

CURRICULUM VITAE

Paul Zhou

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Education:

B. Medicine (1978-1983) Shanghai Second Medical University, Shanghai, China
M. A. (1985-1987) State University of New York at Buffalo, Buffalo, NY
Ph. D. (1985-1989) State University of New York at Buffalo, Buffalo, NY
(Immunology)

Professional Appointments:

1983-1985 Postgraduate study, Shanghai Institute of Immunology, Shanghai, China
1985-1989 Research/Teaching Assistant, Department of Microbiology, School of Medicine, State University of New York at Buffalo, Buffalo, NY
1989-1993 Postdoctoral Fellow, Department of Immunology, Mayo Clinic, Rochester, MN
1993-1998 Senior Staff Fellow, Oral Infection and Immunity Branch, National Institutes of Health, Bethesda, MD
1998-2005 Principal Investigator, Department of Virology and Immunology, Southwest Foundation for Biomedical Research, San Antonio, TX
1999-2005 Adjunct Associate Professor, Department of Microbiology, University of Texas Health Science Center at San Antonio, San Antonio, TX
2001-2005 Affiliate Member of the Southwest National Primate Center, San Antonio, TX
2005-present Professor and Unit Chief of Anti-Viral Immunity and Genetic Therapy Unit, Institute Pasteur of Shanghai, Chinese Academy of Sciences, Shanghai, China

Other Professional Activities

Teaching Viral Immunology and Viral Vectors for Gene Delivery classes to graduate students at University of Texas Health Science Center, San Antonio, TX (1999 – 2005)
Ad Hoc reviewer for research grants submitted to the Wellcome Trustee in England (2001).

Preceptor for NIH Virology Training Grant at University of Texas Health Science Center, San Antonio, TX (2001-2005)
Member of Graduate Student Admission Committee, Department of Microbiology, University of Texas Health Science Center, San Antonio, TX (2002-2005)
Ad Hoc reviewer for research grants submitted to the Regional Center of Excellence in Biodefense (RCE) (2002)
Member of Scientific Program Committee in 22nd Annual Symposium on Non-human Primate Models for AIDS (2004)
Co-chair on Immunology Session in 22nd Annual Symposium on Non-human Primate Models for AIDS (2004)
Member of scientific review panel for PO1 grants submitted to NIAID, NIH under PAR AI-03-138 entitled “Novel HIV Therapies: Integrated Preclinical/Clinical Program” (2004 and 2005)
Teaching Immunology classes to graduate students at Shanghai Institutes of Biomedical Science, Chinese Academy of Science since 2005
Coordinating and teaching Virology classes to graduate students at Shanghai Institutes of Biomedical Science, Chinese Academy of Science since 2005
Organizer for the Pasteur-Areva Course on Blood-Borne Viruses: HIV in Shanghai, China (2006)
Member of Editorial Board of Modern Immunology since 2006
Ad Hoc reviewer for research grants submitted to the National Science Foundation of China (2007)
Ad Hoc reviewer for research grants submitted to INSERM in France (2008)
Ad Hoc reviewer for National Key Research Projects on Infectious Diseases funded by Chinese Ministry of Health (2008)
Member of the 3rd Scientific Steering Committee in Shanghai Institutes of Biological Sciences, Chinese Academy of Sciences 2008 – 2012
Chairman of the Scientific Steering Committee in Institute Pasteur of Shanghai, Chinese Academy of Sciences since 2008
Member of Working Group I – Rational Immunogen Design to the Global AIDS Vaccine Enterprise in New York, USA (2009)

History of Research Funding

Fellowships and Grants (expired)

Pre-doctoral Fellowship in Genetics, State University of New York at Buffalo (1986-1988)
Research Grant, Arthritis Foundation, Minnesota Chapter (1989-1990, 1991-1993)
NIH Postdoctoral Training Fellowship (1992-1993)
Principle Investigator in Pilot Project, Southwest Foundation Forum (12-01-99 to 12-31-00)
Principal Investigator in Pilot Project Grant from NIH grant RR13986 to the Southwest National Primate Research Center entitled “Develop a Xenograft Model to Test Anti-SHIV Activity of Rhesus Hematopoietic Progenitor Cells

Transduced with Intracellular Anti-HIV-1 Gp41 Antibody in vivo” (11-01-01 to 10-30-03)
Principal Investigator in NIH NIAID R01 AI47682-01 entitled “Further Studies on Anti-HIV-1 Activity of Interleukin 16” (07-01-00 to 06-30-05)
Principal Investigator in NIH NIAID R21 AI054254-01 entitled “Inhibition of HIV by Novel Chimeric Receptors” (04-01-03 to 03-31-06)
Project Leader in the French Ministry of Health program grant entitled “A collaborative approach against avian flu” (05-01-06 to 04-30-08)
Principal Investigator in National Science Foundation grant entitled “Membrane-bound antibodies: a novel form of microbicide against HIV” (01-01-08 to 12-31-08)
Principal Investigator in the National Science Foundation grant #30671922 entitled “Develop a chimeric HA-based vaccine strategy against avian influenza” (01-01-07 to 12-31-09)

Research Grants (current)

Project Leader in the grant funded by the Li Ka-Shing Foundation entitled “Optimization of influenza HA-based pseudotypes and their use in development of a novel neutralizing assay” (07-01-06 to 12-30-10)
Project Leader in the Chinese Ministry of Science and Technology 973 program grant 2006CB504308 entitled “Anti-viral Immunity: Basic Science and Therapeutic Applications” (01-01-07 to 12-31-11)
Principal Investigator in the Shanghai Pasteur Foundation program grant entitled “Develop humanized mouse model for evaluating efficacy and safety of vaccine candidates against HIV” (01-01-08 to 12-31-12)
Project Leader in the Grand Science and Technology Special Project on Vaccine against HIV 2008ZX1001-1010-03 entitled “Research on VLP” (10-01-08 to 12-31-10)
Project Leader in the Grand Science and Technology Special Project on Platform Development for Diagnosis of Respiratory and CNS Viral Infection 2009ZX10004-105-05 entitled “Pseudotype-based Assay for Measuring Neutralizing Antibody Responses against HPAI H5N1 viruses” (10-01-08 to 12-31-10)

Professional Memberships:

American Association for the Advancement of Science
American Association of Immunologists
American Society of Gene Therapy

Publications:

Original Research Articles:

1. Quackenbush, L.J., Dowjat, W.K., **Zhou, P.**, and Zaleski, M.B. Anti-Thy-1 response of H-2^f/H-2^r heterozygotes: an unusual case of genetic control. *Immunol. Invest.* 15:169-177, 1986.
2. **Zhou, P.**, Quackenbush, L.J., Albini, B., and Zaleski, M.B. Macrophage I-A hybrid molecules as product of Ir-Thy-1 genes. In: H-2 Antigens, Genes, Molecules, Functions. Edited by C.S. David, Plenum, New York, pp297-304, 1987.
3. **Zhou, P.**, Quackenbush, L.J., Gorzynski, T.J., Thacore, H., Dowjat, W.K., Akinbami, C., and Zaleski, M.B. Factors affecting proliferation on non-immune murine T cells in vitro. *Transplant. Proc.* 21:171-173, 1989.
4. Dowjat, W.K., **Zhou, P.**, Quackenbush, L.J., Gorzynski, T.J., and Zaleski, M.B. In vitro proliferation of murine spleen cells: strain variation of responses to medium from cultures of EL-4 cells. *Immunol. Invest.* 90:162-168, 1989.
5. **Zhou, P.**, Gorzynski, T.J., Dowjat, W.K., Rabin, R., and Zaleski, M.B. In vitro proliferation of murine spleen cells: inhibition by monoclonal antibodies to L3T4 and Lyt-2 T cell markers and intracellular cAMP. *Exp. Cell. Biol.* 57:346-357, 1989.
6. **Zhou, P.**, Quackenbush, L.J., and Zaleski, M.B. *In vitro* proliferative response of murine spleen cells: strain variation of proliferative response induced by recombinant IL-2. *Int. Arch. Allergy Immunol.* 90:162-168, 1989.
7. **Zhou, P.**, Quackenbush, L.J., Albini, B., and Zaleski, M.B. In vitro response induced by phorbol ester and calcium ionophore A23187. *Immunobiology* 180:55-67, 1989.
8. **Zhou, P.**, Reichner, J.S., Gorzynski, T.J., Quackenbush, L.J., and Zaleski, M.B. Evidence that class I-restricted response to Thy-1 antigen requires L3T4 cells and macrophages but not Lyt-2 cells. *Transplantation* 47:1089-1092, 1989.
9. **Zhou, P.**, Savarirayan, S., Qian, L., Knoko, H., and David, C.S. Generation of transgenic mice bearing human class II genes. (Short Report) In Miami Bio/Technology Winter Symposia, pp. 225, 1990.
10. Cunningham, R., **Zhou, P.**, and Zaleski, M.B. Postnatal development of murine spleen cell proliferative responses induced by interleukin 2 or phorbol ester and calcium ionophore A 23187. *Immunobiology* 184:53-62, 1991.
11. **Zhou, P.**, Anderson, G., Savarirayan, S., Inoko, H., and David, C.S. Alteration of mouse T cell receptor repertoire by Aa/DQb hybrid molecules in DQb single transgenic mice. *Transplant. Proc.* 23:423-426, 1991.

12. **Zhou, P.**, Anderson, G., Savarirayan, S., Inoko, H., and David, C.S. Thymic deletion of Vb11 and Vb5 T cells in H-2E negative, HLA DQb+ transgenic mice. *J. Immunol.* 146:854-859, 1991.
13. **Zhou, P.**, Anderson, G., Savarirayan, S., Inoko, H., and David, C.S. HLA-DQb present mouse MIs and clonally deletes Vb6 and Vb8.1 bearing T cells in DQb single transgenic mice. *Human Immunol.* 31:47-56, 1991.
14. **Zhou, P.**, Smart, M.K., Shen, C., Inoko, H., and David, C.S. HLA-DQ β chain can present mouse endogenous provirus MTV-9 product and clonally delete TCR Vb5 and Vb11 T cells in transgenic mice. *Immunogenetics* 35:219-223, 1992.
15. Rodriguez, M., Prayoonwiwat, N., **Zhou, P.**, and David, C.S. Expression of T cell receptor Vb transcripts in central nervous system of mice susceptible and resistant to Theiler's virus-induced demyelination. *J. Neuroimmunol.* 47:95-100, 1993.
16. Zanelli, E., **Zhou, P.**, Cao, H., Smart, M.K., and David, C.S. Genomic organization and tissue expression of mouse *Lmp-7* gene. *Immunogenetics* 38:400-407, 1993.
17. **Zhou, P.**, Zanelli, E., Smart, M.K., and David C.S. Genomic organization and tissue expression of mouse proteasome gene *Lmp-2*. *Genomics* 16:664-668, 1993.
18. **Zhou, P.**, Cao, H., Smart, M.K., and David, C.S. Molecular basis of genetic polymorphism of proteasome gene *Lmp-2*. *Proc. Natl. Acad. Sci. USA* 90:2681-2684, 1993.
19. Cunningham, R.K., Thacore, H.R., **Zhou, P.**, Nakeeb, S., and Zaleski, M.B. Blood transfusion as a means for transmission of retrovirus-induced lymphoproliferative disease in mice. *Int. Arch. Allerg. Immunol.* 103:16-22, 1994.
20. Thacore, H.R., Cunningham, R.K., **Zhou, P.**, Nakeeb, S., Terzian, R., and Zaeleski, M.B. Acquired immunodeficiency in murine lymphoproliferative disease: considerations of pathogenesis. *Immunobiology* 190:195-211, 1994.
21. Cunningham, R.K., Thacore, H.R., **Zhou, P.**, Nakeeb, S., and Zaleski, M.B. Retrovirus-induced lymphoproliferative disease in mice undergoing graft-versus-host reaction. *Immunol. Invest.* 24:881-890, 1995.
22. Zanelli, E., **Zhou, P.**, Cao, H., Smart, M.K., and David, C.S. Genetic polymorphism of the mouse major histocompatibility complex-associated proteasome subunit *Lmp-7*. *Immunogenetics* 41:251-254, 1995.

23. Zaleski, M.B., Thacore, H.R., **Zhou, P.**, Dubiski, S., Nakeeb, S., Cunningham, R.K. Retrovirus-induced lymphoproliferative disease in mice: role of humoral immunity in perinatally exposed mice. *Immunobiology* 194:390-402, 1995.
24. Gonzalez-Gay, M.A., Zanelli, E., Khare, S.D., Krco, C.J., **Zhou, P.**, Inoko, H., Griffiths, M.M., Luthra, H.S., and David, C.S. Human leukocyte antigen-DRB1*1502 (DR2Dw12) transgene reduces incidence and severity of arthritis in mice. *Hum. Immunol.* 50:54-60, 1996.
25. **Zhou, P.**, Goldstein, S., Devadas, K., Tewari, D., and Notkins, A.L. Human CD4 cells transfected with IL-16 cDNA are resistant to HIV-1 infection: inhibition of mRNA expression. *Nature Medicine.* 3:659-664, 1997.
26. Bradley, D.S., Nabozny, G.H., Cheng, S., **Zhou, P.**, Griffiths, M.M., Luthra, H.S., and David, C.S. HLA-DQB1 polymorphism determines incidence, onset, and severity of collagen-induced arthritis (CIA) in transgenic mice: implications in human rheumatoid arthritis. *J. Clin. Invest.* 100:2227-2234, 1997.
27. **Zhou, P.**, Goldstein, S., Devadas, K., Tewari, D., and Notkins, A.L. Cells transfected with a non-neutralizing antibody gene are resistant to HIV infection: targeting in the endoplasmic reticulum and *trans-golgi* network. *J. Immunol.* 160:1489-1496, 1998.
28. Tewari, D., Notkins, A.L., and **Zhou, P.** Inhibition of HIV-1 by anti-HIV-1 p17 (matrix) scFv/Ck expressed in cytosol and nucleus. *J. Immunol.* 161:2642-2647, 1998.
29. **Zhou, P.**, Devadas, K. Tewari, D., Jegorow, A., and Notkins, A.L. Processing, secretion and anti-HIV-1 activity of interleukin-16 with or without a signal peptide in CD4⁺ T cells. *J. Immunol.* 163:906-912, 1999.
30. **Zhou, P.**, J. Lee, P. Moore, and K.M. Brasky. High efficiency gene transfer into rhesus macaque primary T lymphocytes by combining 32⁰C centrifugation and CH-296-coated plates: effect of *ex vivo* gene transfer protocol on lymphocyte homing receptor expression. *Hum. Gene Ther.* 12:1843-1855, 2001.
31. Tewari, D., Notkins, A.L., and **Zhou, P.** Inhibition of HIV-1 replication in human primary T cells transduced with intracellular anti-HIV-1 p17 antibody targeted into cytosolic compartment. *J. Gene Med.* 5:182-189, 2003
32. Devedas, K., **Zhou, P.**, Tewari, D. and Notkins, AL. Inhibition of HIV-1 replication by the synergistic action of anti-gp41 single chain antibody and IL-16. *Antiviral Research* 59:67-70, 2003

33. Lee, S.J., Gauza, L., Yao, J., Notkins, A.L., and **Zhou, P.** A non-neutralizing anti-HIV-1 antibody turns into a neutralizing antibody by expressing it on the surface of HIV-1-susceptible cells – a new way to fight HIV-1. *J. Immunol.* 173:4618-4626, 2004
34. Lee, S.J., Arora, R., Bull, L.M., Arduino, R.C., Garza, L., Allan, J., Kimata, J.T., and **Zhou, P.** A non-neutralizing anti-HIV-1 antibody turns into a broad neutralizing antibody when expressed on the surface of HIV-1-susceptible cells (II): inhibition of HIV-1 captured and transferred by DC-SIGN, *AIDS Res. And Hum. Retroviruses* 22:874-883, 2006
35. Wang, W., Ren, P., Mardi, S., Hou, L., Tsai, C., Chan, K.H., Cheng, P., Sheng, J., Buchy, P., Sun, B., Toyoda, T., Lim, W., Peiris, J.S., **Zhou, P.**, Deubel, V. Design of multiplexed detection assays for identification of avian influenza A virus subtypes pathogenic to humans by SmartCycler real-time reverse transcription-PCR. *J Clin Microbiol.* 47:86-92, 2009
36. Tsai, C., Caillet, C., Hu, H., Zhou, F., Ding, H., Zhang, G.L., Zhou, B.P., Lu, S., Buchy, P., Deubel, V., Vogel, F. and **Zhou, P.** Measure neutralizing antibody responses against HPAI H5N1 viruses using influenza HA and NA pseudotype-based assay. *Vaccine* 27:6777-6790, 2009
37. Ding, H., Tsai, C., Gutiérrez, R. A., Zhou, F., Buchy, P., Deubel, V., and **Zhou, P.** Superior Neutralizing Antibody Response and Protection in Mice Vaccinated with Heterologous DNA Prime and Virus Like Particle Boost against HPAI H5N1 Virus. *Submitted* (under revision)
38. Wen, M., Arora, R., Wang, H., Liu, L., Kimata, J.T., and **Zhou, P.** GPI-anchored single chain Fv - an effective 1 way to capture transiently-exposed neutralization epitopes on HIV-1 envelope spike. *Submitted* (under revision)
39. Tsai, C., Ding, H., Zhou, F., Deubel, V., and **Zhou, P.** Heterosubtypic Antibody Response Elicited with Seasonal Influenza Vaccine Correlates Partial Protection against Highly Pathogenic H5N1 Virus. *Submitted*
40. Thippeshappa, R., Polacino, P., Kimata, M.Y., Siwak, E.B., Anderson, D., Wang, W., Sherwood, L., Arora, R., Wen, M., **Zhou, P.**, Hu, S-L., and Kimata, J.T. Overcoming Intrinsic Immunity by APOBEC3 Proteins Enables Persistent Replication 1 of HIV-1 in Pig-tailed Macaques. *Submitted*
41. Wang, L.L., Hu, H.X., Yang, J., Wang, F., Kaisermayer, C., and **Zhou, P.** Superior Human Monoclonal Antibody Production by Stably Transfected Drosophila Schneider 2 Cells Using Perfusion Culture in WAVE Bioreactor. *Submitted*

Review Articles:

1. Zaleski, M.B., **Zhou, P.**, Quackenbush, L.J., Gorzynski, T.J., and Reichner, J.S. The Ir-Thy-1 concept: a swan song. *Immune Res.* 8:316-326, 1989
2. Cunningham, R.K., Thacore, H.R., **Zhou, P.**, Terzian, R., Nakeeb, S., and Zaleski, M.B. Murine AIDS: a model for the human disease or a distinct entity? *Immune Res.* 13:21-28, 1994
3. Wen, M., Yang, H., and **Zhou, P.** “Unconventional” neutralizing activity of antibodies against HIV. *Virologica Sinica* 22:462-470, 2007
4. Mascola, J., King, C.R., Steinman, R., Alter, G., Burton, D.R., Karlsson-Hedestam, G., Le Grand, R., Liljestrom, P., Liu, M., Liu, Y-J., McElrath, J., Nikolic, B., Nussenzweig, M., Panicali, D., Pensiero, M., Sallusto, F., Seder, R., Stamatatos, L., Williamson, A-L., Yewdell, J., and **Zhou, P.** Immunogens and Antigen Processing: Report from a Global HIV Vaccine Enterprise Working Group. *Submitted*

Book Chapter:

1. **Zhou, P.**, and David, C.S. Co-evolution of MHC, Superantigens and T Cell Receptors. In Major Histocompatibility Complex. Edited by Jan Klein. Academic Press 1991

Patents:

1. **Zhou, P.**, Tsai, C. G., Toyoda, T., and Buchy, P. “HA/NA pseudotyped lentiviral vector and its uses” (European and US Patent, March.2008)