

CURRICULUM VITAE

Walter J. Atwood, Ph.D.
Professor of Medical Science
Department of Molecular Biology, Cell Biology & Biochemistry

EDUCATION

B.S. University of Massachusetts, Amherst, MA, 1986. Microbiology
Ph.D. University of Massachusetts, Amherst, MA, 1991. Neurovirology
Dissertation: Major Histocompatibility Complex Class I Proteins are Receptors for SV40

POSITIONS HELD

March 1991 - March 1994	Staff Fellow, Section on Molecular Virology and Genetics, Laboratory of Viral and Molecular Pathogenesis, NINDS, NIH, Bethesda, Maryland
January 1992 - September 1995	Adjunct Assistant Professor of Microbiology and Immunology, The George Washington University School of Medicine and Health Sciences, Washington, D.C.
March 1994 - September 1995	Senior Staff Fellow, Section on Molecular Medicine and Virology, Laboratory of Molecular Medicine and Neuroscience, NINDS, NIH, Bethesda, Maryland
September 1995 – June 2001	Assistant Professor of Medical Science, Department of Molecular Microbiology and Immunology, Brown University, Providence, Rhode Island
July 2001-June 2005	Associate Professor of Medical Science with Tenure Department of Molecular Microbiology and Immunology, Brown University, Providence, Rhode Island
July 2005-present	Associate Professor of Medical Science with Tenure Department of Molecular Biology, Cell Biology & Biochemistry, Brown University, Providence, Rhode Island
July 2006-present	Professor of Medical Science Department of Molecular Biology, Cell Biology & Biochemistry, Brown University, Providence, Rhode Island

PUBLICATIONS

Book Chapters

7. Ashok, A., and **W.J. Atwood**, 2006. Virus receptors and tropism. In: Polyomaviruses and Human Diseases. *Adv. Exp. Med. Biol.* 577:60-72.
6. **W.J. Atwood**. 2001. Cellular Receptors for the Polyomaviruses. in: *The Human Polyomaviruses, JC, BK, and SV40: Molecular and Clinical Perspectives.* ed. Kamel Khalili and Gerald Stoner, J. Wiley and Sons, Inc., pages 179-196.

5. Schweighardt, B., and **W.J. Atwood**. 2001. Glial cells as targets of viral infection in the human central nervous system. In: *Progress in Brain Research*, vol. 132:731-745. ed. B. Castellano Lopez and M. Nieto-Sampedro. Elsevier Science B.V., Amsterdam. This book chapter was the result of my presentation at the IVth European Meeting on Glial Cell Function in Health and Disease, Barcelona, Spain, May 24-27, 2000.
4. Liu, C.K., and **W.J. Atwood**. 2001. Propagation and Assay of JC Virus. In: *Methods in Molecular Biology: SV40 Protocols*, vol 165:9-18. ed. L. Raptis. Humana Press, Totowa, NJ.
3. **Atwood , W.J.**, and K.V. Shah.1999. Polyomaviruses. In: *Nature Encyclopedia of Life Sciences*, Nature Publishing Group., London.
2. **Atwood, W.J.**, Sumner, C., and E.O. Major. 1996. Molecular mechanisms in the pathogenesis of progressive multifocal leukoencephalopathy: A JC virus induced disease of the human brain. In: *Latent Infection of Pathogens* ed. Takeshi Kurata, Chapter 12, pp 134-146, Saikon Shuppan Press,Tokyo, Japan.
1. Major E.O., **Atwood, W.J.**, Conant, K., Amemiya, K., and R.G. Traub. 1995. Cell cultures from human fetal brain provide a model for HIV-1 persistence and reactivation in the central nervous system, In: *Technical advances in AIDS research in the human nervous system*, edited by Major, E.O.New York, NY: Plenum Publishing Corporation, p. 89-103.

Journals

41. Dugan, A.S., Eash, S., and **W.J. Atwood**. 2006. Update on BK virus entry and intracellular trafficking. *Transpl Infect Dis.* 8:62-67.
40. Gee, G.V., Dugan, A.S., Tsomaia, N., Mierke, D.F., and **W.J. Atwood**. 2006. Sialic acid and human polyomaviruses. *Glycoconjugate Journal* 23:19-26.
39. Eash, S., Manley, K., Gasparovic, M., Querbes, W., and W.J. Atwood. 2006. The Human Polyomaviruses. *Cell Mol. Life Sci.* 63:865-876.
38. Josephson, M.A., Gillen, D., Javaid, B., Kadambi, P., Meehan, S., Foster, P., Harland, R., Thistlethwaite, R.J., Garfinkel, M., **Atwood, W.**, Jordan, J., Sadhu, A., Millis, M.J., and J, Williams. 2006. Treatment of renal allograft polyoma BK virus infection with leflunomide. *Transplantation* 81:704-710.
37. Dugan, A.S., Eash, S., and **W.J. Atwood**. 2005. A N-linked Glycoprotein with a(2,3)-Linked Sialic Acid is a Receptor for BK Virus. *J. Virol.* 79:14442-14445.
36. Eash, S., and **W.J. Atwood**. 2005. Involvement of cytoskeletal components in BKV infectious entry. *J. Virol.* 79:11734-11741.
35. Williams J., Javaid, B., Kadambi, P., Meehan, S., Foster, P., Harland, R., Thistlethwaite, R., Garfinkel, M., **Atwood, W.**, Sadhu, A., Gillen, D., Millis, M., and M. Josephson. 2005. Leflunomide for Polyomavirus Type BK Nephropathy. *NEJM* 352:1157-1158.
34. Elphick, G.F., Querbes, W., Jordan, J.A., Gee, G.V., Eash, S., Manley, K., Dugan, A., Stanifer, M., Roth,B.L., and **W.J. Atwood**. 2004. The human polyomavirus, JCV, uses serotonin receptors to infect cells. *Science* 306:1380-1384.
32. Gee, G.V., Tsomaia, N., Mierke, D., and **W.J. Atwood**. 2004. Modeling a sialic acid binding pocket in the external loops of JCV VP1. *J. Biol. Chem.* 279(47):49172-6.

32. Eash, S., Querbes, W., and **W.J. Atwood**. 2004. Infection of Vero cells by BK Virus (BKV) is caveolae dependent. *J. Virol.* 78:11583-11590.
31. Qu, Q., Sawa, H., Suzuki, T., Semba, S., Henmi, C., Okada, Y., Tsuda, M., Tanaka, S., **Atwood, W.J.**, and K. Nagashima. 2004. Nuclear entry mechanism of the human polyomavirus JC virus like particle: role of importins and the nuclear pore complex. *J. Biol. Chem.* 279:27735-42.
30. Querbes, W., Benmerah, A., Tosoni, D., Di Fiore, P.P., and **Atwood, W.J.**, 2004. A JC virus induced signal is required for infection of glial cells by a clathrin and eps15 dependent pathway. *J. Virol.* 78: 250-256
29. Eash, S., Tavares, R., Stopa, E.G., and **Atwood, W.J.**, 2004. Differential distribution of the JC virus receptor-type sialic acid in normal human tissues. *Am. J. Pathol.* 164:419-428.
28. Trophe, J., Gordon, J., Roy-Chaudhury, P., Koralnik, I., **Atwood, W.J.**, Eash, S., Alloway, R.R., Khalili, K., Alexander, J.W., and E. S. Woodle. 2004. Basic and Clinical Research in Polyomavirus Nephropathy. *Experimental and Clinical Transplantation* 2:162-173.
27. Trophe, J., Gordon, J., Roy-Chaudhury, P., Koralnik, I., **Atwood, W.J.**, Alloway, R.R., Khalili, K., and E. S. Woodle. 2004. Polyomavirus nephropathy in kidney transplantation. *Progress in Transplantation* 14:130-142.
26. **Atwood, W.J.**, 2003. Genotypes, archetypes, and tandem repeats in the molecular epidemiology and pathogenesis of JC virus induced disease. *J. NeuroVirol.* 9:519-521.
25. Gee, G., Manley, K., and **Atwood, W.J.**, 2003. Derivation of a JC Virus resistant human glial cell line: Implications for the identification of host cell factors that determine viral tropism. *Virology* 314:101-109.
24. Baum, S., Ashok, A., Gee, G., Eash, S., Querbes, W., Jordan, J., and **Atwood, W.J.**, 2003. Early events in the life cycle of JC Virus (JCV) as potential therapeutic targets for the treatment of Progressive Multifocal Leukoencephalopathy (PML). *J. NeuroVirol.* 9: 32-37.
23. Ashok, A., and **Atwood, W.J.**, 2003. Contrasting roles of endosomal pH and the cytoskeleton in infection of human glial cells by JC Virus and SV40. *J. Virol.* 77:1347-1356.
22. Komagome, R., Sawa, H., Suzuki, T., Tanaka, S., **Atwood, W.J.**, and K. Nagashima. 2002. Oligosaccharides as receptors for JC Virus. *J. Virol.* 76:12992-13000.
21. Chen, B.J., and **Atwood, W.J.**, 2002. Construction of a novel JCV/SV40 hybrid virus (JCSV) reveals a role for the JCV capsid in viral tropism. *Virology* 300:282-290.
20. **W.J. Atwood**. 2001. A combination of low dose chlorpromazine and neutralizing antibodies inhibit the spread of JC Virus in a tissue culture model: implications for prophylactic and therapeutic treatment of progressive multifocal leukoencephalopathy. *J. NeuroVirol.* 7:307-310.
19. Schweighardt, B., and **Atwood, W.J.**, 2001. HIV type 1 infection of human astrocytes is restricted by inefficient viral entry. *AIDS Res. Hum. Retro.* 17:1133-1142.
18. Schweighardt, B., Shieh, J.T.C., and **Atwood, W.J.**, 2001. CD4/CXCR4 independent infection of human astrocytes by a T-tropic strain of HIV-1. *J. NeuroVirol.* 7:155-162.
17. Schweighardt, B., and **W.J. Atwood**. 2001. Virus receptors in the human central nervous system. *J. NeuroVirol.* 7:187-195.

16. Wei, G.W., Liu, C.K., and **Atwood, W.J.**, 2000 JC Virus binds to primary human glial cells, tonsillar stromal cells, and B-lymphocytes, but not to T-lymphocytes. *J. NeuroVirol.* 6:127-136.
15. Pho. M.T., Ashok, A., and **Atwood, W.J.**, 2000. JC Virus enters human glial cells by clathrin-dependent receptor mediated endocytosis. *J. Virol.* 74:2288-2292.
14. Liu, C.K., Wei, G., and **Atwood, W.J.**, 1998. Infection of glial cells by the human polyomavirus, JCV, is mediated by a N-linked glycoprotein containing terminal α (2-6) linked sialic acids. *J. Virol.* 72:4643-4649.
13. Liu, C.K., Hope, A.P., and **Atwood, W.J.**, 1998. The human polyomavirus, JCV, does not share receptor specificity with SV40 on human glial cells. *J. NeuroVirol.* 4:49-58.
12. Monaco, M.C.G., **Atwood, W.J.**, Gravell, M., Tornatore, C.S., and E.O. Major. 1996. JCV infection of hematopoietic progenitor cells, primary B lymphocytes and tonsillar stromal cells: implication for viral latency. *J. Virol.* 70:7004-7012.
11. Tornatore, C., Baker-Cairns, B., Yadid, G., Hamilton, R., Meyers, K., **Atwood, W.**, Cummins, A., Cheng, S., Tanner, V., and E. Major. 1996. Expression of tyrosine hydroxylase in an immortalized human fetal astrocyte cell line; In vitro characterization and engraftment into the rodent striatum. *Cell Transplantation.* 5:145-163.
10. **Atwood, W.J.**, Wang, L., Durham, L.C., Amemiya, K., Traub, R.G., and E.O. Major. 1995. Evaluation of the role of cytokine activation in the multiplication of JC Virus (JCV) in human fetal glial cells. *J. Neurovirol.* 1:40-49.
9. Conant, K., **Atwood, W.J.**, Traub, R., Tornatore, C.S., and E.O. Major. 1994. Expression of HIV-1 in human fetal astrocytes: Role of PKC and NFkB. *Virology* 205:586-590.
8. Conant, K., Tornatore, C., **Atwood, W.**, Meyers, K., Traub, R., and E.O. Major. 1994. In vivo and in vitro infection of the astrocyte by HIV-1. *Advances in Neuroimmunology.* 4:1-3.
7. **Atwood, W.J.**, Tornatore, C., Traub, R., Conant, K., Drew, P., and E.O. Major. 1994. Stimulation of HIV-1 gene expression and induction of NFkB (p50/p65) in TNF- α treated human fetal glial cells. *AIDS Research and Human Retroviruses.* 10:1207-1211.
6. Tornatore, C.S., Meyers, K., **Atwood, W.J.**, Conant, K., and E.O. Major. 1994. Temporal characterization of HIV-1 mRNA transcripts from persistently infected human fetal astrocytes. *J. Virol.* 68:93-102.
5. Tornatore, C., Amemiya, K., **Atwood, W.**, Conant, K., and J. Berger. 1994. JC Virus: Current controversies in the molecular virology and pathogenesis of progressive multifocal leukoencephalopathy. *Reviews in Medical Virology* 4:197-219.
4. **Atwood, W.J.**, Tornatore, C., Meyers, K., and E.O. Major. 1993. HIV-1 mRNA transcripts from persistently infected human fetal astrocytes. *Ann. New York Acad. Sci.* 693:323-324.
3. **Atwood, W.J.**, Berger, J., Kaderman, R., Tornatore, C.S., and E.O. Major. 1993. HIV-1 infection of the central nervous system. *Clin. Microbiol. Rev.* 6:339-366.
2. Breau, W., **Atwood, W.J.** and L.C. Norkin. 1992. Class I major histocompatibility complex proteins are an essential component of the SV40 receptor. *Journal of Virology* 66:2037-2045.

1. **Atwood, W.J.** and L.C. Norkin. 1989. Class I major histocompatibility proteins as cell surface receptors for simian virus 40. *Journal of Virology* 63:4474-4477.

INVITED LECTURES

Medical College of Wisconsin, Grand Rounds, January 2006
Polyomaviruses and Human Diseases: Basic and Clinical Aspects, Sept.11-14, 2005, Providence RI
Berlex Pharmaceuticals, Monteville NJ, August 2005.
Millenium Pharmaceuticals, Cambridge, MA, July 2005.
NINDS Workshop: Selective adhesion molecule inhibitors and CNS disease.
Washington, DC July 26, 2005.
Schering-Plough Pharmaceuticals, Kenilworth, NJ, June 2005.
State-of-the-Art lecture, 2nd International Meeting on Polyomavirus Nephropathy.
Baltimore, MD May 19-20, 2005
The Third International Workshop on the Structural Biology of Small DNA Tumor
Viruses, April 11-16, 2005, Siena, Italy
Elan Pharmaceuticals, So. San Franscisco, CA, April 2005.
Biogen-Idec, Cambridge, MA, March 2005.
Temple University School of Medicine, November 2004.
Penn State College of Medicine, Hershey, September 2004.
6th International Symposium on Neurovirology, September 10-14, 2004, Sardinia, Italy
Polyomaviruses and Human Diseases: Basic and Clinical Aspects, June 11-13, 2004, Sapporo, Japan
University of Cincinnati Medical School, Grand Rounds, March 2004
National Cancer Institute, Center for Scientific Review, February 2004
University of Massachusetts Medical School, January 29, 2004
Boston College, October 21, 2003
University of Utah School of Medicine, July 9, 2003
Workshop on Receptors and Entry for Oncogenic Viruses, Park City Marriott, Park
City, Utah, July 9-12, 2003.
The Second International Workshop on the Structural Biology of Small DNA Tumor
Viruses, April 22-27, 2003, Siena, Italy
Polyomaviruses and Human Diseases: Basic and Clinical Aspects, May 8-10, 2003,
Pozzolatico, Florence, Italy
National Chung Cheng University, March 25, 2003, Chia-Yi, Taiwan, ROC
Chia-Yi Chang Gung Memorial Hospital, March 26, 2003, Chia-Yi, Taiwan, ROC
The Women's Club of Barre Massachusetts, February 13, 2003, Barre,
Massachusetts.
Polyomavirus Nephropathy in Immunosuppressed Kidney and other
Solid Organ Transplant Patients. Bethesda, MD, August 2002.
Basic, Clinical, and Epidemiological Studies of Progressive
Multifocal Leukoencephalopathy: Implications for Therapy. Portland, ME July 2002
The Univeristy of Massachusetts, Amherst, Department of Microbiology, April 4,
2002.
The Structural Biology of Small DNA Tumor Viruses, **Siena, Italy** May 1-6,
2001
Current Progress on the Biology of JC Virus and the Clinical course of Progressive
Multifocal Leukoencephalopathy: A prospective view of new treatment paradigms in immune
deficient patients. Chicago, IL February 3, 2001
Johns Hopkins University School of Medicine, December 4, 2000
The National Institute of Neurological Diseases and Stroke, November 8, 2000
Third Annual National Institutes of Health Centers for AIDS Research Symposium,
November 1, 2000

The Pennsylvania State University, September 11, 2000
The IVth European Meeting on Glial Cell Function in Health and Disease,
May 24-27, 2000.
Lifespan/Tufts/Brown Center for AIDS Research, HIV/AIDS Symposium, January
26, 2000
University of Kentucky, Lexington, Kentucky December 6, 1999
University of Massachusetts, Amherst, MA 1999
Infectious Disease Rounds, Brown University, Providence, RI, 1999
Pathology Research and Teaching Rounds, Brown University, Providence, RI 1999
Rhode Island College, Providence, RI 1998
Hematology and Oncology Fellows Conference, Miriam Hospital, Providence, RI
1998

ACTIVE FUNDING

1. **National Institutes of Health Grant # R01-CA71878**; “Cellular Receptors for the Human Polyomavirus, JCV”; 04/1/02-03/31/07; **Principal Investigator; W. J. Atwood.**
2. **National Institutes of Health Grant # R01-NS43097-05**; “Virus-Host Cell Interactions in AIDS-Associated PML”; 12/1/05-11/30/10; **Principal Investigator; W. J. Atwood.**
3. **National Institutes of Health Grant # R13-CA110760-01**; “2nd Symposium on Polyomaviruses and Human Disease”; 06/04/04-05/31/08; **Principal Investigator; W.J. Atwood.**
4. **National Institutes of Health Grant # 1F31 NS053340-01**; “Role of JCV coat proteins in neuropathogenesis of PML”; 09/01/05-08/31/07; PI-Megan Gasparovic; **Mentor; W.J. Atwood.**
5. **National Institutes of Health Grant # P20 RR015578-07**; “Center for Cancer Signaling Networks”; 07/01/05-06/30/10; **Principal Investigator; W.J. Atwood.**

AWARD AND FUNDING HISTORY

1. **Fujisawa Healthcare Inc.**, “Anti-viral Activity of FK778 against the Human Polyomaviruses, JCV and BKV”; 12/1/02-06/30/05; **Principal Investigator; W.J. Atwood.**
2. **National Institutes of Health Grant # R29-CA71878**; “Cellular Receptors for the Human Polyomavirus, JCV”; 09/1/97-08/31/01; **Principal Investigator; W. J. Atwood.**
3. **National Institutes of Health, Center of Biomedical Research Excellence Grant # NIH 1 P20 RR15578-01** (01-05); Center for Genetics and Genomics; 10/1/00-9/30/05; (PI- J. Sedivy) - Co-Investigator of Project A - Characterization of Events Regulating the Balance Between Resistance and Infection (Project PI- C.A. Biron); Specific Aim 1-Establishment of Approaches to Identify Early Events in Infection of B cells by JC Virus (**Investigator-W.J. Atwood**).
4. **National Institutes of Health Sponsored Lifespan/Tufts/Brown Center for AIDS Research.** Developmental Research Grant, “Virus Chemokine Receptor Interactions in HIV-Dementia”, **Principal Investigator; W. J. Atwood.**
5. Brown University Salomon Faculty Research Award, “Virus-Chemokine Receptor Interactions in AIDS Dementia”, 1999, **Principal Investigator; W. J. Atwood.**
6. Brown University Salomon Faculty Research Award, “The Role of Cellular Receptor in Restricting the Tropism of JCV to Glial Cells”, 1998, **Principal Investigator; W. J. Atwood.**

7. Brown University Funded Small Grant, “Cellular Receptor for the Human Polyomavirus, JCV”, 1997, **Principal Investigator; W. J. Atwood.**
8. Rhode Island Foundation Medical Research Grant, “Cellular Receptor for the Human Polyomavirus, JCV”, 1997, **Principal Investigator; W. J. Atwood.**
9. American Cancer Society Institutional Grant Allocation, 1996, **Principal Investigator; W. J. Atwood.** “Cellular Receptor for the Human Polyomavirus, JCV”.
10. Rhode Island Foundation Medical Research Grant, “Cellular Receptor for the Human Polyomavirus, JCV”, 1996, **Principal Investigator; W. J. Atwood.**

UNIVERSITY SERVICE

Member, Campus Planning Advisory Committee, 2005-present
 Chair, Laboratories of Molecular Medicine Seminar Series, 2005-present
 Chair, Laboratories of Molecular Medicine Operations Committee, 2004-present
 Member, Search Committee for Faculty Position in Bacteriology in MMI, 2003-2005
 Member, Search Committee for Environmental Toxicology Faculty Position in Pathology, 2003-2004
 Member, Search Committee for NMR Faculty Position in MPPB, 2003-2004
 Member, Pathobiology Graduate Program Steering Committee, 1999-present
 Member, Medical School Curriculum Sub-Committee on the Basic Biology of Cells, 1999
 Member, Search Committee for Faculty Position in Immunology in MMI, 1997-1999
 Chair, Molecular Microbiology and Immunology Seminar Series, 1996

SERVICE TO THE PROFESSION

Organizer and Host for the 3rd International Meeting on Human Polyomavirus Diseases to be held Sept. 11-14, 2005 at The Providence Biltmore.
 Editorial Board, Journal of Virology (2004-2007)
 Secretary, International Society for Neurovirology (2004-2007)
 Editorial Board, International Society for NeuroVirology Newsletter (2004-2005)
 Member, Board of Directors, International Society for NeuroVirology (2003-present)
 Secretary Elect, International Society for NeuroVirology (2003-2004)

GRANT REVIEWS

National Institutes of Health, Virology Study Section, Member (2003-2007)
 National Institute of Neurological Disorders and Stroke, NSD-C Review Panel, 2003
 National Institutes of Health Special Emphasis Panel to review the “Multi Center Neurologic AIDS Research Consortium” 2002
 National Institutes of Health Special Emphasis Study Section, 2002
 National Institutes of Health, Virology Study Section Ad-Hoc Member (2001-2003)
 Department of Veterans Affairs, (2000-present)
 Brown University Center for AIDS Research Developmental Grants Program (1998-present)
 Lifespan Developmental Grants Program (1996-present)

MANUSCRIPT REVIEWS

Journal of Immunology (1) (1998)
 Virology (3-4 per year) (1996-present)
 Journal of Neurovirology (4-6 per year) (1996-present)
 Journal of Virology (10-12 per year) (1996-present)

Cancer Research (1 per year) (2002-present)

ACADEMIC HONORS/FELLOWSHIPS/SOCIETIES

Dean's Teaching Excellence Award, Brown Medical School, 2005-2006

Editorial Board, Journal of Virology (2005-2007)

National Institutes of Health, Virology Study Section, Member (2003-2007)

American Association for the Advancement of Science

American Society of Microbiology

Sigma Xi

American Society for Virology

International Society for NeuroVirology (**Founding Member**)

American Society for Cell Biology

Master of Arts *Ad Eundem* Brown University