

Name: Howard L. Weiner, M.D.

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Home Address: 72 Colbourne Crescent, Brookline, MA 02445

Date of Birth: December 25, 1944 **Place of Birth:** Denver, Colorado

Languages spoken: English, Hebrew, German

Education: 1965 B.A. Dartmouth College, Hanover, New Hampshire
1969 M.D. University of Colorado School of Medicine

Postdoctoral Training:

Internships and Residencies:

1969–1970 Rotating Intern, Tel Hashomer Hospital, Israel
1970–1971 Medical Resident, Beth Israel Hospital, Boston
1970–1971 Clinical Fellow, Harvard Medical School
1971–1974 Resident in Neurology, Longwood Area Neurology Program
1971–1974 Clinical Fellow in Neurology, Harvard Medical School

Clinical and Research Fellowships:

1972–1974 Research Fellow, Massachusetts General Hospital
(Dr. Barry Arnason's laboratory)
1974–1976 Research Fellow, Immunology, University of Colorado Medical Center,
Denver, Colorado (Dr. Henry Claman's laboratory)
1974–1976 Special Research Fellow of Colorado Multiple Sclerosis Society

Licensure and Board Certification:

1970 Massachusetts License Registration
1974 Colorado License Registration
1978 American Board of Psychiatry and Neurology

Academic Appointments:

1976–1977 Instructor in Neurology, Harvard Medical School
1977–1980 Assistant Professor of Neurology, Harvard Medical School

1980–1985 Associate Professor of Neurology, Harvard Medical School
 1985–1997 Robert L. Kroc Associate Professor of Neurology, Harvard Medical School
 1997– Robert L. Kroc Professor of Neurology, Harvard Medical School

Hospital or Affiliated Institution Appointments:

1984– Affiliate Member of the Program in Neuroscience, Harvard Medical School
 1977–1987 Associate in Medicine (Neurology), Brigham and Women's Hospital
 1977–1985 Research Associate in Neuroscience, The Children's Hospital
 1987–1991 Physician, Medicine (Neurology), Brigham and Women's Hospital
 1992– Senior Neurologist, Medicine (Neurology), Brigham and Women's Hospital
 2009– Chief, MS Division, Department of Neurology, Brigham and Women's Hospital

Other Professional Positions & Major Visiting Appointments:

1977–1989 Annual Intensive Clinical Neurology Course, New York City
 1977–1987 Neuropathology 711, Department of Neuroscience, Harvard Medical School
 1977– Introduction to Clinical Medicine, Brigham and Women's Hospital
 1977– Harvard Continuing Education Courses: Neurology, Immunology, Pediatric Neurology, Scientific Foundations of Internal Medicine
 1978–1987 Pathophysiology of the Nervous System—HST 131J
 1981–1983 Lecturer, Neuroimmunology Course, Annual Meeting of the American Academy of Neurology
 1984–1987 Chairman, Neuroimmunology Course, Annual Meeting of the American Academy of Neurology
 1984– Neurobiology of Disease, Department of Neurobiology, Harvard Medical School
 1988 Chairman, FASEB Autoimmunity Conference, Saxton's River, VT
 1989 Co-Chairman, International Conference on Therapy and Diagnosis of Multiple Sclerosis (National MS Society, Jekyll Island)
 1995 Co-Chairman, New York Academy of Sciences Conference on Oral Tolerance

Hospital & Health Care Organization Service Responsibilities:

1976– Attending physician, Brigham and Women's Hospital Neurology Service
 1976– Consulting physician, Beth Israel Hospital and Children's Hospital Neurology Services
 1980–1997 Director, Multiple Sclerosis inpatient and outpatient clinical services Brigham and Women's Hospital
 1985– Co-Director, Center for Neurologic Diseases, Brigham and Women's Hospital
 1998– Director, Partners Multiple Sclerosis Center Brigham and Women's Hospital and Massachusetts General Hospital
 2009– Chief, MS Division, Department of Neurology, Brigham and Women's Hospital

Major Committee Assignments:

1976– Scientific Advisory Board, Massachusetts Multiple Sclerosis Society
 1980–1983 Clinical Research Center Review Study Section, Ad Hoc Member, NIH

- 1982–1987 Scientific Advisory Board, National Multiple Sclerosis Society Committee on Research on the Etiology, Diagnosis, Natural History, Prevention and Therapy of Multiple Sclerosis
- 1982–1989 Committee on Working Trials of New Drugs in MS, National Multiple Sclerosis Society
- 1983–1985 New Pathways Project, Resource Representative for the Department of Neurology, Harvard Medical School
- 1984 Virology Study Section, Ad Hoc Member, NIH
- 1996 Advisory Council, National Institute of Allergy and Infectious Diseases, Ad Hoc Member, NIH
- 1996–1996 Advisory Panel, United States Pharmacopeial Convention
- 1996 Committee on Clinical Immunology and Immunopathology, AAI
- 2004–2010 Advisor, Research Programs Advisory Committee, National Multiple Sclerosis Society
- 2005–2010 Advisor, Max-Planck Institute Advisory Board, Max-Planck Institute of Neurobiology, Germany
- 2008– Advisor, The Guthy Jackson Charitable Foundation Medical Advisory Board for Neuromyelitis Optica Spectrum Disease

Professional Societies:

- 1976 American Academy of Neurology
- 1976 American Society for Microbiology
- 1976 American Association for the Advancement of Science
- 1977 American Association of Immunologists
- 1981 American Neurologic Association
- 1996 American Autoimmune Related Diseases Association

Editorial Boards:

- 2000 Clinical Immunology
- 2000 Multiple Sclerosis
- 2000 Journal of Immunology
- 2000 Journal of Autoimmunity

Awards and Honors:

- 1969 University of Colorado School of Medicine Phi Delta Epsilon Award for Academic Excellence and Merck Award in Medicine
- 1974–1976 Research Fellowship, Colorado Multiple Sclerosis Society
- 1976–1977 NIH Special Research Fellowship
- 1977–1982 NIH Teacher Investigator Award, National Institute of Neurological and Communicative Disorders and Stroke (NINCDS)
- 1985 Recipient of Robert L. Kroc Chair in Neurology for Multiple Sclerosis Research, Awarded by Kroc Foundation, Santa Inez, California
- 1988–1995 NIH Jacob Javits Neuroscience Investigator Award (Seven year Merit Award, NINCDS)
- 2004 Establishment of the Howard L. Weiner Professor of Neurology Endowed Chair, Harvard Medical School

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| 2007 | John Dystel Prize for Multiple Sclerosis Research, American Academy of Neurology |
| 2008 | Betty and David Koetser Memorial Prize, Betty and David Koetser Foundation for Brain Research |
| 2009 | Award for Outstanding Research Achievement, Nature Biotechnology SciCafé, Nature Publications |
| 2012 | NIH Director's Transformative Research Award |

Major Research Interests:

1. Immunology and immunotherapy of multiple sclerosis
2. Mechanisms of autoimmunity
3. Neuroimmunology
4. Oral tolerance

Howard L. Weiner, M.D.**List of Fellows**

| | | | |
|----|-------------------------------------|---|---|
| 1 | Adriano Fontana, MD, PhD 1980 | Professor of Medicine | Univ of Zurich, Switzerland |
| 2 | Stephen L. Hauser MD 1981 | Chairman and Professor of Neurology | Univ of Calif, San Francisco CA |
| 3 | Rochelle Epstein, PhD 1981 | Infectious Diseases | Univ of Chicago, Illinois |
| 4 | Marc Tardieu, MD 1982 | Professor of Neurology | Le Kremlin-Bicetre Hospital, Paris France |
| 5 | David A. Hafler, MD 1985 | Professor of Neurology | Harvard Medical School, Boston MA |
| 6 | Robert Fallis, MD 1984 | Neurologist | The Neurosciences Institute Nashville, TN |
| 7 | David Johnson, PhD 1986 | Associate Dean for Research Operations | Northwestern Univ, Chicago, Illinois |
| 8 | Robert H. Brown MD, PhD 1986 | Professor of Neurology | Harvard Medical School, Boston MA |
| 9 | Herman J. Schluesener, PhD, 1987 | Professor of Immunology | Germany |
| 10 | Paul J. Higgins, PhD 1988 | Professor and Director | Albany Medical College NY |
| 11 | Pierrette Seeldrayers, MD 1988 | Department of Neurology | CHU Charleroi, Charleroi, Belgium |
| 12 | Michael Shepley, PhD 1988 | Assistant Professor | New York Univ |
| 13 | Ofer Lider, PhD 1989 | Professor of Immunology | Weizmann Institute, Israel |
| 14 | Leonilda Santos, MD, PhD 1989 | Associate Professor Immunology | University of Campinas, Campinas- São Paulo – Brazil |
| 15 | Christopher Lee 1989 | Research Scientist | |
| 16 | Samia Khoury MD, 1990 | Associate Professor of Neurology | Harvard Medical School, Boston MA |
| 17 | Kai Wucherpfennig PhD, MD 1990 | Professor of Neurology | Harvard Medical School, Boston MA |
| 18 | Makoto Matsui MD, PhD 1990 | Chief, Dept. of Neurology | Utano National Hospital, Kyoto Japan |
| 19 | Glen A Mackin MD 1990 | Clinical Neurologist, MS Specialist | Allentown, PA |
| 20 | Z. Jenny Zhang, PhD 1990 | Research Scientist | |
| 21 | Ahmad Al-Sabbagh MD PhD 1991 | VP, Medical Affairs | Serono, Rockland MA |
| 22 | Ariel Miller, MD, PhD 1991 | Professor of Neurology | Univ of Haifa, Haifa Israel |

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|----|--|---|---|
| 23 | Mercy Prabhu Das MD, PhD 1993 | Sr. Review Officer | NIH, Rockville, MD |
| 24 | Aaron Friedman, PhD 1994 | Professor of Immunology | Agriculture Univ, Israel |
| 25 | Scott S. Zamvil MD, PhD 1994 | Professor of Neurology | Univ of Calif, San Francisco CA |
| 26 | Marika J. Hohol, MD 1994 | Assistant Professor of Neurology | Univ of Toronto, Toronto, Canada |
| 27 | Vijay K. Kuchroo, DVM, PhD, 1994 | Professor of Neurology | Harvard Medical School, Boston MA |
| 28 | Anna Londono, PhD 1994 | Research Scientist | Brazil |
| 29 | Youhai Chen, MD, PhD 1994 | Professor of Pathology and Laboratory Medicine | Univ of Penn, Philadelphia, PA |
| 30 | Jun-Ichi Inobe PhD 1994 | Associate Professor | Japan |
| 31 | Jacqueline Fishman-Lobell PhD 1994 | Research Scientist | GlaxoSmithKline |
| 32 | Shin Yoshino, PhD 1995 | Associate Professor | Dept. of Pharmacology, Kobe Pharmaceutical Univ., Japan |
| 33 | Konstantin Balashov, MD, PhD, 1995 | Assistant Professor Neurology | New Jersey Med School, New Jersey |
| 34 | Emilia Quattrocchi, PhD 1995 | Research Scientist | Kennedy Institute of Rheumatology, London |
| 35 | Malu Polanski, PhD 1995 | Contractor, Genomics Program Director | NIH, Bethesda MD |
| 36 | Jeffrey Encinas, Ph.D. 1996 | Scientist | Bayer Yakuhin, Ltd., Research Center Kyoto Japan |
| 37 | Ruth Maron, PhD 1996 | Assistant Professor of Neurology | Weizmann Institute, Israel |
| 38 | Takashi Ohashi, MD, 1996 | Clinical Neurology | Department of Immunotherapeutics and Pathology and Immunology, Tokyo Medical University Japan |
| 39 | Derek Smith, PhD 1997 | Director, Clinical MS Center | MS Care of Connecticut at Neurology Associates, Norwich CT |
| 40 | Anthony Slavin, PhD, 1997 | Research Scientist | Director, Immunology and Inflammation, Boehringer Ingelheim Pharmaceuticals, Inc. Ridgefield, CT |
| 41 | Manuel Comabella, M.D., 1998 | Associate Professor of Neurology | Unitat de Neuroimmunologia Clínica, Hospital Universitari Vall d'Hebron, Barcelona Spain |

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| 42 | Liming Liu, PhD 1998 | Associate Director | Syntex, Lexington MA |
| 43 | Patricia Gonnella, PhD 1998 | Assistant Professor | Harvard Medical School, Boston MA |
| 44 | Michael Olek, MD 1999 | MS Specialist | Providence St. Joseph's Hospital, Burbank, CA |
| 45 | Gabriella Garcia, PhD, 1999 | Principal Scientist | Merrimack Pharmaceuticals, Cambridge MA |
| 46 | Thomas Spahn, MD, 1999 | Chairman, Department of Internal Medicine Associate Professor of Medicine | Marienkrankenhaus Schwerte, Schwerte, Germany Münster University Hospital, Osnabrück, Germany |
| 47 | Yoshi Komagata, PhD, 1999 | Assistant Professor | Dept of Allergy and Rheumatology, Graduate School of Medicine, University of Tokyo, Tokyo, Japan |
| 48 | Leonard Izikson, MD. PhD 2000 | Assistant Professor Ophthalmology | Univ of Chicago, Illinois |
| 49 | Ana Faria, PhD, 2001 | Associate Professor | Universidade Federal de Minas Gerais, Belo Horizonte, Minas Gerais, Brazil |
| 50 | Alon Monsonego, PhD 2001 | Professor of Neuroscience | Ben-Gurion University, Beer-Sheva, Israel |
| 51 | DN Koldzic, MD, PhD 2001 | Resident Psychiatry | Tufts University, NE Medical Ctr, Cambridge MA |
| 52 | Jeannie Soos, PhD 2001 | Research Scientist, Immunology | GlaxoSmithKline, PA |
| 53 | Xingmin Zhang, MD, PhD 2001 | Senior Scientist | Synta, Lexington, MA |
| 54 | Victor Zota, MD 2001 | Resident, Pathology | U Mass Medical Center, Worcester, MA |
| 55 | Susan Gauthier, DO 2001 | MS Center Staff Physician | Cornell Medical School, New York |
| 56 | Dan Frenkel, PhD 2002 | Assistant Professor | Department of Neuroscience, Tel- Aviv University, Israel |
| 57 | Arnon Karni, MD 2002 | Director, MS Program, Assistant Professor | Department of Neurology, Tel Aviv Sourasky Medical Center Tel Aviv Univ, Israel |
| 58 | Michal Abraham, PhD 2003 | Research Scientist | Goldyne Savad Institute, Hadassah University Hospital, Israel |
| 59 | Takatoku Oida, PhD 2003 | Senior Scientist | Sakaguchi Lab, Kyoto University Kyoto, Japan |

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|----|--|--|---|
| 60 | Adi Dembinksy-Vaknin, MD PhD 2003 | Assistant Professor, Clinical MS Center | Department of Neurology, Hebrew University, Jerusalem Israel |
| 61 | Kaiyong Yang, PhD 2003 | Research Fellow | Scientist, MedImmune, Inc. Gaithersburg, MD |
| 62 | Julia Carrier, PhD | Researcher | Wyeth Laboratories, Cambridge MA |
| 63 | Hirofumi Ochi, MD PhD 2004 | Clinical Neurologist | Department of Neurology Kyushu University Hospital 3-1-1 Maidashi, Higashi-ku, Fukuoka City Fukuoka, Japan |
| 64 | Jose Vega, MD, PhD 2004 | Neurologist | Miami, FL |
| 65 | Hiroki Ishikawa, PhD 2005 | Research Scientist | Department of Microbiology, Tokyo Medical University, Tokyo JP |
| 66 | Alexandre Basso, PhD 2005 | Research Fellow | Asst. Prof. of Immunology, Medical School of Universidade Federal de São Paulo |
| 67 | Jean Pierre Schatzmann 2006 | Research Fellow | |
| 68 | Rocio Lopez-Diego, MD PhD 2008 | Research Fellow | Neurologist, Partners MS Center Boston MA |
| 69 | Alice Laroni, MD, 2008 | MD | Italy |
| 70 | Mei-Ling Chen, PhD 2005 | Instructor | |
| 71 | Ilya Sotnikov PhD 2007 | Research Fellow | |
| 72 | Mauricio Farez, MD 2006 | Research Fellow | Harvard School of Public Hlth |
| 73 | Takatoku Oida, PhD, 2008 | Research Fellow | |
| 74 | Francisco Quintana, PhD, 2005 | Associate Professor | Harvard Med. Schl. BWH |
| 75 | Henry Y. Wu, Ph.D. 2002 | Instructor | Scientist, Novartis, Basel, Switzerland |
| 76 | Thomas Koegelsperger, MD 2008-June 2011 | Research Fellow | MD, Germany |
| 77 | Laura Edwards, MD 2011 | Research Fellow | UK |
| 78 | Akanksha Mittal, PhD, 2007 | Research Fellow | |
| 79 | Eugene Ponomarev. PhD, 2011 | Asst. Professor | BWH |
| 80 | Chantal Kuhn, PhD, 2013 | Research Fellow | Industry in Boston |
| 81 | Ron Cialic, MD 2011 | Research Fellow | Israel |
| 82 | Shaffiudin Siddiqui, 2008 | Research Fellow | |
| 83 | Andre Pires da Cunha, PhD 2009 | Research Fellow | Industry in Boston |
| 84 | Megumi Nakanishi, MD, PhD | Research Fellow | Japan |

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|----------------|----------------------------|---------------------|-----------------------------|
| 85 | Lior Mayo, Ph.D., Sep 2010 | Research Fellow | Israel |
| 86 | Vanessa Beynon, MD 2009 | Research Fellow | MGH, BWH Neurology Resident |
| 87 | Keren Regev | Research Fellow | |
| CURRENT | | | |
| 88 | Roopali Gandhi, PhD, 2004 | Assistant Professor | |
| 89 | Murugaiyan Gopal, 2006 | Instructor | |
| 90 | Oleg Butovsky, PhD, 2007 | Assistant Professor | |
| 91 | Dan, Hu, Ph.D. July 2010 | Research Fellow | |
| 92 | Amanda Lanser, 2011 | Grad Student | |
| 93 | Galina Gabriely, PhD 2011 | Research Fellow | |
| 94 | Shirong Liu, PhD 2012 | Research Fellow | |
| 95 | Rafa M Rezende, PhD 2012 | Research Fellow | |
| 96 | Hanane M'Hamdi 2012 | Pre-Doctoral Fellow | |
| 97 | Stephanie Tankou, PhD, MD | Research Fellow | |
| 98 | Radhika Raheja, PhD | Research Fellow | |
| 99 | Anu Paul | Pre-Doctoral Fellow | |

Original Communications

- Weiner HL, Robinson WA. Leukopoietic activity in human urine following operative procedures. *Proc. Soc. Exp. Biol. Med.* 136: 29–33, 1971.
- Weiner, H.L., Moorhead, J.W. and Claman, H.N.: Anti-immunoglobulin stimulation of murine lymphocytes. I. Age dependency of the proliferative response. *J. Immunol.* 116: 1565–1661, 1976.
- Weiner, H.L., Moorhead, J.W., Yamaga, K. and Kubo, R.: Anti-immunoglobulin stimulation of murine lymphocytes. II. Identification of cell surface target molecules and requirements for cross linkage. *J. Immunol.* 117: 1527–1533, 1976.
- Caplan, L.R., Weiner, H.L., Weintraub, R.M. and Austen, W.G.: "Migrainous" neurological dysfunction in two patients with prosthetic cardiac valves. *Headache* 16: 218–221, 1976.
- Weiner, H.L., Scribner, D.J. and Moorhead, J.W.: Anti-immunoglobulin stimulation of murine lymphocytes. III. Enhancement of the development of responsive B cells by thymic deprivation. *Cell Immunol.* 31: 77–84, 1977.
- Scribner, D.J., Weiner, H.L. and Moorhead, J.W.: Surface immunoglobulin and Fc receptors on murine B lymphocytes: Loss of receptor interaction after cell activation. *J. Immunol.* 119: 2084–2088, 1977.
- Weiner, H.L. and Fields, B.N.: Neutralization of reovirus: the gene responsible for the neutralization antigen. *J. Exp. Med.* 146: 1305–1310, 1977.

8. Weiner, H.L., Drayna, D., Averill, D.R. and Fields, B.N.: Molecular basis of reovirus virulence: role of the S1 gene. *Proc. Natl. Acad. Sci. USA* 74: 5744–5748, 1977.
9. Schocket, A., Weiner, H.L., Walker, J., McIntosh, K. and Kohler, P.K.: Lymphocytotoxic antibodies multiple sclerosis. *Clin. Immunol. Immunopathol.* 7: 15–23, 1977.
10. Weiner, H.L., Schocket, A.L. and Lehigh, J.R.: Lymphocytotoxic antibodies in subacute sclerosing panencephalitis and amyotrophic lateral sclerosis. *Lancet* 1: 1013–1014, 1977.
11. Opelz, G., Terasaki, P., Myers, L., Ellison, G., Ebers, G., Zabriskie, J., Weiner, H., Kempe, H., and Sibley, W.: The association of HLA antigens A3, B7 and DW2 with 330 multiple sclerosis patients in the United States. *Tissue Antigens* 9: 54–58, 1977.
12. Weiner, H.L., Scribner, D.J. and Moorhead, J.W.: Anti-immunoglobulin stimulation of murine lymphocytes. IV. Re-expression and fate of cell surface receptors during stimulation. *J. Immunol.* 120: 1907–1912, 1978.
13. Scribner, D.J., Weiner, H.L., and Moorhead, J.W.: Anti-immunoglobulin stimulation of murine lymphocytes. V. Age-related decline in Fc receptor-mediated immunoregulation. *J. Immunol.* 121: 377–382, 1978.
14. Weiner, H.L., Scribner, D.J., Schocket, A.I. and Moorhead, J.W.: Increased proliferative response of human peripheral blood lymphocytes to anti-immunoglobulin antibodies in elderly people. *Clin. Immunol. Immunopathol.* 9: 356–363, 1978.
15. Ault, K.A. and Weiner, H.L.: Isolation and characterization of the class of human blood lymphocytes responsible for antibody-dependent cellular cytotoxicity. *Clin. Immunol. Immunopathol.* 11: 60–76, 1978.
16. Weiner, H.L., Cherry, J., and McIntosh, K.: Decreased lymphocyte transformation to vaccinia virus in multiple sclerosis. *Neurology* 28: 415–420, 1978.
17. Schocket, A.L. and Weiner, H.L.: Lymphocytotoxic antibodies in family members of patients with multiple sclerosis. *Lancet* 1: 571–573, 1978.
18. Weiner, H.L., Ramig, R.F., Mustoe, T.A. and Fields, B.N.: Identification of the gene coding for hemagglutinin of reovirus. *Virology* 86: 581–584, 1978.
19. Finberg, R., Weiner, H.L., Fields, B.N., Benacerraf, B. and Burakoff, S.J.: Generation of cytolytic T lymphocytes after reovirus infection: role of S1 gene. *Proc. Natl. Acad. Sci. USA* 76: 442–446, 1979.
20. Ault, K.A. and Weiner, H.L.: Natural killing of measles-infected cells by human lymphocytes. *J. Immunol.* 122: 2611–2616, 1979.

21. Wechsler, S.L., Weiner, H.L. and Fields, B.N.: Immune response in subacute sclerosing panencephalitis: reduced antibody response to the matrix protein of measles virus. *J. Immunol.* 123: 884–889, 1979.
22. Weiner, H.L. and Schocket, A.L.: Lymphocytes in multiple sclerosis: Correlation with CSF immunoglobulins and cold-reactive lymphocytotoxic antibodies. *Neurology* 29: 1504–1508, 1979.
23. Hauser, S.L., Weiner, H.L., Bresnan, M.J. and Ault, K.A.: Lymphocyte capping in muscular dystrophy. *Neurology* 29: 1419–1421, 1979.
24. Weiner, H.L., Powers, M.L. and Fields, B.N.: Absolute linkage of virulence and central nervous system cell tropism of reoviruses to viral hemagglutinin. *J. Infect. Dis.* 141: 609–616, 1980.
25. Weiner, H.L., Ault, K.A. and Fields, B.N.: Interaction of reovirus with cell surface receptors. I. Murine and human lymphocytes have a receptor for the hemagglutinin of reovirus type 3. *J. Immunol.* 124: 2143–2148, 1980.
26. Weiner, H.L., Greene, M.I. and Fields, B.N.: Delayed type hypersensitivity in mice infected with reovirus. I. Identification of host and viral gene products responsible for the immune response. *J. Immunol.* 125: 278–282, 1980.
27. Greene, M.I. and Weiner, H.L.: Delayed hypersensitivity in mice infected with reovirus. II. Induction of tolerance and suppressor T-cells to viral specific gene products. *J. Immunol.* 125: 283–287, 1980.
28. Reinherz, E.L., Weiner, H.L., Hauser, S.L., Cohen, J.A., Distaso, J.A. and Schlossman, S.F.: Loss of suppressor T-cells in active multiple sclerosis. *N. Engl. J. Med.* 303: 125–129, 1980.
29. Fontana, A. and Weiner, H.L.: Interaction of reovirus with cell surface receptors. II. Generation of suppressor T-cells by the hemagglutinin of reovirus type 3. *J. Immunol.* 125: 2660–2664, 1980.
30. Weiner, H.L. and Dawson, D.M.: Plasmapheresis in multiple sclerosis: preliminary study. *Neurology* 30: 1029–1033, 1980.
31. Finberg, R., Weiner, H.L., Burakoff, S.J. and Fields, B.N.: Type-specific reovirus antiserum blocks the cytotoxic T-cell-target cell interaction: Evidence for the association of the viral hemagglutinin of a nonenveloped virus with the cell surface. *Infect. Immun.* 31: 646–649, 1981.
32. Rubin, D., Weiner, H.L., Fields, B.N. and Greene, M.I.: Immunologic tolerance after oral administration of reovirus: Requirement for two viral gene products for tolerance induction. *J. Immunol.* 127: 1698–1701, 1981.
33. Hauser, S.L., Ault, K.A., Levin, M., Garavoy, M. and Weiner, H.L.: Natural killer cell activity in multiple sclerosis. *J. Immunol.* 127: 1114–1117, 1981.

34. Epstein, R., Powers, M.L. and Weiner, H.L.: Interaction of reovirus with cell surface receptors. III. Reovirus type 3 induces capping of viral receptors on murine lymphocytes. *J. Immunol.* 127: 1800–1803, 1981.
35. Tardieu, M. and Weiner, H.L.: Viral receptors on isolated murine and human ependymal cells. *Science* 215: 419–421, 1982.
36. Nepom, J.T., Weiner, H.L., Dichter, M.A., Tardieu, M., Spriggs, D.R., Gramm, C.F., Powers, M.L., Fields, B.N., and Greene, M.I.: Identification of a hemagglutinin-specific idiootype associated with reovirus recognition shared by lymphoid and neural cells. *J. Exp. Med.* 155: 155–167, 1982.
37. Hauser, S.L., Weiner, H.L. and Ault, K.A.: Clonally restricted B cells in peripheral blood of multiple sclerosis patients: kappa/lambda staining patterns. *Ann. Neurol.* 11: 408–412, 1982.
38. Hauser, S.L., Bresnan, M.J., Reinherz, E.L. and Weiner, H.L.: Childhood multiple sclerosis: Clinical features and demonstration of changes in T-cell subsets with disease activity. *Ann. Neurol.* 11: 463–468, 1982.
39. Nepom, J.T., Tardieu, M., Epstein, R.L., Noseworthy, J.H., Weiner, H.L., Gentsch, J., Fields, B.N., and Greene, M.I.: Virus-binding receptors: similarities to immune receptors as determined by anti-idiotypic antibodies. *Surv. Immunol. Res.* 1: 255–261, 1982.
40. Hauser, S.L., Dawson, D.M., Leirich J.R., Beal M.F., Kevy S.V., Propper R.D., Mills J.A., and Weiner H.L.: Intensive immunosuppression in progressive multiple sclerosis: A randomized, three-arm study of high dose intravenous cyclophosphamide, plasma exchange and ACTH. *N. Engl. J. Med.* 308: 173–180, 1983.
41. Weiner, H.L. and Ellison, G.: A working protocol to be used as a guideline for trials in multiple sclerosis. *Arch. Neurol.* 40(11): 704–710, 1983.
42. Weiner, H.L., Dau, P., Birnbaum, G., Feldstein, M., Khatri, B., Petajan, J., and McQuillen, M.P.: Plasma exchange in acute multiple sclerosis. Design of a cooperative study. *Arch. Neurol.* 40(11): 691–692, 1983.
43. Hauser, S.L., Dawson, D.M., Leirich, J.R., Beal, M.F., Kevy, S.V., and Weiner, H.L.: Immunosuppression and plasmapheresis in chronic progressive multiple sclerosis. Design of a clinical trial. *Arch. Neurol.* 40(11): 687–690, 1983.
44. Hauser, S.L., Reinherz, E.L., Hoban, C.J., Schlossman, S.F., and Weiner, H.L.: Immunoregulatory T-cells and lymphocytotoxic antibodies in active multiple sclerosis: weekly analysis over a six month period. *Ann. Neurol.* 13: 418–425, 1983.
45. Hauser, S.L., Reinherz, E.L., Hoban, C.J., Schlossman, S.F., and Weiner, H.L.: CSF cells in multiple sclerosis: monoclonal antibody analysis and relationship to peripheral blood T-cell subsets. *Neurology* 33: 575–579, 1983.

46. Hauser, S.L., Bhan, A.K., Gilles, F., Hoban, C.J., Reinherz, E.L., Schlossman, S.F., and Weiner, H.L.: Immunohistochemical staining of human brain with monoclonal antibodies that identify lymphocytes, monocytes, and the Ia antigen. *J. Neuroimmunol.* 5: 197–205, 1983.
47. Tardieu, M., Powers, M.L., and Weiner, H.L.: Age-dependent susceptibility to reovirus type 3 encephalitis: role of viral and host factors. *Ann. Neurol.* 13: 602–607, 1983.
48. Tardieu, M., Noseworthy, J.H., Perry, L., Che, M., Greene, M.I., and Weiner, H.L.: Generation of a monoclonal antibody (Epen1) which binds selectively to murine ependymal cells. *Brain Res.* 277: 339–346, 1983.
49. Crary, B., Hauser, S.L., Borysenko, M., Kutz, I., Hoban, C.J., Ault, K.A., Weiner, H.L., and Benson, H.: Epinephrine-induced changes in the distribution of lymphocyte subsets in peripheral blood of humans. *J. Immunol.* 131: 1178–1181, 1983.
50. Tardieu, M., Powers, M.L., Hafler, D.A., Hauser, S.L., and Weiner, H.L.: Autoimmunity following viral infection: demonstration of monoclonal antibodies against normal tissue following infection of mice with reovirus and demonstration of shared antigenicity between virus and lymphocytes. *Eur. J. Immunol.* 14: 561–569, 1984.
51. Epstein, R.L., Powers, M.L., Rogart, R.B., and H.L. Weiner: Binding of ¹²⁵I labeled reovirus to cell surface receptors. *Virology* 133: 46–55, 1984.
52. Hauser, S.L., Weiner, H.L., Che, M., Shapiro, M.E., Gilles, F., and N.L. Letvin: Prevention of experimental allergic encephalomyelitis (EAE) in the SJL/J mouse by whole body ultraviolet irradiation. *J. Immunol.* 132: 1276–1281, 1984.
53. Weiner, H.L., Hafler, D.A., Fallis, R.J., Johnson, D., Ault, K.A., and S.L. Hauser: Altered blood T-cell subsets in patients with multiple sclerosis. *J. Neuroimmunol.* 6: 115–121, 1984.
54. Hauser, S.L., Fosburg, M., Kevy, S.V., and H.L. Weiner: Lymphocytapheresis in chronic progressive multiple sclerosis: immunologic and clinical effects. *Neurology* 34: 922–926, 1984.
55. Epstein, R.L., Finberg, R., Powers, M.L., and H.L. Weiner: Interaction of reovirus with cell surface receptors. IV. The reovirus type 3 receptor is expressed predominantly on murine Lyt-2,3+ and human T8 cells. *J. Immunol.* 133: 1614–1617, 1984.
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