Hannah L. Payne | Curriculum Vitae

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EDUCATION

2018 **Stanford University, Stanford, CA**
Ph.D. in Neurosciences

2011 **Dartmouth College, Hanover, NH**
B.A. in Engineering Sciences and Neuroscience

EMPLOYMENT AND RESEARCH EXPERIENCE

2026 – present **Assistant professor, New York University College of Arts & Science**
Center for Neural Science & Department of Psychology

2023 – 2025 **Associate research scientist, Columbia University, Zuckerman Mind Brain Behavior Institute**

2018 – 2023 **Postdoctoral research scientist, Columbia University, Zuckerman Mind Brain Behavior Institute**
Advisor: Dr. Dmitriy Aronov
- Discovered key features of neural activity in avian hippocampus: place cells, sharp wave ripples, and remote activation of place codes by gaze.
- Developed miniaturized silicon probe recording and real-time gaze tracking systems in birds.

2011 – 2018 **Graduate student, Stanford University**
Advisor: Dr. Jennifer Raymond; Co-advisor: Dr. Mark Goldman, University of California, Davis
Thesis: Neural activity patterns for motor control and motor learning
- Investigated the learned cerebellar control of eye movements using *in vivo e*lectrophysiology, optogenetic stimulation, and biophysical modeling.
- Developed magnetic eye tracking technique in mice.

2013 – 2015 **Collaboration with the lab of Dr. Michale Fee, MIT**
Modeled synaptic plasticity underlying neural sequence formation during vocal learning in songbirds.

2009 – 2010 **Research Assistant, Harvard Medical School**
Advisor: Dr. Chinfei Chen. Synaptic remodeling at the retinogeniculate synapse during development.

2009 – 2010 **Research Assistant, Dartmouth College**
Advisor: Dr. David Bucci. Role of the postsubiculum in contextual fear conditioning.

2010 **Research assistant, Dartmouth College**
Advisor: P. Jack Hoopes. MRI-coupled fluorescence tomography images of brain tumors.

2008 **Research Assistant, Dartmouth College**
Advisor: Dr. Fabio Pellacini. Algorithms for high dynamic range imaging.

2006 – 2007 **Research Assistant, Partners for the Future Program, Cold Spring Harbor Laboratory**
Advisor: Dr. Hollis Cline. Development of the tadpole visual system.

GRANTS, HONORS, AND AWARDS

2023 **NIH Pathway to Independence Award (K99-EY034700)** *Processing of visual information by spatial memory circuits in food-caching birds*

2019 **Helen Hay Whitney Foundation postdoctoral research fellowship**

2016 **NIH R21-EY026152** (co-author): A technique for measuring eye movements in small and/or freely moving animals.

2015 – 2017 **Diversifying Academia, Recruiting Excellence (DARE) Fellowship**, Stanford University

2013 – 2018 **Mind, Brain, and Computation Institute Trainee**, Stanford University

2012 – 2015 **NSF Graduate Research Fellowship DGE-114747**

2010 **Goldwater Scholarship**, awarded to 300 undergraduates nationwide pursuing careers in science.

2009 **James O. Freedman Presidential Scholarship**, Dartmouth College

PUBLICATIONS

1. **Payne HL**, Aronov D. (2025). Remote activation of place codes by gaze in a highly visual animal. *Nature*.
2. **Payne HL**, Raymond JL, Goldman MR. (2024). Interactions between circuit architecture & plasticity in closed loop systems. *eLife*.
3. **Payne HL**, Lynch GF, Aronov D. (2021). Neural representations of space in the hippocampus of a food-caching bird. *Science*.
4. **Payne HL,** French RL, Guo CC, Nguyen-Vu TDB, Manninen T, Raymond JL**.** (2019). Cerebellar Purkinje cells control movement with a rapid rate code that is invariant to spike regularity. *eLife*.
5. **Payne HL**, Raymond JL. *(2017).* Magnetic eye tracking in mice*. eLife.*
6. Suvrathan AS, **Payne HL**, Raymond JL. (2016). Timing rules for synaptic plasticity matched to behavioral function. *Neuron.*
7. Okubo T, Mackevicius EL, **Payne HL**, Fee MS. (2015). Growth and splitting of neural sequences in songbird vocal development. *Nature.*
8. Kimpo RR*, Rinaldi JM*, Kim CK*, **Payne HL***, & Raymond JL. (2013). Gating of neural error signals during motor learning. *eLife.* ***Equal contribution.***
9. Demas JA, **Payne HL**, Cline HT. (2011). Vision drives correlated activity without patterned spontaneous activity in developing Xenopus retina. *Devel Neurobio*.
10. Davis SC, Samkoe KS, O'Hara JA, Gibbs-Strauss SL, **Payne HL**, Hoopes PJ, Paulsen KD, Pogue BW. (2010). MRI-coupled fluorescence tomography quantifies EGFR activity in brain tumors. *Academic Radiology.*

CONFERENCE ABSTRACTS

Payne HL, Aronov D (2024). *BRAIN Initiative Conference*. Local and remote spatial codes in the avian hippocampus during active vision. *Scholar Spotlight honorable mention

Payne HL, Aronov D (2023). *SfN Abstracts.* A neural code linking place and gaze in freely moving birds.

Payne HL, Aronov D (2023). *Cosyne Abstracts.* Neural representations of visual deliberation in the avian hippocampus.

Payne HL, Aronov D (2022). *SfN Abstracts.* Neural representations of physical and visual space in the avian hippocampus.

Payne HL, Aronov D (2022). *Gordon Research Conference, Neurobiology of Cognition.* Neural representations of physical and visual space in the avian hippocampus.

Payne HL, Aronov D (2019). *SfN Abstracts.* Neural representations of place in the avian hippocampus.

Payne HL, Li R, Guo CC, Raymond JL. (2016) *SfN Abstracts.* The fine temporal structure of neural spike trains impacts motor behavior.

Payne HL, Raymond JL, Goldman MS. (2016) *Cosyne Abstracts.* Interactions between circuit architecture and plasticity in a closed-loop system.

Payne HL, Raymond JL. (2015). *SfN Abstracts.* Inhibition of Purkinje cell firing induces motor learning.

Payne HL, Goldman MS, Raymond JL. (2013). *SfN Abstracts.* Cerebellar Purkinje cells exhibit rapid plasticity during motor learning.

Payne HL, Bucci DJ, Robinson S. (2010). *SfN Abstracts.* Lesions of the postsubiculum impair fear conditioning.

Demas J, **Payne HL**, Cline HT. (2007). *SfN Abstracts.* The structure of retinal ganglion cell activity in the Xenopus tadpole.

LECTURES

2026	Planned - iNav, invited speaker
2025	Spring Hippocampal Research Conference, Verona, Italy
2025	NYU, Advances in Neuroscience: Did dreams come true? A meeting in honor of Yadin Dudai.
2024	SfN Nanosymposium. Place cells are activated by remote gaze in a highly visual animal.
2024	Invited speaker, Conference of the International Graduate School of Neuroscience at Ruhr University, Bochum, Germany
2024	Invited speaker, St Olaf College, Northfield, MN

2024	Invited speaker, Sainsbury Welcomme Centre, Emerging Neuroscientists Seminar Series, London, UK
2023	Invited speaker, Bernstein Conference, satellite workshop "Behavior across the tree of life", Berlin, Germany
2023	Invited speaker, NYU SPiNES (Seminars by Postdocs in Neuroscience: Extramural Series), New York, NY
2023	Invited speaker, Boston University, Brain, Behavior & Cognition Seminar, Boston, MA
2023	Invited speaker, McGill University, Neurobiology and Behavior Seminar, Canada
2022	Columbia University, Hippocampus Club
2022	Invited speaker, Future of Foraging, Food caching theme (virtual)
2021	Invited speaker, WWNeuRise, Navigation theme (virtual)
2020	Invited speaker, Cambridge NeuroTech Neural Probe Techniques (virtual)
2020	Columbia University, Zuckerman Institute Postdoctoral Seminar
2019	Columbia University, Cerebellum Club
2014, 2016	Stanford University, Mind, Brain, and Computation introductory session
2014	Invited speaker, U.C. Davis, Computational Neuroscience Seminar, Davis, CA

TEACHING

2023	Guest lecturer, BRAINYAC program journal club, Columbia University
2022	Guest lecturer, *Neurobiology* course, Swarthmore College
2016	Guest lecturer, Stanford University, *Computational neuroscience* course for new graduate students
2015	Teaching assistant, *Methods in Computational Neuroscience*, Marine Biological Laboratory, Woods Hole, MA
2012	Co-instructor*, Introduction to MATLAB for the Biosciences*, Stanford University (student-run course)
2011	Teaching assistant, engineering lab section for *Systems engineering*, Dartmouth College
2011	Teaching assistant, engineering lab section for *Distributed systems and fields*, Dartmouth College
2008	Course assistant, *Neurobiology*, Marine Biological Laboratory, Woods Hole, MA

ADDITIONAL TRAINING

2023	BRAINYAC mentor training by Dr. Dana Crawford, Columbia University
2015	Semester-long course *Science and engineering course design*, Stanford University
2015	*Navigating the Academic Profession* training course, Diversifying Academia, Recruiting Excellence (DARE) fellowship program, Stanford University
2013	*Methods in Computational Neuroscience*, Marine Biological Laboratory, Woods Hole, MA

LEADERSHIP AND OUTREACH

2023 – 2024	**Mentor for summer research through Brain Research Apprenticeships in New York at Columbia (BRAINYAC) program** for high-school students in groups historically excluded from STEM careers.
2014 – 2016	**Mentor for undergraduate research, Raymond Lab, Stanford University**
2012	**Mentor for Stanford Biosciences Student Association peer mentorship program**
2011 – 2015	**Attended Gender Issues in Neuroscience discussion series, Stanford University**
2011 – 2015	**Brain Day volunteer, East Palo Alto, CA.** Led brain demonstration for middle school classes
2007 – 2011	**President, editor-in-chief, writer**; **Dartmouth Undergraduate Journal of Science, Dartmouth College** Organized writing, editing, online & print publication, symposium with liquid nitrogen ice cream demo.
2008 – 2011	**Mentor for Peer Academic Link, Dartmouth College**

MEMBERSHIPS

2010 – present	Society for Neuroscience
2011	Phi Beta Kappa Honor Society
2010	Tau Beta Pi Engineering Honor Society

SERVICE

2025	Ad hoc reviewer, Nature Communications
2025	Ad hoc reviewer, German Research Foundation (Deutsche Forschungsgemeinschaft)
2024-2025	COSYNE Program Committee
2023	Abstract reviewer, COSYNE
2023	Ad hoc reviewer, *Scientific Reports*