MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Susan Hockfield, *President Emerita and Professor of Neuroscience*

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Curriculum Vitae

EDUCATION

B.A., Biology, University of Rochester, 1973
Ph.D., Anatomy (and Neuroscience), Georgetown University School of Medicine, 1979

TEACHING, RESEARCH, AND ADMINISTRATIVE POSITIONS

2026-pres Whitehead Professor of Neuroscience, Massachusetts Institute of Technology
2017-pres Joint Professor of Work and Organization Studies, MIT Sloan School of Management
2012-pres. President Emerita, Massachusetts Institute of Technology
2012-2013 Marie Curie Visiting Professor, Harvard University, John F. Kennedy School of Government
2004-pres. Professor of Neuroscience, Massachusetts Institute of Technology
2004-2012 President, Massachusetts Institute of Technology
2002-2004 Provost, Yale University
2001-2004 William Edward Gilbert Professor of Neurobiology, Yale University
1998-2002 Dean, Yale University Graduate School of Arts and Sciences
1994-2004 Professor, Yale University School of Medicine, Department of Neurobiology
1991-1994 Associate Professor (tenure), Yale University School of Medicine, Section of Neurobiology
1989-1991 Associate Professor (term), Yale University School of Medicine, Section of Neurobiology
1986-1994 Director of Graduate Studies, Yale University School of Medicine, Section of Neurobiology
1985-1989 Assistant Professor, Yale University School of Medicine, Section of Neurobiology
1982-1985 Senior Staff Investigator, Cold Spring Harbor Laboratory
1980-1982 Junior Staff Investigator, Cold Spring Harbor Laboratory
1979-1980 National Institutes of Health (NIH) postdoctoral fellow, University of California, San Francisco, Department of Anatomy and Neuroscience Program

BOARD MEMBERSHIPS

Belfer Center for Science and International Affairs, Board of Directors, member, 6/2013-present
Boston Symphony Orchestra, Board of Trustees, member, 9/2014-3/2019
Break Though Cancer, Board of Directors, member, 7/2020-present
Cajal Neuroscience, Board of Directors, member, 7/2021-10/2024
Carnegie Corporation of New York, Board of Trustees, member, 9/2006–12/2014
Charles Stark Draper Laboratory, Board of Directors, member, 10/2018-12/2020
Council on Foreign Relations, Board of Directors, member, 7/2014-6/2019
Fidelity Non-Profit Management Foundation, member, 6/2017-present
General Electric Company, Board of Directors, member, 12/2006–4/2018
Lasker Foundation, Board of Directors, member, 4/2020-7/2023
Massachusetts Institute of Technology, Corporation, life member emerita, 7/2012-present
Mass General Brigham Incorporated, Board of Directors, member, 12/2015-6/2024
Pfizer, Inc., Board of Directors, member, 3/2020-4/2026
Qualcomm Incorporated, Board of Directors, member, 7/2012-3/2016
Repertoire Immune Medicines, Board of Directors, member, 4/2021-present
Whitehead Institute for Biomedical Research, Board of Trustees, member, 1/2020-12/2023
World Economic Forum, Foundation Board, member, 1/2008–9/2012 and 9/2014-5/2016

PROFESSIONAL SOCIETIES

American Academy of Arts and Sciences, Fellow 2004
American Association for the Advancement of Science, Fellow
Council on Foreign Relations, Life Member
Society for Neuroscience, Member

AWARDS AND RECOGNITION

2026 Stratton Laureate, American Swiss Foundation, Cambridge, MA, 2026.
YSEA 2021 Award for Distinguished Service to Industry, Commerce or Education, Yale Science and Engineering Association, New Haven, CT, 2022
D. Walter Cohen, DDS, Service to Science Award, National Disease Research Interchange, Philadelphia, PA, 2022
Doctor of Science (*honoris causa*) degree, New York University, 2022
2020 Phi Beta Kappa Book Awards Shortlist, **The Age of Living Machines: How Biology Will Build the Next Technology Revolution**, 2020
2020 Science Communication Award, American Institute of Physics, **The Age of Living Machines: How Biology Will Build the Next Technology Revolution**, 2020
2019 Charles L. Branch BrainHealth Award, Dallas, 2020
Advocacy Honoree, American Cancer Society Cancer Action Network, Boston, MA, 2019
Geoffrey Beene Builders of Science Award, Research!America, Washington, DC, 2019
The Helen Gurley Brown Presidential Summit on Women and Science Keynote Speaker, Dana-Farber Cancer Institute, Boston, Massachusetts, 2018
Doctor of Humane Letters (*honoris causa*) degree, Georgetown University, 2018
22nd Annual Link Lecture, Institute of Cancer Research and The Royal Marsden, London, United Kingdom, 2018
2017 Celia White Tabor Lecture, Massachusetts General Hospital, Boston, Massachusetts, 2017
Doctor of Science (*honoris causa*) degree, Northeastern University, 2016
Doctor of Humane Letters *(honoris causa)* degree, Duke University, 2014
Arnold D. Kates Lecture, Bowdoin College, Brunswick, Maine, 2014
Edwin L. Godkin Lecture, Harvard University Kennedy School of Government, Cambridge, Massachusetts, 2014
Doctor of Science *(honoris causa)* degree, University of Massachusetts Medical School, 2013
Doctor of Science *(honoris causa)* degree, University of Rochester, 2013
Pinnacle Award for Lifetime Achievement, Greater Boston Chamber of Commerce, 2013
American Academy of Rome, Carnegie Corporation/Vartan Gregorian Affiliated Fellow, 2012
Association of Alumni and Alumnæ of the Massachusetts Institute of Technology, Honorary Member, 2010
Edison Achievement Award, 2010
Royal Irish Academy, Honorary Member, 2010
Doctor *honoris causa* degree, University Pierre and Marie Curie, Paris, France, 2010
Doctor *honoris causa* degree, jointly awarded by the New University of Lisbon, the Technical University of Lisbon, and the University of Porto, Portugal, 2009
America's Best Leaders 2009 honoree, *U.S. News & World Report* and the Center for Public Leadership, John F. Kennedy School of Government, Harvard University, 2009
Citation Award, Midwest Research Institute, 2009
Doctor of Science *(honoris causa)* degree, University of Edinburgh, Scotland, 2009
Doctor of Science *(honoris causa)* degree, Mount Sinai School of Medicine, New York University, 2009
Council on Foreign Relations, Life Member, 2007
Doctor of Science *(honoris causa)* degree, Brown University, 2006
Doctor of Science *(honoris causa)* degree, Cold Spring Harbor Laboratory, Watson School of Biological Sciences, 2006

Honorary doctorate degree, Tsinghua University, China, 2006
Amelia Earhart Award, Women's Union, 2005
Golden Plate Award, Academy of Achievement, 2005
American Association for the Advancement of Science, Fellow (neuroscience), 2005
Sheffield Medal, Yale University, 2004
Meliora Citation for Career Achievement, University of Rochester, 2003
Wilbur Lucius Cross Medal, Yale University Graduate School, 2003
M.A. (hon.), Yale University, 1994
Charles Judson Herrick Award, American Association of Anatomists, 1987
Grass Traveling Scientist, Society for Neuroscience, 1987
Esther A. and Joseph Klingenstein Fellowship in the Neurosciences, 1985
PHS Postdoctoral Research Award, National Institutes of Health, 1980

PROFESSIONAL AND NATIONAL SERVICE ACTIVITIES

1/2023-present	Swiss Re Strategic Council, member
1/2021-2024	Harvard/MIT MD/PhD Program, Board of Overseers, member
10/2019-present	MIT Energy Initiative, External Advisory Board, member
2/2018-2/2019	American Association for the Advancement of Science, chairman 2018
12/2017-2020	Cancer Research Centre of Excellence, London, Scientific Advisory Board, member
10/2017-2024	Harvard Medical School Dean's Special Advisors Group, member
7/2017-1/2025	Brigham & Women's Hospital, Boston, Scientific Advisory Board, member
2/2017-2/2018	American Association for the Advancement of Science, president 2017
6/2016	"Convergence: The Future of Health," report co-chair with Phillip Sharp and Tyler Jacks
2/2016-2/2017	American Association for the Advancement of Science, president-elect 2016
1/2015-5/2020	Andrew Carnegie Fellows Program jury, Carnegie Corporation of New York, chair
9/2014-1/2016	World Economic Forum, Forum Academy, chair
5/2014-11/2015	Commission to Review the Effectiveness of the National Energy Laboratories, U.S. Department of Energy, member
1/2014-2016	David Geffen School of Medicine, UCLA, Scientific Advisory Board, member
2/2013-5/2014	Key Challenge Areas for Convergence, Committee of the National Academies, member
11/2012-11/2013	U.S. Science Envoy, U.S. Department of State
2/2012–6/2012	Sorbonne University Strategy Committee, member
6/2011–10/2012	Advanced Manufacturing Partnership Steering Committee, Co-Chair, sponsored by the Executive Office of the President of the United States
12/2010-7/2012	WGBH Educational Foundation, Inc., Board of Trustees, *ex officio*, Institutional Trustee
7/2009–7/2012	Eli and Edythe L. Broad Institute of MIT and Harvard, Board of Directors, *ex officio*, member
5/2009–3/2012	Zayed Future Energy Prize, member of the Jury
2/2009–7/2012	Ragon Institute of MGH, MIT, and Harvard, Governance Board, *ex officio*, member
1/2009–1/2012	The Climate Group, Leadership Council, member
7/2008–11/2008	Association of American Universities (AAU), Task Force on the 2008 Election, member
8/2007–7/2012	Association of American Universities (AAU), Advisory Task Force on Indirect Costs, member
7/2007–3/2012	Broad Prize for Urban Education, Selection Jury, member
7/2007–3/2009	Carnegie Corporation of New York – Institute for Advanced Study (IAS), Commission on Mathematics and Science Education, member
5/2007–7/2012	Council on Foreign Relations, Higher Education Working Group on Global Issues, member
5/2007–5/2009	Council on Competitiveness, Energy Security, Innovation and Sustainability Initiative Steering Committee, member
5/2007–8/2009	National Math and Science Initiative, Inc., Board of Directors, member
2/2007–4/2012	Massachusetts General Hospital, Scientific Advisory Committee, member

1/2007–7/2012	Massachusetts Life Sciences Collaborative Leadership Council, Co-Chair
2006–7/2012	European Humanities University, International Support Committee, member
7/2006–11/2006	Republic of Singapore, Research, Innovation, and Enterprise Council, member
5/2006–7/2012	Woods Hole Oceanographic Institution, *ex officio*, Corporation member
2/2006–2/2007	Universities Research Association, Council of Presidents, Chair
2005–2008	United States Department of Justice, National Security Higher Education Advisory Board, member
2005–2007	Cogito.org, Board of Advisors, member
2005–2006	Association of American Universities (AAU), Task Force on Interdisciplinarity, member
3/2005–7/2012	Council on Competitiveness, Executive Committee, member
2/2005–2/2006	Universities Research Association, Council of Presidents, Vice-Chair
1/2005–7/2012	Lord Foundation of Massachusetts, Class B Director
2004-2007	Association of American Universities (AAU), Task Force on Export Controls, member
2002-2004	National Institutes of Health, National Advisory Neurological Disorders and Stroke Council, member
2002	Council of Graduate Schools, Member of the Board
2002	Association of Graduate Schools, Executive Committee, member
2000-2004	American Association for the Advancement of Science (AAAS), Section of Neuroscience, Member-at-Large
1999-2002	Human Frontier Science Program, Council of Scientists, member
1998–2004	Cold Spring Harbor Laboratory, Board of Trustees, member
1997-2002	James S. McDonnell Foundation, Brain Cancer Advisory Panel, member
1997	Gordon Conference on Neural Plasticity, Chair
1997-1999	Astra Pharmaceuticals, Neuroscience Advisory Board, member
1996-2002	Calvin Hill Day Care Center and Kitty Lustman Findling Kindergarten, Board Member
1996-2000	Hereditary Disease Foundation, Scientific Advisory Board, member
1995	Gordon Conference on Neural Plasticity, Co-chair
1994	*NeuroImage*, Editorial Board, member
1993	*Learning and Memory*, Editorial Board, member
1992-1996	*Neuroscience Protocols*, Editorial Board, member
1992-1996	Society for Neuroscience, Councilor
1991-1995	Hereditary Disease Foundation, Scientific Advisory Board, member
1990-1995	*Cerebral Cortex*, Editorial Board, member
1989-1991	Society for Neuroscience, Short Course on Basics of Molecular Biology for Neurobiologists, organizer
1988-1994	*Journal of Neuroscience*, Editorial Board, member
1988-1992	National Institutes of Health, Study Section, Visual Sciences B, member
1988-2002	Haskins Laboratory, Board of Directors, member
1988-2002	Yale-New Haven Teachers Institute, University Advisory Council, member
1985-1997	Cold Spring Harbor Laboratory, Summer Neurobiology Program, Program Director
1985	Cold Spring Harbor Laboratory, Course on Molecular Cloning of Eukaryotic Genes, participant
1984-1986	Cold Spring Harbor Laboratory, Course on Immunoglobulins: Molecular Probes of the Nervous System, organizer
1983	Society for Neuroscience, Short Course on Molecular Approaches to the Nervous System, organizer
1981	Society for Neuroscience, Short Course on New Approaches in Developmental Neurobiology, instructor
1981	Cold Spring Harbor Laboratory, Course on Neurobiology of the Leech, participant
1979- 1980	Cold Spring Harbor Laboratory, Pain Workshop, participant

BIBLIOGRAPHY

Opinion Pieces

"Opening the path to biotech," *Science*, May 7, 2021, coauthored with Sangeeta Bhatia and Nancy Hopkins.

"Our science, our society," *Science*, February 2, 2018.

"Convergence: The Future of Health," *Science*, February 10, 2017, coauthored with Phillip Sharp.

"Capitalizing on Convergence for Health Care," *Science*, June 24, 2016, coauthored with Phillip Sharp and Tyler Jacks.

"A New Century's New Technologies," *Project Syndicate*, January 22, 2015.

"Closing America's Innovation Deficit," *The National Interest*, April 28, 2014.

"Manufacturing a Recovery," *New York Times*, August 29, 2011.

"Riding the Innovation Wave," *Boston Globe*, March 14, 2011, coauthored with Drew Faust.

"For Future Prosperity, Sow Seeds Now," *Boston Globe*, August 14, 2010, coauthored with Paul E. Jacobs.

"Immigrant Scientists Create Jobs and Win Nobels," *Wall Street Journal*, October 20, 2009.

"The Next Innovation Revolution," *Science*, February 27, 2009.

"The Next Step in Stimulus: Long-Term Economic Growth," *Boston Globe*, February 13, 2009.

"Reimagining Energy," *Washington Post*, September 11, 2008.

"Gaining Ground on Cancer," *Boston Globe*, April 28, 2008.

"Numbers That Can Change the World," *Boston Globe*, April 14, 2008.

"MIT's Burgeoning Role in the Green Movement," *Boston Globe*, April 7, 2008.

"Investing in the Nation's Future," *Boston Globe*, March 31, 2008.

"A Model for Tackling the Energy Challenge," *Boston Globe*, December 13, 2006.

"The Innovation Equation," *Boston Globe*, October 12, 2006.

"Women in Math, Engineering, and Science: Drawing on Our Country's Entire Talent Pool," *Boston Globe*, February 12, 2005, coauthored with John Hennessy and Shirley Tilghman.

Original Articles

1. Hockfield, S. and S. Gobel. Neurons in and near nucleus caudalis with long ascending projection axons demonstrated by retrograde labeling with horseradish peroxidase. *Brain Research* **139**: 333-339 (1978).

2. Hockfield, S. and S. Gobel. An anatomical demonstration of projections to the medullary dorsal horn (Trigeminal Nucleus Caudalis) from rostral trigeminal nuclei and the contralateral caudal medulla. *Brain Research* **252**: 203-211 (1982).

3. McKay, R. and S. Hockfield. Monoclonal antibodies distinguish antigenically discrete neuronal types in the vertebrate central nervous system. *Proc. Natl. Acad. Sci. U.S.A.* **79**: 6747-6751 (1982).

4. Hockfield, S. and R. McKay. Monoclonal antibodies demonstrate the organization of axons in the leech. *J. Neurosci.* **3**: 369-375 (1983).

5. Hockfield, S. and R. McKay. A surface antigen expressed by a subset of neurons in the vertebrate central nervous system. *Proc. Natl. Acad. Sci. U.S.A.* **80**: 5758-5761 (1983).

6. Hockfield, S., R. McKay, S. Hendry, and E. G. Jones. A surface antigen that identifies ocular dominance columns in cortical area 17 and laminar features of the lateral geniculate nucleus. Cold Spring Harbor Symp. *Quant. Biol.* **48**: 877-889 (1983).

7. McKay, R., S. Hockfield, and J. Johansen. The organization of molecularly distinct axons in the leech connective. Cold Spring Harbor Symp. *Quant. Biol.* **48**: 599-610 (1983).

8. McKay, R., S. Hockfield, J. Johansen, I. Thompson, and K. Frederiksen. Surface molecules identify groups of growing axons. *Science* **222**: 788-794 (1983).

9. Hendry, S., S. Hockfield, E. G. Jones, and R. McKay. A monoclonal antibody that identifies subsets of neurons in the central visual system of the monkey and cat. *Nature* **307**: 267-269 (1984).

10. Johansen, J., S. Hockfield, and R. McKay. Distribution and morphology of nociceptive cells in the central nervous system of the leech. *J. Comp. Neurol.* **226**: 255-262 (1984).

11. Johansen, J., S. Hockfield, and R. McKay. Axonal projections of mechanosensory neurons in the connective and peripheral nerves of the leech. *J. Comp. Neurol.* **226**: 263-273 (1984).

12. McKay, R., J. Johansen, and S. Hockfield. Monoclonal antibody identifies a 63,000 dalton antigen found in all central neuronal cell bodies but in only a subset of axons in the leech. *J. Comp. Neurol.* **226**: 448-455 (1984).

13. Hockfield, S. and R. McKay. Identification of major cell classes in the developing mammalian nervous system. *J. Neurosci.* **5**: 3310-3329 (1985).

14. Hockfield, S. A novel cerebellar neuron identified by a monoclonal antibody generated with immunosuppressive and rapid immunization strategies. *Science* **237**: 67-70 (1987).

15. Sur, M., D. Frost, and S. Hockfield. Expression of a cell surface antigen on Y-cells in the cat lateral geniculate nucleus is regulated by visual experience. *J. Neurosci.* **8**: 874-882 (1988).

16. Hishinuma, A., S. Hockfield, R. McKay, and J. Hildebrand. Monoclonal antibodies reveal cell type-specific antigens in the sexually dimorphic olfactory system of *Manduca sexta*. 1. Generation of monoclonal antibodies and partial characterization of the antigens. *J. Neurosci.* **8**: 296-307 (1988).

17. Hishinuma, A., S. Hockfield, R. McKay, and J. Hildebrand. Monoclonal antibodies reveal cell type-specific antigens in the sexually dimorphic olfactory system of *Manduca sexta*. 2. Expression of antigens during postembryonic development. *J. Neurosci.* **8**: 308-315 (1988).

18. Hendry, S., E. G. Jones, S. Hockfield, and R. McKay. Neuronal populations stained with the monoclonal antibody, Cat-301, in the mammalian cerebral cortex and thalamus. *J. Neurosci.* **8**: 518-542 (1988).

19. Kalb, R. and S. Hockfield. Molecular evidence for early activity-dependent development of hamster motor neurons. *J. Neurosci.* **8**: 2350-2360 (1988).

20. Zaremba, S., A. Guimaraes, R. G. Kalb, and S. Hockfield. Characterization of an activity-dependent, neuronal surface proteoglycan identified with monoclonal antibody Cat-301. *Neuron* **2**: 1207-1219 (1989).

21. Friedman, B., J. A. Black, S. Hockfield, S. G. Waxman, and B. R. Ransom. Antigenic abnormalities in fiber tract astrocytes of myelin-deficient rats: an immunocytochemical study in the olfactory cortex. *Dev. Neurosci.* 11, 99-111 (1989).

22. McGuire, P. K., S. Hockfield, and P. Goldman-Rakic. The distribution of Cat-301 immunoreactivity in the frontal and parietal lobes of the macaque monkey. *J. Comp. Neurol.* **288**, 280-296 (1989).

23. Geschwind, D. H. and S. Hockfield. Identification of proteins that are developmentally regulated during early cerebral corticogenesis in the rat. *J. Neurosci.* **9**: 4303-4317 (1989).

24. Friedman, B., J. Black, K. Woodruff, S. Hockfield, and S. Waxman. Monoclonal antibody RIP produces Golgi-like staining of mature oligodendrocytes *in situ*. *Glia* **2**: 380-390 (1989).

25. Mize, R. R. and S. Hockfield. Cat-301 antibody selectively labels neurons in the Y-innervated laminae of the cat superior colliculus. *Visual Neurosci.* **3**: 433-443 (1989).

26. Kalb, R. and S. Hockfield. Large diameter primary afferent input is required for developmental expression of a proteoglycan on the surface of motor neurons. *Neuroscience* **34**: 391-401 (1990).

27. Hockfield, S., R. Tootell, and S. Zaremba. Molecular differences among neurons reveal an organization of human visual cortex. *Proc. Natl. Acad. Sci.* **87**:3027-3031 (1990).

28. Friedman, B., S. Zaremba, and S. Hockfield. Monoclonal antibody Rat-401 recognizes Schwann cells in mature and developing peripheral nerve. *J. Comp. Neurol.* **295**: 43-51 (1990).

29. DeYoe, E. A., S. Hockfield, H. Garren, and D. Van Essen. Antibody labeling of functional subdivisions in visual cortex: Cat-301 in V1, V2, V3 and MT of the Macaque monkey. *Visual Neurosci.* 5: 67-81 (1990).

30. Sahin, M. and S. Hockfield. Molecular identification of the Lugaro cell in the cat cerebellar cortex. *J. Comp. Neurol.* **301**: 575-584 (1990).

31. Zaremba, S., J. R. Naegele, C. J. Barnstable, and S. Hockfield. Monoclonal antibodies Cat-301 and VC1.1 define different high molecular weight glycoconjugates. *J. Neurosci.* **10**: 2985-2995 (1990).

32. Guimarães, A., S. Zaremba, and S. Hockfield. Molecular and morphological changes in cat lateral geniculate nucleus and visual cortex induced by visual deprivation are revealed by monoclonal antibodies Cat-301 and Cat-304. *J. Neurosci.* **10**: 3014-3024 (1990).

33. Hockfield, S. and M. Sur. Monoclonal antibody Cat-301 identifies Y-cells in the dorsal lateral geniculate nucleus of the cat. *J. Comp. Neurology* **300**: 320-330 (1990).

34. Kalb, R. G. and S. Hockfield. Induction of a neuronal proteoglycan by the NMDA receptor in the developing spinal cord. *Science* **250**: 294-296 (1990).

35. Hockfield, S., S. Zaremba, R. G. Kalb, and H. Fryer. Expression of neural proteoglycans correlates with the acquisition of mature neuronal properties in the mammalian brain. Cold Spring Harbor Sympo. *Quant. Biol.* **55**: 505-514 (1990).

36. Marshall, J., K. A. Martin, M. Picciotto, S. Hockfield, A. C. Nairn, and L. K. Kaczmarek. Identification and localization of a dogfish homologue of human cystic fibrosis transmembrane conductance regulator. *J. Biol. Chem.* **266**: 22749-22754 (1991).

37. Fryer, H. J. L., G. M. Kelly, L. Molinaro, and S. Hockfield. The high molecular weight Cat-301 chondroitin sulfate proteoglycan from brain is related to the large aggregating proteoglycan from cartilage, aggrecan. *J. Biol. Chem.* **267**: 9874-9883 (1992).

38. Martin, K. A., S. Grant, and S. Hockfield. The *mas* proto-oncogene is developmentally regulated in the rat central nervous system. *Dev. Brain Res.* **68**: 75-82 (1992).

39. Perney, T., J. Marshall, K. A. Martin, S. Hockfield, and L. K. Kaczmarek. Expression of the mRNAs for the Kv3.1 potassium channel gene in the adult and developing rat brain. *J. Neurophysiol.* **68**: 756-766 (1992).

40. Kalb, R. G., M. Lidow, and S. Hockfield. NMDA receptors are transiently expressed in the developing spinal cord ventral horn. *Proc. Natl. Acad. Sci. U.S.A.* **89**: 8502-8506 (1992).

41. Kalb, R. G. and S. Hockfield. Activity-dependent development of spinal cord motor neurons. *Brain Res.* Reviews, **17**: 283-289 (1992).

42. Martin, K. A. and S. Hockfield. Expression of the mas proto-oncogene in the rat hippocampal formation is regulated by neuronal activity. *Mol. Brain Res.* **19**: 303-309 (1993).

43. Sahin, M. and S. Hockfield. Identification of putative protein tyrosine phosphatases in developing rat brain. *J. Neurosci.* **13**: 4968-4978 (1993).

44. Kind, P., C. Blakemore, H. Fryer, and S. Hockfield. Identification of proteins down-regulated during the postnatal development of the cat visual cortex. *Cerebral Cortex* **4**: 361-375 (1994).

45. Kalb, R. G. and S. Hockfield. Electrical activity in the neuromuscular unit can influence the molecular development of motor neurons. *Developmental Biology* **162**: 539-548 (1994).

46. Jaworski, D. M., G. Kelly, and S. Hockfield. BEHAB, a new member of the proteoglycan tandem repeat family of hyaluronan binding proteins, that is restricted to the brain. *J. Cell Biology* **125**: 495-509 (1994).

47. Sahin, M., J. J. Dowling, and S. Hockfield. Seven protein tyrosine phosphatases are differentially expressed in the developing rat brain. *J. Comp. Neurol.* **351**: 617-631 (1995).

48. Minturn, J., D. Geschwind, H. J. L. Fryer, and S. Hockfield. Early postmitotic neurons transiently express TOAD-64, a neural specific, membrane associated protein. *J. Comp. Neurol.* **355**: 369-379 (1995).

49. Jaworski, D. M., G. Kelly, and S. Hockfield. The CNS specific hyaluronan-binding protein, BEHAB, is expressed in ventricular zones coincident with gliogenesis. *J. Neurosci.* **15**: 1352-1362 (1995).

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51. Boyne, L. J., K. Martin, S. Hockfield, and I. Fischer. Expression and distribution of phosphorylated MAP1B in growing axons of cultured hippocampal neurons. *J. Neuroscience Res.* **40**: 439-450 (1995).

52. Sahin, M., S. A. Slaugenhaup, J. F. Gusella, and S. Hockfield. A protein tyrosine phosphatase, PTPH1, is expressed in a segment-specific pattern in the rat diencephalon. *Proc. Natl. Acad. Sci.* **92**: 7859-7863 (1995).

53. Minturn, J., H. J. L. Fryer, D. Geschwind, and S. Hockfield. TOAD-64, a gene expressed early in neuronal differentiation in the rat, is related to *unc-33*, a *C. elegans* gene involved in axon outgrowth. *J. Neurosci.* **15**: 6757-6766 (1995).

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55. Jaworski, D. M., G. M. Kelly, J. M. Piepmeier, and S. Hockfield. BEHAB (Brain Enriched Hyaluronan Binding) is expressed in surgical samples of glioma and in intracranial grafts of invasive glioma cell lines. *Cancer Research* **56**: 2293-2298 (1996).

56. Geschwind, D. H., G. Kelly, H. J. L. Fryer, and S. Hockfield. Identification and characterization of novel developmentally regulated proteins in rat spinal cord. *Dev. Brain Research* **97**: 62-70 (1996).

57. Kind, P. K., G. Kelly, H. J. L. Fryer, C. Blakemore, and S. Hockfield. PLC-ß1 is present in the botrysome, an intermediate compartment-like organelle, during periods of developmental plasticity in cat visual cortex. *J. Neurosci.* **17**: 1471-1480 (1997).

58. Redmond, L. J., H. Xie, L. Ziskind-Conhaim, and S. Hockfield. Cues intrinsic to the spinal cord determine the pattern and timing of innervation by primary afferent axons. *Developmental Biology* **182**: 205-218 (1997).

59. Lander, C., P. Kind, M. Maleski, and S. Hockfield. A family of activity-dependent neuronal cell-surface chondroitin sulfate proteoglycans in cat visual cortex. *J. Neurosci.* **17**: 1928-1939 (1997).

60. Maleski, M. and S. Hockfield. Glial cells assemble hyaluronan-based pericellular matrices *in vitro*. *Glia* **20**: 193-202 (1997).

61. Lurie, D. I., T. R. Pasic, S. Hockfield, and E. W. Rubel. Development of Cat-301 immuno-reactivity in auditory brainstem nuclei of the gerbil. *J. Comp. Neurology* **380**: 319-334 (1997).

62. Lander, C., H. Zhang, and S. Hockfield. Neurons produce a neuronal cell-surface associated chondroitin sulfate proteoglycan. *J. Neurosci.* **18**: 174-183 (1998).

63. Zhang, H., G. Kelly, C. Zerillo, D. M. Jaworski, and S. Hockfield. Expression of a cleaved, brain specific, extracellular matrix protein mediates glioma cell invasion in vivo. *J. Neurosci.* **18**: 2370-2376 (1998).

64. Jaworski, D. M., G. Kelly, and S. Hockfield. Intracranial injury acutely induces the expression of the secreted isoform of the CNS-specific hyaluronan-binding protein BEHAB/Brevican. *Experimental Neurology* **157**: 327-337 (1999).

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Patents

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