

## Curriculum Vitae

### Earl K. Miller

Picower Professor of Neuroscience  
The Picower Institute for Learning and Memory and  
Department of Brain and Cognitive Sciences at the  
Massachusetts Institute of Technology

#### Contact information

Massachusetts Institute of Technology  
77 Massachusetts Avenue  
Cambridge, MA 02139  
secretary: 617-252-1790  
ekmiller@mit.edu www.earlkmiller.org

#### Date of Birth

30 November 1962, Columbus, OH USA

#### Education

1990 Ph.D. in Psychology and Neuroscience, Princeton University  
1987 M.A. in Psychology and Neuroscience, Princeton University  
1985 B.A. with honors in Psychology, Kent State University

#### Current Positions

2003 Picower Professor of Neuroscience, The Picower Institute for Learning and Memory and  
Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology  
2008 Director of Graduate Studies in Brain and Cognitive Sciences, Massachusetts Institute of  
Technology  
2010 Adjunct Professor, Department of Cognitive and Neural Systems, Boston University  
2010 Visiting Scholar, Department of Molecular and Cell Biology, Harvard University  
2011 Adjunct Professor, Center for Computational Neuroscience and Neural Technology,  
Boston University  
2014 Chief Scientific Officer, SplitSage

#### Past Positions

2009-2011 Co-Director, Center of Excellence for Learning in Education, Science, and Technology,  
National Science Foundation Science of Learning Center  
2001-2009 Associate Director, The Picower Institute for Learning and Memory, Massachusetts  
Institute of Technology  
2002-2009 Director (Thrust 5), Center of Excellence for Learning in Education, Science, and  
Technology, National Science Foundation Science of Learning Center  
1999-2008 Investigator, RIKEN-MIT Neuroscience Research Center  
2002-2003 Professor of Neuroscience, The Picower Center for Learning and Memory and  
Department of Brain and Cognitive Sciences, Massachusetts Institute of Technology  
1999-2002 Associate Professor of Neuroscience, Department of Brain and Cognitive Sciences,  
Massachusetts Institute of Technology  
2000-2006 Director of Graduate Studies in Brain and Cognitive Sciences, Massachusetts Institute of  
Technology  
1996-1999 Associate Member, Center for Learning and Memory, Massachusetts Institute of  
Technology  
1995-1999 Assistant Professor of Neuroscience, Department of Brain and Cognitive Sciences,  
Massachusetts Institute of Technology

1990-1995 Intramural Research Fellow, Laboratory of Neuropsychology, National Institute of Mental Health  
 1989-1990 Lecturer, Princeton University  
 1985-1990 Research Assistant, Princeton University  
 1985-1989 Assistant in Instruction, Princeton University  
 1983-1985 Research Assistant, Kent State University

## Awards and Honors

2017 Elected to the American Academy of Arts and Sciences  
 2016 Goldman-Rakic Prize for Outstanding Achievement in Cognitive Neuroscience  
 2016 Commencement Address, Kent State University  
 2016 Elected to the Memory Disorders Research Society  
 2015 Professional Achievement Award, Kent State University Alumni Association  
 2014 Amar G. Bose Research Fellow  
 2013 Distinguished Member, National Society of Collegiate Scholars  
 2011 Biomed Distinguished Lecturer, University of Leuven  
 2010 MERIT Award, National Institute of Mental Health  
 2009 A.J. Carlson Memorial Lecture, University of Chicago  
 2008 "An Integrative Theory of Prefrontal Cortex Function" (Miller and Cohen, 2001) designated a *Current Classic* by Thomson Scientific as among the most cited papers in the field of Neuroscience and Behavior  
 2007 Mathilde Soloway Award in the Neurosciences  
 2007 Jeffrey Lecture in Cognitive Neuroscience, UCLA  
 2006 Elected to the International Neuropsychological Symposium  
 2006 Grass Lecture, University of Illinois  
 2005 Fellow, American Association for the Advancement of Science  
 2004 Fred Attneave Memorial Lecture, University of Oregon  
 2003 Picower Professorship (endowed chair)  
 2002 Elected to the International Society for Behavioral Neuroscience  
 2000 Society for Neuroscience Young Investigator Award  
 2000 National Academy of Sciences Troland Research Award  
 1999 Class of 1956 Career Development Professorship (endowed chair)  
 1998 John Merck Scholar Award  
 1996 Pew Scholar Award  
 1996 McKnight Scholar Award  
 1996 Whitehall Foundation Fellowship  
 1996 Alfred P. Sloan Research Fellow  
 1987 National Research Service Award Predoctoral Fellowship  
 1986 National Institutes of Health Predoctoral Training Fellowship  
 1985 Graduate *summa cum laude* with honors, Kent State University  
 1985 Phi Beta Kappa

## Editorships and Editorial Boards

2017 Editorial Board, *Current Opinion in Behavioral Sciences*  
 2016 Senior Editor, *Oxford Research Encyclopedia of Neuroscience*  
 2016 Editorial Board, *Annual Review of Psychology*  
 2011 Advisory Editorial Board, *Trends in Cognitive Science*  
 2010 Co-Editor, *Cognitive Neuroscience 2010*, *Current Opinion in Neurobiology*  
 2010 Editorial Board, *Neural Systems & Circuits*  
 2010 Editorial Board, *Neuroscience Research*  
 2009 Co-Editor, *Experimental Brain Research*  
 2008 Reviewing Editor, *Frontiers in Systems Neuroscience*  
 2006 Senior Editor, *Journal of Neuroscience*  
 2005 Reviewing Editor, *Journal of Neuroscience*  
 2004 Associate Editor, *New Encyclopedia of Neuroscience*

2003 Action Editor, *Journal of Cognitive Neuroscience*  
2002 Editorial Board, Cognitive Sciences, MIT Press  
2002 Editorial Board, *Journal of Neurophysiology*  
2001 Consulting Editor, *Behavioral Neuroscience*  
2000 Editorial Board, *Neuron*  
2000 Editorial Board, *Cognitive, Affective, and Behavioral Neuroscience*

### **Committees, Advisory Boards, Consultant Work, Etc.**

2015 Scientific Advisory Board, Motimatic  
2012 Scientific Advisory Board, Thync  
2011 Society for Neuroscience Committee on Animals in Research  
2011 Advisory Council, International Association for the Study of Attention and Performance  
2010 Consultant, BBN Technologies  
2010 Advisory Panel, Research Domain Criteria Project, National Institute of Mental Health  
2010 College of CSR Reviewers, National Institutes of Health  
2010 Consultant, Shire Pharmaceuticals  
2010 Selection Committee, Eppendorf and Science Prize for Neurobiology  
2009 Advisory Board, National Institutes of Health Program Project, Yale University  
2008 National Institute of Neurological Disorders and Stroke Advisory Panel for Basic Research  
  
2006 Scientific Advisory Board, Nielsen Neuroscience.  
2006 Scientific Advisory Board, Polimetrica, Inc  
2005 National Institutes of Health Cognitive Neuroscience study section  
2005 National Institute of Mental Health Workshop on Social Neuroscience  
2004 College of Reviewers for Canada Research Chairs  
2003 Working Group on Interspecific Chimeric Brains, Phoebe R. Berman Bioethics Institute, Johns Hopkins University  
  
2003 Advisory Council, Department of Psychology, Princeton University  
2002 Advisory Board, International Centre for Research on the Biology of Memory, Norwegian Research Council  
  
1999 Advisory Council of the International Association for the Study of Attention and Performance  
  
1997 Steering Committee, Boston Area Neuroscience Group

### **Patents**

Method and Apparatus Accounting for Independent Cognitive Capacities in the Right vs Left Half of Vision  
United States Patent Application 61/492,877 (Filed June 3, 2011)  
Inventors: Earl K. Miller and Timothy J. Buschman

### **Publications**

1. Pinotsis, D. Brincat, S.L., and Miller, E.K. "On memories, neural ensembles and mental flexibility" *NeuroImage*, in press.
2. Jia, N., Brincat, S.L., Salazar-Gomez, A., Panko, M., Guenther, F. and Miller, E.K. "Decoding of intended saccade direction in an oculomotor brain-computer interface." *Journal of Neural Engineering*, 2017. <https://doi.org/10.1088/1741-2552/aa5a3e>
3. Antzoulatos, E.G. and Miller, E.K. "Synchronous beta rhythms of frontoparietal networks support only behaviorally relevant representations." *eLife*, 2016;10.7554/eLife.17822
4. Stanley, D.A., Roy, J.E., Aoi, M.C., Kopell, N.J., and Miller, E.K. "Low-beta oscillations turn up the gain during category judgments." *Cerebral Cortex*, 2016. doi: 10.1093/cercor/bhw356
5. Stokes, M., Buschman, T.J., and Miller, E.K. "Dynamic coding for flexible cognitive control." *The Wiley Handbook of Cognitive Control*, The Wiley Handbook of Cognitive Control, Edited by Tobias

Egner, John Wiley & Sons, 2017(Chichester, West Sussex, UK).

6. Brincat, S.L. and Miller, E.K. "Prefrontal networks shift from external to internal modes during learning" *Journal of Neuroscience*. 36(37): 9739-9754, 2016 doi: 10.1523/JNEUROSCI.0274-16.2016.
7. Pinotsis, DA. Loonis, R. Bastos, A. Miller, EK. and Friston, KJ "Bayesian modelling of induced responses and neuronal rhythms" *Brain Topography*, in press.
8. Lunqvist, M., Rose, J., Herman, P, Brincat, S.L, Buschman, T.J., and Miller, E.K. "Gamma and beta bursts underlie working memory" *Neuron*, published online March 17, 2016.
9. Fusi, S., Miller, E.K., and Rigotti, M. "Why Neurons Mix: High Dimensionality for Higher Cognition" *Current Opinion in Neurobiology*, 37:66-74, 2016.
10. Widge, A.S., Zorowitz, S., Link, K., Miller, E.K., Deckersbach, T., Eskandar, E.N., and Dougherty, D.D. "Ventral Capsule/Ventral Striatum Deep Brain Stimulation Does Not Consistently Diminish Occipital Cross-Frequency Coupling" *Biological Psychiatry*, Dec 18, 2015
11. Kornblith, S., Buschman, T.J., and Miller, E.K. "Stimulus load and oscillatory activity in higher cortex." *Cerebral Cortex*, 2015. Published online August 18, 2015 doi: 10.1093/cercor/bhv182
12. Siegel, M., Buschman, T.J., and Miller, E.K. "Cortical information flow during flexible sensorimotor decisions." *Science*, 19 June 2015: 1352-1355.
13. Brincat, S.L. and Miller, E.K. "Frequency-specific hippocampal-prefrontal interactions during associative learning." *Nature Neuroscience*, 2015. Published online 23 Feb 2015 doi:10.1038/nn.3954
14. Miller, E.K. and Buschman, T.J. "Working memory capacity: Limits on the bandwidth of cognition". *Daedalus*, Vol. 144, No. 1, Pages 112-122, 2015.
15. McKee, J., Riesenhuber, M., Miller, E.K., and Freedman, D.J. "Task dependence of visual and category representations in prefrontal and inferior temporal cortices". *Journal of Neuroscience*, 34(48): 16065-16075, 2014; doi: 10.1523/JNEUROSCI.1660-14.2014
16. Buschman TJ, Miller EK. "Goal-direction and top-down control". *Philos Trans R Soc Lond B Biol Sci*. Nov 5;369(1655), 2014
17. Roy, J.E., Buschman, T.J., Miller, E.K. "PFC neurons reflect categorical decisions about ambiguous stimuli" *Journal of Cognitive Neuroscience*, 26:6, 1283-1291, 2014.
18. Antzoulatos, E.G. and Miller, E.K. Increases in functional connectivity between the prefrontal cortex and striatum during category learning." *Neuron*, 83:216-225, 2014.
19. Puig, M.V. and Miller, E.K. "Neural substrates of dopamine D2 receptor modulated executive functions in the monkey prefrontal cortex." *Cerebral Cortex*, published online May 9, 2014
20. Miller, E.K. and Buschman, T.J. "Neural mechanisms for the executive control of attention" In: *The Oxford Handbook of Attention*. Nobre, K. and Kastner, S. Oxford University Press, 2014 ISBN: 9780199675111
21. Puig, M. V., Antzoulatos, E. G., & Miller, E. K. Prefrontal dopamine in associative learning and memory. *Neuroscience*, 282, 217-229, 2014.

22. Lindsay, G., Rigotti, M., Warden, M. R., Miller, E. K., & Fusi, S. Hebbian-inspired rewiring of a random network replicates pattern of selectivity seen in PFC. *BMC Neuroscience*, 15(1), 1, 2014.
23. Miller, E.K. "The 'working' of working memory" *Dialogues in Clinical Neuroscience*, 15:411-418, 2013.
24. Miller, E.K. and Buschman, T.J. "Brain Rhythms for Cognition and Consciousness". *Neurosciences and the Human Person: New Perspectives on Human Activities* A. Battro, S. Dehaene and W. Singer (eds), Pontifical Academy of Sciences, *Scripta Varia* 121, Vatican City, 2013.
25. Rigotti, M., Barak, O., Warden, M.R., Wang, X., Daw, N.D., Miller, E.K., & Fusi, S. "The importance of mixed selectivity in complex cognitive tasks." *Nature*, 497, 585-590, 2013 doi:10.1038/nature12160..
26. Miller, E.K. and Fusi, S. "Limber neurons for a nimble mind." (Preview) *Neuron*, 78:211-213, 2013.
27. Miller, E.K. and Buschman, T.J. "Cortical circuits for the control of attention" *Current Opinion in Neurobiology*, 23:216–222, 2013.
28. Buschman, T.J., Denovellis, E.L., Diogo, C., Bullock, D. and Miller, E.K. "Synchronous oscillatory neural ensembles for rules in the prefrontal cortex." *Neuron*, 76: 838-846, 2012.
29. Puig, M.V. and Miller, E.K. "The role of prefrontal dopamine D1 receptors in the neural mechanisms of associative learning." *Neuron*, 74: 874-868, 2012.
30. Miller, E.K. and Wallis, J.D. "The prefrontal cortex and executive brain functions". *Fundamental Neuroscience*, 4th edition, 2013.
31. Duncan, J. and Miller, E.K. "Adaptive neural coding in frontal and parietal cortex." In: Stuss, D.T. and Knight, R.T. (Eds). *Principles of Frontal Lobe Function: Second Edition*, 2012.
32. Silver, M.R., Grossberg, S., Bullock, D., Histed, M. and Miller, E.K. "A neural model of sequential movement planning and control of eye movements: Item-order-rank working memory and saccade selection by the supplementary eye fields." *Neural Networks* 26:29-58, 2012.
33. Miller, E.K. and Buschman, T.J. "Top-Down Control of Attention by Rhythmic Neural Computations" In: Posner, M.I. (ed) *Cognitive Neuroscience of Attention*. New York: Guilford Press, 2012.
34. Buschman, T.J., Siegel, M., Roy, J.E. and Miller, E.K. "Neural substrates of cognitive capacity limitations." *Proceedings of the National Academy of Sciences*, 108(27):11252-5, 2011.
35. Antzoulatos, E.G. and Miller, E.K. "Differences between neural activity in prefrontal cortex and striatum during learning of novel, abstract categories." *Neuron*, 71(2): 243-249, 2011.
36. Cromer, J.A., Roy, J.E., Buschman, T.J., and Miller, E.K. "Comparison of primate prefrontal and premotor cortex neuronal activity during visual categorization." *Journal of Cognitive Neuroscience*, 23: 3355-3365, 2011.
37. Cromer, J.A., Machon, M. and Miller, E.K. "Rapid association learning in the primate prefrontal cortex in the absence of behavioral reversals." *Journal of Cognitive Neuroscience*, 23: 1823-1828, 2011.
38. Warden, M.R. and Miller, E.K. "Task-dependent changes in short-term memory in the prefrontal cortex." *Journal of Neuroscience*, 30(47):15801-15810, 2010.
39. Buschman, T.J. and Miller, E.K. "Shifting the Spotlight of Attention: Evidence for Discrete Computations in Cognition." *Frontiers in Human Neuroscience*, 4(194):1-9, 2010.

40. Cromer, J.A., Roy, J.E., and Miller, E.K. "Representation of multiple, independent categories in the primate prefrontal cortex." *Neuron*, 66: 796-807, 2010
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45. Siegel, M., Warden, M.R., and Miller, E.K. "Phase-dependent neuronal coding of objects in short-term memory." *Proceedings of the National Academy of Sciences*, 106: 21341-21346, 2009.
46. Histed, M.H., Pasupathy, A., and Miller, E.K. "Learning substrates in the primate prefrontal cortex and striatum: sustained activity related to successful actions." *Neuron*, 63: 244-253, 2009.
47. Buschman, T.J. and Miller, E.K. "Serial, covert, shifts of attention during visual search are reflected by the frontal eye fields and correlated with population oscillations." *Neuron*, 63: 386-396, 2009.
48. Miller, E.K. and Wallis, J.D. "Executive function and higher-order cognition: Definitions and neural substrates." In: *The Encyclopedia of Neuroscience*, Volume 4, Squire LR (Ed.), pp 99-104. Oxford: Academic Press, 2009.
49. Miller, E.K. and Wilson, M.A. "All my circuits: Using multiple-electrodes to understand functioning neural networks." *Neuron*, 60: 483-488, 2008.
50. Meyers, E.M., Freedman, D.J., Kreiman, G., Miller, E.K., and Poggio, T. "Dynamic population coding of category information in the inferior temporal cortex and prefrontal cortex" *Journal of Neurophysiology*, 100: 1407-1419, 2008.
51. Loh, M., Pasupathy, A., Miller, E.K., and Deco, G. "Neurodynamics of the prefrontal cortex during conditional visuomotor associations." *Journal of Cognitive Neuroscience*, 20: 421-431, 2008.
52. Freedman, D.J. And Miller, E.K. "Neural mechanisms of visual categorization: Insights from neurophysiology" *Neuroscience and Biobehavioral Reviews*, 32(2):311-29, 2008.
53. Buschman, T.J. and Miller, E.K. "Top-down versus bottom-up control of attention in the prefrontal and posterior parietal cortices." *Science*, 315: 1860-1862, 2007.
54. Miller, E.K. and Wallis, J.D. "The prefrontal cortex and executive brain functions". *Fundamental Neuroscience*, 3rd edition, 2008.
55. Warden, M.R. and Miller, E.K. "The representation of multiple objects in prefrontal neuronal delay activity." *Cerebral Cortex*, 17: i41-i50, 2007.
56. Fusi, S., Asaad, W.F., Miller, E.K., and Wang, X.J. "A neural circuit model of flexible sensori-motor mapping: Learning and forgetting on multiple timescales." *Neuron*, 54: 319-333, 2007.
57. Miller, E.K. and Buschman, T.J. "Rules through recursion: How interactions between the frontal cortex and basal ganglia may build abstract, complex, rules from concrete, simple, ones" S. Bunge & J.

Wallis (Eds.), *The Neuroscience of Rule-Guided Behavior*, Oxford University Press, 2007.

58. Miller, E.K. "The prefrontal cortex: categories, concepts, and cognitive control" In: *Memories: Molecules and Circuits, Research and Perspectives in Neurosciences*, Bontempi B., Silva A.J., Christen Y. (eds), Heidelberg: Springer, 2007.
59. Miller, E.K. and Buschman, T.J. "Bootstrapping your brain: How interactions between the frontal cortex and basal ganglia may produce organized actions and lofty thoughts" In: *Neurobiology of Learning and Memory (2<sup>nd</sup> Edition)*, Kesner, R.P. and Martinez, J.L. (Eds), Elsevier, 2007.
60. Cacioppo, J.T., Amaral, D.G., Blanchard, J.J., Cameron, J.L., Sue C.C., Crews, D., Fiske, S., Heatherton, T., Johnson, M.K., Kozak, M.J., Levenson, R.W., Lord, C., Miller, E.K., Ochsner, K., Raichle, M.E., Tracie S.M., Taylor, S.E., Young, L.J., and Quinn, K.J. "Social Neuroscience: Progress and Implications for Mental Health" *Perspectives on Psychological Science* 2: 99-123, 2007.
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62. 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.
63. Muhammad, R., Wallis, J.D., and Miller, E.K. "A comparison of abstract rules in the prefrontal cortex, premotor cortex, the inferior temporal cortex and the striatum." *Journal of Cognitive Neuroscience*, 18, 974-989, 2006.
64. Greene, M., Schill, K., Takahasi, S., Bateman-House, A., Beauchamp, T., Bok, H., Cheney, D., Coyle, J., Deacon, T., Dennett, D., Donovan, P., Flanagan, O., Goldman, S., Greely, H., Martin, L., Miller, E., Mueller, D., Siegel, A., Solter, D., Gearhart, J., McKhann, G., and Faden, R. "Moral issues of human-non-human primate neural grafting" *Science*, 309, 385-386, 2005.
65. Pasupathy, A. and Miller, E.K. "Different time courses for learning-related activity in the prefrontal cortex and striatum." *Nature*, 433, 873-876, 2005.
66. Nieder A. and Miller E.K. "Neural correlates of numerical cognition in the neocortex of non-human primates" In: S. Dehaene, J. R. Duhamel, M. Hauser & G. Rizzolatti (eds.), *From monkey brain to human brain*. Cambridge, Massachusetts: MIT Press, 2005.
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69. Miller, E.K. and Wallis, J.D. "Volition and the prefrontal cortex" In: *The Visual Neurosciences*, Chalupa, L.M. and Werner, J.S. (eds.), MIT Press, pp 1546-1560, 2004.
70. 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(12):5235-5246, 2003.
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72. Wallis, J.D. and Miller, E.K. "From rule to response: neuronal processes in the premotor and prefrontal cortex." *Journal of Neurophysiology*, 90, 1790-1806, 2003.

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74. Wallis, J.D. and Miller, E.K. "Neuronal activity in the primate dorsolateral and orbital prefrontal cortex during performance of a reward preference task." *European Journal of Neuroscience*, 18, 2069-2081, 2003.
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76. Miller, E.K., Freedman, D.J., and Wallis, J.D. "The prefrontal cortex: categories, concepts, and cognition." In: *The Physiology of Cognitive Processes*, Parker, A., Derrington, A., Blakemore, C. (eds.). Oxford University Press, pp 252-273., 2003.
77. Miller, E.K. and Wallis, J.D. "The prefrontal cortex and executive brain functions" *Fundamental Neuroscience 2<sup>nd</sup> Edition*, Squire, L.R., Bloom, F.E., Roberts, J.L., Zigmond, M.J., McConnell, S.K., Spitzer, N.C. (eds.), Academic Press, pp. 1353-1376, 2003.
78. 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.
79. 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.
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87. Chelazzi, L., Miller, E.K., Duncan, J., and Desimone, R. "Responses of neurons in macaque area V4 during memory-guided visual search." *Cerebral Cortex*, 11, 761-772, 2001.
88. Wallis, J.D., Anderson, K.C., and Miller, E.K. "Single neurons in the prefrontal cortex encode abstract rules." *Nature*, 411, 953-956, 2001.
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93. Miller, E.K. "The prefrontal cortex and cognitive control", *Nature Reviews Neuroscience*, 1, 59-65, 2000.
94. Miller, E.K. "The prefrontal cortex: no simple matter" (Commentary), *Neuroimage*, 11:447-450, 2000.
95. Miller, E.K. "Organization through experience" (News and Views), *Nature Neuroscience*, 3:1066-1068, 2000.
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97. Miller, E.K. "The prefrontal cortex: Complex neural properties for complex behavior." *Neuron* 22, 15-17, 1999.
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100. Miller, E.K. "Straight from the top" (News and Views). *Nature*, 401, 650-651, 1999.
101. Rainer, G., Asaad, W.F., and Miller, E.K. "Selective representation of relevant information by neurons in the primate prefrontal cortex," *Nature* 393, 577-579, 1998.
102. Rainer, G., Asaad, W.F., and Miller, E.K. "Memory fields of neurons in the primate prefrontal cortex," *Proceedings of the National Academy of Sciences* 95, 15008-15013, 1998.
103. Asaad, W.F., Rainer, G. and Miller, E.K. "Neural activity in the primate prefrontal cortex during associative learning," *Neuron* 21, 1399-1407, 1998.
104. Chelazzi, L., Duncan, J., Miller, E.K., and Desimone, R. "Responses of neurons in inferior temporal cortex during memory-guided visual search." *Journal of Neurophysiology* 80, 2918-2940, 1998.
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121. Miller, E.K., Li, L., and Desimone, R. "A neural mechanism for working and recognition memory in inferior temporal cortex," *Science* 254, 1377-1379, 1991.
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## **Invited Lectures**

### **2017**

Goldman-Rakic Memorial Lecture, Yale University  
Big Questions in Neuroscience, Arlington, VA  
Seminar, Brown University  
Seminar, New York University  
Symposium, Memory Disorders Research Society Meeting, Chicago, IL  
ONR Computational Neuroscience Program

### **2016**

Symposium, Memory Disorders Research Society Meeting, Princeton, NJ  
Seminar, Boston University  
28th Annual International Mental Health Research Symposium, Brain and Behavioral Research Foundation, NYC

### **2015**

Brain Stimulation Based Neural Circuit Modeling: Linking Levels of Analysis, Chicago  
Workshop on Advances in Electroencephalography, Chicago  
Computational Neuroscience Seminar, Brandeis University  
Computational Properties of the Prefrontal Cortex, Bethesda  
Neurobiology Seminar, Yale University  
Pfizer Neuroscience Seminar Series

### **2014**

Workshop on Neural Oscillations, Oxford University  
Keynote Address, Annual Alumni College, Kent State University  
Keynote Address, Eastern Psychological Association Annual Meeting  
Symposium on Categorization, Eastern Psychological Association Annual Meeting  
Gordon Conference on Cognitive Neuroscience  
Seminar, Dartmouth College

### **2013**

Symposium on Attention, 20<sup>th</sup> Annual Meeting of the Cognitive Neuroscience Society  
Cognitive Rhythms Collaborative Conference: Rhythmic Dynamics and Cognition, Cambridge, MA  
Neural Circuits for Adaptive Control of Behavior, Paris, France  
Affective Brain Lab Talk, University College London  
Seminar, University of New Hampshire  
Working Memory Conference, University of Oregon

### **2012**

Working Group of the Pontifical Academy of Sciences on "Human Activities, Neurosciences, and the Person", The Vatican  
Reprogramming the Brain, University of Texas at Dallas  
Biomedical Engineering Seminar, Tufts University  
"Rewards, Habits, and Learning: Towards an Integrative View of Frontostriatal Function", Columbia University  
"Measuring and Interpreting Cognitive Changes in Early Huntington's Disease", CHDI Foundation, New York  
Workshop on Categorization, Cosyne Meeting, Salt Lake City  
Workshop on Working Memory, Cosyne Meeting, Salt Lake City  
Center for Mind/Brain Medicine Seminar Series, Brigham and Women's Hospital

### **2011**

International Conference on Cognitive Neuroscience, Mallorca, Spain  
Biomed Distinguished Lecturer, University of Leuven, Belgium  
International Neuropsychological Symposium, Mondsee, Austria  
Meet-the-Expert Event, Society for Neuroscience Annual Meeting, Washington, DC  
Helen Wills Neuroscience Institute, University of California at Berkeley

Interdisciplinary Graduate Conference on Consciousness, Boston University  
Neuroscience Seminar, Brandeis University  
Neuroscience Seminar, Columbia University  
Cognitive Rhythms Collaborative, Cambridge, MA  
Visual Attention Seminar, Brigham and Women's Hospital, Cambridge, MA

## **2010**

Center for Brain Science Seminar, Harvard University  
Cognitive Brain and Behavior Seminar, Department of Psychology, Harvard University  
"Lunch and Learn" seminar, Shire Pharmaceuticals, Philadelphia  
Workshop on Working Memory, National Institute of Mental Health, Bethesda, MD  
Symposium at the annual meeting of the American Psychiatric Association, New Orleans  
Plenary Lecture, International Conference on Cognitive and Neural Systems, Boston University  
Homewood Brain and Cognition Lecture Series, Johns Hopkins University  
The Frontal Lobes 2010, Toronto, Canada  
Adler Symposium, Salk Institute for Biological Studies

## **2009**

Carlson Lecture, University of Chicago  
Keynote Speaker, Meeting of the Comparative Cognition Society  
Engineering Distinguished Lecture, National Science Foundation, Washington, DC  
Ernst Strungmann Forum on Dynamic Coordination in the Brain, Frankfurt, Germany  
Neuroscience Seminar, University of California at San Diego  
Banbury Workshop: "Searching for principles underlying memory in biological systems", Cold Spring Harbor  
Invited address, Computational and Systems Neuroscience meeting, Salt Lake City, Utah  
University of Minnesota Department of Neuroscience seminar  
Charles River Association for Memory seminar, Cambridge, MA

## **2008**

Conference on Memory and Neural Networks, Longyearbyen, Svalbard, Norway  
Netherlands Neuroscience Institute Conference on Perceptual Learning, Motor Learning, and Automaticity, Amsterdam, Netherlands  
Keynote Speaker, Yale University Science Day  
Shire Biopharmaceuticals Advisory Board Meeting – Guanfacine Mechanism of Action in ADHD, New York City  
Seminar, Merck & Co., Inc., Philadelphia  
Neuroscience Seminar, Brown University  
Cognitive Neuroscience Seminar Series, Columbia University  
Seminar, Princeton University  
"Emotions, Memories, Consciousness, and Attention: Biological Approaches to Cognitive Problems", Columbia University  
Symposium in honor of Brenda Milner, Montreal Neurological Institute  
Cognitive, Computational and Systems Neuroscience Seminar, Washington University, St. Louis  
BrainMap Seminar, Martinos Center, Massachusetts General Hospital

## **2007**

Mathilde Solowey Lecture in the Neurosciences, National Institutes of Health  
Plenary Lecture, Japanese Society for Neuroscience Meeting, Yokohama, Japan  
Jeffrey Lecture in Cognitive Neuroscience, UCLA  
Cambridge Neuroscience Symposium, Cambridge, UK  
Meeting on Executive Functions, Leiden, Netherlands  
Neuroscience Seminar, University of California at Irvine  
Wisconsin Symposium on Emotion, University of Wisconsin  
"Neurons, brains and models: crossing levels of analysis in cognitive brain research", University of Michigan  
"The cognitive science of semantics", Tufts University  
Neuroscience Seminar, University of Maryland

## **2006**

“Memories: Molecules and Circuits”, IPSEN Foundation, Paris, France  
Invited Address, Annual Meeting, American Psychological Society, New York City  
Symposium on “Prefrontal cortex, Working Memory, Flexible behavior”, Yale University  
Learning Sciences Institute seminar, Vanderbilt University  
Grass Lecture, University of Illinois at Urbana-Champaign  
Neuroscience Seminar Series, University of California at Berkeley  
Neuroscience Colloquium, Boston University School of Medicine  
“New Frontiers in Brain Science: from molecules to mind”, Massachusetts Institute of Technology

## **2005**

Keynote Address, Human Brain Mapping Meeting, Toronto, Canada  
International Conference on Cognitive Neuroscience, Havana, Cuba  
Fudan University Institute of Neurobiology Seminar, Shanghai, China  
International Neuropsychology Symposium, Sardinia, Italy  
Helmholtz Lecture Series, Helmholtz Research Institute, Universities of Utrecht, Amsterdam, and Rotterdam, The Netherlands  
Colloquium, Max Planck Institute, Berlin, Germany  
Symposium on Executive Functions and the Frontal Lobe, Tuebingen, Germany  
Keynote Address, Motivational Neuronal Network meeting, Clearwater, Florida  
Computational Neuroscience Seminar Series, University of Chicago  
Neuroscience Seminar, University of California at San Diego  
Mind and Brain Colloquium, University of California at Davis  
Psychology Seminar, Stanford University  
Seminar, California Institute of Technology  
Seminar, Harvard Mind, Brain, and Behavior Initiative, Harvard University  
Course on the Biology of Memory, Cold Spring Harbor  
Workshop on Schizophrenia, Cold Spring Harbor

## **2004**

Munich Encounters in Cognition and Action Symposium, Max Planck Institute, Munich, Germany  
International Congress of Psychology, Beijing, China  
American College of Neuropsychopharmacology Meeting, Puerto Rico  
Neurons and Memory, a satellite meeting of the Society for Neuroscience Annual Meeting, San Diego  
Neural Control of Behavior Meeting, University of California, Los Angeles  
Center for Visual Science Symposium, University of Rochester  
Neuroscience Symposium, University of Western Ontario  
Mind, Brain and Behavior Distinguished Lecture, Duke University  
Symposium, Cognitive Neuroscience Meeting, San Francisco  
Course on Brain Science for Knight Science Journalism Fellows, M.I.T.  
Working Group on Interspecific Chimeric Brains, Phoebe R. Berman Bioethics Institute, Johns Hopkins University  
Interdisciplinary Program in Neuroscience Seminar, Georgetown University  
Seminar, University of Texas Medical School  
Seminar, Harvard Medical School  
Seminar, Johns Hopkins University  
Summer Institute in Cognitive Neuroscience, Dartmouth College  
Fred Attneave Lecture, Department of Psychology, University of Oregon

## **2003**

Fyssen Colloquium, St Germain en Laye, France  
Department of Psychology Colloquium, Cornell University  
Center for Neural Science Seminar, New York University  
International Joint Conference on Neural Networks, Portland, Oregon  
Symposium at the Cognitive Neuroscience Society Meeting, New York  
Department of Neuroscience Seminar, University of Connecticut Health Center  
NIDA Workshop on Developing Behavioral Treatments for Cognitively Impaired Drug Abusers, Bethesda  
NIH Workshop on Executive Functions, New York City  
Roche Pharmaceuticals, Palo Alto

RIKEN Brain Sciences Institute Retreat, Shinrin-Koen, Japan  
John Merck Summer Course in Cognitive Neuroscience, Princeton University  
Cognitive Science Seminar, University of Quebec in Montreal  
Neuroscience Seminar Series, Mount Sinai School of Medicine, New York  
Neuroscience Formal Seminar Series, University of California, San Francisco  
Neuroscience Retreat, University of Pittsburgh  
Department of Psychology Seminar, Stanford University  
Seminar, Columbia University

## **2002**

UCLA Neuroscience Seminar Series  
F.C. Donners Lecture, University of Nijmegen, The Netherlands  
Swammerdam Lecture, Vrije Universiteit and University of Amsterdam, The Netherlands  
Symposium at the European Conference on Visual Perception, Glasgow, Scotland  
Seminar, Honda Research and Development Co., Wako-shi, Japan  
Meeting of the American Association for the Advancement of Science (symposium organizer), Boston  
University of Illinois Neuroscience Seminar Series  
Emory University Neuroscience Colloquium  
Institute for Cognitive Science Colloquium Series, University of Colorado at Boulder  
Helmholtz Club, University of California at Irvine  
Sloan Seminar, California Institute of Technology  
Neurobiology and Behavior Seminar Series, Columbia University  
Cognitive Neuroscience Seminar, National Institutes of Health  
Department of Psychology Seminar, University of Pennsylvania  
Neuroscience Seminar, Wake Forest University School of Medicine

## **2001**

Society for Research in Child Development, Minneapolis  
Winter Conference on Neural Plasticity, Antigua, West Indies  
Gordon Research Conference on Neural Plasticity, Newport, Rhode Island  
International Society for Behavioral Neuroscience, Marrakech, Morocco  
Royal Society Meeting, London, UK  
Association for the Study of Consciousness Meeting, Duke University  
Rotman Research Institute Seminar, Toronto, Canada  
University of Rochester Colloquium Series  
Cold Spring Harbor Summer Course  
Kennedy Shriver Center Colloquium Series, Waltham, MA  
Memory Research and Disorders Society Meeting, Boston  
Department of Psychology Colloquium, Harvard University

## **2000**

The Frontal Lobes: In the Forefront of the Millennium, Rotman Research Institute, Toronto Canada  
Symposium on the Cognitive Neuroscience of Attention and Awareness, London, UK  
Neuroscience Seminar, Washington University  
RIKEN Brain Institute Summer Program, Japan  
Workshop on Executive Functions of Attention, New York University  
University of Minnesota Center for Cognitive Sciences Colloquium  
Mini-Symposium on Visual Working Memory, ARVO Meeting  
Neuroscience Colloquium, Massachusetts General Hospital  
Towards Animal Models of Attention and Consciousness, Cold Spring Harbor  
Harvard Psychology Seminar  
Boston University Psychology Seminar  
Baylor University Neuroscience Seminar  
Department of Physiology Seminar, University of Montreal  
Neuroscience Seminar Series, National Institutes of Health

## **1999**

Department of Psychology Seminar, Princeton University  
Neuroscience Seminar Series, Boston University

Attentional Processes in Selective Perception and Working Memory, Satellite Symposium of the Cognitive Neuroscience Society Meeting, Washington, DC  
Department of Psychiatry, Harvard Medical School  
Neuroscience Seminar, University of California at Berkeley  
Summer Institute in Cognitive Neuroscience, Dartmouth College  
RIKEN Brain Institute Summer Program, Japan  
Brain and Machines Lecture Series, MIT  
Stanford Neurosciences Program Annual Retreat, Monterey, CA  
Department of Psychology Seminar, University of Iowa  
Conference in Cognitive Science, Vancouver, Canada  
Brandeis Summer Lecture Series in Neuroscience

### **1998**

Workshop on Visuospatial Working Memory, Executive Control and The Frontal Lobes, Delmenhorst, Germany  
International Symposium on Learning and Memory, University of Otago, New Zealand  
Attention and Performance 18, The Great Park, Windsor, England  
Symposium at the Annual Society for Neuroscience Meeting: Neural Basis of Working Memory  
RIKEN Symposium, Tokyo, Japan  
Cognitive Neuroscience Society Meeting, San Francisco  
McKnight Foundation Meeting, Aspen  
Neuroscience Seminar Series, Princeton University  
Winter Conference on Brain Research, Snowbird, Utah  
Winter Conference on Neural Plasticity, St. Lucia, West Indies  
Institute for Research in Cognitive Science Seminar, University of Pennsylvania  
Neuroscience Seminar Series, Rockefeller University  
Zanvyl Krieger Mind/Brain Institute Seminar Series, Johns Hopkins University  
Developmental Neuroscience Seminar, Eunice Kennedy Shriver Center, Waltham  
Neuroscience Seminar Series, Center for Neuroscience, Rutgers University  
Department of Neuroanatomy Seminar, Boston University  
Second International Conference on Cognitive and Neural Systems, Boston University  
Center for Neuroscience Seminar, University of California at Davis  
Laboratory of Neuropsychology Symposium, National Institute of Mental Health

### **1997**

Novartis Foundation Meeting on Functions of the Prefrontal Cortex, London, UK  
Colloquium Series, MRC Applied Psychology Unit, Cambridge, UK  
ONR Workshop on Cognitive Neuroscience, Marine Biology Lab, Woods Hole  
Department of Psychology Colloquium, Carnegie Mellon University  
Neuroscience Colloquium Series, Brown University  
Bowman Gray Medical School Neuroscience Colloquium Series  
Neurocomputation Seminar, Brandeis University  
Pew Scholars Annual Meeting, San Jose, Costa Rica  
Department of Neurobiology Seminar, Harvard University  
Department of Psychology Seminar, Boston University  
Department of Neuroanatomy Seminar, Boston University  
Imaging Center Seminar, Massachusetts General Hospital  
Brain and Cognitive Sciences Colloquium Series, MIT

### **1996**

Department of Neurobiology Seminar, Weizmann Institute of Science, Israel  
Department of Psychology Seminar, University of Connecticut

### **1995**

Winter Conference on the Neurobiology of Learning and Memory, Park City  
The Helmholtz Club, University of California, Irvine  
Vision Center Laboratory Seminar, The Salk Institute for Biological Studies  
Harvard Undergraduate Neuroscience Society

### **1994**

Cooperation Forum for Multi-Disciplinary Researches, Hiroshima, Japan  
Department of Neurobiology Seminar, Harvard Medical School  
Third Appalachian Conference on Behavioral Neurodynamics, Center for Brain Research and Informational Sciences, Radford University  
Neural Systems, Memory, and Aging Seminar, University of Arizona  
Third Workshop on Neural Networks, Elba International Physics Center, Italy  
Department of Psychology Seminar, Carnegie Mellon University  
Joint Vision Laboratory - Cognitive Brain and Behavior Seminar, Harvard University  
Department of Brain and Cognitive Sciences Seminar, Massachusetts Institute of Technology  
Department of Neurobiology Seminar, Emory University  
Department of Physiology and Biophysics Seminar, University of Washington

## **1992**

Section on Neurobiology Seminar, Yale University  
Vision Center Laboratory Seminar, The Salk Institute for Biological Studies  
Neural Systems Seminar, National Institute of Neurological Disorders and Stroke

## **Teaching (MIT):**

9.02 Brain and Behavior Laboratory (Laboratory course required for undergraduate majors. Primary Instructor, designed the course and student laboratories.)

9.012 Brain and Cognitive Sciences II (Core course taken by all BCS graduate students. Course organizer and one of several primary lecturers)

9.011 Brain and Cognitive Sciences I (Core course taken by all BCS graduate students. Course organizer)

9.011J Principles of Neuroscience (Several lectures)

9.401 Survey of Cognitive Science (Several lectures)

9.10 Cognitive Neuroscience (Several lectures)

9.30/7.98 Neural Plasticity (Several lectures)

## **MIT Committees and Service:**

Animal Care and Use Committee (1998 -2005): MIT's Animal Care and Use Committee oversees all animal research affiliated with MIT.

Graduate Committee (1998 - present): We oversee all policy decisions regarding the graduate program in Brain and Cognitive Sciences at MIT. I also oversee admissions to our graduate program in Systems Neuroscience program and supervise the qualifying exam taken by second year graduate students in Systems Neuroscience.

Director of the Graduate Studies in Brain and Cognitive Sciences at MIT (1999 - 2006 ): I was director of our department's graduate program.

Supervisor, Electronics Shop, Department of Brain and Cognitive Sciences (1996 - 2004): I supervised the work of the electronics shop staff.

Organizer, Brain and Cognitive Sciences Faculty Seminar Series (1998 - 2001)

Thesis Committees: I have been on the thesis committees of many students in the Department of Brain and Cognitive Sciences and in Health Sciences and Technology



Education Committee (1999 - 2000): The Education Committee oversees the curricula of the Department of Brain and Cognitive Sciences.

Lecture at launch of MIT's capital campaign, Spring 2000.

Lecture to MIT alumni for "MIT On the Road" program, Palm Beach, Florida, January 2001

Organizer, Plastic Lunch Seminar Series for MIT's Center for Learning and Memory (1999 - 2003)

Committee on an Interdepartmental Program in Neuroscience (2000): We were charged with constructing a new interdepartmental graduate training program in neuroscience at MIT.

Director Advisory Committee for the McGovern Institute for Brain Research, 2000

Lecture at MIT's Technology Day, June, 2001

Associate Director, The Picower Center for Learning and Memory, 2001 –

Lecture at MIT's Alumni Summer Course in Neuroscience, June 2003

Advisory Committee on the Appointment of the Next Director of the McGovern Institute for Brain Research, 2003

Neuroscience Advisory Council, 2006-2008