

David J. Freedman, Ph.D.

Assistant Professor, Department of Neurobiology at The University of Chicago
Member, Graduate Programs in Neurobiology and Computational Neuroscience, and
Center for Integrative Neuroscience and Neuroengineering Research



Contact Information

The University of Chicago
Department of Neurobiology
947 E. 58th St. MC-0928, Abbott 310
Chicago, IL 60637
voice: 773-834-5186
dfreedman@uchicago.edu
<http://www.freedmanlab.org>

Education

1997-2002 Ph.D. in Systems Neuroscience, Massachusetts Institute of Technology (MIT)
1993-1997 B.A. in Brain and Cognitive Sciences, University of Rochester

Current Positions

2008- Assistant Professor, Department of Neurobiology, The University of Chicago

Past Positions

2003-2008 Postdoctoral Research Fellow, Laboratory of John Assad at Harvard Medical School
2002-2003 Postdoctoral Associate, Laboratory of Earl K. Miller at MIT
1997-2002 Graduate Student, Laboratory of Earl K. Miller at MIT
1996-1997 Research Assistant, Laboratories of Walter Makous and David R. Williams at U Rochester

Honors, Awards and Fellowships

2013 Elected to the International Neuropsychological Symposium
2013 University of Chicago Distinguished Junior Investigator Award in Biomedical Sciences
2012 McKnight Scholar Award
2010 Sloan Research Fellowship
2010 National Science Foundation CAREER Award
2008 Brain Research Foundation Fay/Frank Award
2006 King Trust and Charles H. Hood Foundation Postdoctoral Fellowship
2006 Edward R. and Anne G. Lefler Center Postdoctoral Fellowship (declined)
2005 Eli Lilly Society for Neuroscience Chapters Postdoctoral Travel Fellowship Award
2003 NIH Kirschstein National Research Service Award Individual Postdoctoral Fellowship
2002 Outstanding Ph.D. Thesis Award, Department of Brain and Cognitive Sciences, MIT
1999 Lucille P. Markey Charitable Trust Fellowship Award
1997 Cum Laude, University of Rochester

Currently Funded Grants

Federal

2009-2014 NIH R01, EY019041 (NEI), Role: PI
Direct costs: ~\$225,000/year
2010-2015 NIH R01, CRCNS MH092927 (NIMH), Role: Co-PI with Xiao-Jing Wang (Yale University)

2010-2015 Direct costs: ~\$100,000/year
NSF CAREER Award 0955640, Role: PI
Direct costs: ~\$125,000/year
2012-2014 Predoctoral NRSA F30 MH097428 (NIMH) to my graduate student Arup Sarma
Direct costs: ~\$42,000/year

Private

2012-2015 McKnight Scholar Award
Direct costs: \$225,000 total
2012-2013 Brain Research Foundation Fay/Frank Seed Grant
Direct costs: \$40,000 total
2010-2014 Sloan Research Fellowship, Role: PI
Direct costs: \$100,000 total

Completed Grants

Federal

2010-2012 NIH R03, NS067322 (NINDS), Role: PI
Direct costs: \$50,000/year

Private

2010-2011 Brain Research Foundation Fay/Frank Seed Grant
Direct costs: \$40,000 total
2008-2009 Brain Research Foundation Fay/Frank Seed Grant
Direct costs: \$25,000 total

Editorships and Editorial Boards

2010- Associate Editor, Frontiers in Perception Science

Current Teaching (University of Chicago)

2013 Neurobiology in Paris, primary lecturer
2011- BIOS 24208, Survey of Systems Neuroscience, graduate (several lectures)
2010- BIOS 25126, Animal Models of Human Disease, undergraduate (one lecture/year)
2009- BIOS 24205, Systems Neuroscience, undergraduate
Primary instructor and course organizer
2009- U of Chicago, Psychiatry Residency Program (one lecture/year)

Past Teaching

2010 U of Chicago, Medical Neurobiology (Medical School), several lectures
2009-2011 U of Chicago, CPNS 33100 Computational Neuroscience 2 (graduate), several lectures
1998-2000 MIT: Teaching Assistant: Introduction to Psychology (prof. Steven Pinker), Brain and Behavior Laboratory (prof. Earl Miller), Introduction to Neuroanatomy (prof. Mandar Jog).
1995-1997 University of Rochester: Teaching Assistant: Sensation and Perception (prof. David Williams), Mammalian Anatomy and Physiology (prof. Alan Dietsche).

Ad Hoc Reviewer

Animal Cognition, Cerebral Cortex, Cognitive Affective and Behavioral Neuroscience, COSYNE, Current Biology, European Journal of Neuroscience, Experimental Brain Research, Faculty of 1000, Frontiers in Systems Neuroscience, Hippocampus, Journal of Experimental Psychology, Journal of Neurophysiology,

Journal of Neuroscience, Learning and Memory, PLoS, PNAS, Nature Neuroscience, Neural Computation, Neuron, Science, Psychological Science, Vision Research

Study Sections and Grant Review Service

Biotechnology and Biological Sciences Research Council (ad hoc), European Research Council (ad hoc), Flanders Research Council (ad hoc), National Science Foundation (ad hoc), University of Leuven Research Council (ad hoc), Wellcome Trust (ad hoc)

Academic Committees and Service

2013-	University of Chicago, Neuroscience Graduate Admissions Committee, Chair
2012-2013	University of Chicago, Dept. of Psychology, cognition search committee
2011-2013	Computational and Systems Neuroscience Conference (COSYNE), Program Committee
2011-	U of Chicago, Undergraduate Neuroscience (NEURO) Club, Faculty Advisor
2011-2013	Chicago Chapter, Society for Neuroscience, Councilor
2011-	U of Chicago, Undergraduate Neuroscience Major Committee
2010	Gordon Conference in The Neurobiology of Cognition, Social Activities Chair
2009-2011	U of Chicago, Neurobiology Faculty Search Committee
2009-	U of Chicago, Neuroscience Website Committee, Chair
2009-	U of Chicago, Animal Resources Advisory Committee
2009-2013	U of Chicago, Executive Committee, Committee on Neurobiology
2009-	U of Chicago, Executive Committee, Committee on Computational Neuroscience
2008-2009	U of Chicago, Neurobiology and Computational Neuroscience Admissions Committee
2008-	U of Chicago, Neurobiology Faculty Chalk Seminar Series, organizer
2008-2011	U of Chicago, Neurobiology, Student Preliminary and Awards Committee
2006-2007	Harvard, Graduate student rotation supervisor, mentorship of first year graduate students
2000-2003	MIT, UROP supervisor, mentorship of MIT undergraduate research assistants
1998-1999	MIT, Chair and coordinator, Brain Lunch seminar series

Professional Memberships

Chicago Chapter of the Society for Neuroscience, Society for Neuroscience, American Physiological Society, Association for Psychological Science

Peer-Reviewed Publications (N = 15)

Swaminathan S.K.*, Masse N.Y.*, and **Freedman D.J.** A comparison of lateral and medial intraparietal areas during a visual categorization task. *Journal of Neuroscience*, 33:13157-13170, 2013.

Rishel C.A., Huang G., and **Freedman D.J.** Independent category and spatial encoding in parietal cortex. *Neuron*, 77: 969-979, 2013.

Fitzgerald J.K., **Freedman D.J.**, Fanini A., Bennur S., Gold J.I., and Assad J.A. Biased associative representations in parietal cortex. *Neuron*, 77: 180-191, 2013.

Asaad W.F., Santhanam N., McClellan S.M., and **Freedman D.J.** High-performance execution of psychophysical tasks with complex visual stimuli in MATLAB. *Journal of Neurophysiology*, 109: 249-260, 2013.

Swaminathan S.K. and **Freedman D.J.** Preferential encoding of visual categories in parietal cortex compared to prefrontal cortex. *Nature Neuroscience*, 15: 315-320, 2012.

Fitzgerald J.K., **Freedman D.J.**, and Assad J.A. Generalized Associative Representations in Parietal Cortex. *Nature Neuroscience*, 14: 1075-1079, 2011.

Freedman D.J. and Assad J.A. Distinct Encoding of Spatial and Non-Spatial Factors in Parietal Cortex. *Journal of Neuroscience*, 29: 5671-5680, 2009.

Meyers E.M., **Freedman D.J.**, Krieman G., Miller E.K., Poggio T. Dynamic population coding of category information in inferior temporal and prefrontal cortex. *Journal of Neurophysiology*, 100: 1407-1419, 2008.

Freedman D.J. and Assad J.A. Experience-Dependent Representation of Visual Categories in Parietal Cortex. *Nature*, 443: 85-88, 2006.

Freedman D.J., Riesenhuber M., Poggio T., and Miller E.K. Experience-Dependent Sharpening of Visual Shape Selectivity in Inferior Temporal Cortex. *Cerebral Cortex*, 16: 1631-1644, 2006.

Freedman D.J., Riesenhuber M., Poggio T., and Miller E.K. A Comparison of Primate Prefrontal and Inferior Temporal Cortices During Visual Categorization. *Journal of Neuroscience*, 23: 5235-5246, 2003.

Nieder A., **Freedman D.J.**, and Miller E.K. Representation of the Quantity of Visual Items in the Primate Prefrontal Cortex. *Science*, 297: 1708-1711, 2002.

Knoblich U., **Freedman D.J.**, and Riesenhuber M. Categorization in IT and PFC: Model and Experiments. *AI Memo*, 2002-007, Artificial Intelligence Lab, Massachusetts Institute of Technology, 2002.

Freedman D.J., Riesenhuber M., Poggio T., and Miller E.K. Visual Categorization and the Primate Prefrontal Cortex: Neurophysiology and Behavior. *Journal of Neurophysiology*, 88: 914-928, 2002.

Freedman D.J., Riesenhuber M., Poggio T., Miller E.K. Categorical Representation of Visual Stimuli in the Primate Prefrontal Cortex. *Science*, 291: 312-316, 2001.

Reviews, Book Chapters, and Commentary (N = 8)

Fitzgerald J.K., Swaminathan S.K., and **Freedman D.J.** Visual categorization and the Parietal Cortex. *Frontiers in Integrative Neuroscience*, 6: 18, 2012.

Freedman D.J. Familiarity Breeds Plasticity: Distinct Effects of Experience on Putative Excitatory and Inhibitory Neurons in Inferior Temporal Cortex. *Neuron*, 74: 8-11, 2012.

Freedman D.J. and Assad J.A. A Proposed Common Neural Mechanisms for Categorization and Perceptual Decisions. *Nature Neuroscience*, 14:143-146, 2011.

Freedman D.J. Visual Categorization: Physiological Mechanisms. In: *The Sage Encyclopedia of Perception*. Goldstein B.E. (ed.). Sage Publications, 2010.

Freedman D.J. Neuronal Mechanisms of Visual Categorization and Category Learning. In: *The Neuroscience of Rule-Guided Behavior*. Wallis J.D. and Bunge S. (eds.). Oxford University Press, pp 391-418, 2007.

Freedman D.J. Posterior Parietal Cortex: Space...and Beyond. *Neuron*, 42: 881-883, 2004.

Miller E.K., Nieder A., **Freedman D.J.**, and Wallis J.D. Neural Correlates of Categories and Concepts. *Current Opinion in Neurobiology*, 13:2:198-203, 2003.

Miller E.K., **Freedman D.J.**, and Wallis J.D. The Prefrontal Cortex: Categories, Concepts, and Cognition. *Philosophical Transactions of the Royal Society London: Biological Sciences*, 357: 1123-1136, 2002.

Invited Talks and Symposia (N = 62)

2013

Caltech, Computation and Neural Systems Seminar, Pasadena, CA. January.

Catholic University of Leuven, Lab for Neuro and Psychophysiology, Leuven, Belgium. February.

Université Paris Descartes, Institut Neurosciences Cognition Seminar, Paris, France. March
Michigan State University, Dept of Psychology, Cognitive Forum. Lansing, MI. April
University of Iowa, Behavioral and Cognitive Neuroscience Seminar, Iowa City, IA. May
University of Pennsylvania, Vision Colloquium Seminar. Philadelphia, PA. May
University of Chicago, Undergraduate NEURO Seminar. Chicago, IL. June

2012

Brain Research Foundation/Chicago Neuroscience Day, Chicago, IL. January.
Stanford University, Neuro-innovation & Translational Neuroscience Institute Seminar, Palo Alto, CA. Feb.
Computational and Systems Neuroscience (COSYNE) Meeting Workshop Chair, Salt Lake City, UT. Feb.
Perceptual Expertise Network Meeting, Invited Seminar, Chicago, IL. April.
Université Paris Descartes, Symposium on Decision Making, Invited speaker. Paris, France. June.
Columbia University, Department of Neuroscience Seminar, New York, NY. June.
Evolution and Function of Consciousness Symposium, University du Quebec a Montreal, Canada. July.
Carnegie Mellon, Center for the Neural Basis of Cognition, Pittsburgh, PA. December.

2011

Boston University, CELEST Science of Learning Seminar. Boston, MA. February.
University of Oregon, Department of Psychology Seminar. Eugene, OR. February.
Society for Neuroscience Chicago Chapter, Systems Neuroscience Symposium. Chicago, IL. March.
Champalimaud Foundation Neuroscience Program, Invited Lectures. Lisbon, Portugal. May.
International Neuropsychological Symposium, Mondsee, Austria. June.
Summer Institute of Cognitive Neuroscience, U California Santa Barbara, June. (declined)
University of Illinois at Chicago, Department of Psychology Seminar. Chicago, IL. August.
Collaborative Research in Computational Neuroscience, Princeton University, October.
Society for Neuroscience, Chair of Category Representations Nanosymposium. Washington, DC, Nov.

2010

Champalimaud Foundation Neuroscience Program, Invited Lectures. Lisbon, Portugal. April.
University of California Berkeley, Department of Psychology Seminar, Berkeley, CA. May.
AREADNE Conference, Santorini Island, Greece. June.
Gordon Research Conference, Neurobiology of Cognition, Waterville Valley, NH. August.
U of Western Ontario, Dept. of Physiology and Pharmacology Seminar, London, Ontario. September.
McGill University, Montreal Neurological Institute, Killam Lecture, Montreal, Quebec. October.
Georgetown University. Department of Neuroscience Seminar. Washington, DC. November.

2009

Computational and Systems Neuroscience Meeting Workshop, Salt Lake City, UT. March.
Johns Hopkins University, Zanvyl Krieger Mind/Brain Institute Bodian Seminar, March.
University of Minnesota, Department of Neuroscience Seminar, Minneapolis, MN. September.
Society for Neuroscience, Minisymposium on Non-Spatial Functions of Parietal Cortex, October.

2008

National Institute of Mental Health, Bethesda, MD. February.
The University of Chicago, Biopsychology Seminar Series, Chicago, IL. April.
Society for Neuroscience, Chair of Decision and Response Selection Session. Washington, DC, Nov.
Catholic University of Leuven, Symposium on Parietal Cortex, Leuven, Belgium. December.

2007

Washington University, Department of Anatomy and Neurobiology, St. Louis, MO. January.
University of Chicago, Department of Neurobiology, Chicago, IL. February.
Yale School of Medicine, Department of Neurobiology, New Haven, CT. February.
OIST Workshop on Cognitive Neurobiology, Okinawa, Japan. March.
Vanderbilt University, Institute of Imaging Science, Nashville, TN. April.
Brigham and Women's Hospital, Visual Attention Lab, Cambridge, MA. November.

2006

Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA, April.
Experimental Psychology Society, Symposium on Categorical Perception. Plymouth, UK. July.
University of Glasgow, Department of Psychology. Glasgow, Scotland, UK. October.

2005

MIT, NIH-Conte Center for Detection and Recognition of Objects in Visual Cortex, September.
Harvard Medical School, Department of Neurobiology, Boston, MA, December.

2004

Harvard University, Department of Psychology, Cambridge, MA. February.
Johns Hopkins, Zanvyl Krieger Mind/Brain Institute, Baltimore, MD. March.
Johns Hopkins, Department of Psychological and Brain Sciences, Baltimore, MD. May.
MIT, NIH-Conte Center for Detection and Recognition of Objects in Visual Cortex, September.

2003

Cognitive Neuroscience of Category Learning Symposium. New York, NY. September.

2002

Harvard Medical School, Department of Neurobiology, Boston, MA. May.
National Institute of Mental Health, Bethesda, MD. May.

2001

MIT, Center for Biological and Computational Learning, Object Recognition Workshop. January.
Brown University Brain Science Program, March.
MIT, The Picower Center for Learning and Memory Retreat, Kennebunkport, ME. June.
RIKEN Brain Sciences Institute, Tokyo, Japan, October.

2000

MIT, The Picower Center for Learning and Memory Retreat, Ogunquit, ME. June.

Supervision of Students and Postdoctoral Researchers

2001-2003	Michelle Machon, MIT undergraduate
2006-2008	Jamie Fitzgerald, Harvard Ph.D. graduate student in neurobiology Currently: Postdoctoral Fellow, Rockefeller University
2008-	Sruthi Swaminathan, U of Chicago Ph.D. graduate student in neurobiology Currently: Postdoctoral Fellow in my laboratory
2008-2012	Christopher Rishel, U of Chicago, M.D./Ph.D. student in computational neuroscience Currently: Medical student at U of Chicago Pritzker School of Medicine
2008	Richard Williams, U of Chicago rotation graduate student in computational neuroscience
2008	Jared Clemens, U of Pittsburgh, summer student
2008-	Steve McClellan, Reed College, summer student
2008	Ryan Walters, U of Chicago, rotation graduate student in neurobiology

2008	Etienne Manderscheid, U of Chicago, rotation student in computational neuroscience
2009	Yelena Grinberg, U of Chicago, rotation student in neurobiology
2009-	Guilhem Ibos, U of Chicago, postdoctoral scholar
2009-	Jillian McKee, U of Chicago, Ph.D. student in computational neuroscience
2009-	Arup Sarma, U of Chicago, Ph.D. student in computational neuroscience
2009-2010	Patrick Stinson, U of Chicago, undergraduate research assistant
2009-2010	Gang Huang, U of Chicago, undergraduate research assistant
2010	Adam Stevenson, U of Chicago undergraduate research assistant
2011-	Jonathan Hodnefield, U of Chicago undergraduate research assistant
2011	Arjun Venkataswamy, U of Chicago summer research technician
2011-	Jared Clemens, U of Chicago Ph.D. graduate student in computational neuroscience
2011-	Nicolas Masse, U of Chicago postdoctoral scholar
2012-	Alex Gonzalez, U of Chicago Ph.D. graduate student in neurobiology
2012-	Maimon Rose, U of Chicago undergraduate research assistant

Service on Ph.D. Thesis Committees

Adam Dickey, The University of Chicago, Graduate Program in Computational Neuroscience, 2009-11
 Yang Sun, The University of Chicago, Graduate Program in Integrative Neuroscience, 2010-11
 Luke Woloszyn, Brown University, Graduate Program in Neuroscience, 2011-2012
 Tim Brawn, The University of Chicago, Graduate Program in Psychology, 2012-
 Alex Rajan, The University of Chicago, Graduate Program in Computational Neuroscience, 2012-
 Jah Chaisangmongkon, Yale University Medical School, Program in Neuroscience, 2012-
 Justin Lieber, The University of Chicago, Graduate Program in Computational Neuroscience 2013-
 Doreen Rhee, The University of Chicago, Graduate Program in Neurobiology, 2013-