

- Education**
- 2008 Stanford University
 - **Ph.D. in neuroscience**
 - 2002 Princeton University
 - **A.B. in physics, magna cum laude** (certificate in biophysics)
- Honors & Awards**
- 2015-2019 NIH R01 (from NIMH)
 - 2014-2016 McKnight Scholars Award in Neuroscience
 - 2014-2016 Co-PI on BRAIN Initiative U01
 - 2014-2015 NARSAD Young Investigator Grant
 - 2014 Award from Essig and Enright '82 Innovation Fund
 - 2013-2017 Pew Scholarship in the Biomedical Sciences
 - 2013-2015 Alfred P. Sloan Research Fellowship
 - 2012-2017 NIH Director's New Innovator Award
 - 2009-2012 Helen Hay Whitney Foundation Postdoctoral Fellowship
 - 2008 Swartz Travel Fellowship for CoSyNe 2008
 - 2003-2006 National Science Foundation Graduate Research Fellowship
 - 2002 Allen G. Shenstone prize in physics
 - 2002 High honors awarded by the Princeton Department of Physics
 - 2002 Sigma Xi Research Honor Society nomination
 - 2000 Lucent Technology Prize of the Princeton Department of Physics
 - 1998 Edward J. Bloustein Scholarship
- Research positions**
- 2012-present. *Assistant Professor*, Princeton Neuroscience Institute and Department of Psychology, Princeton University. Circuit-level analysis of learning and decision making.
- 2008-2012. *Postdoctoral Scholar*, Bioengineering laboratory of Professor Karl Deisseroth, Stanford University. Dopaminergic and cholinergic modulation of learning and motivated behavior.
- 2003-2008. *Graduate Student*, Neuroscience laboratory of Professor Eric Knudsen, Stanford University. Identification of neural computations underlying the representation of a complex auditory scene.
- Publications**
- Dissociated sequential activity and stimulus encoding in striatal neurons during spatial working memory. Akhlaghpour H, Wiskerke J, Choi JY, Taliaferro J, Au J, **Witten IB**. *eLife*. 2016; 10.7554/eLife.19507.
- Linking cholinergic interneurons, synaptic plasticity, and behavior during the extinction of a cocaine-context association. Lee J*, Finkelstein J*, Choi JY, **Witten IB**. *Neuron*. 2016 May 18.
- Reward and choice encoding in terminals of midbrain dopamine neurons depends on striatal target. Parker NF, Cameron C, Taliaferro J, Choi JY, Lee J, Davidson T, Daw ND, **Witten IB**. *Nature Neuroscience*. 2016 Apr 25. doi: 10.1038/nn.4287.
- Gaining on reward prediction errors. Parker NF, **Witten IB**. *Nature Neuroscience*. 2016 Feb 23;19(3):418-9. doi: 10.1038/nn.4246.
- Segregated cholinergic transmission modulates dopamine neurons integrated into distinct functional circuits. Dautan D, Souza AS, Huerta-Ocampo I, Valencia

M, Assous M, **Witten IB**, Deisseroth K, Tepper JM, Bolam JP, Gerdjikov TV, Mena-Segovia J. *Nature Neuroscience*. Jun 27 2016. doi: 10.1038/nn.4335.

Wiring and molecular features of molecular ensembles representing distinct experiences. Ye L, Allen WE, Thompson KR, Tian Q, Hsueh B, Ramakrishnan C, Wang AC, Jennings JH, Adhikari A, Halpern CH, **Witten IB**, Barth AL, Luo L, McNab JA, Deisseroth K. *Cell*. 2016 May 25.

Coordination of brainwide activity by dopamine neurons. Decot HK, Namboodiri VM, Gao W, McHenry JA, Jennings JH, Lee SH, Kantak PA, Jill Kao YC, Das M, **Witten IB**, Deisseroth K, Shih YI, Stuber GD. *Neuropsychopharmacology*. 2016 Sep 14. doi: 10.1038/npp.2016.151.

Mesolimbic dopamine dynamically tracks, and is causally linked to, discrete aspects of value-based decision making. Saddoris MP, Sugam JA, Stuber GD, **Witten IB**, Deisseroth K, Carelli RM. *Biol Psychiatry*. 2015 May 15;77(10):903-11. doi: 10.1016/j.biopsych.2014.10.024. Epub 2014 Nov 13.

Optical suppression of drug-evoked phasic dopamine release. McCutcheon JE, Cone JJ, Sinon CG, Fortin SM, Kantak PA, **Witten IB**, Deisseroth K, Stuber GD, Roitman MF. *Front Neural Circuits*. 2014 Sep 17;8:114. doi: 10.3389/fncir.2014.00114. eCollection 2014.

Positive reinforcement mediated by midbrain dopamine neurons requires d1 and d2 receptor activation in the nucleus accumbens. Steinberg EE, Boivin JR, Saunders BT, **Witten IB**, Deisseroth K, Janak PH. *PLoS One*. 2014 Apr 14;9(4):e94771. doi: 10.1371/journal.pone.0094771.

A major external source of cholinergic innervation of the striatum and nucleus accumbens originates in the brainstem. Dautan D, Huerta-Ocampo I, **Witten IB**, Deisseroth K, Bolam JP, Gerdjikov T, Mena-Segovia J. *J Neurosci*. 2014 Mar 26;34(13):4509-18. doi: 10.1523/JNEUROSCI.5071-13.2014.

Steinberg EE, Keiflin R, Boivin JR, **Witten IB**, Deisseroth K, Janak PH. A causal link between prediction errors, dopamine neurons, and learning. *Nature Neuroscience*. 2013 May 26. doi: 10.1038/nn.3413.

Tye KM, Mirzabekov JJ, Warden MR, Ferenczi EA, Tsai HC, Finkelstein J, Kim SY, Adhikari A, Thompson KR, Andalman AS, Gunaydin LA, **Witten IB**, Deisseroth K. Dopamine neurons modulate neural encoding and expression of depression-related behavior. *Nature*. 2013 Jan 24;493(7433):537-41.

DePuy SD, Stornetta RL, Bochorishvili G, Deisseroth K, **Witten IB**, Coates M, Guyenet PG. Glutamatergic neurotransmission between the C1 neurons and the parasympathetic preganglionic neurons of the dorsal motor nucleus of the vagus. *J Neurosci*. 2013 Jan 23;33(4):1486-97.

Witten IB*, Steinberg E*, Lee SY, Davidson TJ, Zalocusky KA, Brodsky M, Yizhar O, Cho SL, Gong S, Ramakrishnan C, Stuber GD, Tye K, Janak P, Deisseroth K. Recombinase-driver rat lines: tools, techniques, and optogenetic application to dopamine-mediated reinforcement. *Neuron*. 2011 Dec 8;72(5):721-33.

Anikeeva P*, Andalman AS*, **Witten IB**, Warden MR, Goshen I, Grosenick L, Gunaydin LA, Frank LM, Deisseroth K. Optetrode: a multichannel readout for optogenetic control in freely moving mice. *Nature Neuroscience*. 2011 Dec 4. doi: 10.1038/nn.2992.

Witten IB*, Lin S*, Brodsky M*, Prakash R*, Diester I, Anikeeva P, Gradinaru V, Ramakrishnan C, Deisseroth K. Cholinergic interneurons control local circuit activity and cocaine conditioning. *Science*. 2010. 330(6011):1677-81.

Witten IB, Knudsen PF, Knudsen EI. A dominance hierarchy of auditory spatial cues in barn owls. *PLoS ONE*. 2010; 5(4): e10396.

Witten IB, Knudsen EI, Sompolinsky H. A Hebbian learning rule mediates asymmetric plasticity in aligning sensory representations. *Journal of*

Neurophysiology. 2008; 100(2): 1067-79.

Witten IB*, Bergan JF*, Knudsen EI. Dynamic shifts in the owl's auditory space map predict moving sound location. *Nature Neuroscience*. 2006; 9(11):1439-45.

Witten IB, Knudsen EI. Why seeing is believing: merging auditory and visual worlds. *Neuron*. 2005; 48(3):489-96.

**Selected
Invited Talks**

McKnight Conference. Aspen, CO. June 2017.

Neuroscience seminar. UC Davis. San Francisco, CA. May 2017.

Pew Conference. Santa Barbara, CA. May 2017.

Gladstone Institute at UCSF. San Francisco, CA. Apr 2017.

Neuroscience seminar. Harvard University. Apr 2017.

Neuroscience seminar. Columbia University. Apr 2017.

Psychology seminar. Cornell University. Feb 2017.

Neuroscience seminar. U Chicago. Feb 2017.

Neuroscience seminar. NYU. Jan 2017.

NIMH Intramural Research Program. Washington, DC. Nov 2017.

Penn Center for Cognitive Neuroscience seminar. U Penn. Nov 2016.

NIDA Intramural Research Program. Baltimore, MD. Nov 2016.

Knudsen Festschrift Symposium. Stanford, CA. Sept 2016.

Symposium speaker at Dopamine 2016. Vienna, Austria. Sept 2016.

Speaker at Optogenetics GRC. Snowbird, ME. July 2016.

Psychology seminar. Rutgers University. May 2016.

Workshop speaker. Cosyne 2016. Feb 2016.

Department of Neurobiology seminar. Weizmann Institute. Jan 2016.

Keynote speaker at ELSC annual retreat. Hebrew University. Jan 2016.

Panel speaker. ACNP 2015 annual conference. Dec 2015.

Neuroscience seminar. Jenalia Farms Research Campus. July 2015.

RLDM2015. Edmonton, CA. June 2015.

Neuroscience seminar. Rockefeller. June 2015.

Behavior, Genetics, and Neuroscience @ Yale. New Haven. Mar 2015.

Rutgers-Princeton Neuroscience Seminar Series. Rutgers. Mar 2015.

2014 Genetics Society. Royal Society, London. Dec 2014.

Neuroscience seminar. CSHL. Dec 2014.

FENS 2014. Milan, Italy. June 2014.

Rat genetics: focus on reward related behaviors. Minisymposium. SfN. San Diego. Nov 2013.

Optogenetics & Chemogenetics. Short Course. SfN. San Diego. Nov 2013.

Department of Neurobiology (Temple). Jan 2013.

Winter Conference in Brain Research. Breckenridge, CO. Jan 2013.

The 10th International Catecholamine Symposium. Monterey, CA. Sept 2012.

Cell Biology of Addiction (CSHL) Barcelona, Spain. August 2012.

National Institute of Drug Abuse (NIDA) Baltimore, MD, June 2012.

Society of Biological Psychiatry. Philadelphia, PA. May 2012.

Cell Biology of Addiction (CSHL) CSH, NY. August 2011.

Department of Biology. (Caltech) Pasadena, CA. March 2011.

Princeton Neuroscience Institute. (Princeton) Princeton, NJ. March 2011.

Departments of Biology & Physics. (Columbia) New York, NY. March 2011.

Department of Cellular & Molecular Physiology. (Yale) New Haven, CT. Feb

2011.
Keck Center & Department of Otolaryngology (UCSF) San Francisco, CA. Feb 2011.
Neuroscience Department (Columbia Medical School) New York, New York. Feb 2011.
Neurobiology Department (Northwestern) Evanston, IL. Feb 2011.
Department of Biology (Stanford) Stanford, CA. Jan 2011.
Department of Biological Sciences (Carnegie Mellon) Pittsburgh, PA. Jan 2011.
McGovern Institute (MIT). Cambridge, MA. Jan 2011.
Departments of Neurobiology & Organismal Biology and Anatomy (U Chicago). Chicago, IL. Dec 2010.
Mathematical Biology Institute, Workshop on Neural Development (Ohio State University). Columbus, OH. April 2009.
Ear Club (UC Berkeley). Berkeley, CA. Feb 2009.
Redwood Center for Theoretical Neuroscience (UC Berkeley). Berkeley, CA. March 2008.
Keck Center (UCSF). San Francisco, CA. March 2008.
 Spotlight Presentation at *Computational and Systems Neuroscience* (CoSyNe). Salt Lake City, UT. Feb 2008.

Advanced Coursework Methods in Computational Neuroscience (MBL). Woods Hole, MA. Aug 2005.

Teaching

2015-	Principles of Neuroscience (NEU 201/PSY258). Princeton.
2012-	From Molecules to Mind (501A/B). Princeton.
2012, 2013	Cellular and Systems Neuroscience (NEU408). Princeton.
2015, 2016	Neurotechnologies for the analysis of neural dynamics (NAND). Princeton.
2012, 2013.	Biophysics and Computation in Neurons and Network. Princeton.
2006, 2008	Mathematical Tools in Neuroscience (NBIO 218). Stanford.
2005	Computational Neuroscience (NENS 220). Stanford.

Service to Princeton

2016-	Faculty co-organizer of the PNI retreat
2015-	Participant in lecture series for PNI summer outreach program
2015-	Chair of committee to oversee PNI virus core
2014-	Member of committee to select CV Starr candidates
2014-	Member of committee to organize PSY colloquium series
2014-2015	Member of committee to select under-represented minorities for the PNI undergraduate summer program
2012-	Member of committee for PNI graduate student admissions
2014	Member of committee to update PNI graduate student curriculum
2013	Member of committee to select molecular equipment for PNI
2013	Oral presentation for the PSY Graduate Student Reunion

Service to community

2016-2017	Program Co-chair for Cosyne 2017.
2014	Program committee member for Cosyne 2014.

Ivana B. Witten

609.258.8143 iwitten@princeton.edu

2014-2015 Reviewer for BRAIN Initiative Study sections.
2013 Ad-hoc reviewer for NIH study section (Molecular
Neuropharmacology & Signaling).
2012 Reviewer for Cosyne 2012.

**Thesis
students**

Undergraduate students: Joshua Taliaferro '15 (CBE), Michelle Park '16 (PSY),
Hee Jae Jang '17 (PHY), Jennifer Au '17 (MOL), Duc Nguyen '17 (PSY).

Graduate students: Hessam Akhlaghpour (PNI), Nathan Parker (PNI), Joel
Finkelstein (PNI), Lili Cai (PNI), Clare Choi (PSY).

Committee member for the following graduate students: Miriam Bocarsly '12
(PSY), Ann Duan '15 (PNI), Maya Opendak '15 (PSY), Gary Kane (PSY), Kevin
Miller (PNI), Tom Pisano (MOL).