

CURRICULUM VITAE

LAWRENCE STEINMAN, M. D.

Born: November 14, 1947, Los Angeles, California
Child: Jonathan Baruch

Education

B.A. Dartmouth College, 1964-1968
Major: Physics; Minor: Russian, Phi Beta Kappa, Magna Cum Laude
M.D. Harvard University, 1968-1973
NIH Fellow Chemical Neurobiology at Harvard Medical School, 1970-1971

Post-graduate Training

Internship: 1973 Stanford University Hospital, Surgery
Resident: 1974 Stanford University Hospital, Pediatrics
Resident: 1977-1980 Stanford University Hospital, Pediatric and Adult Neurology
Fellow: 1975-1977 Weizmann Institute of Science, Chemical Immunology
1975-1976 Aharon Katzir Katchalsky Fellow
1976-1977 National Institutes of Health Visiting Fellow

Academic Posts

Assistant Professor: 1980-1985 Stanford University, Departments of Neurology and Pediatrics
Associate Professor: 1985-1991 Stanford University, Departments of Neurology, Pediatrics and Genetics
Professor 1994-1997 Weizmann Institute of Science
Professor 1991-present Stanford University, Departments of Neurology and Neurological Sciences, Pediatrics and Genetics
Chair 2002-present Stanford University Program in Immunology
2008 George A. Zimmerman Professor of Neurological Sciences, Neurology, Genetics and Pediatrics

Professional Awards and Prizes

- 1979 S. Weir Mitchell Award, American Academy of Neurology
- 1981-1986 Teacher-Investigator Award, National Institutes of Health (5 yr award)
- 1988-2002 Senator Jacob Javits Neuroscience Investigator Award from Congress of the United States and National Institutes of Health
- 1994 Dr. Friedrich Sasse Award for Outstanding Contributions in Immunology from the Free University of Berlin
- 2004 John M. Dystel Prize for Outstanding Contributions in Multiple Sclerosis Research, National MS Society & the American Academy of Neurology
- 2004 Outstanding Inventor Stanford University
- 2008 Honorary Doctorate Hasselt University

Professional Organizations

American Academy of Neurology
American Neurological Association
American Association of Immunologists
Clinical Immunology Society

Board Certification

American Board of Psychiatry and Neurology (Neurology), 1984

Patents [partial list]

1. Immunotherapy of Autoimmune Disease, US Patent Number 4,695,459
2. Polypeptide Pertussis Toxin Vaccine, US Patent Number 5,000,952
3. Anti-T-Cell Receptor Determinants as Autoimmune Disease Treatment, Patent EP 0340109B1.
4. T cell receptor variable transcripts as disease related markers. US patent 5667967 9/16/97.
5. Treatment of central nervous system inflammatory disease with matrix metalloprotease inhibitors. US Patent 5532265
6. DNA Vaccination for induction of suppressive T cell response. US patent 5,939,400
7. Treatment of Demyelinating Disease with Ordered Peptide, US patent 6531130,
8. Treatment of Demyelinating Disease with Ordered Peptide US Patent 7070780
9. Methods for treatment of multiple sclerosis using peptide analogues at position 91 of human myelin basic protein U.S.6,329,499
10. Methods for treatment of multiple sclerosis using peptide analogues at position 91 of human myelin basic protein U.S.6,369,033
11. Methods for treatment of multiple sclerosis using peptide analogues at position 91 of human myelin basic protein U.S.6,489,299
12. Methods for treatment of multiple sclerosis using peptide analogues of human myelin basic protein U.S.6,740,638
13. Methods for treatment of multiple sclerosis using peptide analogues at position 91 of human myelin basic protein EP0792286
14. DNA Vaccination to Treat Autoimmune Disease, US Patent 7030098
15. Treatment of Demyelinating Disease with Ordered Peptide US Patent 7070780
16. Methods and Compositions for Treating Diseases Mediated by Transglutaminase Activity US Patent 6794414

17. Osteopontin Related Methods and Compositions, US Patent 10/495,893 allowed 6/11/2007

Administrative Posts

Organizer of the following conferences:

Midwinter Immunology Conference, Asilomar, CA 1986

FASEB Autoimmunity Meeting, Vermont 1990

National Multiple Sclerosis Meeting, "Immunologic Tolerance", Santa Fe 1991

Advisory Committees and Study Sections:

Advisory Committee on Pertussis Immunization, National Institute of Medicine, 1987-1990

Fellowship Advisory Committee, National Multiple Sclerosis Society 1988-1991

Grant Review Committee, National Multiple Sclerosis Society 2006-

Medical Advisory Committee, Muscular Dystrophy Association 1990-present

Medical Advisory Committee, National Multiple Sclerosis Society 1990-1995

Member Immunological Sciences Study Section, NIH 1991-1995

Member Research Grant Committee A National MS Society 2006-present

Editorial Posts

International Immunology, Transmitting Editor 1988-2006

Journal of Immunology, Associate Editor 1991-1995

Neurobiology of Disease, Associate Editor 1998-present

Business Positions

Centocor, Board of Directors 1991-1999, when sold to Johnson and Johnson

Neurocrine Biosciences, Founder 1992, Board of Directors 2001-2005, Scientific Advisory Board 1992-2004

Roche Biosciences, Scientific Advisory Board 1998-2002

Neuronyx, 2000-present Board of Directors

Bayhill Therapeutics, Founder 2001-present, Head of SAB, and member of Board of Directors

Nuon Therapeutics, Founder 2007-present, Member Scientific Advisory Board

Peptimmune, 2007- Member Scientific Advisory Board

BIBLIOGRAPHY

Journals

1. Budin J and Steinman L. Theory of transfinite numbers. In: *Research Papers in Mathematics* (R.E. Gaskill, ed.), National Science Foundation and Oregon State University, 1963, pp 9-31.
2. Lam DMK and Steinman L. Uptake of gamma-aminobutyric acid in the goldfish retina. *Proceedings of the National Academy of Sciences USA*, 68:2777, 1971.
3. Steinman L and Ames A. The sites of synthesis and the subsequent migration of newly synthesized protein in retina. *Tissue and Cell*, 6:137, 1971.
4. Steinman L. Maldistribution of physicians in Yugoslavia. *Journal of Medical Education*, 49:182, 1974.
5. Steinman L, Cohen I, Teitelbaum D, and Arnon R. Regulation of auto sensitization to encephalitogenic myelin basic protein by macrophage-associated and soluble antigen. *Nature*, 265:173, 1977.
6. Teitelbaum D, Steinman L and Sela M. Unprimed spleen cell populations recognize macrophage-bound antigen with opposite net electrical charge. *Proceedings of the National Academy of Sciences USA*, 74:1693, 1977.
7. Lonai P and Steinman L. Physiological regulation of antigen binding to T cells: Role of a soluble macrophage factor and of interferon. *Proceedings of the National Academy of Sciences USA*, 74:5662, 1977.
8. Steinman L, Cohen I, Teitelbaum D, Glickman E and Arnon R. Regulation of autoimmunity by the mode of presentation of autoantigen to lymphocytes. In: *Regulatory Mechanisms in Lymphocyte Activation*. DO Lucas (ed), New York Academic Press, p. 728, 1977.
9. Lonai P, Steinman L, Zeicher M and Puri I. Physiological regulation of the H-2 complex. *Cellular Immunology*, 27:341, 1977.
10. Steinman L, Tzevalou E, Cohen I, Segal S, and Glickman E. Sequential interactions of macrophages, initiator T lymphocytes and recruited T lymphocytes in cell-mediated responses to soluble antigen. *European Journal of Immunology*, 8:29, 1978.
11. Lonai P, Ben-Neriah Y, Steinman L, and Givol D. Selective participation of immunoglobulin V region and major histocompatibility complex products in antigen binding T cells. *European Journal of Immunology*, 8:827, 1978.
12. Sogg R, Steinman L, Rathjen B, Tharp B and O'Brien J. Cherry red spot myoclonus syndrome. *Ophthalmology*, 86:1861, 1979.
13. Steinman L, Cohen I and Teitelbaum D. Natural occurrence of thymocytes with receptors for myelin basic protein. *Neurology (Minneapolis)*, 30:755, 1980.
14. Steinman L, Dorfman L, Tharp B, Forno L, Kelts K, O'Brien J and Sogg R. Peripheral neuropathy in the cherry red spot-myoclonus syndrome (Sialidosis Type 1). *Annals of Neurology*, 7:450-456, 1980.

15. Lonai P, Puri I, Zeicher M and Steinman L. Regulation of antigen binding to T cells: The role of products of adherent cells, and the H-2 restrictions of the antigen bound. In: *Advances in Experimental Medicine and Biology*. MR Escobar and H Friedman (eds), New York, Plenum Press, pp. 451-458, 1980
16. Chan CC, Sogg RL and Steinman L. Isolated oculomotor palsy after measles immunization. *American Journal of Ophthalmology*, 89:446, 1980.
17. Steinman L, Smith ME and Forno LS. Genetic control of susceptibility to experimental allergic neuritis and the immune response to P₂ protein. *Neurology (Minneapolis)*, 31:950-954, 1981.
18. Lonai P, Steinman L, Friedman V, Drizlikh G and Puri J. Specificity of antigen binding by T cells: Competition between soluble and Ia associated antigen. *European Journal of Immunology*, 11:382-387, 1981.
19. Steinman L, Rosenbaum JT, Sriram S and McDevitt HO. *In vivo* effects of antibodies to immune response gene products: Prevention of experimental allergic encephalitis. *Proceedings of the National Academy of Sciences USA*, 78:7111-7114, 1981.
20. Steinman L. Neurologic complications of routine immunization. *Western Journal of Medicine*, 137:315, 1982
21. Steinman L, Sriram S, Adelman NE, Zamvil S, McDevitt HO and Urich H. Murine model for pertussis vaccine encephalopathy: Linkage to H-2. *Nature*, 299:738-740, 1982.
22. Sriram S, Solomon D, Rouse RV and Steinman L. Identification of T cell subsets and B lymphocytes in mouse brain EAE lesions. *Journal of Immunology*, 129:1649, 1982.
23. Steinman L, Clancy RR, Cann H and Urich H. Neuropathology of propionic acidemia. *Developmental Medicine and Child Neurology*, 25:87-94, 1983.
24. Waldor M, Sriram S, McDevitt HO and Steinman L. *In vivo* therapy with monoclonal anti I-A antibody suppresses immune response to acetylcholine receptor. *Proceedings of the National Academy of Sciences USA*, 80:2713-2717, 1983.
25. Steinman L, Solomon D, Zamvil S, Lim M and Sriram S. Prevention of EAE with anti I-A antibody: Decreased accumulation of radiolabeled lymphocytes in the central nervous system. *Journal of Neuroimmunology*, 5:91-97, 1983.
26. Sriram S and Steinman L. Anti I-A antibody suppresses active encephalomyelitis: Treatment model for IR gene linked diseases. *Journal of Experimental Medicine*, 158: 1362-1367, 1983.
27. Sriram S, Schwartz G and Steinman L. Myelin basic protein coupled spleen cells prevent EAE. *Cellular Immunology*, 75:378-382, 1983.
28. Dave P, Curless RG and Steinman L. Cerebellar hemorrhage complicating methylmalonic and proprionic acidemia. *Archives of Neurology*, 41:1293-1296, 1984.
29. Trotter JL and Steinman L. Homing of Lyt 2⁺ and Lyt 2⁻ T cell subsets and B lymphocytes to the central nervous system of mice with acute experimental allergic encephalomyelitis. *Journal of Immunology*, 132:2919-2923, 1984.

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32. McDevitt HO, Adelman N, Watling D, Sriram S and Steinman L. The use of monoclonal anti I-A antibodies for haplotype specific immunosuppression in animal models of autoimmune disease. In: *Immunogenetics*. T Sasazuki and T Tada (eds). San Diego, Academic Press, pp. 85-94, 1984.
33. Sriram S and Steinman L. Postinfectious and postvaccinial encephalomyelitis.. In: *Neurology Clinics*. Saunders, Philadelphia, 2:341-353, 1984.
34. Steinman L, Sriram S and Waldor MK. Therapy of autoimmune diseases with antibodies to immune response gene products. *Clinical Immunology Newsletter*, Vol. 5, 3:43-45, 1984.
35. Steinman L, Trotter J, Waldor MK and Sriram S. New approaches to therapy of autoimmune disease. In: *Concepts in Immunopathology*. J. Cruse (ed). Karger, Basel, Vol. 1, pp. 85-95, 1985.
36. Shalev R and Steinman L. Whooping cough immunization: The experiments and the lessons. *Harefuah (Journal of the Israel Medical Association)*, 109:47-49, 1985.
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38. Steinman L. Introduction to Immunotherapy. *Annual Course, Neuroimmunology-Virology*. American Academy of Neurology, pp 15-30, 1985.
39. Waldor MK, Hardy R, Herzenberg LA, Herzenberg LA, Lanier L, Sriram S, Lim M and Steinman L. Reversal of EAE with monoclonal antibody to a T cell subset marker (L3T4). *Science*, 227:415-417, 1985.
40. Trotter J, Sriram S, Rassisti L, Jen Chou C-H, Fritz RB and Steinman L. Characterization of T cell lines and clones from SJL/J and (BALB/c x SJL/J)F1 mice specific for myelin basic protein. *Journal of Immunology*, 134:2322-2327, 1985.
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42. Steinman L, Weiss A, Adelman NE, Lim M, Zuniga R, Oehlert J, Hewlett E and Falkow S. Pertussis toxin is required for pertussis vaccine encephalopathy. *Proceedings of the National Academy of Science USA*, 82:8733-8736, 1985.
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44. Novotny E, Singh G, Wallace D, Dorfman LJ, Louis A, Sogg R and Steinman L. Leber's disease and dystonia: A mitochondrial disease. *Neurology*, 36(8):1053-1060, 1986.

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51. Steinman L. *Neuroimmunology Update, Scientific Basis of Neurology*. American Academy of Neurology, 1986 Course, pp. 43-50.
52. Black WJ, Steinman L, Lim M, Kent AR and Falkow S. Non-toxic mutants of *Bordetella pertussis*. In: *Bacterial Vaccines and Local Immunity*. Ann Sclaro (ed). 1-2, pp. 175-182, 1986.
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55. Steinman L. Monoclonal antibodies and therapy of multiple sclerosis. In: *Multiple Sclerosis*. FC Rose (ed). John Libbey, London, pp 57-61, 1987.
56. Steinman L. Molecular approaches toward a therapy for multiple sclerosis. In: *Revista di Neurologia*. 57:173-174, 1987.
57. McDevitt HO, Perry R and Steinman L. Monoclonal anti-Ia antibody therapy in animal models of disease. In: *Autoimmunity and Autoimmune Disease* (Ciba Foundation Symposium 129). Wiley, Chichester, pp 184-193, 1987.
58. Bell JI, Steinman L, Toyka K and McDevitt HO. HLA-DQ restriction fragment length polymorphisms in myasthenia gravis. *Annals of the New York Academy of Science*, 505:655-668, 1987.

59. Steinman L, Kitamura K, Zuniga R, Lim M and Peroutka S. Experimental murine pertussis vaccine encephalopathy. In: *Clinical Neuroimmunology*. J Aarli, W Behan & PO Behan (eds). Blackwells, Oxford, pp. 156-161, 1987
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71. Rothbard J, Zamvil S, Steinman L and McMichael A. Restricted nature of the T cell response. In: *HLA-B27 and Reactive Arthritis*. Elsevier, 1988.
72. Brautbar C, Holubar K, Szafer F, Tzfon E, Aberer W, Steinman L and Friedmann A. Specific RFLP linked to HLA-DQw1 and DQw3 genes in Austrian non-Jewish pemphigus vulgaris patients. In: *Dermatology in Five Continents*. CE Orfanos, R Stadler and H Gollnick (eds). Springer-Verlag, Berlin, pp 377-380, 1988.

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78. Zamvil SS, Mitchell DJ, Lee NE, Moore AC, Waldor MK, Sakai K, Rothbard JB, McDevitt HO, Steinman L and Acha-Orbea H. Predominant expression of a T cell receptor V gene subfamily in autoimmune encephalomyelitis. *Journal of Experimental Medicine*, 167:1586-1596, 1988.
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receptor synthetic peptides in patients with myasthenia gravis and relation to HLA class II genes. *Journal of Clinical Investigation*, 82:1894-1900, 1988.

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96. Sakai K, Mitchell DJ, Hodgkinson SJ, Zamvil SS, Rothbard JB and Steinman L. Prevention of experimental encephalomyelitis with peptides that block interaction of T cells with major histocompatibility complex proteins. *Proceedings of the National Academy of Sciences USA*, 86:9470-9474, 1989.
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of the Tenth International Histocompatibility Conference, *Immunology of HLA*. (Vol.2) B Dupont (ed). Springer-Verlag, New York, 1989.

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102. Sinha AA, Brautbar C, Szafer F, Friedmann A, Tzfon E, Steinman L and McDevitt HO. HLA-DR and HLA-DQ alleles associated with pemphigus vulgaris. In: *Cellular Basis of Immune Modulation*. JG Kaplan (ed). Alan R. Liss, Inc., New York, pp 465-468, 1989.

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