

CURRICULUM VITAE

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Education:

- 1964 A.B. Holy Cross College, Worcester, Massachusetts
- 1966 B.M.Sc. Dartmouth College, Hanover, New Hampshire
- 1968 M.D. Harvard University, Boston, Massachusetts

Post-Doctoral Training:

- 1968-1971 Intern/Resident, St. Louis Children's Hospital, St. Louis, MO and Children's Hospital Medical Center, Boston, MA
- 1971-1974 Senior Assistant Surgeon, United States Public Health Service, Virology Division, Laboratory Bureau, Center for Disease Control, Atlanta, GA
- 1974-1976 Fellow in Infectious Diseases, Beth Israel Hospital and Children's Hospital Medical Center, Boston, MA
- 1976-1977 Research Fellow in Infectious Diseases, Dana-Farber Cancer Institute, Boston, MA
- 1976-1980 Instructor in Medicine, Harvard Medical School, Clinical Associate, Dana-Farber Cancer Institute, Boston, MA

Faculty Positions:

- 1980-Present Director, Infectious Diseases Section, Department of Pediatrics, City of Hope National Medical Center, Duarte, CA
- 1982-1984 Director, Infectious Diseases Section, Department of Medicine, City of Hope National Medical Center, Duarte, CA
- 1982-1987 Clinical Associate Professor of Pediatrics, University of Southern California/L.A. County Medical Center, Los Angeles, CA
- 1987-Present Professor, Department of Pediatrics, City of Hope National Medical Center, Duarte, CA
- 1998-2010 Director, General Clinical Research Center of the University of Southern California School of Medicine, City of Hope Satellite Unit
- 1999-2015 Chairman, Department of Virology, Beckman Research Institute of the City of Hope, Duarte, CA
- 2015-Present Director, Center for Gene Therapy, Hematologic Malignancies and Stem Cell Transplantation Institute, Department of Hematology

Hospital Positions:

- 1982-1998 Member, Board of Directors, City of Hope Medical Group, Inc., City of Hope National Medical Center, Duarte, CA
- 1991-2000 Chairman, Gene Therapy Advisory Committee, City of Hope National Medical Center, Duarte, CA
- 1991-1994 IRB Institutional Official for City of Hope National Medical Center, Duarte, CA
- 1991-1994 Member, Scientific and Medical Affairs Committee, City of Hope National Medical Center, Duarte, CA
- 1995-2005 Chairman, IRB, City of Hope National Medical Center, Duarte, CA
- 2005-2009 Associate Chair, IRB, City of Hope National Medical Center, Duarte, CA

2009-2012 Deputy Director for Clinical Research, City of Hope Comprehensive Cancer Center, Duarte, CA
2009-present Institutional Official, City of Hope, Duarte, CA
2018-present Chair, Islet Cell Transplant – Quality Management Council

Certification:

1973 American Board of Pediatrics
1994 Pediatric Infectious Disease Boards

License:

Commonwealth of Massachusetts (#67532)
Medical Board of California (G-042848)

Honors and Awards:

1963 National Science Foundation Summer Fellowship at Worcester Foundation for Experimental Biology
1977 Young Investigator Award, National Institute of Allergy and Infectious Disease
1987-95 Director, National Cooperative Drug Discovery Group for AIDS at City of Hope National Medical Center, Duarte, CA
1995-2003 Director, Strategic Program for Innovative Research in AIDS Treatment at City of Hope National Medical Center, Duarte, CA
2004-Present Innovative Pre-Clinical and Clinical Program for AIDS Research
2009 Aaron D. and Edith Miller Chair in Gene Therapy, City of Hope
2010-2011 Chairman for NIH Recombinant DNA Advisory Committee
2010 Scientific Research Portrait Gallery – City of Hope
2015-Present Director, City of Hope Alpha Stem Cell Clinic

Membership:

- American Society for Blood and Marrow Transplantation
- American Society for Gene Therapy
- Infectious Diseases Society of America, *Fellow*
- Los Angeles County Medical Association
- Pediatric Infectious Diseases Society, *Full Member*
- Society for Pediatric Research
- American Academy of HIV Medicine
- HIV Medicine Association (HIVMA), *Member*

Selected Committees:

1995-2007 Collaborative Antiviral Study Group
2000-2005 National Gene Vector Lab Steering Committee
2005 Ad hoc meeting, Cellular, Tissue and Gene Therapies Advisory Committee (FDA)
2007-2011 NIH, Recombinant DNA Advisory Committee, member
2008 CIBMTR Writing Committee, Guidelines for Preventing Opportunistic Infections Among Hematopoietic Stem Cell Transplant Recipients
2018-present Genes, Editorial Board

Patents:

1. **Zaia JA**, Hawkins, G. Protein Kinase Deficient, Immunologically Active CMVpp65 Mutants. U.S. Patent 7,025,969 April 11, 2006.
2. **Zaia JA**, Hawkins, G. Protein Kinase Deficient, Immunologically Active CMVpp65 Mutants. U.S. Patent 6,835,383 December 28, 2004.
3. **Zaia JA**, Giugni, TD, Moller E, Soderberg C. Treatment of cytomegalovirus using aminopeptidase N. U.S. Patent 6,511,662 January 28, 2003.

4. Pande H, Riggs A, **Zaia JA**, Clark B. Method for Detection and Prevention of Human Cytomegalovirus Infection. U.S. Patent 6,242,567 June 5, 2001.
5. Pande H, **Zaia JA**. Induction of Cytolytic T-Lymphocytes with Cytomegalovirus Polypeptides. U.S. Patent 6,207,161 March 27, 2001.
6. Pande H, Riggs A, **Zaia JA**, Clark B. Method for Detection and Prevention of Human Cytomegalovirus Infection. U.S. Patent 6,133,433 October 17, 2000. Management of pregnant patient exposed to varicella
7. Rossi JJ, Cantin EM, **Zaia JA**, Chang P. Ribozyme Cleavage of HIV-RNA. U.S. Patent 6,069,007, May 30, 2000.
8. Rossi JJ, Cantin EM, **Zaia JA**, Chang P. Ribozyme Cleavage of HIV-I-RNA. U.S. Patent 5,144,019, September 1, 1992.
9. Cantin EM, **Zaia JA**, Wallace RB, Rossi JJ. Oligonucleotide phosphonates and method of inhibiting a human immunodeficiency virus *in vitro* utilizing said oligonucleotide phosphonates. U.S. Patent 5,110,802, May 5, 1992.
10. Pande H, Riggs AD, **Zaia JA**. Method for detection and prevention of human cytomegalovirus infection. U.S. Patent 5,075,213, December 24, 1991.
11. **Zaia JA**, Protein kinase deficient, immunologically active CMVpp65 Muttants. U.S. Patent 7,387,782, June 17, 2008.

Letters to the Editor:

1. **Zaia JA**, Federoff HJ. Death in a gene-therapy trial. N Engl J Med. 2009 Oct 29;361(18):1811. PubMed PMID: 19864684.
2. Behrendt CE, Nakamura R, **Zaia J**. Institution Affects Association between CMV Seronegative Graft and Leukemic Relapse after Pediatric HCT. Biol Blood Marrow Transplant 2010;16:133-5.

Peer Reviewed Publications:

1. **Zaia J**. Illusive fever in the newborn. Clin Pediatr (Phila) 10(12): 744-5, 1971.
2. **Zaia JA**, Palmer EL, Feorino PM. Humoral and cellular immune responses to an envelope-associated antigen of herpes simplex virus. J Infect Dis 132(6): 660-6, 1975.
3. Bartfeld H, **Zaia JA**, Donnenfeld H. Letter: Cellular immunity in multiple sclerosis. Lancet 1(7954): 317, 1976.
4. Levin MJ, **Zaia JA**. Immunosuppression and infection-progress. N Engl J Med 296(24): 1406-8, 1977.
5. **Zaia JA**, Oxman MN. Antibody to varicella-zoster virus-induced membrane antigen: immunofluorescence assay using monodisperse glutaraldehyde-fixed target cells. J Infect Dis 136(4): 519-30, 1977.
6. **Zaia JA**, Leary PL, Levin MJ. Specificity of the blastogenic response of human mononuclear cells to herpesvirus antigens. Infect Immun 20(3): 646-51, 1978.
7. **Zaia JA**, Levin MJ, Wright GG, Grady GF. A practical method for preparation of varicella-zoster immune globulin. J Infect Dis 137(5): 601-4, 1978.
8. Crumpacker CS, Schnipper LE, **Zaia JA**, Levin MJ. Growth inhibition by acycloguanosine of herpesviruses isolated from human infections. Antimicrob Agents Chemother 15(5): 642-5, 1979.
9. Levin MJ, Rinaldo CR, Jr., Leary PL, **Zaia JA**, Hirsch MS. Immune response to herpesvirus antigens in adults with acute cytomegaloviral mononucleosis. J Infect Dis 140(6): 851-7, 1979.
10. **Zaia JA**, Levin MJ. Varicella vaccine. Pediatrics 63(2): 348, 1979.
11. **Zaia JA**, Levin MJ, Leszczynski J, Wright GG, Grady GF. Cytomegalovirus immune globulin: production from selected normal donor blood. Transplantation 27(1): 66-7, 1979.
12. Stephen R. Preblud, John A. Zaia, Phillip I. Nieberg, Alan R. Hinman, Myron J. Levin. Management of pregnant patient exposed to varicella. The Journal of Pediatrics, Vol. 95, Issue 2, p334-335, Aug 1979
13. Leclair JM, **Zaia JA**, Levin MJ, Congdon RG, Goldmann DA. Airborne transmission of chickenpox in a hospital. N Engl J Med 302(8): 450-3, 1980.
14. Richman DD, Cleveland PH, Oxman MN, **Zaia JA**. A rapid radioimmunoassay using 125I-labeled staphylococcal protein A for antibody to varicella-zoster virus. J Infect Dis 143(5): 693-9, 1981.
15. Arbeit RD, **Zaia JA**, Valerio MA, Levin MJ. Infection of human peripheral blood mononuclear cells by varicella-zoster virus. Intervirology 18(1-2): 56-65, 1982.
16. Forman SJ, Nocker P, Gallagher M, **Zaia J**, Wright C, Bolen J, Mills B, Hecht T. Pattern of T cell reconstitution following allogeneic bone marrow transplantation for acute hematological malignancy. Transplantation 34(2): 96-8, 1982.

17. Balfour HH, Jr., Bean B, Laskin OL, Ambinder RF, Meyers JD, Wade JC, **Zaia JA**, Aeppli D, Kirk LE, Segreti AC, Keeney RE. Acyclovir halts progression of herpes zoster in immunocompromised patients. *N Engl J Med* 308(24): 1448-53, 1983.
18. Beatty JD, Robinson GV, **Zaia JA**, Benfield JR, Kemeny MM, Meguid MM, Riihimaki DU, Terz JJ, Lemmelin ME. A prospective analysis of nosocomial wound infection after mastectomy. *Arch Surg* 118(12): 1421-4, 1983.
19. Forman SJ, Spruce WE, Farbstein MJ, Wolf JL, Scott EP, Nademanee AP, Fahey JL, Hecht T, **Zaia JA**, Krance RA, Findley DO, Blume KG. Bone marrow ablation followed by allogeneic marrow grafting during first complete remission of acute nonlymphocytic leukemia. *Blood* 61(3): 439-42, 1983.
20. Meyers JD, Leszczynski J, **Zaia JA**, Flournoy N, Newton B, Snyderman DR, Wright GG, Levin MJ, Thomas ED. Prevention of cytomegalovirus infection by cytomegalovirus immune globulin after marrow transplantation. *Ann Intern Med* 98(4): 442-6, 1983.
21. **Zaia JA**, Levin MJ, Preblud SR, Leszczynski J, Wright GG, Ellis RJ, Curtis AC, Valerio MA, LeGore J. Evaluation of varicella-zoster immune globulin: protection of immunosuppressed children after household exposure to varicella. *J Infect Dis* 147(4): 737-43, 1983.
22. Clark BR, **Zaia JA**, Balce-Directo L, Ting YP. Isolation and partial chemical characterization of a 64,000-dalton glycoprotein of human cytomegalovirus. *J Virol* 49(1): 279-82, 1984.
23. Eberle R, Mou SW, **Zaia JA**. Polypeptide specificity of the early antibody response following primary and recurrent genital herpes simplex virus type 2 infections. *J Gen Virol* 65 (Pt 10)(1839-43, 1984.
24. Forman SJ, Gallagher MT, **Zaia JA**, Wright C, Blume KG. Cyclosporine does not prevent in vivo expression of T cell activation antigens following allogeneic bone marrow transplantation. *Transplantation* 37(2): 219-20, 1984.
25. Pande H, Baak SW, Riggs AD, Clark BR, Shively JE, **Zaia JA**. Cloning and physical mapping of a gene fragment coding for a 64-kilodalton major late antigen of human cytomegalovirus. *Proc Natl Acad Sci USA* 81(15): 4965-9, 1984.
26. Robinson GV, Tegtmeier BR, **Zaia JA**. Brief report: nosocomial infection rates in a cancer treatment center. *Infect Control* 5(6): 289-94, 1984.
27. **Zaia JA**, Forman SJ, Gallagher MT, Vanderwal-Urbina E, Blume KG. Prolonged human cytomegalovirus viremia following bone marrow transplantation. *Transplantation* 37(3): 315-7, 1984.
28. **Zaia JA**, Lang DJ. Cytomegalovirus infection of the fetus and neonate. *Neurol Clin* 2(2): 387-410, 1984.
29. Eberle R, Mou SW, **Zaia JA**. The immune response to herpes simplex virus: comparison of the specificity and relative titers of serum antibodies directed against viral polypeptides following primary herpes simplex virus type 1 infections. *J Med Virol* 16(2): 147-62, 1985.
30. Forman SJ, **Zaia JA**, Clark BR, Wright CL, Mills BJ, Pottathil R, Racklin BC, Gallagher MT, Welte K, Blume KG. A 64,000 dalton matrix protein of human cytomegalovirus induces in vitro immune responses similar to those of whole viral antigen. *J Immunol* 134(5): 3391-5, 1985.
31. Kloth DD, Tegtmeier BR, Kong C, Akahoshi MP, Leach SH, Beatty JD, **Zaia JA**. Altered gentamicin pharmacokinetics during the perioperative period. *Clin Pharm* 4(2): 182-5, 1985.
32. Levin MJ, **Zaia JA**, Hershey BJ, Davis LG, Robinson GV, Segreti AC. Topical acyclovir treatment of herpes zoster in immunocompromised patients. *J Am Acad Dermatol* 13(4): 590-6, 1985.
33. Blume KG, Forman SJ, Nademanee AP, O'Donnell MR, Snyder DS, Fahey JL, Sniecinski IJ, Findley DO, Lipsett JA, **Zaia JA**, et al. Bone marrow transplantation for hematologic malignancies in patients aged 30 years or older. *J Clin Oncol* 4(10): 1489-92, 1986.
34. Forman SJ, **Zaia JA**, Wright C, Gallagher MT, Blume KG. Increased Leu-7-positive T lymphocytes during cytomegalovirus infection following allogeneic bone marrow transplantation for hematologic malignancies. *Transplantation* 41(2): 268-71, 1986.
35. **Zaia JA**. The biology of human cytomegalovirus infection after bone marrow transplantation. *Int J Cell Cloning* 4 Suppl 1:135-54,1986.
36. **Zaia JA**, Forman SJ, Ting YP, Vanderwal-Urbina E, Blume KG. Polypeptide-specific antibody response to human cytomegalovirus after infection in bone marrow transplant recipients. *J Infect Dis* 153(4): 780-7, 1986.
37. Churchill MA, **Zaia JA**, Forman SJ, Sheibani K, Azumi N, Blume KG. Quantitation of human cytomegalovirus DNA in lungs from bone marrow transplant recipients with interstitial pneumonia. *J Infect Dis* 155(3): 501-9, 1987.

38. Forman SJ, Krance RA, O'Donnell MR, Nademanee AP, Snyder DS, Fahey JL, Schmidt GM, **Zaia JA**, Lipsett JA, Findley DO, et al. Bone marrow transplantation for acute nonlymphoblastic leukemia during first complete remission. An analysis of prognostic factors. *Transplantation* 43(5): 650-3, 1987.
39. **Zaia JA**, Kovacs A, Forman SJ. Human cytomegalovirus-associated pneumonitis: pathogenesis, prevention, and treatment. *Transplant Proc* 19(6 Suppl 7): 125-31, 1987.
40. Brown NA, Kovacs A, Lui CR, Hur C, **Zaia JA**, Mosley JW. Prevalence of antibody to human herpesvirus 6 among blood donors infected with HIV. *Lancet* 2(8620): 1146, 1988.
41. Murakawa GJ, **Zaia JA**, Spallone PA, Stephens DA, Kaplan BE, Wallace RB, Rossi JJ. Direct detection of HIV-1 RNA from AIDS and ARC patient samples. *Dna* 7(4): 287-95, 1988.
42. Pande H, Campo K, Churchill MA, Clark BR, **Zaia JA**. Genomic localization of the gene encoding a 32-kDa capsid protein of human cytomegalovirus. *Virology* 167(1): 306-10, 1988.
43. Schmidt GM, Kovacs A, **Zaia JA**, Horak DA, Blume KG, Nademanee AP, O'Donnell MR, Snyder DS, Forman SJ. Ganciclovir/immunoglobulin combination therapy for the treatment of human cytomegalovirus-associated interstitial pneumonia in bone marrow allograft recipients. *Transplantation* 46(6): 905-7, 1988.
44. **Zaia JA**, Rossi JJ, Murakawa GJ, Spallone PA, Stephens DA, Kaplan BE, Eritja R, Wallace RB, Cantin EM. Inhibition of human immunodeficiency virus by using an oligonucleoside methylphosphonate targeted to the tat-3 gene. *J Virol* 62(10): 3914-7, 1988.
45. Lang DJ, Kovacs AA, **Zaia JA**, Doelkin G, Niland JC, Aledort L, Azen SP, Fletcher MA, Gauderman J, Gjerset GJ, et al. Seroepidemiologic studies of cytomegalovirus and Epstein-Barr virus infections in relation to human immunodeficiency virus type 1 infection in selected recipient populations. Transfusion Safety Study Group. *J Acquir Immune Defic Syndr* 2(6): 540-9, 1989.
46. McCarrey JR, Kaufman JC, Churchill MA, **Zaia JA**. Differential detection of viral DNA and RNA in situ in cells infected with human cytomegalovirus. *J Virol Methods* 25(3): 301-14, 1989.
47. Holland HK, Saral R, Rossi JJ, Donnenberg AD, Burns WH, Beschorner WE, Farzadegan H, Jones RJ, Quinnan GV, Vogelsang GB, Vriesendorp HM, Wingard JR, **Zaia JA**, Santos GW. Allogeneic bone marrow transplantation, zidovudine, and human immunodeficiency virus type 1 (HIV-1) infection. Studies in a patient with non-Hodgkin lymphoma. *Ann Intern Med* 111(12): 973-81, 1989.
48. Zaia JA, Rossi JJ. Confirmation of HIV infection using gene amplification. *Transfus Med Rev* 3(1 Suppl 1): 27-30, 1989.
49. Edwards VM, Mosley JW (**Transfusion Safety Study Group**). Reproducibility in Quality Control of Protein (Western) Immunoblot Assay for Antibodies to Human. *Am J. Clin Pathol.* Volume 91, Issue 1, 1 January 1989, Pages 75-78
50. Pande H, Lee TD, Churchill MA, **Zaia JA**. Structural analysis of a 64-kDa major structural protein of human cytomegalovirus (Towne): identification of a phosphorylation site and comparison to pp65 of HCMV (AD169). *Virology* 178(1): 6-14, 1990.
51. Pande H, Terramani T, Tressel T, Churchill MA, Hawkins GG, **Zaia JA**. Altered expression of fibronectin gene in cells infected with human cytomegalovirus. *J Virol* 64(3): 1366-9, 1990.
52. Rossi JJ, Cantin EM, **Zaia JA**, Ladne PA, Chen J, Stephens DA, Sarver N, Chang PS. Ribozymes as therapies for AIDS. *Ann N Y Acad Sci* 616: 184-200, 1990.
53. Sarver N, Cantin EM, Chang PS, **Zaia JA**, Ladne PA, Stephens DA, Rossi JJ. Ribozymes as potential anti-HIV-1 therapeutic agents. *Science* 247(4947): 1222-5, 1990.
54. **Zaia JA**, Gallez-Hawkins G, Churchill MA, Morton-Blackshire A, Pande H, Adler SP, Schmidt GM, Forman SJ. Comparative analysis of human cytomegalovirus a-sequence in multiple clinical isolates by using polymerase chain reaction and restriction fragment length polymorphism assays. *J Clin Microbiol* 28(12): 2602-7, 1990.
55. Chang PS, Cantin EM, **Zaia JA**, Ladna PA, Stephens DA, Sarver N and Rossi JR. Ribozyme-Mediateid Site-specific Cleavage of the HIV-1 Genome. *Clinical Biotechnology* 2 (1): 23-31, Jan/Feb 1990.
56. Gershon AA, Steinberg SP. Live Attenuated varicella vaccine: Protection in healthy adults compared with leukemic children. National Institute of Allergy and Infectious Diseases Varicella Vaccine Collaborative **Study Group**. *J Infec Dis.* 1990 Apr. 161 (4) 661-6.
57. Iain Hardy, M.B., Ch.B., Anne A. Gershon, M.D., Sharon P. Steinberg, and Philip LaRussa, M.D. the Varicella Vaccine Collaborative **Study Group**. The Incidence of Zoster after Immunization with Live Attenuated Varicella Vaccine — A Study in Children with Leukemia. *N Engl J Med* 1991; 325:1545-1550.

58. Pande H, Campo K, Shanley JD, Creeger ES, Artishevsky A, Gallez-Hawkins G, **Zaia JA**. Characterization of a 52K protein of murine cytomegalovirus and its immunological cross-reactivity with the DNA-binding protein ICP36 of human cytomegalovirus. *J Gen Virol* 72 (Pt 6)(1421-7, 1991.
59. Pande H, Campo K, Tanamachi B, **Zaia JA**. Human cytomegalovirus strain Towne pp28 gene: sequence comparison to pp28 of HCMV AD169 and stable expression in Chinese hamster ovary cells. *Virology* 184(2): 762-7, 1991.
60. Pande H, Campo K, Tanamachi B, **Zaia JA**. Human cytomegalovirus strain Towne pp65 gene: nucleotide sequence and expression in *Escherichia coli*. *Virology* 182(1): 220-8, 1991.
61. Rossi JJ, Elkins D, Taylor N, **Zaia J**, Sullivan S, Deshler JO. Exploring the use of antisense, enzymatic RNA molecules (ribozymes) as therapeutic agents. *Antisense Res Dev* 1(3): 285-8, 1991.
62. Schmidt GM, Horak DA, Niland JC, Duncan SR, Forman SJ, **Zaia JA**. A randomized, controlled trial of prophylactic ganciclovir for cytomegalovirus pulmonary infection in recipients of allogeneic bone marrow transplants; The City of Hope-Stanford-Syntex CMV Study Group. *N Engl J Med* 324(15): 1005-11, 1991.
63. Giugni TD, Churchill MA, Pande H, Campo K, Guha M, **Zaia JA**. Expression in insect cells and immune reactivity of a 28K tegument protein of human cytomegalovirus. *J Gen Virol* 73 (Pt 9)(2367-74, 1992.
64. Horak DA, Schmidt GM, **Zaia JA**, Niland JC, Ahn C, Forman SJ. Pretransplant pulmonary function predicts cytomegalovirus-associated interstitial pneumonia following bone marrow transplantation. *Chest* 102(5): 1484-90, 1992.
65. Rossi JJ, Elkins D, **Zaia JA**, Sullivan S. Ribozymes as anti-HIV-1 therapeutic agents: principles, applications, and problems. *AIDS Res Hum Retroviruses* 8(2): 183-9, 1992.
66. **Zaia JA**, Chatterjee S, Wong KK, Elkins D, Taylor NR, Rossi JJ. Status of ribozyme and antisense-based developmental approaches for anti-HIV-1 therapy. *Ann N Y Acad Sci* 660(95-106, 1992.
67. **Zaia JA**, Schmidt GM. Prophylaxis of CMV infection after BMT. *Bone Marrow Transplant* 10 Suppl 1(139-43, 1992.
68. Kovacs AA, Churchill MA, Wood D, Mascola L, **Zaia JA**. Molecular and epidemiologic evaluations of a cluster of cases of Menetrier's disease associated with cytomegalovirus. *Pediatr Infect Dis J* 12(12): 1011-4, 1993.
69. Gallez-Hawkins G, Villacres MC, Li X, Sanborn MC, Lomeli NA, **Zaia JA**. Use of transgenic HLA A*0201/Kb and HHD II mice to evaluate frequency of cytomegalovirus IE1-derived peptide usage in eliciting human CD8 cytokine response. *J Virol*. 2003 Apr;77(7):4457-62. PMID: PMC150670.
70. Soderberg C, Giugni TD, **Zaia JA**, Larsson S, Wahlberg JM, Moller E. CD13 (human aminopeptidase N) mediates human cytomegalovirus infection. *J Virol* 67(11): 6576-85, 1993.
71. Aspin MM, Gallez-Hawkins GM, Giugni TD, Tegtmeier B, Lang DJ, Schmidt GM, Forman SJ, **Zaia JA**. Comparison of plasma PCR and bronchoalveolar lavage fluid culture for detection of cytomegalovirus infection in adult bone marrow transplant recipients. *J Clin Microbiol* 32(9): 2266-9, 1994.
72. Forman SJ, **Zaia JA**. Treatment and prevention of cytomegalovirus pneumonia after bone marrow transplantation: where do we stand? *Blood* 83(9): 2392-8, 1994.
73. McLaughlin-Taylor E, Pande H, Forman SJ, Tanamachi B, Li CR, **Zaia JA**, Greenberg PD, Riddell SR. Identification of the major late human cytomegalovirus matrix protein pp65 as a target antigen for CD8+ virus-specific cytotoxic T lymphocytes. *J Med Virol* 43(1): 103-10, 1994.
74. Rossi JJ, Carbonnelle C, Li S, Chatterjee S, **Zaia JA**, Larson G, Bertrand E. Promoter for Expression of Transduced Anti-Hiv and Siv Ribozymes. *J Cell Biochem* 221-221, 1994.
75. Zhou C, Bahner IC, Larson GP, **Zaia JA**, Rossi JJ, Kohn EB. Inhibition of HIV-1 in human T-lymphocytes by retrovirally transduced anti-tat and rev hammerhead ribozymes. *Gene* 149(1): 33-9, 1994.
76. Diamond DJ, Tsunoda T, York J, Wright C, **Zaia JA**, Forman SJ. Vaccine Strategies for Prevention of Cmv Infections in Immunocompromised Adults. *J Cell Biochem* 295-295, 1995.
77. Pande H, Campo K, Tanamachi B, Forman SJ, **Zaia JA**. Direct DNA immunization of mice with plasmid DNA encoding the tegument protein pp65 (ppUL83) of human cytomegalovirus induces high levels of circulating antibody to the encoded protein. *Scand J Infect Dis Suppl* 99(117-20, 1995.
78. Rossi J, Westaway S, Larson G, Carbonnelle C, Kohn D, Zhou C, Chatterjee S, Brar D, Wong KK, **Zaia J**, Li S, Bertrand E. Facilitation of Intracellular Functioning of Hammerhead Ribozymes - Applications to Treatment of Hiv-Infection. *J Cell Biochem* 202-202, 1995.

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80. **Zaia JA**, Schmidt GM, Chao NJ, Rizk NW, Nademanee AP, Niland JC, Horak DA, Lee J, Gallez-Hawkins G, Kusnierz-Glaz CR, et al. Preemptive ganciclovir administration based solely on asymptomatic pulmonary cytomegalovirus infection in allogeneic bone marrow transplant recipients: long-term follow-up. *Biol Blood Marrow Transplant* 1(2): 88-93, 1995.
81. Bauer G, Wen SF, Bahner I, Kearns K, Valdez P, **Zaia J**, Kohn DB. Inhibition of HIV-1 replication in anti HIV-1 gene expressing long term bone marrow cultures established from CD34+ cells of HIV-1 infected donors. *Blood* 88(10): 1937-1937, 1996.
82. Gallez-Hawkins GM, Li X, Tegtmeier BR, TerVeer A, Niland JC, Forman SJ, **Zaia JA**. Late CMV disease in marrow transplantation is predicted by virus load in plasma. *Blood* 88(10): 1688-1688, 1996.
83. Giugni TD, Soderberg C, Ham DJ, Bautista RM, Hedlund KO, Moller E, **Zaia JA**. Neutralization of human cytomegalovirus by human CD13-specific antibodies. *J Infect Dis* 173(5): 1062-71, 1996.
84. Rossi J, Lee NS, Bertrand E, Westaway S, Zhou C, Bahner I, Kohn D, Engelke D, Good P, Li S, **Zaia J**. Ribozyme therapeutics for the treatment of HIV infection: Progress and future directions. *J Clin Biochem Nutr* 21(1): 69-72, 1996.
85. Yam P, **Zaia JA**, Yee JK, Li S, Sniecinski I, Forman S, Ito J. Mobilization of peripheral blood stem cells using G-CSF in HIV-1 infected persons and retroviral transduction efficiency in vitro. *Transfusion* 36(9): S147-S147, 1996.
86. **Zaia JA**. Prophylaxis and treatment of CMV infections in transplantation. *Adv Exp Med Biol* 394: 117-34, 1996.
87. Pande H, Campo K, Tanamachi B, Forman SJ, **Zaia JA**. Direct DNA Immunization of mice with plasmid DNA encoding the tegument protein protein pp65(ppUL83) of human cytomegalovirus induces high levels of circulating antibody to encoded protein. *Scand J Infect Dis Suppl.* 1995;99:117-20.
88. Bauer G, Valdez P, Kearns K, Bahner I, Wen SF, **Zaia JA**, Kohn DB. Inhibition of human immunodeficiency virus-1 (HIV-1) replication after transduction of granulocyte colony-stimulating factor-mobilized CD34+ cells from HIV-1-infected donors using retroviral vectors containing anti-HIV-1 genes. *Blood* 89(7): 2259-67, 1997.
89. Boeckh M, Gallez-Hawkins GM, Myerson D, **Zaia JA**, Bowden RA. Plasma polymerase chain reaction for cytomegalovirus DNA after allogeneic marrow transplantation: comparison with polymerase chain reaction using peripheral blood leukocytes, pp65 antigenemia, and viral culture. *Transplantation* 64(1): 108-13, 1997.
90. Gallez-Hawkins GM, Tegtmeier BR, ter Veer A, Niland JC, Forman SJ, **Zaia JA**. Evaluation of a quantitative plasma PCR plate assay for detecting cytomegalovirus infection in marrow transplant recipients. *J Clin Microbiol* 35(3): 788-90, 1997.
91. Good PD, Krikos AJ, Li SX, Bertrand E, Lee NS, Giver L, Ellington A, **Zaia JA**, Rossi JJ, Engelke DR. Expression of small, therapeutic RNAs in human cell nuclei. *Gene Ther* 4(1): 45-54, 1997.
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- A173. Don J. Diamond, PhD, Corinna La Rosa, PhD, Jeffrey Longmate, PhD2, Joy Martinez, Qiao Zhou, Theodora Kaltcheva, PhD, Jennifer Drake, Mary Carroll, Sanjeet Dadwal, Ibrahim Aldoss, Ryotaro Nakamura, MD and **John A. Zaia, MD**. Safety, Maximum Tolerated Dose and Immunogenicity of CMV-MVA-Triplex in Healthy Volunteers with or without Prior Immunity to CMV and Vaccinia. ASH 2015
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- A175. Liana Nikolaenko, MD, Saro Armenian, DO, MPH, Joseph Alvarnas, MD, **John Zaia, MD**, Leanne Goldstein, DrPH, Maria Viviana Marroquin, Amrita Krishnan, MD. Long-Term Follow Up of Patients With HIV-Associated Non-Hodgkin Lymphoma (NHL) After Autologous Stem Cell Transplantation (ASCT). ASH 2016.
- A176. Ghislaine M. Gallez-Hawkins, A. Krishnan, A. Nademane, Laetitia Jeannet, Anne E. Franck, Joycelyne M. Palmer, Andy Dagis, Jennifer Simpson, , Dr A. Raubitschek, **J.A. Zaia**, Stephen J. Forman. Effect of 90Y-zevalin-rituximab on natural killer (NK) cell numbers and costimulatory molecule responses prior to and after autologous and allogeneic hematopoietic stem cell transplantation for patients with poor risk/relapsed B-cell lymphoma. 2013 ASH Annual Meeting and Exposition December 7-10, 2013 Ernest N. Morial Convention Center, New Orleans, LA
- A177. Myo Htut, Ghislaine Gallez-hawkins, Joycelyne Palmer, Ricardo Spielberger, Pablo M Parker, Len T Farol, Anne Franck, Laetitia Jeannet, Eunicia Reburiano, Valerie Jimenez, Lupe Duarte, Andy Dagis, Firoozeh Sahebi, Chatchada Karanes, Stephen J. Forman, **John Zaia**. NK cell recovery and costimulatory molecule profiles after autologous hematopoietic cell transplantation (HCT) in multiple myeloma (MM) patients. BMT Tandem Meetings, February 13, 2013, Salt Lake City, UT.
- A178. James L. Klosky PhD, Melissa M. Hudson MD, Yanjun Chen MS, James Connelly MD, Karen Wasileski-Masker MD, Can-Lan Sun PhD, Liron Francisco BA, Laura Gustafson BA, Kathryn Russell PhD, Gina Sabbatini MS, Jessica Simmons MS, Jocelyn York BA, **John Zaia, MD**, Anna Giuliano, PhD, Leslie L. Robison, PhD, F. Lennie Wong PhD, Smita Bhatia MD, MPH, Wendy Landier PhD, RN. Human Papillomavirus (HPV) Vaccination among Survivors of Childhood Cancer: Predictors of Non-Initiation and Population Comparisons. ASCO 2016
- A179. Monica Torres-Coronado, Agnes Gardner, Angel Gu, Anitha Rao, Liz Epps, Amira Ahmed, Nancy Gonzalez, Lijing Li, David Colcher, Mark Sherman, Sarah McCaig, and Barbara Szpikowska, Otto Yang, **John Zaia**, David DiGiusto. Analysis of an IL-7/Fc NSG mouse model for enhanced gene modification of functional T cell. ASGCT 2016.
- A180. Ryotaro Nakamura, MD, Carolyn Behrendt, PhD, Anne Franck, PhD, Ghislaine Gallez-hawkins, PhD, Laetitia Jeannet , PhD, Xiuli Li , PhD, Andy Dagis, MS, Stephen J. Forman, MD, John A. **Zaia,MD**. Phenotypic and Functional Characteristics of NK Cells Associated with Cytomegalovirus (CMV) Reactivation after Allogeneic Hematopoietic Stem Cell Transplantation (HCT). ASBMT 2016
- A181. Nadia Ewing, **John A. Zaia**, Rodica Stan, Vanessa Salinas, Cara Nolan, Teresa Kim, Amira Ahmed, C. Anderson, M. Holmes, Shelley Wang, Kathleen Meyer and Dale Ando. Pre-clinical Studies and Clinical Design of a Phase I, Open-Label, Ascending Dose Study to Assess the Safety and Tolerability of AAV2/6 Factor IX Gene Therapy via Zinc Finger Nuclease (ZFN)-mediated Targeted Integration of SB-FIX in Adult Subjects with Severe Hemophilia B. 2016
- A182. Liana Nikolaenko, M, Saro Armenian, DO, MPH, Joseph C. Alvarnas, MD, **John A. Zaia, MD**, Leanne Goldstein, DrPH, Maria Viviana Marroquin^{4*} and Amrita Y. Krishnan, MD. 4614 Long-Term Follow up of Patients with HIV-Associated Non-Hodgkin Lymphoma (NHL) after Autologous Stem Cell Transplantation (ASCT) Clinical Allogeneic and Autologous Transplantation: Late Complications and Approaches to Disease Recurrence Program: Oral and Poster Abstracts Session: 723. Clinical Allogeneic and Autologous Transplantation: Late Complications and Approaches to Disease Recurrence: Poster III ASH 58th Annual Meeting & Exposition, San Diego, Dec 5, 2016
- A183. Monzr M. Al Malki, Sanjeet Dadwal, Dongyun Yang, Sally Mokhtari, Thai Cao, Ketevan Gendzekhadze Ibrahim Aldoss, Pablo Parker, Margaret R O Donnell, David Snyder, David Senitzer, Auayporn Nademane, Don Diamond, **John Zaia**, Stephen J. Forman, Ryotaro Nakamura High incidence of CMV reactivation

after haploidentical donor hematopoietic stem cell transplantation (HCT) using post-HCT cyclophosphamide (PTCy), and its impact on transplant outcomes 59th ASH 2017, San Diego, CA

- A184. Rodica Stan, Angelo Cardoso, Amrita Krishnan, Teresa Kim, Monica Torres-Coronado, Agnes Gardner, Salena Killion, Garry Lee, Judy Greengard, Nathalie Dubois-Stringfellow, Ed Conner, Michael Holmes, Sandra Win, Richard Pushkin, Anthony Mills, Ronald Mitsuyasu, **John A. Zaia**. Feasibility, Safety and Engraftment of Zinc Finger Nuclease CCR5-Modified CD34+ Hematopoietic Stem/Progenitor Cells in HIV-1 (R5) Infected Subjects, ISSCR Annual Meeting 2018 Melbourne.
- A185. Ibrahim Aldoss, Lindsey Baden, Ella Ariza-Heredia, Corinna La Rosa, Jeffrey Longmate, Cindy Slape, Lupe Duarte, Andy Dagens, Len Farol, Auayporn Nademanee, Monzr Al Malki, Nicolas C. Issa, Alisha Pandit, Ester Haddad Arbona, **John A. Zaia**, Stephen Forman, Ryotaro Nakamura, Don Diamond. Multi-antigen vaccine (Triplex) based on attenuated poxvirus 14:00 - 14:11 prevents cytomegalovirus viremia in a multi-center placebocontrolled, double blinded, randomized phase 2 clinical trial in allogeneic hct recipients, EBMT 2019, Frankfurt, Germany.