2025.

Janelia Conference, Sensory Biology of Ingestion. Ashburn, VA. Nov 2024.

Princeton/Rutgers Conte Center for Understanding Latent Cause Inference. Virtual. May 2024.

Cosyne Conference. Lisbon, Portugal. Mar 2024.

Princeton Neuroscience Institute Retreat. Philadelphia, PA. May 2023.

Helen Hay Whitney Foundation Retreat. Dedham, MA. Nov 2022.

Hellenic Society for Neuroscience Meeting. Virtual. Oct 2021.

Scripps Department of Neuroscience. La Jolla, CA. Sep 2018.

Keystone Symposium, Synapses and Circuits. Santa Fe, NM. Mar 2017.

UCSF Neuroscience Retreat. Pacific Grove, CA. Sep 2016.

UCSF Diabetes and Obesity Retreat. Santa Cruz, CA. Sep 2015.

CONFERENCE POSTERS

Howard Hughes Medical Institute Science Meeting. Ashburn, VA. Oct 2024.

Society for Neuroscience Meeting. Washington, DC. Nov 2023.

Lake Conference, Neural Coding and Dynamics. Seattle, WA. Sep 2023.

Winter Conference on Brain Research. Snowbird, UT. Jan 2023.

Gordon Research Conference, Optogenetics. Newry, ME. Jul 2022.

Winter Conference on Brain Research. Big Sky, MT. Jan 2020. Poster Award.

Gordon Research Conference, Neuromodulation. Les Diablerets, Switzerland. May 2019.

Howard Hughes Medical Institute Science Meeting. Chevy Chase, MD. Dec 2018.

Cold Spring Harbor Meeting, Neuronal Circuits. Laurel Hollow, NY. Apr 2018.

Keystone Symposium, Synapses and Circuits. Santa Fe, NM. Mar 2017.

Society for Neuroscience Meeting. San Diego, CA. Nov 2016.

TEACHING AND MENTORSHIP

2021–2022 Princeton Neuroscience Institute Undergraduate Junior Tutorial Course Instructor
2021–2022 Princeton Neuroscience Institute Graduate Student Bootcamp Course Instructor
2021 Neuromatch Academy Computational Neuroscience Course Mentor
2021– Trainee Supervision in the Witten Lab: 4 PhD Rotations, 3 Technicians, 2 Undergraduates
2020–2023 Princeton Neuroscience Institute Graduate Student Journal Club Course Instructor
2019 UCSF Science and Health Education Partnership Teaching Volunteer
2015 UCSF School of Dentistry Cell Physiology Course Teaching Assistant
2014–2019 Trainee Supervision in the Knight Lab: 4 PhD Rotations, 3 Technicians, 1 Undergraduate

PROFESSIONAL SERVICE

2024 Princeton Neuroscience Institute TigerBrain Extramural Postdoc Symposium Co-organizer
2024 ERC Consolidator Grant Reviewer
2023–2024 Cosyne Conference Reviewer
2022–2023 Princeton Neuroscience Institute Seminar Host
2021–2022 Princeton Neuroscience Institute Seminar Series Committee
2021– Journal Peer Review: *Nature*, *Current Biology*, *Current Opinion in Neurobiology*, *PLOS One*, *Science Advances*, *Scientific Reports*, *STAR Protocols*
2018 UCSF Neuroscience Graduate Program Recruitment Speaker
2014–2017 UCSF Neuroscience Graduate Program Recruitment Host

PRESS AND MEDIA

The Transmitter, [‘It must be something I ate’ is hard-wired into the brain](#). Mar 2024.
Cosyne Conference, [Cosyne Main Meeting talk recording \(Session 3: Learning\)](#). Mar 2024.
Scientific American, [Your body has a clever way to detect how much water to drink](#). Sep 2022.
SfN Press Release, [Society for Neuroscience presents 2020 Lindsley Prize](#). Oct 2020.
Naked Neuroscience Podcast, [How does thirst work in the brain?](#). Oct 2020.
Inverse, [Scientists discover the origin of thirst in the brain](#). Oct 2020.
Eppendorf Press Release, [Research on thirst wins 2020 Eppendorf and Science Prize](#). Oct 2020.
AAAS Press Release, [Real-time signals from body to brain help regulate sensation of thirst](#). Oct 2020.
Fred Hutch Press Release, [Fred Hutch announces 2020 Weintraub Award recipients](#). Mar 2020.
Nature Reviews Gastroenterology & Hepatology, [A thirst-quenching gut–brain signal](#). Apr 2019.
NHLBI Press Highlight, [Your gut controls your thirst and keeps your brain informed](#). Mar 2019.
Inscopix, [A gut check tells the brain about thirst](#). Mar 2019.
NPR News, [Blech! Brain science explains why you’re not thirsty for salt water](#). Mar 2019.
HHMI Press Release, [Thirst controlled by signal from the gut](#). Mar 2019.
UCSF Press Release, [Had enough water? Brain’s thirst centers make a gut check](#). Mar 2019.
Cell, [Firing up in anticipation](#). Nov 2016.
Nature, [Forecast for water balance](#). Sep 2016.
Nature Podcast, [Scientists quench a decades-old question about thirst](#). Aug 2016.
STAT News, [Thirsty? Your brain knows before you do](#). Aug 2016.
BBC News, [Brain’s thirst circuit ‘monitors the mouth’](#). Aug 2016.
UCSF Press Release, [New understanding of thirst emerges from brain study](#). Aug 2016.