

Curriculum Vitae

May 2023

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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.

Research Interests

Development, plasticity and dynamics of the cerebral cortex
Neuromodulatory influences on neuronal and astrocyte networks
Technologies for imaging brain cells, synapses and circuits *in vivo*
Brain disorders and diseases

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, MIT, 2000
Sigma Xi, 2001
Member, National Academy of Sciences, India, 2001 (elected)
Distinguished Alumnus Award, Indian Institute of Technology, Kanpur, 2002
Associate, 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, The 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 (elected)
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, 2011
Member, National Academy of Medicine, USA, 2011 (elected)
Distinguished Alumnus Award in the Psychological Sciences, Vanderbilt University, 2012
Brain and Cognitive Sciences Award for Excellence in Undergraduate Advising, MIT, 2013
Narayana Murthy Distinguished Chair, IIT Madras, 2015
Foreign Fellow, Indian National Science Academy, 2015 (elected)
Krieg Cortical Discover Prize, 2016
Doctor of Science *honoris causa*, IIT Kanpur, 2017
Fellow, American Institute for Medical and Biological Engineering, 2021 (elected)

Distinguished and Plenary 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
Bearg Lecture, Carnegie-Mellon University, 2016
Michigan Society for Neuroscience Distinguished Lecture, 2016
Institute Lecture, Indian Institute for Science, Education and Research, Mohali, 2016

Institute Lecture, ISI, 2016
Merzenich Discovery Lecture, UCSF, 2016
Presidency University 200 Year Anniversary Lecturer, 2017
DSc *honoris causa* Institute Lecture, Indian Institute of Technology, Kanpur, 2017
Jerzy Konorski Lecture, International Congress of the Polish Neuroscience Society, Warsaw, 2017
Frontiers in Interdisciplinary Neuroscience and Technology, Zhejiang University, Hangzhou, 2017
FENS Forum of Neuroscience, Berlin, 2018
Shirodkar Memorial Lecture, Hyderabad, 2019
Indian National Science Academy Fellows Lecture, 2020
University of Massachusetts Amherst Distinguished Lecture, 2020
Rutgers Brain Health Institute Plenary Lecture, 2021
Centennial Lecture, Punjab Engineering College, Chandigarh, 2021
National Science Day Lecture, TIFR, 2022
Plenary Lecture, International Symposium on Drug Discovery Research, 2022
Cognitive Neuroscience Society, San Francisco, 2022
Schmitt Lecture, Del Monte Center, University of Rochester, 2022

Boards, Advisory Committees

Editorial Boards

Editorial Board, Philosophical Transactions of the Royal Society, 2016-2023
Editorial Board, Cerebral Cortex, 1995-
Chief Editor, Systems Neuroscience, Frontiers in Neuroscience, 2007-2009
Associate Editor, Frontiers in Systems Neuroscience, 2009-
Editorial Board, International Journal of Humanoid Robotics, 2007-2022
Advisory Board, IEEE Transactions on Cognitive and Developmental Systems, 2009-2015
Section Editor, The Cognitive Neurosciences, MIT Press, 2007-2011
Editorial Board, Neurosignals, 2001-2014
Editorial Board, The Visual Neurosciences, 2001
Scientific Advisory Board, Encyclopedia of Neuroscience, 1999
Member, Faculty of 1000, Current Science, 2002-2004
Editorial Advisory Board, The MIT Press – Cognitive Science, 1998-2003
Editorial Board, Journal of Biosciences, 1998-2001
Editorial Board, Journal of Basic and Applied Biomedicine, 1992-1994
Editorial Board, Visual Neuroscience, 1990-1994

Advisory Committees

Chair of the jury, Infosys Prize in the Life Sciences, 2018-
Scientific Advisory Board, Institute for Stem Cell Biology and Regenerative Medicine, 2014-
NIH Study Sections (ad hoc), ongoing
Chair, Team Science Grants Committee, Wellcome Trust India Alliance, 2019-2022
Chair, IEEE Conference on Intelligent Human-Computer Interactions, 2021
National Eye Institute Advisory Council, NIH, 2003-2008
Board of Scientific Counselors, National Eye Institute, NIH, 2010-2015
Board of Governors, Academy of Scientific and Innovative Research, CSIR, 2010-2015
Board of Directors, The Autism Consortium, 2006-2015
World Economic Forum, Global Agenda Council (Brain and Cognitive Sciences), 2011-2012
National Eye Institute Advisory Council Planning Oversight Committee, 2009-2011
National Research Council Decadal Panel on Biological and Physical Sciences in Space, 2009-2010
Co-chair, NIH Blueprint for Neuroscience Research Workshop on “Neuroplasticity”, 2008-2009
Committee on Training Programs, Society for Neuroscience, 2016-19

Finance Committee, Society for Neuroscience, 2013-2018
External Advisory Consultant, NIMH U19 (COPACABANA) Panel, 2016-2021
Strategic Advisory Council, Wellcome Trust India Alliance, 2011-2019
Member and Chair, Fellowship Committee, Wellcome Trust India Alliance, 2010-2019
Infosys Prize Jury, 2010-11
The Royal Society, UK, Sectional Committee 8, 2006-2009
Executive Committee, The Autism Consortium, 2006-2008
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
Visual Sciences B Study Section, NIH, 1999-2003
Program Chair, International Conference on Development and Learning, 2002
Scientific Review Board, NINDS, 1997-99
National Research Council HHMI Fellowship Review Panel, 1998
Molecular, Cellular and Developmental Neurobiology Review Committee, NIMH/NIH, 1997-98
National Research Council HHMI Fellowship Review 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
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)

Faculty Policy Committee, 2021-
Killian Award Committee, 2018-2019
Provost's Committee on Space Economy Systems, 2013-2018
Brain and Cognitive Sciences Council, 2012-
Committee on Outside Professional Activities, MIT, 2013-2016
MIT Science Council, 1997-2012
Chair, Institute Professorship Committee, 2008-2009
Planning Committee on Biomedical Research, 2007-2012
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. Uhrich 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. Uhrich 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: Laminar 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. Hahn 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. Hahm 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-range connections. In: Lateral Interactions in the Cortex: Structure and Function, eds. J. Sirosh, R. Miikkulainen and Y. Choe, Univ. of Texas, Austin, 1996.
94. Cramer, K.S., A. Angelucci, J.O. Hahn, M.B. Bogdonov and M. Sur. A role for nitric oxide in the development of the ferret retinogeniculate projection. Journal of Neuroscience 16: 7995-8004, 1996.
95. Sheth, B.R., J. Sharma, S.C. Rao and M. Sur. Orientation maps of subjective contours in visual cortex. Science 274: 2110-2115, 1996.
96. Somers, D.C., Todorov, E.V., Siapas, A.G. and Sur, M. Vector-space integration of local and long-range information in visual cortex. AI Lab Memo 1556, M.I.T., 1996.
97. Angelucci, A., F. Clasca, E. Bricolo, K.S. Cramer and M. Sur. Experimentally induced retinal projections to the ferret auditory thalamus: Development of clustered eye-specific patterns in a novel target. Journal of Neuroscience 17: 2040-2055, 1997.
98. Cramer, K.S. and M. Sur. Blockade of afferent impulse activity disrupts on/off sublamination in the ferret lateral geniculate nucleus. Developmental Brain Research 98: 287-290, 1997.
99. Rao, C., L.J. Toth and M. Sur. Optically imaged maps of orientation preference in primary visual cortex of cats and ferrets. Journal of Comparative Neurology 387: 358-370, 1997.
100. Toth, L.J., D.-S. Kim, S.C. Rao and M. Sur. Integration of local inputs in visual cortex. Cerebral Cortex 7: 703-710, 1997.
101. Somers, D.C., E.V. Todorov, A.G. Siapas, and M. Sur. A local circuit integration approach to understanding visual cortical receptive fields. In: Computational Neuroscience, Trends in Research, J. Bower, ed., pp 505-510, Plenum Press, New York 1997.
102. Moore, C.I., and M. Sur. Cortical plasticity and LTP. Behavioral Brain Sciences 20: 623-624, 1997.
103. Sheth, B.R., C.I. Moore, and M. Sur. Temporal modulation of spatial borders in rat barrel cortex. Journal of Neurophysiology 79:464-470, 1998.
104. Garraghty, P.E., A. Roe and M. Sur. Specification of retinogeniculate X and Y axon arbors in cats: fundamental differences in developmental programs. Developmental Brain Research 107: 227-231, 1998.

105. Somers, D.C., E.V. Todorov, A.G. Siapas and M. Sur. A local circuit approach to understanding integration of local and long-range inputs in visual cortex. Cerebral Cortex 8: 204-217, 1998.
106. Angelucci, A, F. Clasca, and M. Sur. Brainstem inputs into the ferret medial geniculate nucleus and the effect of early deafferentation on novel retinal projections to the auditory thalamus. Journal of Comparative Neurology 400: 417-439, 1998.
107. Leamey, C.A., K. Cramer, and M. Sur. The role of activity-dependent mechanisms in pattern formation in the retinogeniculate pathway. In: "Development and organization of the retina: From molecules to function," L. Chalupa and B. Finlay, eds., pp 309-318, Kluwer Academic Press, 1998.
108. Cramer, K.S., C.A. Leamey and M. Sur. Nitric oxide as a signaling molecule in visual system development. In "Nitric Oxide and other diffusible signals in brain development, plasticity and disease," R. Mize and M. Friedlander, eds., pp. 101-114, Progress in Brain Research Series, Elsevier, 1998.
109. Hohnke, C.D., and M. Sur. Development of the visual pathways: Effects of neural activity. Mental Retardation & Developmental Disabilities Research Reviews 5: 51-59, 1999.
110. Hohnke, C.D., and M. Sur. Stable properties of spontaneous EPSCs and miniature retinal EPSCs during the development of ON/OFF sublamination in the ferret lateral nucleus. Journal of Neuroscience 19: 236-247, 1999.
111. Hahm, J., K. Cramer, and M. Sur. Pattern formation by retinal afferents in the ferret lateral geniculate nucleus: developmental segregation and the role of NMDA receptors. Journal of Comparative Neurology 411: 327-345, 1999.
112. Cramer K.S., and M. Sur. The neuronal form of nitric oxide synthase is required for pattern formation by retinal afferents in the ferret lateral geniculate nucleus. Developmental Brain Research 116: 79-86, 1999.
113. Moore, C.I., S.B. Nelson, and M. Sur. Dynamics of neuronal integration in rat somatosensory cortex. Trends in Neurosciences 22: 513-520, 1999.
114. Yuste, R., and M. Sur. Development and plasticity of the cerebral cortex: from molecules to maps. Journal of Neurobiology 41: 1-6, 1999.
115. Sur, M., A. Angelucci and J. Sharma. Rewiring cortex: The role of patterned activity in development and plasticity of neocortical circuits. Journal of Neurobiology 41: 33-43, 1999.
116. Sharma, J., A. Angelucci and M. Sur. Induction of visual orientation modules in auditory cortex. Nature 404:841-847, 2000.
117. Von Melchner, L., S.L. Pallas and M. Sur. Visual behavior mediated by retinal projections directed to the auditory pathway. Nature 404:871-876, 2000.
118. Dragoi, V., and M. Sur. Dynamic properties of local interactions between inhibitory interneurons in primary visual cortex: Contrast and orientation dependence of contextual effects. Journal of Neurophysiology 83: 1019-1030, 2000.
119. Angelucci, A., J. Sharma and M. Sur. Modifiability of neocortical connections and function during development. In: "The Mutable Brain", J.H. Kaas, ed, Harwood Academic Publishers, pp 351-392, 2000.

120. Dragoi, V., J. Sharma and M. Sur. Adaptation-induced plasticity of orientation tuning in primary visual cortex. Neuron 28:287-298, 2000.
121. Hohnke, C.D., S. Oray and M. Sur. Activity-dependent patterning of retinogeniculate axons proceeds with a constant contribution from AMPA and NMDA receptors. Journal of Neuroscience 20: 8051-8060, 2000.
122. Weng, J., J. McClelland, A. Pentland, O. Sporns, I. Stockman, M. Sur and E. Thelen. Autonomous mental development by robots and animals. Science 291: 599-600, 2001.
123. Rivadulla, C., J. Sharma and M. Sur. Specific roles of NMDA and AMPA receptors in direction-selective and spatial phase-selective responses in visual cortex. Journal of Neuroscience 21: 1710-1719, 2001.
124. Sur, M. and C. Leamey. Development and plasticity of cortical areas and networks. Nature Reviews Neuroscience 2:251-262, 2001.
125. Dragoi, V., C. Rivadulla and M. Sur. Foci of orientation plasticity in visual cortex. Nature 411: 80-86, 2001.
126. Leamey, C., C. Ho-Pao and M. Sur. Disruption of retinogeniculate pattern formation by inhibition of soluble guanylyl cyclase. Journal of Neuroscience 21: 3871-3880, 2001.
127. Hohnke, C.D., and M. Sur. Neural activity and the development of brain circuits. In: Encyclopedia of Life Sciences, London: Nature Publishing Group, vol. 13, pp. 19-27, 2001.
128. Lyckman, A., S. Jhaveri, D. Feldheim, P. Vanderhaeghen, J. Flanagan and M. Sur. Enhanced plasticity of retinthalamic compartmentalization in an ephrin-A2/A5 double null mutant. Journal of Neuroscience 21: 7684-7690, 2001.
129. Dragoi, V., C. Turcu and M. Sur. Stability of cortical responses and the statistics of natural scenes. Neuron 32: 1181-1192, 2001.
130. Sur, M. Mechanisms of cortical development: Transplantation and rewiring studies. International Encyclopedia of the Social and Behavioral Sciences 4: 2837-2842, 2001.
131. Somers, D., V. Dragoi and M. Sur. Orientation selectivity and its modulation by local and long-range connections in visual cortex. In: "The Cat Primary Visual Cortex", A. Peters and B. Payne, eds., Academic Press, pp 471-520, 2002.
132. Dragoi, V., C. Rivadulla and M. Sur. Contributions of ascending thalamic and local intracortical connections to visual cortical function. In: "Virtual Lesions: Understanding perception and behavior with reversible deactivation techniques", S. Lomber and R. Galuske, eds., Oxford University Press, pp 41-60, 2002.
133. Sur, M., J. Schummers and V. Dragoi. Cortical plasticity: Time for a change. Current Biology 12: R168-170, 2002.
134. Leamey, C.A. and M. Sur. The thalamus: A new proposal. Neuron 34: 507-508, 2002.
135. Lyckman, A. and M. Sur. The role of afferent activity in the development of cortical specification. In: "Cortical Development I: Results and Problems in Cell Differentiation", C. Hohmann, ed., Springer-Verlag, pp 139-156, 2002.

136. Dragoi, V., J. Sharma, E.K. Miller and M. Sur. Dynamics of neuronal sensitivity in visual cortex and local feature discrimination. Nature Neuroscience 5: 883-891, 2002.
137. Schummers, J., J. Marino and M. Sur. Synaptic integration by V1 neurons depends on location within the orientation map. Neuron 36: 969-978, 2002.
138. Sharma, J., V. Dragoi, J. Tenenbaum, E. Miller and M. Sur. V1 neurons signal acquisition of an internal representation of stimulus location. Science 300: 1758-1763, 2003.
139. Leamey, C.A., C. Ho-Pao and M. Sur. The role of calcineurin in activity-dependent pattern formation in the dorsal lateral geniculate nucleus of the ferret. Journal of Neurobiology 56: 153-162, 2003.
140. Dragoi, V., J. Sharma and M. Sur. Response plasticity in primary visual cortex and its role in vision and visuomotor behavior: Bottom up and top-down influences. IETE Journal of Research 49: 77-85, 2003.
141. Sur, M and Jayadeva. Cognitive Science: Sensation, Perception and Learning. Editorial, Special Issue on Cognitive Science. IETE Journal of Research 49: 73-75, 2003.
142. Dragoi, V. and M. Sur. Plasticity of orientation processing in adult visual cortex. In: The Visual Neurosciences, L.M. Chalupa and J. Werner, eds., MIT Press, pp 1654-1663, 2003.
143. Majewska, A. and M. Sur. Motility of dendritic spines in visual cortex in vivo: Changes during the critical period and effects of visual deprivation. Proceedings of the National Academy of Sciences 26: 16024-16029, 2003.
144. Marino, J., J. Schummers and M. Sur. Combination of new electrophysiological and imaging techniques in the study of primary visual cortex function. Revista de Neurologia 36: 944-950, 2003.
145. Newton, J.R. and M. Sur. Plasticity of cerebral cortex in development. Encyclopedia of Neuroscience, Third Edition, 2004.
146. Sur, M. Rewiring cortex: Cross-modal plasticity and its implications for cortical development and function. In: The Handbook of Multisensory Processes, G. Calvert, C. Spence, B. E. Stein, eds., MIT Press, pp 681-694, 2004.
147. Newton, J.R., C. Ellsworth, T. Miyakawa, S. Tonegawa and M. Sur. Acceleration of visually cued conditioned fear through the auditory pathway. Nature Neuroscience 7: 968-973, 2004.
148. Oray S, A. Majewska and M. Sur. Dendritic spine dynamics are regulated by monocular deprivation and extracellular matrix degradation. Neuron 44: 1021-1030, 2004.
149. Newton, J.R. and M. Sur. Rewiring cortex: functional visual plasticity in the auditory cortex during development. In: Plasticity of the central auditory system and processing of complex acoustic signals, ed., J. Syka and M.M. Merzenich, 2004.
150. Schummers J., J. Mariño and M. Sur. Local networks in visual cortex and their influence on neuronal responses and dynamics. Journal of Physiology Paris 98:429-441, 2004.
151. George, P., A. Lyckman, D. LaVan, A. Hegde, Y. Liung, R. Avasare, C. Testa, P. Alexander, R. Langer and M. Sur. Fabrication and biocompatibility of polypyrrole implants suitable for neural prostheses. Biomaterials 26: 3511-3519, 2005.

152. Mariño J., J. Schummers, D.C. Lyon, L. Schwabe, O. Beck, P. Wiesing, K. Obermayer and M. Sur. Invariant computations in local cortical networks with balanced excitation and inhibition. Nature Neuroscience 8: 194-201, 2005.
153. Ellsworth, C.A., A. W. Lyckman, D. A. Feldheim, J. G. Flanagan and M. Sur. Ephrin-A2 and A-5 influence patterning of normal and novel retinal projections to the thalamus: Conserved mapping mechanisms in visual and auditory thalamic targets. Journal of Comparative Neurology 488: 140-151, 2005.
154. Lyckman, A., G. Fan, M. Rios, R. Jaenisch and M. Sur. Normal eye-specific patterning of retinal inputs to subcortical visual nuclei in the absence of brain-derived neurotrophic factor. Visual Neuroscience 22: 27-36, 2005.
155. Yu, H., B. Farley, D. Z. Jin and M. Sur. The coordinated mapping of visual space and stimulus features in visual cortex. Neuron 47: 267-280, 2005.
156. Sur, M. Breathing life into biology. Nature 436: 487, 2005.
157. Schummers J., J. Sharma and M. Sur. Bottom up and top down dynamics in visual cortex. Progress in Brain Research 149: 65-81, 2005.
158. Sur, M. and J. Rubenstein. Patterning and plasticity of the cerebral cortex. Science 310: 805-810, 2005.
159. Jin, D.Z., V. Dragoi, M. Sur and H.S. Seung. The tilt aftereffect and adaptation-induced changes in orientation tuning in visual cortex. Journal of Neurophysiology 94: 4038-4050, 2005.
160. Newton, J.R., A.K. Majewska, C. Ellsworth and M. Sur. Reprogramming cortex: the consequences of cross-modal plasticity during development. In: Reprogramming the Cerebral Cortex, ed., S. Lomber and J. Eggermont, Oxford University Press, pp 349-360, 2006.
161. Oray, S., A. Majewska and M. Sur. Effects of synaptic activity on dendritic spine motility of developing cortical layer 5 pyramidal neurons. Cerebral Cortex 16: 730-741, 2006.
162. Majewska, A., J.R. Newton and M. Sur. Remodeling of synaptic structure in sensory cortical areas *in vivo*. Journal of Neuroscience 26: 3021-3029, 2006.
163. Dragoi, V. and M. Sur. Image structure at the center of gaze during free viewing. Journal of Cognitive Neuroscience 18: 737-748, 2006.
164. Majewska, A. and Sur, M. Plasticity and specificity of cortical processing networks. Trends in Neurosciences 29: 323-329, 2006.
165. Tropea, D., G. Kreiman, A. Lyckman, S. Mukherjee, H. Yu, S. Horng and M. Sur. Gene expression changes and molecular pathways mediating activity-dependent plasticity in visual cortex. Nature Neuroscience 9: 660-668, 2006.
166. Horng, S.H. and M. Sur. Visual activity and cortical rewiring: activity-dependent plasticity of cortical networks. Progress in Brain Research 157: 3-11, 2006.
167. Wang, K.H., A. Majewska, J. Schummers, B. Farley, C. Hu, M. Sur, and S. Tonegawa. In vivo two-photon imaging reveals a role of Arc in enhancing orientation specificity in visual cortex. Cell 126: 389-402, 2006.

168. Newton, J.R., D. Page and M. Sur. Developmental studies on rewiring the brain: What they tell us about brain evolution. In: Evolution of Nervous Systems, ed. J.H. Kaas, Academic Press, Oxford, vol 3, pp 103-112, 2007.
169. Leamey, C.A., S. Merlin, P. Lattouf, N. Demel, K.A. Glendining, H. Zhou, T. Oohashi, A. Sawatari, M. Sur and R. Fässler. Ten_m3 regulates eye-specific patterning in the mammalian visual pathway and is required for binocular vision. PLoS Biology 5: 2077-2092, 2007.
170. Farley, B., H. Yu, D. Z. Jin and M. Sur. Alteration of visual input results in a coordinated reorganization of multiple visual cortex maps. Journal of Neuroscience 27:10299-10310, 2007.
171. Schummers, J., B. Cronin, K. Wimmer, M. Stimberg, R. Martin, K. Obermayer, K. Kording and M. Sur. Dynamics of orientation tuning in cat V1 neurons depend on location within layers and orientation maps. Frontiers in Neuroscience 1: 145-159, 2007.
172. Wilson, N.R., M.T. Ty, D.E. Ingber, M. Sur and G. Liu. Synaptic reorganization in scaled networks of controlled size. Journal of Neuroscience 27: 13581- 13589, 2007.
173. Leamey, C. A., K.A. Glendining, G. Kreiman, N. Kang, K.H. Wang, Reinhard Fassler, S. Tonegawa and M. Sur. Differential gene expression between sensory neocortical areas: a potential role for Ten_m3 in patterning visual projections. Cerebral Cortex 18: 53-66, 2008.
174. Schummers, J., H. Yu and M. Sur. Tuned responses of astrocytes and their influence on hemodynamic signals in the visual cortex. Science 320: 1638-1643, 2008.
175. Lyckman, A.W., S. Horng, C. Leamey, D. Tropea, A. Van Wart, C. McCurry, A. Wakatabe, T. Yamamori and M. Sur. Gene expression in visual cortex during the critical period: synaptic stability and reversal by visual deprivation. Proceedings of the National Academy of Sciences 105: 9409-9414, 2008.
176. Tropea, D., A. Van Wart and M. Sur. Molecular mechanisms of experience-dependent plasticity in visual cortex. Philosophical Transactions of the Royal Society B 364: 341-355, 2008 (e-pub Nov 2008).
177. Sur, M. The emerging nature of nurture. Science 322:1636. 2008.
178. Page, D.T., O. Kuti, C. Prestia and M. Sur. Haploinsufficiency for *Pten* and *Serotonin transporter* cooperatively influences brain size and social behavior. Proceedings of the National Academy of Sciences 106: 1989-1994, 2009.
179. Tropea, D., E. Giacometti, N. R. Wilson, C. Beard, C. McCurry, D. Fu, R. Flannery, R. Jaenisch, M. Sur. Partial reversal of Rett-Syndrome like symptoms in MeCP2 mutant mice. Proceedings of the National Academy of Sciences 106: 2029-2034, 2009.
180. Stimberg, M., K. Wimmer, R. Martin, L. Schwabe, J. Marino, J. Schummers, D. Lyon, M. Sur and K. Obermayer. The operating regime of local computations in primary visual cortex. Cerebral Cortex 19: 2166-2180 (advanced access e-publication Feb 16), 2009.
181. Horng, S.H. and M. Sur. Patterning and plasticity of maps in the mammalian visual pathway. In: The Cognitive Neurosciences (Gazzaniga M., ed, MIT Press, Cambridge), pp 91-107, 2009.

182. Neville, H. and M. Sur. Introduction to Plasticity. In: The Cognitive Neurosciences (Gazzaniga M., ed, MIT Press, Cambridge), pp 89-91, 2009.
183. Leamey, C.A., A. Van Wart and M. Sur. Intrinsic patterning and experience-dependent mechanisms that generate eye-specific projections and binocular circuits in the visual pathway. Current Opinion in Neurobiology 19: 181-187, 2009.
184. Malik, W.Q., J. Schummers, M. Sur and E.N. Brown. A statistical model for multiphoton calcium imaging of the brain. Proceedings of the IEEE – Engineering in Medicine and Biology 31: 7002-7005, 2009.
185. Mao, R., D.T. Page, J. Holtzman, I. Merzlyak, C. Kim, L. H. Tecott, P.H. Janak, J.L.R. Rubenstein and M. Sur. Reduced conditioned fear response in mice that lack *Dlx1* and show subtype-specific loss of interneurons. Journal of Neurodevelopmental Disorders (DOI 10.1007/s11689-009-9025-8), 2009.
186. Horng, S.H., G.Kreiman, C.Ellsworth, D.Page, M.Blank, K.Millen and M.Sur. Differential gene expression in the developing lateral geniculate nucleus and medial geniculate nucleus reveals novel roles for *Zic4* and *Foxp2* in visual and auditory pathway development. Journal of Neuroscience 29: 13672-13683, 2009.
187. Wimmer, K., M. Stimberg, R. Martin, L. Schwabe, J. Mariño, J. Schummers, D. C. Lyon, M. Sur, and K. Obermayer. Dependence of orientation tuning on recurrent excitation and inhibition in a network model of V1. Advances in Neural Information Processing Systems 21: 769–1776, 2009.
188. Page, D.T., O. Kuti and M. Sur. Computerized assessment of social approach behavior in mouse. Frontiers in Behavioral Neuroscience 3: 48, 2009.
189. Yu, H., J. Schummers and M. Sur. The influence of astrocyte activation on hemodynamic signals for functional brain imaging. In: Imaging the Brain with Optical Methods (Roe AW, ed, Springer NY), pp 45-64, 2010.
190. Cronin, B., I.H. Stevenson, M. Sur and K. Kording. Hierarchical Bayesian modeling and Markov Chain Monte Carlo sampling for tuning curve analysis. Journal of Neurophysiology 103: 591-602, 2010.
191. McCurry, C.L., J.D. Shepherd, D. Tropea, K.H. Wang, M.F. Bear and M. Sur. Loss of Arc renders the visual cortex impervious to the effects of sensory deprivation or experience. Nature Neuroscience 13: 450-457, 2010.
192. Tropea, D., A. Majewska, R. Garcia and M. Sur. Structural dynamics of synapses in vivo correlate with functional changes during experience-dependent plasticity in visual cortex. Journal of Neuroscience 30:11086-11095, 2010.
193. Stevenson, I.H., B.Cronin, M.Sur and K.Kording. Sensory adaptation and short-term plasticity as Bayesian correction for a changing brain. PLoS ONE 5: e12436. doi:10.1371/journal.pone.0012436, 2010.
194. Runyan, C.A., J. Schummers, A. Van Wart, S. Kuhlmann, N. Wilson, Z.J. Huang and M. Sur. Response features of parvalbumin-expressing interneurons suggest precise roles for subtypes of inhibition in visual cortex. Neuron 9: 847-857, 2010.
195. Wilson, N.R. and M. Sur. Determinants of synaptic and circuit plasticity in the cerebral cortex: Implications for neurodevelopmental disorders. In: Cerebral Plasticity: New Perspectives (Chalupa L.M., et al., ed, MIT Press), pp 75-88, 2011.

196. Cramer, S.C., M. Sur, B.H. Dobkin, C. O'Brien, T.D. Sanger, J.Q. Trojanowski, J.M. Rumsey, R. Hicks, et al. Harnessing neuroplasticity for clinical applications. Brain 134: 1591-1609, 2011.
197. Malik, W.Q., J. Schummers, M. Sur, and E.N. Brown. Denoising two-photon calcium imaging data. PLoS One 6: e20490, 2011. (doi:10.1371/journal.pone.0020490)
198. Tropea, D., M. Sur and A.K. Majewska. Experience-dependent plasticity in visual cortex: dendritic spines and visual responsiveness. Communicative and Integrative Biology 4: 216-219, 2011.
199. Mellios, N., H. Sugihara, J. Castro, A. Banerjee, C. Le, A. Kumar, B. Crawford, J. Strathmann, D. Tropea, S. S. Levine, D. Edbauer and M. Sur. miR-132, an experience-dependent microRNA, is essential for visual cortex plasticity. Nature Neuroscience 14: 1240-1242, 2011.
200. Yu, H., A.K. Majewska and M. Sur. Rapid experience-dependent plasticity of synapse function and structure in ferret visual cortex *in vivo*. Proceedings of the National Academy of Sciences 108: 21235-21240, 2011.
201. Mower, A.F., S. Kwok, H. Yu, A. K. Majewska, K. Okamoto, Y. Hayashi and M. Sur. Experience-dependent regulation of CaMKII activity within single visual cortex synapses *in vivo*. Proceedings of the National Academy of Sciences 108: 21241-21246, 2011.
202. Zheng HW, Malik WQ, Runyan CA, Sur M, Brown EN. Modeling two-photon calcium fluorescence of episodic VI recordings using multifrequency analysis. Proceedings of the IEEE – Engineering in Medicine and Biology 33: 3016-3019, 2011.
203. Mao, R., J.Schummers, U.Knoblich, C. J.Lacey, A.Van Wart, C.Kim, J.R.Huguenard, J.L.R.Rubenstein and M.Sur. Influence of an inhibitory interneuron subtype on stimulus-specific responses in visual cortex. Cerebral Cortex 22: 493-508, 2012.
204. Jarosiewicz, B., J. Schummers, W.Q. Malik, E.N. Brown and M. Sur. Functional biases in visual cortex neurons with identified projections to higher cortical targets. Current Biology 22: 269-277, 2012.
205. Banerjee A., J. Castro and M. Sur. Rett syndrome: genes, synapses, circuits and therapeutics. Frontiers in Psychiatry 3, 34: 1-13, 2012. (doi:10.3389/fpsy.2012.00034)
206. Gorlin, S., M. Meng, J. Sharma, H. Sugihara, M. Sur and P. Sinha. Imaging prior information in the brain. Proceedings of the National Academy of Sciences 109: 7935-7940, 2012.
207. Mellios, N. and M. Sur. The emerging role of microRNAs in schizophrenia and autism spectrum disorders. Frontiers in Psychiatry 3: 39 [doi: 10.3389/fpsy.2012.00039], 2012.
208. Wilson, N.R., C.A. Runyan, F.L. Wang, and M. Sur. Division and subtraction by distinct cortical inhibitory networks *in vivo*. Nature 488: 343-348, 2012.
209. Anguera, M.C., R. Sadreyev, Z. Zhang, A. Szanto, B. Payer, S.D. Sheridan, S. Kwok, S.J. Haggarty, M. Sur, J. Alvarez, A. Gimelbrant, M. Mitalipova, J.E. Kirby, and J.T. Lee. Molecular signatures of human induced pluripotent stem cells highlight sex differences and cancer genes. Cell Stem Cell 11: 75-90, 2012.
210. Chen, N., H. Sugihara, J. Sharma, G. Perea, J. Petravic, C. Le, and M. Sur. Nucleus basalis enabled stimulus specific plasticity in the visual cortex is mediated by astrocytes. Proceedings of the National Academy of Sciences 109: E2832–E2841, 2012.

211. Kwok, S., N. Mellios and M. Sur. PI3K signaling and micro RNA regulation in autism spectrum disorders. In: Neuroscience of Autism Spectrum Disorders (J.D. Buxbaum and P.R. Hof, eds, Elsevier), pp 449-459, 2012.
212. Merlin S., S. Horng, L.R. Marotte, M. Sur, A. Sawatari, and C.A. Leamey. Deletion of Ten-m3 induces the formation of eye dominance domains in mouse visual cortex. Cerebral Cortex 23: 763-774, 2013.
213. Castro, J., N. Mellios and M. Sur. Mechanisms and therapeutic challenges in autism spectrum disorders: Insights from Rett Syndrome. Current Opinion in Neurology 26: 154-159, 2013.
214. Runyan, C.A., and M. Sur. Response selectivity is correlated to dendritic structure in parvalbumin-expressing inhibitory neurons in visual cortex. Journal of Neuroscience 33: 11724–11733, 2013.
215. Wilson N. R., J. Schummers, C.A. Runyan, S.X. Yan, R.E. Chen, Y. Deng, M. Sur. Two-way communication with neural networks in vivo using directed light. Nature Protocols 8: 1184–1203, 2013.
216. Nagakura, I., N. Mellios and M. Sur. Mechanisms of visual cortex plasticity during development. In: The New Visual Neurosciences (J. Werner and L.Chalupa, Eds, MIT Press), pp 1359-1368, 2013.
217. Li, Y., H. Wang, J. Muffat, A.W. Cheng, D.A. Orlando, J. Lovén, S. Kwok, D.A. Feldman, H.S. Bateup, Q. Gao, D. Hockemeyer, M. Mitalipova, C.A. Lewis, M.G. Vander Heiden, M. Sur, R.A. Young, and R. Jaenisch. Global transcriptional and translational repression in human-embryonic-stem-cell-derived Rett Syndrome neurons. Cell Stem Cell 13: 446–458, 2013.
218. Banerjee, A., E. Romero-Lorenzo and M. Sur. MeCP2: Making sense of missense in Rett syndrome. Cell Research 23:1244-1246, 2013.
219. Sur, M., I. Nagakura, N. Chen and H. Sugihara. Mechanisms of plasticity in the developing and adult visual cortex. Progress in Brain Research 207: 243-254, 2013.
220. Perea, G., A. Yang, E. Boyden and M. Sur. Optogenetic astrocyte activation modulates response selectivity of visual cortex neurons *in vivo*. Nature Communications [doi: 10.1038/ncomm4262], 2014.
221. El-Boustani, S., N. Wilson, C. Runyan and M. Sur. Principles of divisive and subtractive inhibition. Nature 508: E3-4 (doi: 10.1038/nature13130), 2014.
222. Khwaja, O.S., E. Ho, K.V. Barnes, O’Leary HM, Pereira L, Finkelstein Y, Nelson CA, Vogel V, DeGregorio G, Fichorova RN, Holm IA, Khatwa U, Kapur K, Gregas M, Alexander ME, Finnegan DM, Cantwell NG, Walco AC, Rappaport LA, Shannon MW, Sur M, Kaufmann WE. Safety, pharmacokinetics, and preliminary assessment of efficacy of mecasermin (recombinant human-IGF1 injection) for the treatment of Rett Syndrome. Proceedings of the National Academy of Sciences 111: 4596-4601, 2014.
223. Castro, J., R. Garcia, S. Kwok, A. Banerjee, J. Petravicz, J. Woodson, D. Tropea and M. Sur. Functional recovery with recombinant human IGF1 treatment in a mouse model of Rett Syndrome. Proceedings of the National Academy of Sciences 111: 9941-9946, 2014.
224. Mellios, N., J. Woodson, R. Garcia, B. Crawford, J. Sharma, S.D. Sheridan, S.J. Haggarty and M. Sur. β -2 adrenergic receptor agonist ameliorates phenotype and corrects microRNA-mediated IGF1 deficits in an animal model of Rett Syndrome. Proceedings of the National Academy of Sciences 111: 9947-9952, 2014.

225. Bosch, M., J. Castro, T. Saneyoshi, H. Matsuno, M. Sur and Y. Hayashi. Structural and molecular remodeling of dendritic spine substructures during long-term potentiation. Neuron 82: 444-459 [doi: 10.1016/j.neuron.2014.03.021.], 2014.
226. Sharma, J. and M. Sur. The ferret as a model for visual system development and plasticity. In: Biology and Diseases of the Ferret (edited by J.G. Fox and R.P. Marini, Wiley-Blackwell), pp 711-734, 2014.
227. Caggiano, V., M. Sur and E. Bizzi. Rostro-caudal inhibition of hindlimb movements in the spinal cord of mice. PLoS One 9(6):e100865 [doi: 10.1371/journal.pone.0100865], 2014.
228. Nagakura, I., A. Van Wart, J. Petravicz, D. Tropea and M. Sur. STAT1 regulates the homeostatic component of visual cortical plasticity via an AMPA receptor-mediated mechanism. Journal of Neuroscience 34: 10256-10263 [doi: 10.1523/JNEUROSCI.0189-14.2014], 2014.
229. Landman, R., J. Sharma, M. Sur and R. Desimone. Effect of distracting faces on visual selective attention in the monkey. Proceedings of the National Academy of Sciences [doi/10.1073/pnas.1420167111], 2014.
230. 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.
231. 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 [doi: 10.1016/j.stemcr.2014.10.001], 2014.
232. 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.
233. 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 33:102-106 [doi:10.1038/nbt.3055], 2015.
234. 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 [doi:10.1093/cercor/bhu086], 2015.
235. Chen, N., H. Sugihara and M. Sur. An acetylcholine-activated microcircuit drives temporal dynamics of cortical activity. Nature Neuroscience 18: 892-902 [doi: 10.1038/nn.4002], 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 [doi: 10.1038/mp.2014.176], 2015.
238. Sahin, M. and M. Sur. Genes, circuits and precision therapies for autism and related neurodevelopmental disorders. Science 350: 926 [doi: 10.1126/science.aab3897], 2015.
239. Rikhye, R.V. and M. Sur. Spatial correlations in natural scenes modulate response reliability in mouse visual cortex. Journal of Neuroscience 35: 14661-14680 [doi: 10.1523/JNEUROSCI.1660-15.2015], 2015.

240. Tropea, D., I. Molinos, E. Petit, S. Bellini, I. Nagakura, C. O'Tuathaigh, L. Schorova, K.J. Mitchell, J. Waddington, M. Sur, M. Gill and A.P. Corvin. Disrupted in schizophrenia 1 (DISC1) L100P mutants have impaired activity-dependent plasticity in vivo and in vitro. Translational Psychiatry 6: e712 [doi:10.1038/tp.2015.206], 2016.
241. Feldman, D., A. Banerjee and M. Sur. Developmental dynamics of Rett Syndrome. Neural Plasticity [http://dx.doi.org/10.1155/2016/6154080], 2016.
242. Goard, M.J., G.N. Pho, J. Woodson and M. Sur. Distinct roles of visual, parietal, and frontal motor cortices in memory-guided sensorimotor decisions. eLife 5: e13764. [doi: http://dx.doi.org/ 10.7554/eLife.13764], 2016.
243. Sugihara, H., N. Chen and M. Sur. Cell-Specific modulation of plasticity and cortical state by cholinergic inputs to the visual cortex. Journal of Physiology (Paris) 110: 37-43 [doi: 10.1016/j.jphysparis.2016.11.004], 2016.
244. Banerjee, A., R.V. Rikhye, V. Breton-Provencher, X. Tang, C. Li, C.A. Runyan, Z. Fu, R. Jaenisch and M. Sur. Jointly reduced inhibition and excitation underlies circuit-wide changes in cortical processing in Rett Syndrome. Proceedings of the National Academy of Sciences 113: E7287-E7296 [doi: 10.1073/pnas.1615330113], 2016.
245. Chen, N., H. Sugihara, J. Kim, Z. Fu, B. Barak, M. Sur, G. Feng and W. Han. Direct modulation of GFAP-expressing glia in the arcuate nucleus bi-directionally regulates feeding. eLife 5: e18716 [doi: 10.7554/eLife.18716], 2016.
246. Li, Y., J. Muffat, A. Omer, I. Bosch, M.A. Lancaster, M. Sur, L. Gehrke, J.A. Knoblich and R. Jaenisch. Induction of expansion and folding in human cerebral organoids. Cell Stem Cell 20: 385-396 [doi: 10.1016/j.stem.2016.11.017], 2017.
247. Bosch, M., J. Castro, M. Sur and Y. Hayashi. Photomarking relocalization technique for correlated two-photon and electron microscopy imaging of single stimulated synapses. Methods in Molecular Biology 1538: 185-214 [doi: 10.1007/978-1-4939-6688-2_14], 2017.
248. Philips, R.T., M. Sur, and V.S. Chakravarthy. The influence of astrocytes on the width of orientation hypercolumns in visual cortex: A computational perspective. PLoS Computational Biology 27: 13(10): e1005785 [doi: 10.1371/journal], 2017.
249. Mellios, N., D.A. Feldman, S.D. Sheridan, J.P.K. Ip, S. Kwok, S.K. Amoah, B. Rosen, B.A. Rodriguez, B. Crawford, R. Swaminathan, S. Chou, Y. Li, M. Ziats, C. Ernst, R. Jaenisch, S.J. Haggarty, and M. Sur. MeCP2-regulated miRNAs control early human neurogenesis through differential effects on ERK and AKT signaling. Molecular Psychiatry 23:1051-1065 [doi: 10.1038/mp.2017.86], 2017.
250. Bloem, B., R. Huda, M. Sur and A.M. Graybiel. Two-photon imaging in mice shows striosomes and matrix have overlapping but differential reinforcement-related responses. eLife 6: e32353 [doi: 10.7554/eLife.32353], 2017.
251. Ip, J.P.K., I. Nagakura, J. Petravicz, J. Benoit, E.A.C. Wiemer and M. Sur. Major vault protein, a candidate gene in 16p11.2 microdeletion syndrome, is required for the homeostatic regulation of visual cortical plasticity. Journal of Neuroscience 38: 3890-3900 [doi: 10.1523/JNEUROSCI.2034-17.2018], 2018.

252. Ip J.P.K., N. Mellios and M. Sur. Rett syndrome: insights into genetic, molecular and circuit mechanisms. Nature Reviews Neuroscience 19: 368-382 [doi: 10.1038/s41583-018-0006-3], 2018.
253. Okada, S., B.B. Bartelle, N. Li, V. Breton-Provencher, J.J. Lee, E. Rodriguez, J. Melican, M. Sur and A. Jasanoff. Calcium-dependent molecular fMRI using a magnetic nanosensor. Nature Nanotechnology 13: 473-477 [doi: 10.1038/s41565-018-0092-4], 2018.
254. Pho, G., M.J. Goard, J. Woodson, B. Crawford, and M. Sur. Task -dependent representations of stimulus and choice in mouse parietal cortex. Nature Communications 9: 2596 [doi: 10.1038/s41467-018-05012-y], 2018.
255. El-Boustani, S., J.P.K. Ip, V. Breton-Provencher, H. Okuno, H. Bito and M. Sur. Locally coordinated synaptic plasticity of visual cortex neurons *in vivo*. Science 360:1349-1354 [doi: 10.1126/science.aao0862], 2018.
256. Huda, R., M.J. Goard, G.N. Pho and M. Sur. Neural mechanisms of sensorimotor transformation and action selection. European Journal of Neuroscience [doi: 10.1111/ejn.14069], 2018.
257. Kaschube, M., C.A. Nelson III, A.A. Benasich, G. Buzsáki, P. Gressens, T.K. Hensch, M. Hübener, M.S. Kobor, W. Singer and M. Sur. Emergent Brain Dynamics – Early Childhood. MIT Press, pp. 101-123, 2018
258. Breton-Provencher, V., M. Sur. Active control of arousal by a locus coeruleus GABAergic circuit. Nature Neuroscience 22: 218-228 [doi: 10.1038/s41593-018-0305-z], 2019.
259. Banerjee, A., M.T. Miller, K. Li and M. Sur. Towards a better diagnosis and treatment of Rett syndrome: a model synaptic disorder. Brain 142: 239-248 [doi: 10.1093/brain/awy323], 2019.
260. Yildirim, M., H. Sugihara, P.T.C. So and M. Sur. Functional imaging of visual cortical layers and subplate in awake mice with optimized three-photon microscopy. Nature Communications 10: 177 [doi: 10.1038/s41467-018-08179-6], 2019.
261. Zhou, Y., J. Sharma, Q. Ke, R. Landman, J. Yuan, H. Chen, D.S. Hayden, J.W. Fisher III, M. Jiang, W. Menegas, T. Aida, T. Yan, Y. Zou, D. Xu, S. Parmar, J.B. Hyman, A. Fanucci-Kiss, O. Meisner, D. Wang, Y. Huang, Y. Li, Y. Bai, W. Ji, X. Lai, W. Li, L. Huang, Z. Lu, L. Wang, S.A. Anteraper, M. Sur, H. Zhou, A.P. Xiang, R. Desimone, G. Feng and S. Yang. Atypical behaviour and connectivity in SHANK3-mutant macaques. Nature 570: 326–331 [doi: 10.1038/s41586-019-1278-0], 2019.
262. Sebastian, J., M.G. Kumar, V.S. Viraraghavan, M. Sur and H.A. Murthy. Spike Estimation From Fluorescence Signals Using High-Resolution Property of Group Delay. IEEE Transactions on Signal Processing 67: 2923-2936 [doi: 10.1109/TSP.2019.2908913], 2019.
263. Tang, X., J. Drotar, K. Li, C.D. Clairmont, A.S. Brumm, A.J. Sullins, H. Wu, X.S. Liu, J. Wang, N.S. Gray, M. Sur and R. Jaenisch. Pharmacological enhancement of KCC2 gene expression exerts therapeutic effects on human Rett syndrome neurons and Mecp2 mutant mice. Science Translational Medicine 11: eaau0164 [doi: 10.1126/scitranslmed.aau0164], 2019.
264. Kumar M.G., M.S. Saranya, S. Narayanan, M. Sur, H.A. Murthy. Subspace techniques for task-independent EEG person identification. Annual Int Conf IEEE Engg Med Biol Soc: 4545-4548 [doi: 10.1109/EMBC.2019.8857426], 2019.

265. Sharon R.A., S. Aggarwal, P. Goel, R. Joshi, M. Sur, H.A. Murthy, S. Ganapathy. Level-wise Subject adaptation to improve classification of motor and mental EEG tasks. *Annual Int Conf IEEE Eng Med Biol Soc*: 6172-6175 [doi: 10.1109/EMBC.2019.8857584], 2019.
266. Stowell, R.D., G.O. Sipe, R.P. Dawes, H.N. Batchelor, K.A. Lordy, B.S. Whitelaw, M.B. Stoessel, J.M. Bidlack, E. Brown, M. Sur and A.K. Majewska. Noradrenergic signaling in the wakeful state inhibits microglial surveillance and synaptic plasticity in the mouse visual cortex. *Nature Neuroscience* 22: 1782-1792 [doi: <https://doi.org/10.1038/s41593-019-0514-0>], 2019.
267. Whipple, A.J., V. Breton-Provencher, H.N. Jacobs, U.K. Chitta, M. Sur and P.A. Sharp. Imprinted Maternally Expressed microRNAs Antagonize Paternally Driven Gene Programs in Neurons. *Molecular Cell* 78: 85-95[<https://doi.org/10.1016/j.molcel.2020.01.020>], 2020.
268. Huda R., G.O. Sipe, V. Breton-Provencher, K.G. Cruz, G.N. Pho, E. Adam, L.M. Gunter, A. Sullins, I.R. Wickersham, and M. Sur. Distinct prefrontal top-down circuits differentially modulate sensorimotor behavior. *Nature Communications* 11: 6007 [<https://doi.org/10.1038/s41467-020-19772-z>], 2020.
269. Yildirim M., M. Hu, N.M. Le, H. Sugihara, P.T.C. So, and M. Sur. Quantitative third-harmonic generation imaging of mouse visual cortex areas reveals correlations between functional maps and structural substrates. *Biomedical Optics Express* 11: 5650–5673 [<https://doi.org/10.1364/BOE.396962>], 2020.
270. Sharon R.A., S.S. Narayanan, M. Sur, H. Murthy. Neural Speech Decoding During Audition, Imagination and Production. *IEEE Access* [<https://doi.org/10.1109/ACCESS.2020.3016>], 2020.
271. Bassett D.S., K.E. Cullen, S.B. Eickhoff, M.J. Farah, Y. Goda, P. Haggard, H. Hu, Y.L. Hurd, S.A. Josselyn, B.S. Khakh, J.A. Knoblich, P. Poirazi, R.A. Poldrack, M. Prinz, P.R. Roelfsema, T.L. Spires-Jones, M. Sur, H.R. Ueda. Reflections on the past two decades of neuroscience. *Nature Reviews Neuroscience* [<https://doi.org/10.1038/s41583-020-0363-6>], 2020.
272. Tang X., R. Jaenisch, M. Sur. The role of GABAergic signalling in neurodevelopmental disorders. *Nature Reviews Neuroscience* 22: 290-307 [<https://doi.org/10.1038/s41583-021-00443-x>], 2021.
273. Kumar M.G., M. Hu, A. Ramanujan, M. Sur, H.A. Murthy. Functional parcellation of mouse visual cortex using statistical techniques reveals response-dependent clustering of cortical processing areas. *PLoS Computational Biology* 17: e1008548 [<https://doi.org/10.1371/journal.pcbi.1008548>], 2021.
274. Sebastian J., M. Sur, H.A. Murthy, M. Magimai-Doss. Signal-to-signal neural networks for improved spike estimation from calcium imaging data. *PLoS Computational Biology* 17: e1007921 [<https://doi.org/10.1371/journal.pcbi.1007921>], 2021.
275. Sipe G.O., J. Petravicz, R.V. Rikhye, R. Garcia, N. Mellios, M. Sur. Astrocyte glutamate uptake coordinates experience-dependent, eye-specific refinement in developing visual cortex. *Glia* 69: 1723-1735 [<https://doi.org/10.1002/glia.23987>], 2021.
276. Khan I., A. Prabhakar, C. Delepine, H. Tsang, V. Pham, M. Sur. A low-cost 3D printed microfluidic bioreactor and imaging chamber for live-organoid imaging. *Biomicrofluidics* 15: 024105 [<https://doi.org/10.1063/5.0041027>], 2021.
277. Delepine C., V.A. Pham, H.W.S. Tsang, M. Sur. GSK3 β inhibitor CHIR 99021 modulates cerebral organoid development through dose-dependent regulation of apoptosis, proliferation, differentiation and migration. *PLOS One* [<https://doi.org/10.1063/5.0041027>], 2021.

278. Kumar M.G., S. Narayanan, M. Sur, H.A. Murthy. Evidence of Task-Independent Person-Specific Signatures in EEG Using Subspace Techniques. IEEE Transactions on Information Forensics and Security [<https://doi.org/10.1109/TIFS.2021.3067998>], 2021.
279. Breton-Provencher V., G.T. Drummond, M. Sur. Locus Coeruleus Norepinephrine in Learned Behavior: Anatomical Modularity and Spatiotemporal Integration in Targets. Frontiers in Neural Circuits [<https://doi.org/10.3389/fncir.2021.638007>], 2021.
280. Zheng C., J.K. Park, M. Yildirim, J.R. Boivin, Y. Xue, M. Sur, P.T.C. So, D.N. Wadduwage. De-scattering with Excitation Patterning enables rapid wide-field imaging through scattering media. Science Advances [<https://doi.org/10.1126/sciadv.aay5496>], 2021.
281. Cheng C., S.A. Reis, E.T. Adams, D.M. Fass, S.P. Angus, T.J. Stuhlmiller, J. Richardson, H. Olafson, E.T. Wang, D. Patnaik, R.L. Beauchamp, D.A. Feldman, M.C. Silva, M. Sur, G.L. Johnson, V. Ramesh, B.L. Miller, S. Temple, K.S. Kosik, B.C. Dickerson, S.J. Haggarty. High-content image-based analysis and proteomic profiling identifies Tau phosphorylation inhibitors in a human iPSC-derived glutamatergic neuronal model of tauopathy. Scientific Reports 11: 17029 [<https://doi.org/10.1038/s41598-021-96227-5>], 2021.
282. Rikhye R.V., M. Yildirim, M. Hu, V. Breton-Provencher, M. Sur. Reliable Sensory Processing in Mouse Visual Cortex through Cooperative Interactions between Somatostatin and Parvalbumin Interneurons. Journal of Neuroscience 41: 8761-8778 [<https://doi.org/10.1523/JNEUROSCI.3176-20.2021>], 2021.
283. Jenks K.R., K. Tsimring, J.P.K. Ip, J.C. Zepeda, M. Sur. Heterosynaptic Plasticity and the Experience-Dependent Refinement of Developing Neuronal Circuits. Frontiers in Neural Circuits 15:803401 [<https://doi.org/10.3389/fncir.2021.803401>], 2021.
284. Desai M., J. Sharma, A.L. Slusarczyk, A.A. Chapin, R. Ohlendorf, A. Wisniowska, M. Sur, A. Jasanoff. Hemodynamic molecular imaging of tumor-associated enzyme activity in the living brain. Elife. [<https://doi.org/10.7554/eLife.70237>], 2021.
285. Wilson N.R., F.L. Wang, N. Chen, S.X. Yan, A.L. Daitch, B. Shi, S. Sharma, M. Sur. A Platform for Spatiotemporal "Matrix" Stimulation in Brain Networks Reveals Novel Forms of Circuit Plasticity. Frontiers in Neural Circuits 15:792228 [doi:10.3389/fncir.2021.792228], 2021.
286. Bloem B., R. Huda, K.I. Amemori, A.S. Abate, G. Krishna, A.L. Wilson, C.W. Carter, M. Sur, A.M. Graybiel. Multiplexed action-outcome representation by striatal striosome-matrix compartments detected with a mouse cost-benefit foraging task. Nature Communications 13:1541 [doi:10.1038/s41467-022-28983-5], 2022.
287. Leow Y.N., B. Zhou, H.A. Sullivan, A. Barlowe, I.R. Wickersham, M. Sur. Brain-wide Mapping of Inputs to the Mouse Lateral Posterior (LP/Pulvinar) Thalamus - Anterior Cingulate Cortex Network. Journal of Comparative Neurology [<https://doi.org/10.1002/cne.25317>], 2022.
288. Breton-Provencher V., G.T. Drummond, J. Feng, Y. Li, M. Sur. Spatiotemporal dynamics of norepinephrine during learned behavior. Nature [<https://doi.org/10.1038/s41586-022-04782-2>], 2022.
289. Yildirim M., C. Delepine, D. Feldman, V.A. Pham, S. Chou, J.P.K. Ip, A. Nott, L.-H. Tsai, G.-L. Ming, P.T.C. So, M. Sur. Label-free three-photon imaging of intact human cerebral organoids for tracking early

- events in brain development and deficits in Rett syndrome. *eLife* [<https://doi.org/10.7554/eLife.78079>], 2022.
290. Adam E.M., T. Johns, M. Sur. Dynamic control of visually guided locomotion through corticosubthalamic projections. *Cell Reports* [<https://doi.org/10.1016/j.celrep.2022.111139>], 2022.
291. Shovlin S., C. Delepine, L. Swanson, S. Bach, M. Sahin, M. Sur, W.E. Kaufmann, D. Tropea. Molecular Signatures of Response to Mecasermin in Children with Rett Syndrome. *Frontiers in Neuroscience* [doi: 10.3389/fnins.2022.868008], 2022.
292. Adam E.M., M. Sur. Algebraic approach for subspace decomposition and clustering of neural activity. *STAR Protocols* [doi: 10.1016/j.xpro.2022.101841], 2022.
293. Cruz K.G., Y.N. Leow, N.M. Le, E. Adam, R. Huda, M. Sur. Cortical-Subcortical Interactions in Goal-directed Behavior. *Physiological Reviews* 103: 347-389 [<https://doi.org/0.1152/physrev.00048.2021>], 2023.
294. Krzisch M.A., H. Wu, B. Yuan, T.W. Whitfield, X.S. Liu, D. Fu, C.M. Garrett-Engele, A.S. Khalil, T. Lungjangwa, J. Shih, A.N. Chang, S. Warren, A. Cacace, K.R. Andrykovich, R.G.J. Rietjens, O. Wallace, M. Sur, B. Jain, R. Jaenisch. Fragile X syndrome patient-derived neurons developing in the mouse brain show FMR1 -dependent phenotypes. *Biological Psychiatry* 93: 71-81 [doi:10.1016/j.biopsych.2022.08.020], 2023.
295. Delepine C, J. Shih, K. Li, P. Gaudeaux, M. Sur. Differential Effects of Astrocyte Manipulations on Learned Motor Behavior and Neuronal Ensembles in the Motor Cortex. *Journal of Neuroscience* 43: 2696-2713 [doi: 10.1523/JNEUROSCI.1982-22.2023], 2023.
296. Jin L., H.A. Sullivan, M. Zhu, T.K. Lavin, M. Matsuyama, X. Fu, N.E. Lea, R. Xu, Y.Y. Hou, L. Rutigliani, M. Pruner, K. R. Babcock, J.P.K. Ip, M. Hu, T.L. Daigle, H. Zeng, M. Sur, G. Feng, I.R. Wickersham. Long-term labeling and imaging of synaptically-connected neuronal networks in vivo using double-deletion-mutant rabies viruses. *bioRxiv* 2021.12.04.471186 [*Nature* (in revision)].
297. Le N.M., M. Yildirim, Y. Wang, H. Sugihara, M. Jazayeri, M. Sur. Mixture of Learning Strategies Underlies Rodent Behavior in Dynamic Foraging. *bioRxiv* 2022.03.14.484338 [*PLoS Computational Biology* (in revision)].

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.

Patents

M. Sur, D. Tropea, G. Kreiman. Identifying and modulating molecular pathways that mediate nervous system plasticity. US Patent No. 8,969,295.

M. Sur, D. Tropea, N. Wilson, E. Giacometti, R. Jaenisch. Treatment of Rett Syndrome and other disorders. US Patent No. 7,994,127.

D. Page, M. Sur. Diagnosis of autism spectrum disorders and its treatment with an antagonist or inhibitor of the 5-HT_{2c} receptor signaling pathway. US Patent No. 8,940,732.

W. Malik, J. Schummers, M. Sur, E.N. Brown. Noise reduction of imaging data. US Patent No. 8,903,192.

Symposia and 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 21st 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”, 6th 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. Ladislav 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, Defense 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 Lecture, Bernstein Conference on Computational Neuroscience, Germany, October 2009.

How the Brain Creates Intelligence. Science Conclave, IIIT 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, Accademia 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. 6th Annual Tufts Neuroscience Symposium, October 2014.

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

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

Brains, Minds and Machines. Leadership Lecture, 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 Keynote Lecture, March 2015.

The Functional Logic of Cortical Circuits. Symposium on Physics, Mathematics and Neuroscience of Cortical Function, Boston University, May 2015.

Animal Models of Cortical Plasticity: Implications for Understanding and Treating Amblyopia. Lasker Foundation/IRRF Initiative on Amblyopia Workshop, Woods Hole, July 2015.

Mechanisms of Plasticity in the Cerebral Cortex. Conference on ‘Exciting Biologies – Biology of Plasticity’, IPSEN/Cell Press, La Jolla, October 2015.

Plasticity in Cortical Circuits. Symposium on Molecular and Cellular Mechanisms of Neural Homeostasis, Max Planck Institute for Brain Research, Frankfurt, October 2015.

Neural Architectures for Cognition. Workshop, Center for Computational Brain Research, Indian Institute of Technology, Madras, January 2016.

The Functional Logic of Cortical Circuits. Victor Bearg Lecture, Carnegie-Mellon University, February 2016.

Mechanisms and Potential Therapeutics for Neurodevelopmental Disorders. Special Lecture, National Center for Biological Sciences, Bangalore, India, March 2016.

The Functional Logic of Cortical Circuits. Michigan Society for Neuroscience Keynote Distinguished Lecture, Michigan State University, East Lansing, May 2016.

Mechanisms and Emerging Therapeutics for Neurodevelopmental Disorders. Symposium on Biology of Brain Disorders, Trinity College, Dublin, June 2016.

The Neural Architecture of Cognition. Institute Lecture, Indian Institute of Science, Education and Research, Mohali, August 2016.

The Neural Architecture of Cognition. Institute Lecture, Indian Statistical Institute, Kolkata, August 2016.

The Functional Logic of Cortical Circuits. Merzenich Discovery Lecture, Univ of California, San Francisco, October 2016.

Brain Circuits and Neural Dynamics underlying Cognition. Workshop, Center for Computational Brain Research, Indian Institute of Technology, Madras, January 2017.

Brain Circuits and Dynamics of Cognition. Symposium on Brain, Computation and Learning, Indian Institute of Science, Bangalore, January 2017.

Brains, Minds and Society. Presidency University 200 Year Anniversary Symposium, January 2017.

Brain Wiring and Brain Disorders. Center for Neuroscience, Havana, January 2017.

Brains, Minds and Intelligent Machines. My journey from EE to Neuroscience. DSc *honoris causa* Institute Lecture, Indian Institute of Technology, Kanpur, June 2017.

The Neural Architecture of Cognition. National Brain Research Center, India, August 2017.

The Functional Logic of Cortical Circuits. Jerzy Konorski Lecture, International Congress of the Polish Neuroscience Society, Warsaw, August 2017.

The Functional Logic of Cortical Circuits. Frontiers in Interdisciplinary Neuroscience and Technology, Zhejiang University, Hangzhou, November 2017.

Brain and Cognition. Workshop, Center for Computational Brain Research, January 2018.

Neuroscience and the Future of AI. ‘Shaastra’ Lecture, Indian Institute of Technology, Madras, January 2018.

The Functional Logic of Cortical Circuits. International Center for Theoretical Sciences Symposium “ICTS@10”, Bangalore, January 2018.

Rules of Plasticity in Visual Cortex Neurons and Circuits. International Society for Developmental Neuroscience, Symposium on ‘Development and plasticity of sensory pathways’, Nara, Japan, May 2018.

Calcium Microdomains in Cortical Astrocytes, and their relationship to Synapses, Circuits and Processing. FENS meeting, Symposium on Microdomain astrocyte Ca²⁺ signals and their functional relevance’, Berlin, July 2018.

Cortical plasticity and brain disorders. Colloquium, University of Virginia, Charlottesville, September 2018.

Locally coordinated synaptic plasticity mediated by Arc: A unifying principle for autism? Simons Foundation Autism Research Initiative Symposium, New York, October 2018.

Cortical plasticity and brain disorders. NIMH Symposium on ‘Neurodevelopmental origins of brain circuit architecture and psychiatric disorders’, November 2018.

Reconfigurable networks and brain plasticity. Workshop, Center for Computational Brain Research, Indian Institute of Technology, Madras, January 2019.

How does the brain create the mind? Dr. M.V.N. Shirodkar Memorial Lecture, Telengana Academy of Sciences, Hyderabad, January 2019.

Cortical plasticity and brain disorders. Plenary Lecture, Institute for Stem Cell Research Advisory Board Meeting, Bangalore, March 2019.

Control of brain states by acetylcholine and noradrenaline circuits. Neuromodulation of Neural Microcircuits - NM2, Champery, Switzerland, May 2019.

Mechanisms of plasticity in the developing cortex. International Neuropsychological Symposium, Vietri, Italy, June 2019.

Mechanisms of dysfunction across developmental stages in Rett Syndrome. Neurodevelopmental disorders Symposium, Boston, November 2019.

Locally coordinated synaptic plasticity in visual cortex neurons and circuits. International Conference on Neural Cells, Circuits and Behavior, Beijing, November 2019.

Brain wiring and brain disorders. Workshop on Computational Brain Research, Indian Institute of Technology, Madras, January 2020.

Brain plasticity and brain disorders. NHLBI/NIH Distinguished Speakers Series, March 2020.

Brain plasticity and brain disorders. Georgetown University Neuroscience Colloquium Series, April 2020.

Cortical plasticity. Brain and Cognitive Sciences Special Lecture, May 2020.

The neural architecture of cognition. Indian National Science Academy Fellows Lecture, September 2020.

Meep2 mechanisms across developmental stages in Rett Syndrome. Rett Syndrome Scientific Symposium, October 2020.

How does the brain create the mind? IIT Hyderabad Lecture, November 2020.

Cortical plasticity and brain disorders. University of Massachusetts Amherst Distinguished Lecture Series, December 2020.

Cortical plasticity and Autism Spectrum Disorder. Israel Society for Neuroscience Symposium Plenary Lecture, February 2021.

Cortical Plasticity. Rutgers Brain Health Institute Plenary Seminar, February 2021.

Artificial Intelligence and the Brain. Punjab Engineering College Centennial Lecture, March 2021.

Cortical development, plasticity and dynamics. BCS Brains on Brains meeting, May 2021.

Mechanisms and therapeutics for neurodevelopmental disorders: Rett Syndrome. BCH Neurosurgery Translational Research Rounds, September 2021.

Mechanism-based therapeutics for neurodevelopmental disorders: Rett Syndrome. Plenary lecture, Institute for Stem Cell Research, Bangalore, February 2022.

Brain circuits and computations underlying cognition: how the brain gives rise to the mind. National Science Day lecture, Tata Institute for Fundamental Research, Mumbai, February 2022.

Mechanism-based therapeutics for neurodevelopmental disorders. Plenary Lecture, 8th international Symposium on Current Trends in Drug Discovery Research, Central Drug Research Institute, Lucknow, India, March 2022.

Cortical dynamics and sensory-motor transformations during goal-directed behavior. Symposium on ‘Taking things to the next level: Deep dives into neural population activity’, Cognitive Neuroscience Society, San Francisco, April 2022.

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 2015-2021, 2023

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

GIAN Workshop on Modelling and Plasticity of the Cerebral Cortex, IIT Allahabad, India, 2016.

GIAN Workshop on Cognition: An Interdisciplinary Perspective, IISER Mohali, 2016.

Graduate Students

Current Doctoral Students:

Katherine Tsimring, Gabrielle Drummond, Jiho Park, Gregg Heller, Emma Odom. Ziyu Wang

Doctoral Theses Supervised:

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: 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: Clifford M. and Ruth M. Altermatt Professor of Glaucoma; Professor of Ophthalmology and Visual Sciences, 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: Distinguished Senior Fellow, Schar School of Policy and Government, George Mason University.

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

Diana K. Smetters, Ph.D. 1995. Electrotonic structure and synaptic integration in cortical neurons. Current position: Google Inc.

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: 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: 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: Senior Vice-President, Michigan Economic Development Corporation.

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: Associate Professor, Department of Bioengineering, Florida International University.

Serkan Oray, Ph.D. 2004. Structural dynamics and synaptic development in the visual system. Current position: Senior Director, Device and Technology, UCB 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: Scientist, Biogen-Idec Inc.

Beau Cronin, Ph.D. 2008. Quantifying uncertainty in computational neuroscience with Bayesian statistical inference. Current position: Chief Scientist, Beseeq.

Cortina McCurry, Ph.D. 2009. Deficient plasticity in the visual cortex of Arc null mice. Current position: Principal, 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: Assistant Professor, Neurology, Icahn School of Medicine at Mount Sinai.

Caroline Runyan, Ph.D. 2012. Structure, function and circuits of inhibitory neuron subtypes in the visual cortex. Current position: Assistant Professor, Department of Neuroscience, University of Pittsburgh.

Naiyan Chen, Ph.D. 2013. Cell-type specific cholinergic modulation of the cortex. Current position: Scientist, Novartis Inc.

Rodrigo Garcia, Ph.D. 2016. Cell-type specific contributions to Rett Syndrome: neuronal and astrocytic signaling and sensory processing. Current position: Associate Director of Productions, JoVE.

Rajeev Rikhye, Ph.D. 2016. The mechanisms of reliable coding in mouse visual cortex. Current position: Researcher, Google Inc.

Danielle Feldman, Ph.D. 2016. Human induced pluripotent stem cell models of Rett Syndrome reveal deficits in early cortical development. Current position: Seven Bridges Genomics, Cambridge.

Gerald Pho, Ph.D. 2017. Sensorimotor transformation and information coding across cortex during perceptual decisions. Current position: Senior ML Data Scientist, OURA Inc.

Marvin Nayan, Ph.D. 2020. Local regulation of experience-dependent synaptic plasticity by the noncoding exonic circular RNA circHomer1. Current position: Field Application Scientist, Nanostring Inc.

Nhat Minh Le, Ph.D. 2022. Behavioral strategies and neural mechanisms of dynamic foraging. Current position: Biomedical Data Scientist, PathAI.

Yi Ning Leow, Ph.D. 2022. Multiplexed representations of uncertainty by mouse pulvinar-prefrontal projections during goal-directed behaviors. Current position: Postdoctoral Fellow, MIT.

K. Guadalupe Cruz. 2022. Prefrontal-collicular interactions in visually driven behavior. Current position: Technology Specialist, Wolf, Greenfield and Sacks, PC.

Master's Theses Supervised:

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:

Hiroki Sugihara, Jennifer Shih, Kyle Jenks, Sofie Aehrlund Richter, Yuma Osako, Tatsuya Osaki, Prachi Ojha, Giselle Fernandes

Previous Fellows:

Preston Garraghty, 1984-87; Professor, Dept. of Psychology, Indiana University

Ronald Langdon, 1987-90; Expert Scientific Writer, Novartis Ireland

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

Darren Gitelman, 1990-91; Associate Professor, Dept. of Neurology, Northwestern University School of Medicine

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; Plastic Surgeon, Texas

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

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

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

S. Chenchal Rao, 1992-1995; Research Scientist, Vanderbilt University School of Medicine

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 Neurobiology and Behavior, University of California, Irvine

Jitendra Sharma, 1994-97; Research Scientist, MIT

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

Chrystal Ho Pao, 1997-1998; Professor of Biology, Trinity International University

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

Casto Rivadulla, 1998-1999; Professor, University of Coruña, Spain

Valentin Dragoi, 1998-2003; Rochelle and Max Levit Distinguished Professor in Neuroscience, Dept. of Neurobiology and Anatomy, McGovern Medical School, University of Texas, Houston

Jorge Marino, 2002-2003; Research Scientist, University of Coruña, Spain

Alvin Lyckman, 1998-2004; Assistant Professor, Tufts University School of Medicine and St. Elizabeth's Hospital, Boston

David Lyon, 2002-2004; 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; Professor, Dept. of Neurobiology and Anatomy, University of Rochester Medical Center

Paul George, 2005-2006; Assistant Professor of Neurology, Stanford University School of Medicine

Hiroki Sugihara, 2005-2008; Research Scientist, MIT

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; Medical Director, Impact Communication Partners, New York

Daniela Tropea, 2003-2009; Associate Professor, Trinity College Dublin

Hongbo Yu, 2002-2009; Professor, School of Life Sciences, Fudan University, Shanghai

Rong Mao, 2005-2010; Research Scientist, Stanford University School of Medicine

Beata Jarosiewicz, 2006-2010; Senior Research Scientist, Stanford University

Damon Page, 2004-2010; Associate Professor, 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, Verily Life Sciences
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 Data Specialist, California Dept of Developmental Services
Jeremy Petravicz, 2010-2018; Technical Editor, Wiley.
Vardhan Dani, 2012-2014; Scientist, Tevard Biosciences, MA
Sami El-Boustani, 2011-15; Assistant Professor, Dept of Basic Neurosciences, University of Geneva
Nikolaos Mellios, 2009-15; Associate Professor, Dept of Neurosciences, University of New Mexico, Albuquerque
Michael Goard, 2010-15; Assistant Professor, Depts of Molecular, Cellular and Developmental Biology,
University of California, Santa Barbara
Abhishek Banerjee, 2010-15; Senior Lecturer, Centre for Transformative Neuroscience, Newcastle University,
UK
Jamie Benoit, 2015-17; Senior Scientist, Axovant Sciences
Jacque Ip, 2014-2020; Assistant Professor, The Chinese University of Hong Kong
Rafiq Huda, 2014-2019; Assistant Professor, Dept of Cell Biology and Neuroscience, Rutgers University
Ming Hu, 2015-2020; Instructor, Dept of Neuroscience, Baylor College of Medicine
Keji Li, 2015-2020; Quantitative Developer, Acadia Asset Management
Elie Adam, 2017-2021; Research Scientist, MIT
Chloe Delepine, 2016-2021; Scientist, Agenus
Vincent Breton-Provencher, 2014-2021; Assistant Professor, CERVO Brain Research Center, University of Laval
Murat Yildirim, 2016-2022; Assistant Professor, Lerner Institute, Cleveland Clinic
Grayson Sipe, 2016-22; Assistant Professor, Department of Biology, Penn State University

Research Support

Active:

Research Grants:

NIH, R01 MH133066 (PI: M.Sur, co-PI: R.Yang): Neuron-astrocyte mechanisms of norepinephrine in goal-directed learning, 2023-2028
NIH, R01 NS130361 (PI: M. Sur): Astrocyte-neuron circuits underlying cortical mechanisms of learned behavior, 2022-2027
Multi-University Research Initiative, DoD (PI: M. Sur, co-PIs: A. Graybiel, J. O'Doherty, P. Agrawal, A. Rakhlin): Rethinking reinforcement learning, 2021-2026
NIH, R01 MH126351 (PI, M. Sur): Spatiotemporal dynamics of locus coeruleus circuits during learned behavior, 2021-2026
NIH, R01 MH085802 (PI, M. Sur): Early developmental mechanisms of Rett Syndrome, 2021-2026
NIH, R01 DA049005 (PI, M. Sur; co-PIs, R. Jaenisch, E. Boyden): Novel tools for spatiotemporal modulation of astrocytes in neuronal circuits, 2019-2023

Center Grants:

Simons Foundation Autism Research Initiative: Simons Center for the Social Brain at MIT
(Director, M. Sur), 2012-2027

Training and Core grants:

NIH Core Grant EY02621 (co-PI): Central Visual Processes, 1994-2023

Completed Grants:

NIH, R01 EY028219 (P.I., M. Sur): Astrocyte-neuron interactions in visual cortex circuits, 2018-2023
NIH, R01 MH085802 (PI, M. Sur): MicroRNA mechanisms of Rett Syndrome, 2015-2021
NIH, R01 EB022726 (PI, E. Brown, co-PI, M. Sur): Filtered point process inference framework for modeling neural data, 2016-2020
NIH, R01 EY007023 (PI, M. Sur): Cell-specific circuits and contextual modulation in visual cortex, 2015-2020
NIH Training Grant T32 GM07484 (co-PI): Integrative Neuronal Systems, 1986-2019 (PI: 1997-2013).
NIH BRAIN Initiative, U01 NS090473 (PI, M. Sur; co-PIs, E. Brown, I. Wickersham, K. Chung): Cortical circuits and information flow during memory-guided perceptual decisions, 2014-2018
NIH, R24 MH109081 (PI, A. Jasanoff, co-PI, M. Sur): Toward functional molecular neuroimaging using vasoactive probes in human subjects, 2015-2018
NIH Training Grant T32 MH074249 (co-PI): Training in the Neurobiology of Learning and Memory, 2007-2018.
NSF BRAIN EAGER EF145125 (PI, M. Sur): Massive-scale multi-area single neuron recordings to reveal circuits underlying short-term memory, 2014-2017.
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 award 2014
Rafiq Huda, NIH, 2014; K99 award 2018
Jacques Pak Kan Ip, IBRO 2013; HFSP, 2014
Vincent Breton-Provencher, FRSQ, NSERC, Canada, 2015, 2017
Jamie Benoit, JFDP Fellowship, 2016
Keji Li, International Rett Syndrome Foundation, 2016
Grayson Sipe, NIH, 2017; K99 award, 2021
Elie Adam, JFDP Fellowship, 2017
Jennifer Shih, NIH, 2018; JFDP Fellowship, 2022
Chloe Delepine, JFDP Fellowship, 2020
Murat Yildirim, NIH, K99 award 2020
Sofie Aehrlund Richter, Wenner-Gren Fellowship, 2021
Kyle Jenks, NIH, 2022
Yuma Osako, JSPS Fellowship, 2022