

## Curriculum Vitae

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### **Mriganka Sur**

Newton Professor of Neuroscience  
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### **Education**

Indian Institute of Technology, Kanpur	B. Tech.	1974	Electrical Engg.
Vanderbilt University, Nashville, TN	M.S.	1975	Electrical Engg.
Vanderbilt University, Nashville, TN	Ph.D.	1978	Electrical Engg.

### **Positions**

1978-80	Postdoctoral Associate, Vanderbilt University
1980-83	Research Assistant Professor, Dept. of Neurobiology and Behavior, S.U.N.Y., Stony Brook
1983-86	Assistant Professor, Section of Neuroanatomy, Yale University School of Medicine
1986-92	Associate Professor of Neuroscience, Dept. of Brain and Cognitive Sciences, M.I.T.
1992-93	Associate Professor with tenure, Dept. of Brain and Cognitive Sciences, M.I.T.
1993-	Professor of Neuroscience, Dept. of Brain and Cognitive Sciences, M.I.T.
1994-97	Associate Head, Dept. of Brain and Cognitive Sciences, M.I.T.
1997-2012	Head, Dept. of Brain and Cognitive Sciences, M.I.T.
1998-2008	Sherman Fairchild Professor of Neuroscience, M.I.T.
2000-	Investigator, Picower Institute for Learning and Memory, M.I.T.
2008-	Paul E. and Lilah Newton Professor of Neuroscience, M.I.T.
2009-2011	Director, Simons Foundation Initiative on Autism and the Brain, MIT
2012-	Director, Simons Center for the Social Brain, M.I.T.

### **Honors and Awards**

First Division with Distinction, Indian Institute of Technology, Kanpur, 1974  
Meghnad Saha Award, Institute of Electronics and Telecommunication Engineers, India, 1976  
Charles Judson Herrick Award, American Association of Anatomists, 1983  
A.P. Sloan Foundation Fellowship, 1985  
Whitaker Health Sciences Fund Faculty Award, 1986  
Distinguished Neuroscientist Award, ASIOA, 1987  
McKnight Neuroscience Development Award, 1988  
Graduate Student Council Teaching Award, MIT, 1989  
TOKTEN Award, United Nations Development Program, 1991  
Hans-Lukas Teuber Scholar in the Brain Sciences, MIT, 1997  
Sherman Fairchild Chair of Neuroscience, MIT, 1998  
School of Science Prize for Excellence in Graduate Teaching and Advising, MIT, 2000  
Sigma Xi, 2001

Elected Member, National Academy of Sciences, India, 2001  
Distinguished Alumnus Award, Indian Institute of Technology, Kanpur, 2002  
Elected Fellow, Neurosciences Research Program, La Jolla, 2002  
Elected Member, Rodin Remediation Academy, Stockholm, 2002  
Elected Fellow, American Academy of Arts and Sciences, 2003  
Elected Fellow of the Royal Society, UK, 2006  
Elected Fellow, Third World Academy of Sciences/Academy of Sciences of the Developing World, 2007  
Elected Fellow, International Neuropsychological Symposium, 2008  
Elected Fellow, American Association for the Advancement of Science, 2008  
Newton Chair of Neuroscience, MIT, 2008  
Foundation Day Lecture and Medal, National Brain Research Center, India, 2008  
Convocation Address and Scroll, Indian Statistical Institute, Calcutta, 2009  
Top 50 Alumni, IIT Kanpur, 2010  
DBT Distinguished Biotechnology Chair, National Brain Research Center, India, 2011  
Elected Member, Institute of Medicine of the National Academies, USA, 2011  
Distinguished Alumnus Award in the Psychological Sciences, Vanderbilt University, 2012  
Brain and Cognitive Sciences Award for Excellence in Undergraduate Advising, MIT, 2013  
NIH BRAIN Initiative award, 2014  
Narayana Murthy Distinguished Chair, IIT Madras, 2015

### **Distinguished Lectures**

Institute Lecture, Indian Institute of Technology, Delhi, 1993  
NINDS Distinguished Lecture, National Institutes of Health, 1996  
Distinguished Overseas Lecture, Australian Neuroscience Society, 2000  
Sigma Xi Distinguished Lecturer, 2001  
Grass Foundation Lecture, University of Missouri, Columbia, 2001  
Institute Lecture, Indian Institute of Technology, Kanpur, 2003  
The Charles E. Schmidt Lecture on Frontiers of Science, Florida Atlantic University, 2003  
Schmitt Lecture, University of Rochester, 2006  
Society for Neuroscience Special Lecture, 2007  
Darwin Bicentennial Lecture, National Institute of Immunology, 2008  
College de France Lecture, 2008  
Brain-Mind Institute Distinguished Lecture, Michigan State University, 2011  
Distinguished University Lecture, University of Hyderabad, 2012  
Merson Distinguished Lecture, Queensland Brain Institute, 2012  
Flexner Discovery Lecture, Vanderbilt University Medical Center, Nashville, 2012  
American Junior Academy of Science Lecture, 2013  
University Lecture, Presidency University, India, 2015  
Leadership Lecture, Indian Institute of Technology, Madras, 2015.  
Chicago Society for Neuroscience Lecture, 2015.  
Keynote and Plenary Lectures at various conferences, 1995-2015

### **Boards, Advisory Committees**

#### **Current Editorial Boards**

Editorial Board, Cerebral Cortex, 1995 –  
Editorial Board, Neurosignals, 2001-  
Advisory Board, International Journal of Humanoid Robotics, 2007 -  
Editor, Systems Neuroscience, Frontiers in Neuroscience, 2007 -

Editorial Board, IEEE Transactions on Autonomous Mental Development, 2009 -

### **Current Advisory Committees**

Finance Committee, Society for Neuroscience, 2013-  
Advisory Council, Brain-Mind Institute, Michigan State University, 2012-  
Strategic Advisory Council, Wellcome Trust, 2011-  
Chair, Senior Fellowship Committee, Wellcome Trust India Alliance, 2011-  
Board of Scientific Counselors, National Eye Institute, NIH, 2010-  
Advisory Council, Bernstein Centers for Computational Neuroscience, Germany, 2009-  
Board of Governors, Academy of Scientific and Innovative Research, CSIR, 2010-  
Board of Directors, The Autism Consortium, 2006 -  
Scientific Advisory Board, Posit Science, 2004 -

### **Completed**

World Economic Forum, Global Agenda Council (Brain and Cognitive Sciences), 2012-2013  
Infosys Prize Jury, 2010-11  
National Eye Institute Advisory Council Planning Oversight Committee, 2009 -2011  
Section Editor, The Cognitive Neurosciences, MIT Press, 2007 -2011  
National Research Council Decadal Panel on Space, 2009  
Co-chair, NIH Blueprint for Neuroscience Research Workshop on “Neuroplasticity”, 2008-2009  
The Royal Society, UK, Sectional Committee 8, 2006 - 2009  
Executive Committee, The Autism Consortium, 2006 - 2008  
National Eye Institute Advisory Council, NIH, 2003 - 2008  
Scientific Advisory Committee (Overseas), Department of Biotechnology, India, 2000 - 2008  
Chair, IEEE Conference on Human-Computer Interaction, IIT Allahabad, 2009  
Chair, RIKEN Brain Sciences Institute Group Review Committee, Japan, 2005 - 2007  
Scientific Committee, International Symposium on Brain, Vision and Artificial Intelligence, 2007  
Program Committee, National Academy of Science, National Academy of Engineering and Institute of  
Medicine *Futures Initiative on ‘Smart Prosthetics’*, 2006  
Principal Research Fellowship Interview Committee, Wellcome Trust, UK, 2005  
National Eye Institute Director’s Neuroscience Group, 2004  
IEEE – NNS Committee on Autonomous Mental Development, 2004  
Advisory Committee, International Conference on Biophysics, Shanghai, 2004  
Advisory Board, International Conference on Development and Learning (ICDL), 2004  
Advisory Committee, International Conference on Natural Language Processing, 2004, 2005  
Advisory Committee, International Conference on Intelligent Signal Processing and Robotics, 2003  
Editorial Board, The Visual Neurosciences, 2001  
Scientific Advisory Board, Encyclopedia of Neuroscience, 1999  
Faculty of 1000, Current Science, 2002-2004  
Editorial Board, The MIT Press – Cognitive Science, 1998-2003  
Visual Sciences B Study Section, NIH, 1999-2003  
Editorial Board, Journal of Biosciences, 1998-2001  
Program Chair, International Conference on Development and Learning, 2002  
Scientific Review Board, NINDS, 1997-99  
National Research Council HHMI Fellowship Panel, 1998  
Molecular, Cellular and Developmental Neurobiology Study Section, NIMH/NIH, 1997-98  
National Research Council HHMI Fellowship Panel, 1997  
External Advisory Committee, Center for Neuroscience, U.C. Davis, 1996  
Neurological Disorders Review Committee, NIH, 1996  
Behavioral and Neural Sciences I Study Section, NIH, 1991-95

Editorial Board, Journal of Basic and Applied Biomedicine, 1992-1994  
Editorial Board, Visual Neuroscience, 1990-1994  
Special Emphasis Study Section, NIMH, 1994  
Visual Sciences Special Emphasis Panel, NIH, 1993  
Visual Sciences B Study Section, NIH, 1986-90  
Chair, Visual Sciences Review Committee, NIH, 1990  
Communicative Disorders Review Committee, NINCDS/NIH, 1990  
NIH Committee and Report on Use of Higher Mammals in Neuroscience Research, 1989  
Neurological Sciences A Special Study Section, NIH, 1985

### **Advisory Committees and Administrative Service, MIT (selected)**

Special Committee, Space Economy System, 2013 -  
Brain and Cognitive Sciences Council, 2012-  
Committee on Outside Professional Activities, MIT, 2013-  
MIT Science Council, 1997 - 2012  
Chair, Institute Professorship Committee, 2008-2009  
Planning Committee on Biomedical Research, 2007 -  
Council, Program in Human Rights and Justice, 2006 -  
MGH-MIT Career Development Fellowship Committee, 2006 -2010  
Provost's Committee on Funding of Graduate Students, 2005  
MIT Neuroscience Council, 2004 - 2006  
Member, Select Agents Policy Task Force, 2002-2004  
Advisory Board, McGovern Institute for Brain Research, 2000-2003  
Chair, Institute Professorship Committee, 2002  
Committee on Inter-Institutional Initiative in Genomics and Integrative Biology (Formation of the Broad Institute), 2002

### **Publications**

1. Sur, M., S.S. Jamuar and S.K. Mullick. Design of a contourograph using integrated circuits. Journal of Electronics and Telecommunication Engineers 22: 786-790, 1976.
2. Sur, M., R.J. Nelson and J.H. Kaas. The representation of the body surface in somatosensory area I of the grey squirrel. Journal of Comparative Neurology 179: 425-450, 1978.
3. Merzenich, M.M., J.H. Kaas, M. Sur and C.S. Lin. Double representation of the body surface within cytoarchitectonic areas 3b and 1 in "SI" in the owl monkey (*Aotus trivirgatus*). Journal of Comparative Neurology 181: 41-74, 1978.
4. Nelson, R.J., M. Sur and J.H. Kaas. The organization of the second somatosensory area (SmII) of the grey squirrel. Journal of Comparative Neurology 184: 473-489, 1979.
5. Lin, C.S., M.M. Merzenich, M. Sur and J.H. Kaas. Connections of areas 3b and 1 of the parietal somatosensory strip with the ventroposterior lateral (VPL) nucleus in the owl monkey. Journal of Comparative Neurology 185: 355-371, 1979.
6. Kaas, J.H., R.J. Nelson, M. Sur, C.S. Lin and M.M. Merzenich. Multiple representations of the body within "SI" of primates: a redefinition of "primary somatosensory cortex." Science 204: 521-523, 1979.

7. Sur, M., R.J. Nelson and J.H. Kaas. The map of the body surface in somatic koniocortex in the prosimian, Galago. Journal of Comparative Neurology 189: 381-402, 1980.
8. Sur, M., M.M. Merzenich and J.H. Kaas. Magnification, receptive field area and "hypercolumn" size in areas 3b and 1 of somatosensory cortex in owl monkeys. Journal of Neurophysiology 44: 295-311, 1980.
9. Nelson, R.J., M. Sur, D.J. Felleman, and J.H. Kaas. Representations of the body surface in postcentral parietal cortex of Macaca fascicularis. Journal of Comparative Neurology 192: 611-643, 1980.
10. Sur, M., R.E. Weller, and J.H. Kaas. The body representation in somatosensory area I of the tree shrew (Tupaia glis). Journal of Comparative Neurology 194: 71-96, 1980.
11. Sur, M., R.E. Weller, and J.H. Kaas. The organization of somatosensory area II in tree shrews. Journal of Comparative Neurology 201: 121-133, 1981.
12. Sur, M., R.E. Weller and J.H. Kaas. Physiological and anatomical evidence for a discontinuous representation of the trunk in SI of tree shrews. Journal of Comparative Neurology 201: 135-147, 1981.
13. Sur, M. Receptive fields of neurons in Areas 3b and 1 of somatosensory cortex in monkeys. Brain Research 198: 465-471, 1981.
14. Sur, M., J.T. Wall and J.H. Kaas. Modular segregation of functional cell classes within postcentral somatosensory cortex of primates. Science 212: 1059-1061, 1981.
15. Dykes, R.W., M. Sur, M.M. Merzenich, J.H. Kaas and R.J. Nelson. Regional segregation of neurons responding to quickly adapting, slowly adapting, deep and pacinian receptors within thalamic ventroposterior lateral and ventroposterior inferior nuclei in the squirrel monkey (Saimiri sciureus). Neuroscience 6: 1687-1692, 1981.
16. Kaas, J.H., M. Sur and J.T. Wall. Modular segregation of slowly and rapidly adapting neurons in somatosensory cortex of monkeys. Trends in Neuroscience 4: 13, 1981.
17. Kaas, J.H., M. Sur, R.J. Nelson and M.M. Merzenich. Multiple representations of the body in postcentral somatosensory cortex of primates. In: Cortical Sensory Organization, Vol.I, C.N. Woolsey, ed., pp. 29-45, Humana Press, 1981.
18. Merzenich, M.M., M. Sur, R.J. Nelson and J.H. Kaas. Redefinition of "SI" in primates. Some features of organization of the Area 3b and Area 1 cutaneous representations in the owl monkey. In: Cortical Sensory Organization, Vol. I, C.N. Woolsey, ed., pp. 47-55, Humana Press, 1981.
19. Kaas, J.H., R.J. Nelson, M. Sur, and M.M. Merzenich. Organization of somatosensory cortex in primates. In: The Organization of the Cerebral Cortex, F.O. Schmitt, F.G. Worden, G. Adelman, S.G. Dennis, eds., pp. 237-261, MIT Press, 1981.
20. Sur, M., R.J. Nelson and J.H. Kaas. Representation of the body surface in cortical areas 3b and 1 of squirrel monkeys: Comparison with other primates. Journal of Comparative Neurology 211: 177-192, 1982.

21. Sur, M. and S.M. Sherman. Linear and nonlinear W-cells in C laminae of the cat's lateral geniculate nucleus. Journal of Neurophysiology 47: 869-884, 1982.
22. Sur, M. and S.M. Sherman. Retinogeniculate terminations in cats: Morphological differences between X- and Y-cell axons. Science 218: 389-391, 1982.
23. Sur, M., A.L. Humphrey and S.M. Sherman. Monocular deprivation affects X- and Y-cell retinogeniculate terminations in cats. Nature 300: 183-185, 1982.
24. Merzenich, M.M., J.H. Kaas, J. Wall, R.J. Nelson, M. Sur and D.J. Felleman. Topographic reorganization of somatosensory cortical areas 3b and 1 in adult monkeys following restricted deafferentation. Neuroscience 8: 33-35, 1983.
25. Felleman, D.J., R.J. Nelson, M. Sur, and J.H. Kaas. Representations of the skin surface in areas 3b and 1 of postcentral parietal cortex of cebus monkeys. Brain Research 268: 15-26, 1983.
26. Merzenich, M.M., J.T. Wall, M. Sur, R.J. Nelson, D.J. Felleman and J.H. Kaas. Progression of change following median nerve section in the cortical representation of the hand in area 3b and 1 in adult owl and squirrel monkeys. Neuroscience 10: 639-665, 1983.
27. Sur, M., J.T. Wall and J.H. Kaas. Modular distribution of neurons with slowly adapting and rapidly adapting responses in area 3b of somatosensory cortex in monkeys. Journal of Neurophysiology 51: 724-744, 1984.
28. Kaas, J.H., R.H. Nelson, R.W. Dykes, M.M. Merzenich, and M. Sur. The representation of the body surface in the ventroposterior nucleus of the squirrel monkey, Saimiri sciureus. Journal of Comparative Neurology 226: 111-140, 1984.
29. Sur, M., R.E. Weller and S.M. Sherman. Development of retinogeniculate X-and Y-cell terminations in kittens. Nature 310: 246-249, 1984.
30. Sur, M. and S.M. Sherman. The position sensitivity of retinal X- and Y-cells in cats. Experimental Brain Research 56: 497-501, 1984.
31. Humphrey, A.L., M. Sur, D.J. Uhlrich and S.M. Sherman. Projection patterns of individual X- and Y-cell axons from the lateral geniculate nucleus to cortical area 17 in the cat. Journal of Comparative Neurology 233: 159-189, 1985.
32. Humphrey, A.L., M. Sur, D.J. Uhlrich and S.M. Sherman. Termination patterns of individual X- and Y-cell axons in the visual cortex of the cat: Projections to area 18, to the 17-18 border region, and to both areas 17 and 18. Journal of Comparative Neurology 233: 190-212, 1985.
33. Sur, M., P.E. Garraghty and C.J. Bruce. Somatosensory cortex in macaque monkeys: Laminal differences in receptive field size in areas 3b and 1. Brain Research 342: 391-395, 1985.
34. Wall, J.T., J.H. Kaas, M. Sur, R.J. Nelson, D.J. Felleman and M.M. Merzenich. Functional reorganization in somatosensory cortical areas 3b and 1 of adult monkeys after median nerve repair: possible relationships to sensory recovery in humans. Journal of Neuroscience 6: 218-233, 1986.
35. Sur, M. What does the cortex do? Behavioral Brain Science 9: 105, 1986.

36. Garraghty, P.E., M. Sur, R.E. Weller and S.M. Sherman. Morphology of retinogeniculate X and Y axon arbors in monocularly enucleated cats. Journal of Comparative Neurology 251: 198-215, 1986.
37. Garraghty, P.E., M. Sur and S.M. Sherman. The role of competitive interactions in the postnatal development of X and Y retinogeniculate axons. Journal of Comparative Neurology 251: 216-239, 1986.
38. Garraghty, P.E., D.O. Frost and M. Sur. The morphology of retinogeniculate X- and Y-cell axonal arbors in dark-reared cats. Experimental Brain Research 66: 115-127, 1987.
39. Sur, M., M. Esguerra, P.E. Garraghty, M.F. Kritzer and S.M. Sherman. Morphology of physiologically identified retinal X- and Y-cell axons in the cat lateral geniculate nucleus. Journal of Neurophysiology 58: 1-32, 1987.
40. Weller, R.E., M. Sur and J.H. Kaas. Callosal and ipsilateral cortical connections of the body surface representations in S-I and S-II of tree shrews. Somatosensory Research 5: 107-133, 1987.
41. Sur, M., D.O. Frost and S. Hockfield. Expression of a surface antigen on Y-cells in the cat lateral geniculate nucleus is regulated by visual experience. Journal of Neuroscience 8: 874-882, 1988.
42. Garraghty, P.E., C.J. Shatz and M. Sur. Prenatal disruption of binocular interactions creates novel lamination in the cat's lateral geniculate nucleus. Visual Neuroscience 1: 93-102, 1988.
43. Garraghty, P.E., C.J. Shatz, D.W. Sretavan and M. Sur. Axon arbors of X and Y retinal ganglion cells are differentially affected by prenatal disruption of binocular inputs. Proceedings of the National Academy of Sciences 85: 7361-7365, 1988.
44. Sur, M., P.E. Garraghty and A.W. Roe. Experimentally induced visual projections into auditory thalamus and cortex. Science 242: 1437-1441, 1988.
45. Sur, M. Development and plasticity of retinal X and Y axon terminations in the cat's lateral geniculate nucleus. Brain Behavior and Evolution 31: 243-251, 1988.
46. Garraghty, P.E. and M. Sur. Interactions between retinal axons during development of their terminal arbors in the cat's lateral geniculate nucleus. In: Cellular Thalamic Mechanisms, M. Bentivoglio and R. Spreafico, eds., pp. 465-477, Elsevier, 1988.
47. Sur, M. Visual projections induced into auditory thalamus and cortex: implications for thalamic and cortical information processing. Progress in Brain Research vol. 75: Vision within extrageniculostriate systems, T.P. Hicks and G. Benedek, eds., pp. 129-136, 1988.
48. Sur, M. Visual plasticity in the auditory pathway: visual inputs induced into auditory thalamus and cortex illustrate principles of adaptive organization in sensory systems. In: Dynamic Interactions in Neural Networks: Models and Experiments, M.A. Arbib and S. Amari, eds., Springer-Verlag Research Notes in Neurocomputing, vol. 1: 35-51, 1988.
49. Garraghty, P.E., T.P. Pons, M. Sur and J.H. Kaas. The arbors of axons terminating in middle cortical layers of somatosensory area 3b in owl monkeys. Somatosensory and Motor Research 6: 401-411, 1989.

50. Roe, A.W., P.E. Garraghty and M. Sur. The terminal arbors of single On-center and Off-center X and Y retinal ganglion cell axons within the ferret's lateral geniculate nucleus. Journal of Comparative Neurology 288: 208-242, 1989.
51. Garraghty, P.E., A.W. Roe, Y.M. Chino and M. Sur. The effects of convergent strabismus on the development of physiologically identified retinogeniculate axons in cats. Journal of Comparative Neurology 289: 202-212, 1989.
52. Garraghty, P.E. and M. Sur. The morphology of single intracellularly stained axons terminating in area 3b of macaque monkeys. Journal of Comparative Neurology 294: 583-593, 1990.
53. Pallas, S.L., A.W. Roe and M. Sur. Visual projections induced into the auditory pathway of ferrets. I. Novel inputs to primary auditory cortex (AI) from the LP/pulvinar complex and the topography of the MGN-AI projection. Journal of Comparative Neurology 298: 50-68, 1990.
54. Roe, A.W., S.L. Pallas, J.O. Hahm and M. Sur. A map of visual space induced in primary auditory cortex. Science 250: 818-820, 1990.
55. Langdon, R.B. and M. Sur. Components of field potentials evoked by white matter stimulation in isolated slices of primary visual cortex: spatial distributions and synaptic order. Journal of Neurophysiology 64: 1484-1501, 1990.
56. Sur, M., S.L. Pallas and A.W. Roe. Cross-modal plasticity in cortical development: differentiation and specification of sensory neocortex. Trends in Neuroscience 13: 227-233, 1990.
57. Hockfield, S. and M. Sur. Monoclonal antibody Cat-301 identifies Y-cells in the dorsal lateral geniculate nucleus of the cat. Journal of Comparative Neurology 300: 320-330, 1991.
58. Hahm, J.-O., R.B. Langdon and M. Sur. Disruption of retinogeniculate afferent segregation by antagonists to NMDA receptors. Nature 351: 568-570, 1991.
59. Kwon, Y.H., M. Esguerra and M. Sur. NMDA and Non-NMDA receptors mediate visual responses of neurons in the cat's lateral geniculate nucleus. Journal of Neurophysiology 66: 414-428, 1991.
60. Sur, M. Sensory inputs and the specification of neocortex during development. In: The Development of the Visual System, D.M.K. Lam and C.J. Shatz, eds., pp. 217-228, MIT Press, 1991.
61. Esguerra, M., Y.H. Kwon and M. Sur. Retinogeniculate EPSPs recorded intracellularly in the ferret lateral geniculate nucleus in vitro: role of NMDA receptors. Visual Neuroscience 8: 545-555, 1992.
62. Kwon, Y.H., S.B. Nelson, L.J. Toth and M. Sur. Effect of stimulus contrast and size on NMDA receptor activity in the cat lateral geniculate nucleus. Journal of Neurophysiology 68: 182-196, 1992.
63. Roe, A.W., S.L. Pallas, Y.H. Kwon and M. Sur. Visual projections routed to the auditory pathway in ferrets: receptive fields of visual neurons in primary auditory cortex. Journal of Neuroscience 12: 3651-3664, 1992.

64. Nelson, S.B. and M. Sur. NMDA receptors in sensory information processing. Current Opinion in Neurobiology 2: 484-488, 1992.
65. White, C.A. and M. Sur. Membrane and synaptic properties of developing lateral geniculate nucleus neurons during retinogeniculate axon segregation. Proceedings of the National Academy of Sciences 89: 9850-9854, 1992.
66. Langdon, R.B. and M. Sur. The effects of selective glutamate receptor antagonists on synchronized firing bursts in layer III of rat visual cortex in vitro. Brain Research 599: 283-296, 1992.
67. Sur, M., J.O. Hahm and M. Esguerra. Role of postsynaptic activity in retinogeniculate pattern formation. In: The Visual System from Genesis to Maturity, R. Lent, ed., pp. 104-110, Birkhauser Boston, 1992.
68. Sur, M. Input activity and cortical development. Neuroscience Facts 3: 58, 1992.
69. Garraghty, P.E. and M. Sur. Factors influencing the development of retinal axon arbors in the cat's lateral geniculate nucleus. Physiological Reviews 73: 529-545, 1993.
70. Roe, A.W., P.E. Garraghty, M. Esguerra and M. Sur. Experimentally induced visual projections to the auditory thalamus in ferrets: Evidence for a W cell pathway. Journal of Comparative Neurology 334: 263-280, 1993.
71. Pallas, S.L. and M. Sur. Visual projections induced into the auditory pathway of ferrets. II. Corticocortical connections of primary auditory cortex. Journal of Comparative Neurology 336: 317-333, 1993.
72. Esguerra, M. and M. Sur. Spike trains and signaling modes of neurons in the ferret lateral geniculate nucleus. Experimental Brain Research 273-286, 1993.
73. Pallas, S.L., L.S. Carman and M. Sur. Visual inputs and information processing in sensory cortex: An in vivo developmental study. In: Analysis and Modeling of Neural Systems, F. Eeckman, ed., pp. 167-178, Kluwer Academic Publishers, 1993.
74. Sur, M. Cortical specification: Microcircuits, perceptual identity, and an overall perspective. Perspectives on Developmental Neurobiology 1: 109-113, 1993.
75. Garraghty, P.E., A.W. Roe, Y.M. Chino and M. Sur. Abnormal development of retinogeniculate X axons in strabismic cats: a possible substrate for visual dysfunction. Neuroscience Letters 165: 223-226, 1994.
76. Chino, Y.M., H. Cheng, E.L. Smith, P.E. Garraghty, A.W. Roe and M. Sur. Early discordant binocular vision disrupts signal transfer in the lateral geniculate nucleus. Proceedings of the National Academy of Sciences 91: 6938-6942, 1994.
77. Nelson, S., L. Toth, B. Sheth, and M. Sur. Orientation selectivity of cortical neurons persists during intracellular blockade of inhibition. Science 265: 774-777, 1994.
78. Pallas, S.L., J. Hahm, and M. Sur. Morphology of axons induced to arborize in a novel target, the medial geniculate nucleus. I. Comparison with arbors in normal targets. Journal of Comparative Neurology 347: 1-20, 1994.

79. Pallas, S.L. and M. Sur. Morphology of axons induced to arborize in a novel target, the medial geniculate nucleus. II. Comparison with arbors from the inferior colliculus. Journal of Comparative Neurology 347: 21-35, 1994.
80. Smetters, D.K., J. Hahn and M. Sur. An N-methyl-D-aspartate receptor antagonist does not prevent eye-specific segregation in the ferret retinogeniculate pathway. Developmental Brain Research 658:168-178, 1994.
81. Cramer, K.S., C.I. Moore and M. Sur. Transient expression of NADPH-diaphorase in the lateral geniculate nucleus of the ferret during early postnatal development. Journal of Comparative Neurology 353:306-316, 1995.
82. Somers, D.C., S.B. Nelson and M. Sur. An emergent model of visual cortical orientation selectivity. In: The Neurobiology of Computation, J. Bower, Ed., Kluwer Academic Publishers, pp. 311-316, 1995.
83. Cramer, K.S. and M. Sur. Activity-dependent remodeling of connections in the mammalian visual system. Current Opinion in Neurobiology 5:106-111, 1995.
84. Rocha, M. and M. Sur. Rapid acquisition of dendritic spines by visual thalamic neurons after blockade of NMDA receptors. Proceedings of the National Academy of Sciences 92: 8026-8030, 1995.
85. Somers, D.C., S.B. Nelson and M. Sur. An emergent model of orientation selectivity in cat visual cortical simple cells. Journal of Neuroscience 15: 5448-5465, 1995.
86. Clasca, F., A. Angelucci and M. Sur. Cell-specific programs of development in neocortical projection neurons. Proceedings of the National Academy of Sciences 92: 11145-11149, 1995.
87. Sur, M. Maps of time and space. Nature 378: 13-14, 1995.
88. Sur, M. and Cowey, A. Cerebral cortex: function and development. Neuron 15: 497-505, 1995.
89. Angelucci, A., F. Clasca and M. Sur. Anterograde axonal transport of Cholera Toxin Subunit B: a highly sensitive immunohistochemical protocol for revealing fine axonal morphology in adult and neonatal brains. Journal of Neuroscience Methods 65: 101-112, 1996.
90. Ramoa, A.S. and M. Sur. Short-term synaptic plasticity in the visual cortex during development. Cerebral Cortex 6: 640-646, 1996.
91. Toth, L.J., S.C. Rao, D.-S. Kim, D. Somers and M. Sur. Subthreshold facilitation and suppression in primary visual cortex revealed by intrinsic signal imaging. Proceedings of the National Academy of Sciences 93: 9869-9874, 1996.
92. Cramer, K.S. and M. Sur. The role of NMDA receptors and nitric oxide in retinogeniculate development. Progress in Brain Research 108: 235-244, 1996.
93. Somers, D.C., Toth, L.J., Todorov, E., Rao, S.C., Kim, D.S., Nelson, S.B., Siapas, A.G. and Sur, M. Variable gain control in local cortical circuitry supports context-dependent modulation by long-

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230. Swiech, L., M. Heidenreich, A. Banerjee, N. Habib, Y. Li, J. Trombetta, M. Sur and F. Zhang. In vivo interrogation of gene function in the mammalian brain using CRISPR-Cas9. Nature Biotechnology [doi:10.1038/nbt.3055], 2014.
231. Perea G., M. Sur and A. Araque. Neuron-glia networks: integral gear of brain function. Frontiers in Cellular Neuroscience 8:378 [doi: 10.3389/fncel.2014.00378], 2014.
232. Cassady J.P., A.C. D’Alessio, S. Sarkar, V.S. Dani, Z.P. Fan, K. Ganz, R. Roessler, M. Sur, R.A. Young and R. Jaenisch. Direct lineage conversion of adult mouse liver cells and B lymphocytes to neural stem cells. Stem Cell Reports 3: 948–956, 2014.
233. El-Boustani, S. and M. Sur. Response-dependent dynamics of cell-specific inhibition in cortical networks *in vivo*. Nature Communications [doi: 10.1038/ncomm6689], 2014.
234. Chen N, H. Sugihara and M. Sur. An acetylcholine-activated microcircuit drives temporal dynamics of cortical activity. Nature Neuroscience 18: 892-902, 2015.

235. Sharma, J., H. Sugihara, Y. Katz, J. Schummers, J. Tenenbaum and M. Sur. Spatial attention and temporal expectation under timed uncertainty predictably modulate neuronal responses in monkey V1. Cerebral Cortex 25: 2894-2906, 2015.
236. Sur M. Cortical Development. In: International Encyclopedia of the Social & Behavioral Sciences, Second Edition, Vol 5 (Oxford: Elsevier, James D. Wright, editor-in-chief), pp. 30–34., 2015.
237. Bavamanian S., N. Mellios, J. Lalonde, D.M. Fass, J. Wang, S.D. Sheridan, J.M. Madison, F. Zhou, E. H. Rueckert, D. Barker, R.H. Perlis, M. Sur, S. J. Haggarty. Dysregulation of miR-34a links neuronal development to genetic risk factors for bipolar disorder. Molecular Psychiatry 20: 573-584, 2015.

### **Edited Volumes**

- R. Yuste and M. Sur. Editors, Special issue on **Developmental Plasticity in Neocortex**, Journal of Neurobiology, October 1999.
- M. Sur and Jayadeva. Editors, Special Issue on **Cognitive Science**, IETE Journal of Research, May 2003.

### **Symposia, Major Lectures**

- Development and plasticity of retinal ganglion cell arbors in the cat's lateral geniculate nucleus. Symposium on "Developmental Neural Plasticity", Annual Meeting of the American Association of Anatomists, Reno, April 1986.
- Visual inputs induced into auditory thalamus and cortex: implications for sensory processing. U.S. - Japan Symposium on "Competition and Cooperation in Neural Nets", Los Angeles, May 1987.
- Visual plasticity and the auditory pathway. Symposium on "Extrageniculo-striate Visual Mechanisms", International Brain Research Organization, Szeged, Hungary, August 1987.
- Experimentally induced visual projections into the auditory system. Southeastern Neuroscience Symposium, University of Alabama at Birmingham, May 1988.
- Visual projections induced into the auditory pathway: implications for thalamic and cortical processing. Colloquium, Center for Cognitive Science, MIT, April 1989.
- Interactions between retinal ganglion cell axons in the developing lateral geniculate nucleus. Symposium on "Instructive Effects of Activity in the Developing Visual Pathway", Society for Neuroscience Annual Meeting, Phoenix, November 1989.
- Visual inputs and the specification of neocortex during development. Symposium on "Plasticity at the Systems Level", McKnight Foundation, San Diego, March 1990.
- Cross-modal plasticity and cortical specificity. Symposium on "Development of the Visual System", Retina Research Foundation, Houston, May 1990.
- NMDA receptors in visual development and plasticity. International School on "Morphological and Functional Development of the Visual System", Erice, July 1990.
- Self-organization in brain development. Symposium on "Prenatal Development of Function", American Psychological Association, Boston, August 1990.
- Role of NMDA receptors in visual transmission and development. Symposium on "Vision", Brandeis University, June 1991.
- Adaptive organization of sensory cortex during development. Symposium on "Analysis and Modeling of Neural Systems", San Francisco, July 1991.
- NMDA receptors and retinogeniculate pattern formation. Symposium on "The Visual System from Genesis to Maturity", Rio de Janeiro, July 1991.

Cortical microcircuits: basic algorithms and the role of inputs during development. Symposium on "Specification of Cerebral Cortex during Development", Society for Neuroscience Annual Meeting, New Orleans, November 1991.

Rewiring cortex: Visual activity and cortical development. McDonnell-Pew Symposium, Key Biscayne, January 1992.

Rewiring cortex: Visual inputs and cortical development. McDonnell-Pew Lecture, Salk Institute for Biological Studies, San Diego, April 1992.

Visual networks in the brain. Institute Lecture, Indian Institute of Technology, New Delhi, January 1993.

Role of NMDA receptors and nitric oxide in visual development. Symposium on "Neural Development and Plasticity", Louisiana State University Medical Center, New Orleans, April 1995.

Cortical plasticity, visual activity and cortical function. The Computing Brain Lecture, Boston University, April 1995.

Visual activity and cortical development. Symposium on "Cerebral Cortex Function and Development", Lyon, France, May 1995.

Plasticity in developing cortex. Symposium on "Dynamic Processing of Information in Adult Cortex", International Center for Theoretical Physics, Trieste, Italy, May 1995.

Dynamic regulation of activity in visual cortex. Workshop on "Neural Coding", Jackson Hole, Wyoming, February, 1996.

Visual networks in the brain. Colloquium, Dept. of Physics, MIT, April, 1996.

Inter-modal plasticity in cortex. McDonnell-Pew Symposium, Boston, June 1996.

Cortical plasticity and visual development. 50th Anniversary Symposium, TIFR, National Center for Biological Sciences, Bangalore, India, October 1996.

Rewiring Cortex: Visual activity and cortical development. NINDS Distinguished Lecture Series, Bethesda, November 1996.

The neural basis of vision. Colloquium, Center for Intelligent Control Systems and Laboratory for Information and Decision Systems, MIT, March 1997.

Role of retinal ganglion cell activity in forming retinogeniculate termination patterns. NATO Advanced Study Institute, Crete, June 1997.

Inhibition of nitric oxide synthase disrupts pattern formation in the later geniculate nucleus of the ferret. Symposium on "Nitric Oxide and other diffusible signals in Brain Development, Plasticity and Disease," Louisiana State University, New Orleans, October 1997.

Functional plasticity mediated by input activity in rewired cortex. Symposium on "Cortical Plasticity: Molecules, Synapses and Circuits," Society for Neuroscience Annual Meeting, New Orleans, October 1997.

Representation and reconstruction in sensory perception. Conference on "Can Science explain Intentionality," Boston University Center for the History and Philosophy of Science, December 1997.

Visual activity and cortical plasticity. Third International Symposium on "Neural Mechanisms of Vision," Neurovision, Ruhr-Universitat Bochum, Germany, February 1998.

Visual activity and cortical circuits. Symposium on "Plasticity of Sensory-Motor Systems," College on Neurophysics, International Center for Theoretical Physics, Trieste, Italy, May 1998.

Vision, neural activity and cortical development. Symposium on "Environmental Structure, Statistical learning and Visual Perception," Center for Visual Science, University of Rochester, June 1998.

Plasticity induced by visual activity in rewired cortex. Gordon Conference on "Molecular and Cellular Neurobiology," Beijing, China, September 1998.

Activity-dependent development of connections from the eye to the brain. International Summer School in Developmental Neuroscience, Izmir, Turkey, July 1999.

The role of activity in development of cortical circuits. International Summer School in Developmental Neuroscience, Izmir, Turkey, July 1999.

Cortical Plasticity: Patterned activity and the development of networks in sensory cortex. Inaugural Symposium, National Brain Research Center, Delhi, India, October 1999.

Rewiring Cortex: Patterned activity and the development of cortical networks. Distinguished Overseas Lecture, Australian Neuroscience Society, Melbourne, January 2000.

Cortical plasticity and its limits. Faculty Colloquium, Department of Brain and Cognitive Sciences, MIT, February 2000.

The development of cortical networks. Workshop on Development and Learning, Michigan State University, Lansing, April 2000.

Retinal projections routed to the auditory pathway: Mechanisms and consequences. Gordon Conference on “Molecular and Cellular Neurobiology”, Hong Kong, June 2000.

Rewiring Cortex. Festschrift in honor of Jon Kaas, Vanderbilt University, September 2000.

Visual activity and cortical development. Symposium on Brain Development, University of Helsinki, December 2000.

Rewiring Cortex. Western North Carolina Neuroscience Society Lecture, Wake Forest University, March 2001.

Rewiring Cortex: Visual activity and Cortical Development. Grass Foundation Lecture, University of Missouri, Columbia, April 2001.

Wiring the Brain. Symposium on Visions for the 21<sup>st</sup> Century, MIT Industrial Liaison Program, Amsterdam, June 2001.

Orientation plasticity in visual cortex. IUPS Symposium on “Organization and Processing in the Sensory Cortex”, Sydney, August 2001.

Orientation maps and local processing in visual cortex. Symposium on “Cortical Maps”, Cold Spring Harbor Labs, Cold Spring Harbor, October 2001.

Biopolymer-based Neuronal Networks. DuPont MIT Alliance Research Symposium, Cambridge, October 2001.

Orientation plasticity in visual cortex. RIKEN-MIT Neuroscience Symposium, “New Frontiers in Brain Science: From Molecules to Mind”, Cambridge, November 2001.

Rewiring the brain. Plenary lecture, Indian Science Congress, Lucknow, India, January 2002.

Orientation plasticity in visual cortex. Indo-US Symposium on Brain Research, New Delhi, India, January 2002.

Orientation plasticity in visual cortex. Symposium on “Organizing the Brain: Genes, Neurons and Circuits”, Ascona, Switzerland, February 2002.

Cortical development and plasticity. Mind, Brain and Behavior Symposium, Harvard University, American Academy of Arts and Sciences, Cambridge, February 2002.

Brain networks and brain implants. Plenary Lecture, “Shaastra” Conference on Technology and Innovation, Indian Institute of Technology, Madras, March 2002.

Rewiring Cortex. Plenary Symposium, “Towards a Science of Consciousness”, University of Arizona, Tucson, April 2002.

How does the brain work? The Dorothea Raacke Lecture in Modern Biology, The Roxbury Latin School, MA, April 2002.

Rewiring Cortex: Visual Activity and cortical development. International Workshop on “Sensory Systems Plasticity”, RIKEN Brain Science Institute, Tokyo, Japan, May 2002.

Plasticity of visual networks in the developing and adult cortex. International Symposium “From Sensory Perception to Emotion”, Hanse Wissenschaftskolleg, University of Bremen and University of Oldenburg, Germany, June 2002.

Plasticity and specificity in development of neocortex. Rodin Academy Conference “The Art of Reading: Texts, Pictures, Cultures”, Institute of Medical Psychology, Munich, September 2002.

Plasticity in cortical development. Brainstorm – The Future of Neuroimaging. Athens, Greece, September 2002.

Rewiring Cortex: Plasticity and specificity of brain pathways and networks. Keynote Address, International Symposium on Cognitive Neuroscience of Learning and Memory, Beijing, October 2002.

How the brain wires itself. Pembroke Seminar, The Pembroke Center for Teaching and Research on Women, Brown University, October 2002.

Orientation plasticity and dynamics in visual cortex. International Neuroscience Summit, Berlin, November 2002.

Genes and the environment: How the brain wires itself. Plenary Lecture, Indian Science Congress, Bangalore, India, January 2003.

Plasticity and specificity of cortical pathways and networks. Public Lecture, Conference on Brain Networks and Behavior, National Center for Biological Sciences, Bangalore, India, January 2003.

How the brain wires itself. Institute Lecture, Indian Institute of Technology, Kanpur, January 2003.

How the brain wires itself. Sigma Xi Lecture, Miami University, Oxford, Ohio, February 2003.

Bottom-up and top-down dynamics in early visual cortex. Symposium on “The Brain in Motion”, Lausanne, Switzerland, February 2003.

How the brain wires itself. The Charles Schmidt Lecture on Frontiers of Science, Florida Atlantic University, Boca Raton, February 2003.

Plasticity and dynamics of visual cortex networks. Inaugural Lecture, Neurosciences Research Program, La Jolla, March 2003.

Plasticity and specificity of cortical pathways and networks. Symposium on “Reprogramming the Human Brain”, University of Texas, Dallas, April 2003.

Plasticity and specificity of the cortex. Keynote Lecture, American Synesthesia Association, New York, May 2003.

Plasticity and specificity of brain pathways and networks. Keynote Lecture, International Multisensory Research Forum, McMaster University, Hamilton, Canada, June 2003.

Rewiring Cortex: Plasticity and specificity of auditory pathways and networks. Satellite Symposium on “Plasticity of the Central Auditory System and the Processing of Complex Acoustic Signals”, 6<sup>th</sup> IBRO World Congress of Neuroscience, Prague, July 2003.

Plasticity and specificity of cortical pathways and networks. Jerzy Konorski Memorial Symposium on “Integrative Activity of the Brain”, Sixth International Congress of the Polish Neuroscience Society, Warsaw, July 2003.

How Brains Wire Themselves. Keynote Lecture, InterAction Conference, Foresight Cognitive Systems Project, Office of Science and Technology, UK; Bristol, September 2003.

Rewiring Cortex: Plasticity and specificity of brain representations. Distinguished Speakers in Cognitive Science Series, Michigan State University, October 2003.

Plasticity and dynamics of visual cortex networks. Colloquium, Institute for Neuroinformatics, ETH, Zurich, October 2003.

Plasticity and dynamics of visual cortex networks. Ladislau Tauc Conference in Neurobiology on “Decoding and Interfacing the Brain”, Gif sur Yvette, December 2003.

Brain wiring and brain function. Symposium of Biotechnology: Progress and Prospects. Department of Biotechnology, New Delhi, India, December 2003.

Plasticity and dynamics of visual cortex networks. Symposium, Montreal Neurological Institute, Mont Tremblant, Quebec, February 2004.

Brains, Computers and Intelligence. Keynote Lecture, International Conference on Signal Processing and Intelligent Systems, Allahabad, India, February 2004.

Body and Brain. Keynote address, International Conference of the Pediatric Orthopedic Society, Allahabad, India, February 2004.

How brains wire themselves. University Lecture, University of Wisconsin, Madison, March 2004.

How the brain wires itself. Sigma Xi Distinguished Public Lecture, University of New Mexico, Albuquerque, April 2004.

Plasticity and Dynamics of Visual Cortex Networks. Invited Lecture, International Conference on Cognitive and Neural Systems, Boston University, May 2004.

How the Brain Wires Itself. Keynote Lecture, Neurosciences Program Retreat, Vanderbilt Brain Institute, Vanderbilt University, Nashville, June 2004.

Rewiring Cortex: Molecular, Physiological and Behavioral Correlates of Cortical Plasticity. Symposium, Molecular and Cellular Cognition Society, Lisbon, Portugal, July 2004.

Plasticity and Dynamics of Visual Cortex Networks. Plenary Lecture, Federacao de Sociedades de Biologia Experimental (FeSBE), Aguas de Lindoia, Brazil, August 2004.

Activity dependent plasticity of dendritic spines in visual cortex. Symposium, Federacao de Sociedades de Biologia Experimental (FeSBE), Aguas de Lindoia, Brazil, August 2004.

Bottom up and top down dynamics in visual cortex. Symposium on "Cortical function: A view from the thalamus", University of Wisconsin, Madison, September 2004.

Plasticity and Dynamics of Visual Cortex Networks. Keynote Lecture, RIKEN BSI Retreat, Saitama, Japan, October 2004.

Plasticity and Dynamics of Visual Cortex Networks. Stanford University Neuroscience Graduate Program Retreat, October 2004.

How the Brain Wires Itself: Plasticity and Specificity of Cortical Pathways and Networks. Plenary Lecture, Shanghai International Conference on Physiological Biophysics, Shanghai, China, November 2004.

Bottom up and Top down Plasticity in Visual Cortex. Symposium on "Plasticity and Dynamics in Cerebral Cortex", Shanghai International Conference on Physiological Biophysics, Shanghai, China, November 2004.

Dynamics and Plasticity in Visual Cortex. Symposium on Neural Information Processing, National Center for Biological Sciences, Bangalore, India, January 2005

Time Scales of Cortical Plasticity. Neural Information Coding Workshop, Mangalore, India, January 2005.

Plasticity and Specificity of Cortical Pathways and Networks. Symposium on The Neural Substrates of Cognition, Instituto Juan March de Estudios e Investigaciones, March 2005.

Plasticity and Dynamics of Visual Cortex Networks. Office of Naval Research Workshop on Visual Processing and Plasticity, University of Minnesota, Minneapolis, April 2005.

Our Brains and Us. AAAS Conference on Neuroethics, Responsibility and the Self, Cambridge, April 2005.

Molecules and Mechanisms of Cortical Plasticity. International Neuropsychology Symposium, Sardinia, Italy, June 2005.

Plasticity and Specificity of Cortical Pathways and Networks. Summer Institute in Cognitive Neuroscience, Dartmouth College, Hanover, NH, July 2005.

Plasticity and Specificity of Cortical Pathways and Networks. Cold Spring Harbor Course on the Biology of Memory, NY, July 2005.

Plasticity and Specificity of Cortical Pathways and Networks. Symposium on Neuronal Differentiation in Cortical Development, Osaka University, Japan, September 2005.

Structural Correlates of Rapid Functional Plasticity in the Visual Cortex. Symposium on Visual Plasticity, 37th Annual General Meeting of the EBBS, Trinity College, Dublin, Ireland, September 2005.

The Substrates of Visual Cortex Function: Imaging Synapses, Cells, and Networks in vivo. Symposium on Illuminating the Biological Manuscript, Rutgers University, November 2005.

How Brain Wiring Creates Brain Function. Foundation Day Lecture, Biotechnology Society of India, New Delhi, January 2006.

How the Brain Wires Itself. 8th Annual "MIT in Japan" Symposium, Japan, January 2006.

Structural Correlates of Rapid Functional Plasticity in the Visual Cortex. Keynote address, Satellite Symposium on Visual Sciences, "Seeing Connections", Australian Neuroscience Society, Sydney, January 2006.

Plasticity and Dynamics of Visual Cortex Networks. Keynote address, Satellite Symposium on Developmental Neurobiology, Australian Neuroscience Society, Sydney, January 2006.

Plasticity and Dynamics of Visual Cortex Networks. Euroconference, Institut Pasteur, France, March 2006.

Plasticity and Dynamics of Visual Cortex Networks. Cajal Winter Conference, Benasque, Spain,

March 2006.

Plasticity and Dynamics of Visual Cortex Networks. UCSF Symposium on Plasticity, San Francisco, March 2006.

Functional and Structural Dynamics of Visual Cortex Networks. UBC Symposium, Vancouver, Canada, May 2006.

Cortical Plasticity. Princeton/Merck Summer Symposium, New Jersey, June 2006

Cortical Plasticity and Dynamics. The Royal Society New Fellows Symposium, London, July 2006.

How the Brain Wires Itself. Schmitt Lecture, University of Rochester, New York, October 2006.

How the Brain Wires Itself. Presidential Fellows Lecture, MIT, November 2006.

Brains, Computers and Intelligence. Techvista, Microsoft Research India Research Symposium, Bangalore, January 2007.

Plasticity and Dynamics of Neuronal and Astrocyte Networks in Visual Cortex. Symposium, International Institute for Neuroscience in Natal, Brazil, February 2007.

Plasticity and Dynamics of Neuronal and Astrocyte Networks in Visual Cortex. Neurosciences Research Program, La Jolla, CA, March 2007.

Plasticity and Dynamics of Neuron and Astrocyte Networks in V1. Workshop on Information Processing in the Visual System, Ohio State University, April 2007.

Plasticity and Specificity of Cortical Pathways and Networks. International Symposium on Applied Neuroscience, University of Hong Kong, May 2007.

Plasticity in the Visual Cortex. Cold Spring Harbor Course on the Biology of Learning and Memory, NY, July 2007.

New Approaches for Revealing Cortical Function: Plasticity and Dynamics of Visual Cortex Networks. Society for Neuroscience Special Lecture, San Diego, November 2007.

Role of IGF1 Signaling in Brain Development and Autism. NLM Family Foundation, Boston, December 2007.

Brain Wiring and Brain Function. Sigma Xi Lecture, Defence and Engineering Research Center, Natick, December 2007.

Brains, Computers and Intelligence. Platinum Jubilee Lecture, Indian Statistical Institute, Kolkata, January 2008.

Plasticity and Dynamics of Cerebral Cortex Networks. Platinum Jubilee Lecture, Indian Statistical Institute, Kolkata, January 2008.

Plasticity. Boston Colloquium for Philosophy of Science, Boston University, February 2008.

Plasticity and Dynamics of Visual Cortex Networks. US-Germany Computational Neuroscience Symposium, Munich, June 2008.

Cortical Plasticity and its Mechanisms. Symposium on Critical Periods and Plasticity, McGill University, Montreal, June 2008.

Patterning and Plasticity of the Cerebral Cortex. Symposium on Cognitive Neuroscience, Tahoe, June 2008.

Brain Wiring, Evolution, and Brain Disorders. Darwin Bicentennial Lecture, National Institute of Immunology, India, July 2008.

Cortical Plasticity. FENS/IBRO School on Imaging, Lausanne, September 2008.

Plasticity and Dynamics of Visual Cortex Networks. Symposium in honor of Brenda Milner, Montreal Neurological Institute, Montreal, September 2008.

Deficits in Synapse Maturation and their Therapeutic Reversal in a mouse model of Rett Syndrome. World Rett Syndrome Congress, Paris, October 2008.

Brain Wiring and Brain Disorders. College de France Lecture, Paris, October 2008.

Rules of Plasticity in the Developing and Adult Cortex. Symposium in honor of Lamberto Maffei, Pisa, Italy, October 2008.

Therapeutic Strategies for Rett Syndrome and Autism Spectrum Disorders. Autism Consortium Symposium, Boston, November 2008.

Brain Wiring and Brain Disorders. Centennial Symposium of the Indian Institute of Science, Bangalore, India, December 2008.

Brains, Computers and Intelligence. Foundation Day Lecture, National Brain Research Center, India, December 2008.

Role of Astrocytes in Visual Cortex. Symposium, American Society for Neurochemistry, Charleston, March 2009.

Role of Astrocytes in Visual Cortex: Tuned Responses, Hemodynamic Regulation and Gain Control. Gordon Conference on Astrocytes, Ventura, CA, March 2009.

The Brain and Mind. Convocation Address, Indian Statistical Institute, Kolkata, March 2009.

Brain Disorders. MIT Symposium 'Brains on Brains', May 2009.

Rules of Cortical Plasticity. Workshop on 'Research Frontiers in Neuroscience: Brainstorming Tinnitus'. Cernobbio, Italy, May 2009.

Brains, Machines and Intelligence. Keynote Lecture, International Conference on Development and Learning, Shanghai, June 2009.

Brain Wiring and Brain Disorders. Annual Lecture, Institute of Neuroscience, University of Newcastle, June 2009.

Deficits in Synapse Maturation and their Therapeutic Reversal in Rett Syndrome. Symposium, International Rett Syndrome Foundation, Chicago, June 2009.

Plasticity of Neuron and Astrocyte Networks in Visual Cortex. Physiological Society Symposium, Dublin, Ireland, July 2009.

Brain Plasticity and Brain Disorders. 'Salad Symposium', L.V.Prasad Eye Institute, Hyderabad, India, July 2009.

Neural Plasticity. National Academies Kavli Chinese-American Frontiers of Science Symposium, China, September 2009.

Rules of Cortical Plasticity. Keynote, Bernstein Conference on Computational Neuroscience, Germany, October 2009.

How the Brain Creates Intelligence. Science Conclave, IIT Allahabad, India, December 2009.

Brains, Computers & Intelligence. Indian Inst of Science, Education and Research, Pune, India, December 2009.

Cell-specific Circuits and Plasticity in Visual Cortex. National Institute for Basic Biology Symposium on Cortical Organization, Okazaki, Japan, March 2010.

Convergence in Neuroscience: Its Past and Future History. Pathways to Convergence Symposium, MIT, April 2010.

Rules of Visual Cortex Plasticity. International Symposium of the GRSNC, "Enhancing Performance for Perception and Action", University of Montreal, May 2010.

Two-photon Calcium Imaging of Cell-specific Circuits and Responses in Visual Cortex. Fifth Statistical Analysis of Neuronal Data (SAND5) Meeting, Pittsburgh, May 2010.

Brains and Computers. IISER Mohali, India, August 2010.

Role of Astrocytes in Cortical Information Processing and Hemodynamic Signaling. 29th Naito Conference, Japan, October 2010.

From Genes to Synapses in Developmental Disorders: Therapeutics for Rett Syndrome. Williams Syndrome meeting, The Allen Institute for Brain Science, Seattle, October 2010.

Effects of Serotonin on Cortical Development and Autism. Vanderbilt Conte Center 3rd Annual Symposium, Vanderbilt University, November 2010.

Mechanisms of patterning and plasticity that generate precise thalamocortical and intracortical circuits in the visual pathway, Development of Thalamocortical Systems, Arolla, Switzerland, February 2011.

Introduction to Brain Disorders. MIT Symposium 'Brains on Brains', April 2011.

Genes and plasticity. MIT 150 Symposium on Nature and Nurture, Brains, Minds and Machines, Cambridge, May 2011.

Mechanisms and Therapeutics for Rett Syndrome. International Rett Syndrome Foundation Family Conference, Boston, May 2011.

Mechanisms and Therapeutics for Rett Syndrome. MIT-Children's Hospital Boston Symposium, June 2011.

The Functional Basis of Hemodynamic Brain Imaging: Role of Astrocytes. Keynote Lecture, Organization for Human Brain Mapping, Quebec City, Canada, June 2011.

Brains, Computers and Intelligent Machines. Distinguished University Lecture, Panjab University, Chandigarh, August 2011.

Mechanisms and Emerging Therapeutics for Neurodevelopmental Disorders. AIIMS Special Lecture, Department of Pediatrics, August 2011.

Brains, Computers and Intelligent Machines. Public Lecture, Society for the Promotion of Science and Technology in India, Chandigarh, August 2011.

Brain Wiring and Brain Disorders. School of Science talks series, MIT, September 2011.

Mechanisms and Emerging Therapeutics for Rett Syndrome. Simons Foundation Autism Research Initiative Symposium, Washington DC, September 2011.

IGF1: Mechanisms and Emerging Therapeutics for Rett Syndrome. NIH Workshop on Setting Priorities for Therapy Development in Rett Syndrome, Washington, DC, September 2011.

Brain Wiring and Brain Function. Distinguished Speakers Series lecture, Brain-Mind Institute, Michigan State University, October 2011.

Mechanisms and emerging therapeutics for Rett Syndrome and autism spectrum disorders. Cell Symposium on Autism Spectrum Disorders, Washington DC, November 2011.

Brain Wiring and Brain Disorders. Symposium Honoring Obaid Siddiqi at 80, National Center for Biological Sciences, Bangalore, January 2012.

Brains, Minds and Machines. Distinguished University Lecture, University of Hyderabad, India, January 2012.

Cortical Plasticity: Cell-specific Circuits and Disorders of Brain Development. Symposium, International Society for Developmental Neuroscience, Mumbai, January 2012.

Mechanisms and Emerging Therapeutics for Autism Spectrum Disorders. Neurology Grand Rounds, Medical University of South Carolina, Charleston, February 2012.

Brain Wiring and Brain Disorders. MIT Club of Boston, April 2012.

Brains, Minds and Machines. Distinguished Alumnus Award and Psychology Day Lecture, Vanderbilt University, Nashville, April 2012.

Cell-specific circuits in the cerebral cortex. Gordon Research Conference, Hong Kong, June 2012.

Insights from Rett Syndrome and autism can inform the neurobiology of Williams Syndrome. Keynote Lecture, International Williams Syndrome Scientific/Professional Conference, Boston, July 2012.

Brain Wiring and Brain Disorders. Merson Lecture, Queensland Brain Institute, Australia, August 2012.

Brain Circuits and Brain Disorders. National Institute of Immunology, India, August 2012.

Signals that affect synapses in autism: Insights from Rett Syndrome. Symposium on Systems Biology of Autism, Cold Spring Harbor Labs, September 2012.

Meeting the challenge of Autism Spectrum Disorders. Autism Consortium Annual Symposium, Boston, October 2012.

Mechanism-based treatments in Neurodevelopmental Disorders: Rett Syndrome. Presidential Symposium, Child Neurology Society, Huntington Beach, CA, November 2012.

Mechanisms and Emerging Therapeutics for Autism Spectrum Disorders. Flexner Discovery Lecture, Vanderbilt University Medical Center, Nashville, November 2012.

Cortical Plasticity and Neurodevelopmental Disorders. Symposium, Melbourne Brain Institute, University of Melbourne, February 2013.

Circuits that create tuned responses in Visual Cortex. Australian Neuroscience Society Symposium on "Neural basis of visual cortical orientation selectivity: 50 years after Hubel & Wiesel's hypothesis", Melbourne, February 2013.

Brains, Minds and Machines. Keynote lecture, American Junior Academy of Science, February 2013.

Brain Wiring and Brain Disorders. Life Sciences Colloquium, Colorado State University, March 2013.

Understanding Autism Spectrum Disorders. MIT Symposium “Brains on Brains 2”, April 2013.

The Functional Logic of Information Processing Circuits in the Cerebral Cortex. Symposium, Indian Institute of Science, Bangalore, June 2013.

Rules of Plasticity in the Developing and Adult Visual Cortex. Federation of European Neuroscience Societies (FENS) Symposium, Prague, September 2013.

Brain Plasticity. Symposium on Neuroethics, Federation of European Neuroscience Societies (FENS) Symposium, Prague, September 2013.

The Functional Logic of Cortical Circuits. Cajal Institute, Madrid, November 2013.

Mechanisms and Emerging Therapeutics for Autistic Disorders. West Syndrome Symposium, Madrid, November 2013.

How the Brain Works. Science Conclave, IIT Allahabad, India, December 2013.

Rules of Cortical Plasticity: Circuits, Neurons and Synapses. Workshop: A Dynamic Architecture of Life, Academia Nazionale dei Lincei, Rome, May 2014.

Role of Major Vault Protein (MVP) in synaptic and circuit plasticity in cortex. Simons Foundation Workshop, New York, June 2014.

The Functional Logic of Cortical Circuits. Bernstein Conference on Computational Neuroscience, Gottingen, September 2014.

Signaling and Circuit Mechanisms of Rett Syndrome. EMBO Conference on Brain Disorders, La Ciotat, France, September 2014.

MicroRNA Mechanisms of Rett Syndrome. Simons Foundation Autism Research Initiative Symposium, New York, September 2014.

Cortical circuits and their dysfunction in developmental brain disorders. 6<sup>th</sup> Annual Tufts Neuroscience Symposium, October 2014.

Brains, Minds and Machines. Saha Institute for Nuclear Physics, India, January 2015.

Brain Wiring and Brain Disorders. Presidency University, India, January 2015.

Brains, Minds and Machines. Indian Institute of Technology, Madras, February 2015.

Role of Astrocyte Calcium Signaling and Glutamate Transporters in Visual Cortex. Gordon Research Conference on Glial Biology, Ventura, CA, March 2015.

Signaling and Circuit Mechanisms of Rett Syndrome. Keystone Symposium, “Pathways of Neurodevelopmental Disorders”, Tahoe City, March 2015.

Brain Wiring and Brain Disorders. Chicago Society for Neuroscience, March 2015.

## **Expositions**

### **Radio and Television**

Universities Grants Commission, India: Television film on The Visual System, 1991

BBC World Service Radio, April 2000

Canadian Broadcasting Corporation – Radio show “Quirks and Quarks”, April 2000

Public Broadcasting Service Television Series, "The Secret Life of the Brain. Episode 1: The baby's brain: Wider than the sky", David Grubin Productions, January 2002

The University of the Air, Japan, “Learning under Transformation: Brain and Epistemology”, September 2003

### **Lectures on the Web**

The Brain and Mind. MIT Lectures on Fundamentals of the Brain and Mind, June 2003  
<http://mitworld.mit.edu/video/194/>

Our Brains, Ourselves, Our Common Future. Science, Technology and Human Rights Series, MIT, November 2004. <http://mitworld.mit.edu/video/247/>  
Brains, Minds and Machines. American Junior Academy of Science, February 2013.  
<http://techtv.mit.edu/tags/166-education/videos/22794-professor-mriganka-sur-speaks-to-the-american-junior-academy-of-science>

## **Teaching**

### **Yale University School of Medicine (1983-86)**

Co-instructor, Neuroscience 502: Structure and function of neocortex, Fall 1983  
Lectures in Neuroscience 500: Structural and functional organization of the human nervous system, Spring 1984-86  
Instructor, Tutorial on Sensory-motor integration, Spring 1984  
Instructor, Tutorial on Organization of the nervous system: general principles, Spring 1985-86  
Co-director, Neuroscience 501: Principles of Neuroscience, Fall 1985

### **Massachusetts Institute of Technology (1986-present)**

Director, 9.011: Principles of Neuroscience, Fall 1989-97; 1999-2002  
Co-instructor, 9.024: Development and plasticity of the visual system, Spring 1987, 1989, 1991  
Co-instructor, 9.373: Somatosensory and motor systems, Spring 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004  
Co-instructor, 9.05: Neural basis of movement, Spring 1995, 1997, 1999, 2001, 2003, 2005, 2007  
Instructor, 9.24: Disorders and diseases of the nervous system, Spring 2015.  
Lectures in Independent Activities Period (IAP), 1990-2015.

### **Other**

Short courses on brain organization, function and development, International Center for Theoretical Physics, Trieste, 1986, 1988, 1990, 1993, 1995, 1998  
Review and Update of Neuroscience for Neurosurgeons (RUNN), Woods Hole, 1996  
Workshop on Computational Neuroscience, Institute for Theoretical Physics, University of California, Santa Barbara, 2001  
Workshop on Neural Spectroscopy, Woods Hole, 2003

## **Graduate Students**

### **Current Doctoral Students:**

Rodrigo Garcia, Gerald Pho, Danielle Feldman, Rajeev Rikhye.

### **Previous Doctoral Students:**

Anna W. Roe, Ph.D. 1991. Functional transformations of visual input by auditory thalamus and cortex: An experimentally induced visual pathway in ferrets. Current position: Professor, Department of Psychology, Vanderbilt University; Director, Zhejiang University Institute of Neuroscience and Technology, China.

Young H. Kwon, Ph.D. 1991. Functional role of neurotransmitters in the visual thalamus. Current position: Professor, Depts. of Ophthalmology and Physiology, University of Iowa School of Medicine.

Jong-On Hahm, Ph.D. 1991. Influence of the target on development of the ferret retinogeniculate projection. Current position: Director, Committee on Women in Science, National Research Council, Washington.

Manuel Esguerra, Ph.D. 1991. Synaptic transmission in the ferret lateral geniculate nucleus *in vitro*: Modulation by membrane voltage and neurotransmitters. Current position: Research Scientist, Dept. of Physiology, University of Minnesota School of Medicine.

Diana K. Smetters, Ph.D. 1995. Electrotonic structure and synaptic integration in cortical neurons. Current position: Scientist, Xerox Corp.

Louis J. Toth, Ph.D. 1995. Layout and connectivity of orientation domains in mammalian visual cortex: A physiological description. Current position: Associate Professor, Department of Anatomy and Neurobiology, Boston University School of Medicine.

Bhavin Sheth, Ph.D. 1996. Representation of a class of subjective contours in visual cortex. Current position: Associate Professor, Department of Computer Science, University of Houston.

Alessandra Angelucci, Ph.D. 1996. Experimental retinal projections to the auditory thalamus: morphology, development and effects on auditory cortical organization. Current position: Professor, Program in Neuroscience and Department of Ophthalmology, University of Utah School of Medicine, Salt Lake City.

Christopher Moore, Ph.D. 1998. Some principles of somatosensory cortical organization in rats and humans. Current position: Associate Professor, Department of Neuroscience, Brown University.

Carsten Hohnke, Ph.D. 1999. The development of functional inputs to a neural circuit: Synaptic strength before and after the activity-dependent maturation of the retinogeniculate system. Current position: Consultant, Mars and Company.

James Schummers, Ph.D. 2003. Examination of inhomogeneities in the representation of orientation in the primary visual cortex (area 17) of the cat. Current position: Group Leader, Max Planck Institute, Florida.

Serkan Oray, Ph.D. 2004. Structural dynamics and synaptic development in the visual system. Current position: Senior Director, UBS Pharma, Brussels.

Charlene Ellsworth, Ph.D. 2004. Intrinsic constraints on cross-modal plasticity. Current position: Internist/ General Internal Medicine, Barnes-Jewish Hospital, Providence.

Brandon Farley, Ph.D. 2006. Principles underlying the organization and development of feature maps in the visual cortex. Current position: Research Scientist, Biogen-Idec.

Beau Cronin, Ph.D. 2008. Quantifying uncertainty in computational neuroscience with Bayesian statistical inference. Current position: CEO, Navia Systems.

Cortina McCurry, Ph.D. 2009. Deficient plasticity in the visual cortex of Arc null mice. Current position: Boston Consulting Group.

Sam H. Horng, Ph.D. 2009. Identification and functional characterization of two patterning genes, *Zic4* and *Ten\_m3*, in topographic map formation of the visual pathway. Current position: Resident, Mount Sinai School of Medicine.

Caroline Runyan, Ph.D. 2012. Structure, function and circuits of inhibitory neuron subtypes in the visual cortex. Current position: Postdoctoral fellow in Neurobiology, Harvard Medical School.

Naiyan Chen, Ph.D. 2013. Cell-type specific cholinergic modulation of the cortex. Current position: Postdoctoral fellow, NSTAR, Singapore.

### **Previous Master's Students:**

Ben Y. Reis, M.S. 1996. Implementation of a line attractor-based model of the gaze holding integrator using nonlinear spiking neuron models.

Sherri L. Hitz, M.S. 1998. Postnatal development of brainstem cholinergic inputs to the dorsal lateral geniculate nucleus of the domesticated ferret, *Mustela putorius fero*.

### **Postdoctoral Fellows**

### **Current Postdoctoral Fellows and Research Scientists:**

Jitendra Sharma, Hiroki Sugihara, Abhishek Banerjee, Michael Goard, Jeremy Petravicz, Jacques Ip, Rafiq Huda, Vincent Breton-Provencher, Ming Hu

### **Previous Fellows:**

Preston Garraghty, 1984-87; Professor, Dept. of Psychology, Indiana University  
Ronald Langdon, 1987-90; Senior Specialist, Scientific Affairs (Senior Medical Writer), Merck Sharp & Dohme

Sarah Pallas, 1988-92; Professor, Dept. of Biology, Georgia State University

Darren Gitelman, 1990-91; Professor, Dept. of Neurology, Harvard Medical School

Ary Ramoa, 1990-91; Professor, Dept. of Anatomy, Medical College of Virginia (deceased)

Laurie Carman, 1990-92; Staff Scientist, Merck AG, Frankfurt

Cheryl White, 1990-93; Assistant Professor of Surgery, Univ. of Washington School of Medicine

Monica Santos-Rocha, 1990-1993; Professor, Inst. of Biophysics, Federal Univ. of Rio de Janeiro

Sacha Nelson, 1991-1994; Professor and Chair, Dept. of Biology, Brandeis University

Francisco Clasca, 1992-1995; Professor, Dept. of Anatomy, University of Madrid

S. Chenchal Rao, 1992-1995; Research Scientist, Dept. of Psychology, Vanderbilt University

Dae-Shik Kim, 1994-1996; Professor, Korea Advanced Institute of Science and Technology

David Somers, 1992-1996; Professor and Chair, Dept. of Psychology, Boston University

Karina Cramer, 1992-1997; Professor, Dept. of Neuroscience, University of California, Irvine

Cathy Leamey, 1996-1998; 2000-2003; Senior Lecturer, Dept. of Physiology, University of Sydney, Australia

Chrystal Ho Pao, 1997-1998; Professor, Dept. of Biology, Trinity International Univ., Chicago

George Kalarickal, 1998-1999; Research Staff, Digital Technology Inc

Casto Rivadulla, 1998-1999; Associate Professor, University of Coruña, Spain  
Valentin Dragoi, 1998-2003; Professor, Dept. of Neurobiology and Anatomy, University of Texas – Houston Medical School  
Jorge Marino, 2002-2003; Research Scientist, University of Coruña, Spain  
Alvin Lyckman, 1998-2004; Assistant Professor, Tufts University and St. Elizabeth's Hospital, Boston  
David Lyon, 2002-2004; Associate Professor, Dept. of Neurobiology and Anatomy, University of California, Irvine  
Serkan Oray, 2004; Senior Director, UBS Pharma, Brussels  
Jessica Newton, 2001-2004; Helix Medical Communications LLC, San Francisco  
Ania Majewska, 2000-2005; Associate Professor, Dept. of Neurobiology and Anatomy, University of Rochester Medical Center  
Paul George, 2005-2006; Assistant Professor of Neurology, Stanford Medical School  
Anna Bolteus, 2005-2007; MRC consultant, Sweden  
Leigh Carmody, 2006-2008; Scientist, Broad Institute  
Audra Van Wart, 2006-2009; Director of Education and Training, Virginia Tech Carilion Research Institute  
Amanda Mower, 2004-2009; Assoc Scientific Director, Synapse Medical Communications, New York  
Daniela Tropea, 2003-2009; Assistant Professor, Trinity College Dublin  
Hongbo Yu, 2002-2009; Associate Professor, School of Life Sciences, Fudan University, Shanghai  
Rong Mao, 2005-2010; Research Scientist, Stanford University School of Medicine, CA  
Beata Jarosiewicz, 2006-2010; Staff Scientist, Cyberkinetics Inc., Providence, Rhode Island  
Damon Page, 2004-2010; Group Leader, Scripps Institute, Florida  
James Schummers, 2003-2010; Group Leader, Max Planck Institute, Florida  
Nathan Wilson, 2005-2012; Chief Technical Officer, Nara Systems, Boston  
Show-ming Kwok, 2009-2013; Scientist, Edison Pharmaceuticals  
Jorge Castro, 2008-2013; IP and Tech Licensing Consultant  
Gertrudis Perea, 2010-2013; Permanent Scientist, Spanish Research Council, Cajal Institute, Madrid  
Ikue Nagakura, 2010-2014; Research Scientist, Beth-Israel Deaconess Medical Center, Boston  
Vardhan Dani, 2012-2014; Research Scientist, MIT  
Sami El-Boustani, 2011-15; Research Scientist and Marie Curie Fellow, EPFL Lausanne  
Nikolaos Mellios, 2009-15; Assistant Professor, University of New Mexico, Albuquerque  
Michael Goard, 2010-15; Assistant Professor, Depts of Molecular, Cellular and Developmental Biology, and Psychology, University of California, Santa Barbara

## **Research Support**

### **Active:**

NIH, R01 EY007023 (PI, M. Sur): Cell-specific circuits and contextual modulation in visual cortex, 2015-19.  
NIH, R01 MH085802 (PI, M. Sur): MicroRNA mechanisms of Rett Syndrome, 2015-2020.  
NIH BRAIN Initiative, U01 NS090473 (PI, M. Sur): Cortical circuits and information flow during memory-guided perceptual decisions, 2014-2017.  
NSF BRAIN EAGER (PI, M. Sur): Massive-scale multi-area single neuron recordings to reveal circuits underlying short-term memory, 2014-2016.  
Picower Institute Innovation Fund (PI, M. Sur): Astrocyte-neuron interactions during cortical plasticity in vivo, 2014-2016.

### **Center Grants:**

Simons Foundation Autism Research Initiative: Simons Center for the Social Brain at MIT  
(Director, M. Sur), 2012-2017.

### **Training and Core grants:**

NIH Training Grant T32 GM07484 (PI, M. Sur; 14 co-PIs): Integrative Neuronal Systems, 2012-2017  
(continuous PI since 1997).  
NIH Core Grant EY02621 (co-PI; PI, J. DiCarlo): Central Visual Processes, 2008-2018 (continuous since  
1988).  
NIH Training Grant T32 MH074249 (co-PI; PI, M. Bear): Training in the Neurobiology of Learning and  
Memory, 2007-2017.

### **Completed Grants:**

NIH, R01 MH085802 (PI, M. Sur): Mechanisms and therapeutics for Rett Syndrome, 2009-2015.  
NIH, R01 EY007023 (PI, M. Sur): Cell-specific circuits in visual cortex, 2009-2014.  
Simons Foundation Autism Research Initiative (PI, R. Jaenisch, co-PI, M. Sur): iPSC derived isogenic  
neurons for characterizing fragile X and Rett Syndrome, 2011-2014.  
NSF, US-German Collaboration (PIs, M. Sur and K. Obermayer): Role of astrocytes in cortical  
information processing, 2010-2014.  
NIH, R01 EY 018648 (PI, M. Sur): Cortical Representations and Plasticity: Neurons and Astrocytes,  
2007-2012.  
NIH, R01 EY019152 (PI, M. Sur): Molecular and Functional Mechanisms underlying Binocular Vision,  
2010-2012.  
Simons Foundation Autism Research Initiative: Simons Initiative at MIT on Autism and the Brain  
(Program Director: M.Sur), 2009-2012.  
Simons Foundation: Neural and Cognitive Mechanisms of Autism (Program Director, M. Sur), 2005-  
2012.  
NIH, R01 EY 17098 (PI, M. Sur): Structural Correlates of Rapid Cortical Plasticity, 2006-2011.  
Marcus Family Foundation (Program Director, M. Sur): Research on Autism and Developmental  
Disorders, 2006-2009.  
Picower Institute Innovation Fund (PI, M. Sur): Role of astrocytes in cortical circuits, 2007-2009.  
NIH, R01 EY 15068 (PI, M. Sur): Cortical Plasticity: Inputs, networks and behavior, 2003-2009.  
NIH, R01 EY 07023 (PI, M. Sur): Orientation Specificity in Visual Cortex, 2002-2008.  
NIH, R03 EY 14134 (PI, M. Sur): Novel genes underlying connectivity in visual cortex, 2003-2007.  
NIH, R01 NS 39022: Dynamic integration in somatosensory cortex, 2000-2005.  
Marcus Family Foundation (PI, M. Sur), Research on Autism and Developmental Disorders, 2003-2006.  
NIH, R01 EY 11512: Activity-dependent mechanisms of visual development, 1996-2004.  
DuPont-MIT Alliance (PI, M. Sur; co-PI, R. Langer): Biopolymer based neuronal networks, 2001-2004.  
March of Dimes Birth Defects Foundation: Mechanisms of thalamic compartmentalization and plasticity,  
2000-2003.  
Markey Foundation grant in Developmental Neuroscience (co-PI, M. Sur), 1990-1998.  
NSF, IBN-9602143: Role of retrograde messengers in visual development, 1996-1998.  
Sloan Fund: Cortical dynamics of learning, 1997-1998  
March of Dimes Birth Defects Foundation: Plasticity and specificity in visual development, 1995-1997.  
Science Partnerships Fund: Orientation modules in visual cortex: theory and experiments, 1995-1997.  
NIH, R01 EY 07719: Development and plasticity of visual projections, 1988-1996 (1988-91, 1991-96).  
March of Dimes Birth Defects Foundation: Visual inputs and cortical development, 1992-1994.  
NIH, Biomedical Research Support Grant: Optical recording of electrical activity in rewired cortex, 1992-

1993.  
McKnight Fund for Neuroscience: Target specificity in visual development, 1988-1992.  
Whitaker Health Sciences Fund: Cellular mechanisms underlying spared functions after damage to visual cortex, 1990-1991.  
Sloan Foundation: Research Fellowship in Neuroscience, 1985-1989.  
March of Dimes Birth Defects Foundation: Functional visual projections induced into auditory thalamus and cortex, 1987-1989.  
Center for Environmental Health Sciences/National Institute of Environmental Health Sciences: Formamidine pesticides and adrenergic modulation of function in visual cortex, 1989-1991.  
Educational Foundation of America: Retinal axon outgrowth and arborization, 1989-1990.  
National Science Foundation, BNS 8411973: Functional organization of primate somatosensory cortex, 1985-1988.  
Whitaker Health Sciences Fund: Functional development of central visual structures, 1986-1988.  
Educational Foundation of America: Role of fibroblast growth factors in development, 1988-1989.  
Educational Foundation of America: Role of testosterone in neuronal development, 1988-1989.  
NIH, Biomedical Research Support Grant: Target specificity in development, 1987-1988.  
NIH Shared Instrumentation grant: Transmission electron microscope to study cell structure, 1990.

### **Postdoctoral fellowships sponsored:**

Preston Garraghty, NIH, 1984.  
Sarah Pallas, NIH, 1989.  
Leah Krubitzer, NIH, 1990 (declined).  
Cheryl White, NIH, 1990; Bunting Fellowship, 1992.  
Sacha Nelson, NIH, 1991.  
Karina Cramer, NIH, 1992.  
Francisco Clasca, M.E.C. Spain, 1992; Fogarty Fellowship, 1993.  
David Somers, McDonnell-Pew Fellowship, 1992; NIMH, 1993.  
Jitendra Sharma, Fogarty Fellowship, 1994.  
Ding-you Li, MRC Canada, 1995 (declined).  
Chrystal Ho, NIH, 1996.  
Casto Rivadulla, Fulbright Fellowship, 1998.  
Valentin Dragoi, Merck Fellowship, 2000; McDonnell-Pew Foundation Fellowship, 2000.  
Jorge Marino, M.E.C. Spain, 2000.  
Ania Majewska, MIT Science Fellowship, 2001; Burroughs Wellcome Award, 2003.  
Jessica Newton, NIH, 2001.  
David Lyon, NIH, 2002.  
Amanda Mower, NIH, 2004.  
Damon Page, Nancy Lurie Marks Foundation, 2004, 2007.  
Daniela Tropea, NIH, 2005.  
Nathan Wilson, NIH, 2006; Simons Fellowship, 2009.  
Beata Jarosiewicz, NIH, 2006.  
Rong Mao, NIH, 2006.  
Audra Van Wart, NIH, 2007.  
Jorge Castro, M.E.C. Spain, 2007.  
Showming Kwok, Simons Fellowship, 2009.  
Nikolaos Mellios, NIH, 2009.  
Gertrude Perea Parilla, Marie-Curie Fellowship, 2010.  
Abhishek Banerjee, Simons Fellowship, 2010.  
Sami El-Boustani, Marie-Curie Fellowship, 2011.  
Ikue Nagakura, Simons Fellowship, 2011.

Jeremy Petravicz, NIH, 2012.  
Michael Goard, NIH, 2013; K99 2014.  
Rafiq Huda, NIH, 2014.  
Jacques Pak Kan Ip, IRSF 2013; HFSP, 2014.  
Vincent Breton-Provencher, FRSQ, Canada, 2015.