Weston Fleming, Ph.D.

Postdoctoral scientist, HHMI, University of Washington
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Education

2015 – 2022	Princeton University Ph.D. in Neuroscience.
2014	Duke University B.S. in Neuroscience, Graduation with Distinction

Research positions

2022 – Present	Postdoctoral scientist, laboratories of Drs. Garret Stuber and Richard Palmiter, HHMI & University of Washington.
2015 – 2022	Graduate student, laboratory of Dr. Ilana Witten, Princeton University
2013 – 2014	Undergraduate research assistant, laboratory of Dr. Cynthia Kuhn, Duke University

Honors & awards

2017 – 2022	NSF Graduate Research Fellowship
2017	Sigma Xi Research Honor Society nomination
2013	Duke Neuroscience Program of Research Fellow
2010 – 2014	Kids' Chance of South Carolina Scholar
2010	Byrd Scholar
2010	Carolina Scholar, University of South Carolina

Teaching experience

2017	Teaching assistant - Introduction to Neuroscience, NEURO 175. Princeton University.
2016	Teaching assistant - Introduction to Neuroscience. NEURO 201. Princeton University.

Publications

Simon, R.C., **Fleming, W.T.**, Briones, B.A., Trzeciak, M., Senthilkumar, P., Ishii, K.K., Hjort, M.M., Martin, M.M., Hashikawa, K., Sanders, A.D., Golden, S.A., Stuber, G.S. Opioid-driven disruption of the septum reveals a role for neurotensin-expressing neurons in withdrawal. *Neuron*. 2025.

Minakuhi, T., Guthman, E.M., Acharya, P., Hinson, J., **Fleming, W.**, Witten, I.B., Oline, S.O., Falkner, A.L. Independent inhibitory control mechanisms for aggressive motivation and action. *Nature Neuroscience*. 2024.

Cox, J., Minerva, A., **Fleming, W.**, Zimmerman, C. A., Hayes, C., Bandi, A., Ornelas, S., Parker, N.F., Witten, I.B. A neural substrate of sex-dependent modulation of motivation. *Nature Neuroscience*. 2023.

Fleming, W., Lee, J., Briones, B., Bolkan, S., Witten, I.B. Cholinergic interneurons modulate cocaine extinction through shared plasticity mechanisms across medium spiny neuron subtypes. *Cell Reports*. 2022.

Briones, B.A., Pitcher, M.*, **Fleming, W.***, Libby, A., Diethorn, E., Haye, A.E., MacDowell, C. J., Zych, A.D., Waters, R.C., Buschman, T.J., Witten, I.B., Gould, E. Increased perineuronal nets surrounding paravalbumin interneurons in the dorsomedial striatum are associated with excessive repetitive behaviors. *Biological Psychiatry Global Open Science*. 2022.

Fleming, W.*, Jewell, S.*, Engehlard, B., Witten, D.M., Witten, I.B. Inferring spikes from calcium imaging in dopamine neurons. *PLOS One*. 2021.

Choi, J.Y., Jang, H.J., Ornelas, S., **Fleming, W.**, Fürth, D., Au, J., Bandi, A., Engel, E.A., Witten, I.B. A comparison of dopaminergic and cholinergic populations reveals unique contributions of VTA dopamine neurons to short-term memory. *Cell Reports*. 2020.

Cai, L.X., Pizano, K., Gundersen, G.W., Hayes, C.L., **Fleming, W.**, Holt, S., Cox, J.M., Witten, I.B. Distinct signals in medial and lateral VTA dopamine neurons modulate fear extinction at different times. *eLife*. 2020.

Engelhard B., Finkelstein J., Cox J., **Fleming W.**, Koay S.A., Thiberge S., Tank D.W., Witten I.B. Specialized and spatially organized coding of sensory, motor, and cognitive variables in midbrain dopamine neurons. *Nature*. 2019.

Fleming W., Jones Q., Chandra U., Saini A., Walker Q.D., Francis R., Ocampo G., Kuhn, C. Withdrawal from brief repeated alcohol treatment in adolescent and adult male and female rats. *Alcoholism Clinical & Experimental Research*. 2019.

Pre-prints

Fleming, W., Pauli, J.L., Ishii K.K.., Trzeciak, M., Burke, C.T., Park, S., Gordon, A.G., Zweifel, L.S., Palmiter, R. D., Stuber, G.S. A cholinergic eligibility trace facilitates amygdala plasticity in flavour avoidance learning. *bioRxiv*. 2026.

Invited talks

A cholinergic eligibility trace facilitates amygdala plasticity in flavour avoidance learning. UW NAPE Center Seminar Series. Seattle, WA. USA. 2026.

Parabrachial cholinergic neurons solve the temporal credit assignment problem in postingestive learning. CoNECTOME 2026. Seattle, WA. USA. 2026.

A role for central amygdala acetylcholine in conditioned taste aversion. Gordon Research Conference – Amygdala Function in Emotion, Cognition, and Disease. Barcelona, Spain. 2025.

A role for central amygdala acetylcholine in conditioned taste aversion. Conference on Stress, Pain, Emotion, Addiction, and Reward. Friday Harbor, WA. USA. 2025.

Inferring spikes from calcium imaging data. UW NAPE Center Computing Group. 2022.

Regulation of behavior and plasticity by cholinergic interneurons. Princeton Neuroscience Institute In-house Seminar. Princeton, NJ. USA. 2021.

Regulation of behavior and plasticity by cholinergic interneurons. UW Center for Excellence in Neurobiology of Addiction, Pain, and Emotion Seminar. Remote. USA. 2021.

Regulation of behavior and plasticity by cholinergic interneurons. Princeton Neuroscience Graduate Research Seminar. Princeton, NJ. USA. 2020.

Cholinergic interneurons mediate cell type-specific and non-specific plasticity onto nucleus accumbens medium spiny neurons. Gordon Research Seminar on Modulation of Neural Circuits and Behavior. Les Diablerets, Switzerland. 2019.

Conference abstracts

Fleming, W., Pauli, J., Ishii, K., Trzeciak, M., Palmiter, R., Stuber, G. A role for central amygdala acetylcholine conditioned taste aversion. CoNECTOME. 2026.

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Fleming, W., Pauli, J., Ishii, K., Trzeciak, M., Palmiter, R., Stuber, G. A role for central amygdala acetylcholine conditioned taste aversion. UW NAPE Symposium. 2026.

Fleming, W., Pauli, J., Ishii, K., Trzeciak, M., Palmiter, R., Stuber, G. A role for central amygdala acetylcholine conditioned taste aversion. HHMI Science Meeting. 2026.

Fleming, W., Pauli, J., Ishii, K., Trzeciak, M., Palmiter, R., Stuber, G. A role for central amygdala acetylcholine conditioned taste aversion. Gordon Research Conference – Amygdala Function in Emotion, Cognition, and Disease. 2025.

Fleming, W.*, Jewell, S.*, Engelhard, B., Witten, D.M., Witten, I.B. Inferring spikes from calcium imaging in dopamine neurons. ViDA 2021.

Fleming, W.*, Jewell, S.*, Engelhard, B., Witten, D.M., Witten, I.B. Accurate spike inference in dopamine neurons based on calcium fluorescence. ViDA 2020.

Fleming, W., Lee J., Witten I.B. Cholinergic interneurons mediate cell type-specific and non-specific plasticity onto nucleus accumbens medium spiny neurons. Gordon Research Conference on Modulation of Neural Circuits and Behavior. 2019.

Fleming W., Lee J., Witten I.B. Cell type-specific and non-specific mechanisms of cholinergic interneuron-mediated plasticity onto MSNs. Society for Neuroscience. 2018.

References

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Professor of Biostatistics and Statistics, University of Washington
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