

Curriculum Vitae
Michael Paul Busch, M.D., Ph.D.

CURRENT POSITIONS:

Senior Vice-President, Research and Scientific Affairs, Blood Systems, Inc., Scottsdale, Arizona
Director, Blood Systems Research Institute, San Francisco, California
Professor of Laboratory Medicine, University of California, San Francisco

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EDUCATION:

1977 B.A., Pharmacology, U.C. Santa Barbara (UCSB), cum laude
1982 M.S., Experimental Pathology, University of Southern California (USC), Los Angeles
1982 M.D., USC, magna cum laude
1985 Ph.D., Experimental Pathology, USC

RESEARCH FELLOWSHIP TRAINING:

1976 Edmondson Research Fellowship, USC
1977 Cancer Center Research Fellowship, USC
1978 Cancer Center Research Fellowship, USC
1980 Cancer Center Research Fellowship, USC

POST GRADUATE TRAINING:

1982-1984 Internship/Residency, Anatomic Pathology, University of California, San Francisco (UCSF)
1983-1984 Chief Resident, Anatomic Pathology, Veterans Administration Medical Center, San Francisco (SF VAMC)
1984-1985 Residency, Laboratory Medicine, UCSF
1985-1986 Chief Resident, Laboratory Medicine, UCSF

PROFESSIONAL EMPLOYMENT HISTORY, POST-RESIDENCY

1986-present Department of Laboratory Medicine, University of California, San Francisco (UCSF)
1986-1992 Assistant Professor, in Residence
1992-1996 Associate Professor, in Residence
1996-1998 Professor, in Residence
1999-present Adjunct Professor
1986-2003 Blood Centers of the Pacific (BCP), San Francisco, CA
1986-1989 Assistant Scientific Director
1989-1990 Associate Scientific Director
1990-1994 Scientific Director
1994-2003 Vice-President, Research and Scientific Affairs
1999-present Blood Systems, Inc. (BSI), Scottsdale, AZ
1999-2010 Vice-President, Research and Scientific Affairs
2001-2003 Acting President, Blood Systems Foundation (BSF), Scottsdale AZ
2010-present Senior Vice-President, Research and Scientific Affairs
2004-present Director, Blood Systems Research Institute (BSRI)

HONORS / AWARDS:

- 1980 Medical Student Research Award, USC
- 1982 Merck Manual Award for Academic Achievement, USC
- 1982 Upjohn Award for Academic Excellence, USC
- 1986 Resident Research Award, American Society of Clinical Pathology (ASCP) and College of American Pathologists (CAP)
- 1994 Alsever Award, United Blood Services
- 1997 Robert Race Scientific Lecturer, South Central Association of Blood Centers
- 1998 Morton Grove-Rasmussen Award, American Association of Blood Banks
- 1999 Charles S. Shepard Science Award for publication, Centers for Disease Control
- 1999 Tibor Greenwalt Scientific Lectureship, American Association of Blood Banks
- 2000 Quest Distinguished Visiting Professor of Pathology, Johns Hopkins University, Baltimore
- 2004 Owen Thomas, MD Award, California Blood Bank Society
- 2005 President's Award, Society for the Advancement of Blood Management
- 2005 Emily Cooley Award, American Association of Blood Banks
- 2007 Visiting Professor, Rita and Taft Schreiber Lecture, Cedars-Sinai Medical Center, Los Angeles

BOARD CERTIFICATION:

- 1989 Clinical Pathology, CAP
- 1989 Blood Banking and Transfusion Medicine, CAP

PROFESSIONAL SOCIETY MEMBERSHIPS:

- 1981 - present Alpha Omega Alpha, Honor Medical Society
- 1982 - present Phi Kappa Phi, All University Honor Society
- 1984 - present American Society of Clinical Pathology
- 1985 - present American Association for Advancement of Science
- 1986 - present American Association of Blood Banks
- 1986 - present California Blood Bank Society
- 1988 - present American Society for Microbiology
- 1991 - 2002 Academy of Clinical Laboratory Physicians and Scientists
- 1996 - present International Society of Blood Transfusion
- 1996 - present Infectious Diseases Society of America
- 1999 - 2002 American Society for Blood and Marrow Transplantation
- 2000 - 2003 HIV Medicine Association of IDSA
- 2000 - present American Society of Hematology

PROFESSIONAL APPOINTMENTS:

- 1988 -1995 Steering Committee, Transfusion Safety Study (TSS), National Heart, Lung and Blood Institute (NHLBI)
- 1988 - 1995 Publications Committee, TSS
- 1988 - 1995 Chair, Virology Working Group, TSS
- 1988 - 1990 Committee on Transfusion Transmitted Diseases, California Blood Bank Society (CBBS) (Chair, 1989-90)
- 1989 - 1994 AIDS Advisory Committee, NHLBI
- 1989 - 1997 Selection of Scientific Abstracts Committee, American Association of Blood Banks (AABB) (Chair, 1991-96)
- 1990 - 1991 Technical Scientific Workshops Committee, AABB
- 1990 - 1991 Hepatitis B and C Advisory Group, US Public Health Service (USPHS), Centers for Disease Control and Prevention (CDC)
- 1990 - 1993 Physicians Committee, CBBS
- 1990 - 1993 Scientific Program Committee, CBBS
- 1991 - 2002 Chair, Laboratory Committee, Retrovirus Epidemiology in Donors Study, Part I (REDS-I), NHLBI

- 1991 - 2002 Transfusion-Transmitted Diseases Committee, AABB
- 1991 - 1997 Liaison, Scientific Program Committee, AABB
- 1991 - 1995 Annual Meeting Planning Committee, AABB
- 1992 - 1995 Blood Products Advisory Committee, US Food and Drug Administration (FDA)
- 1992 - present **TRANSFUSION** Editorial Board, AABB
- 1992 - 1994 Chair, ad hoc Working Group on Idiopathic CD4 T- Lymphocytopenia, AABB/ARC/CCBC
- 1993 - 1994 ad hoc Consultant on Hepatitis Virus Screening, Scientific Advisory Committee, Canadian Blood Agency
- 1994 - 1998 ad hoc Non-Voting Member, FDA Anti-Viral Drug Advisory Committee
- 1994 - 2002 NIH Office of AIDS Research Advisory Committee
- 1994 - 1997 NIH Office of AIDS Research, ad hoc Committee for Planning Fiscal Years 1996/97
- 1994 - 2000 Chair, Laboratory Committee; Viral Activation in Transfusion Study (VATS), NHLBI
- 1994 - 2000 Steering Committee, VATS
- 1995 - present ad hoc Consultant/Reviewer, NIH AIDS and Related Research Study Section
- 1995 - 1998 ad hoc Non-Voting Member, FDA Anti-Viral Drug Advisory Committee
- 1995 - 2000 member, ad hoc Committee for Review of Donor Criteria, AABB (Chair, 1995-96)
- 1996 - 2007 **TRANSFUSION MEDICINE** Editorial Board (British Blood Transfusion Society)
- 1996 ad hoc Consultant/Reviewer, NIH NIAID Special Emphasis Panel
- 1997 - 2001 Steering Committee, UCSF AIDS Research Institute (ARI)
- 1997 - 2001 Advisory Committee on Blood Safety and Availability, US Dept of Health and Human Services (HHS)
- 1997 - present **JOURNAL OF HUMAN VIROLOGY** Editorial Board
- 1997 - 2007 NHLBI Biological Specimen Repository Utilization Committee
- 1997 - 2000 ad hoc Committee on PCR Testing, AABB
- 1997 - 2005 International Consortium (*originally* International Task Force, ITFBS) on Blood Safety (ICBS)
- 1998 - present ad hoc Special Government Employee (SGE), invited expert consultant/presenter, FDA BPAC
- 1998 - 2005 Basic Science Sub-Committee, University of California, San Francisco (UCSF) AIDS Research Institute (ARI)
- 1999 - 2002 ad hoc Committee on Nucleic Acid Technology (NAT) Testing, (*originally* Genomic Acid Technology, GAT) AABB
- 1999 - 2002 Scientific and Technical Advisory Committee (STAC), Canadian Blood Services (CBS)
- 1999 - present Executive Council, UCSF AIDS Research Institute (ARI)
- 1999 - present Biological Specimens Central Storage Committee, UCSF
- 2000 - present Associate Editor, **TRANSFUSION**
- 2000 - present Scientific/Medical/Technical (SMT) Committee, America's Blood Centers (ABC)
- 2000 - present ABC SMT, Subcommittee on Future Donor Testing Strategies
- 2000 - present ABC SMT, Subcommittee on Impact of Future Scientific Developments
- 2000 - present Submissions Reviewer, Canadian Blood Services 2000/2001 Intramural Grants Competition
- 2001 - present Member, Disease Stage Working Group, of the CDC/NIH Acute [HIV] Infection Early Detection Research Program (AIEDRP).
- 2001 - 2008 Member, Pathogenesis Working Group, of the CDC/NIH Acute [HIV] Infection Early Detection Research Program (AIEDRP).
- 2002 - 2008 ad hoc Special Government Employee (SGE), invited expert consultant/presenter, DHHS ACBSA
- 2002 ad hoc Grant Application Reviewer, NIH Center for Scientific Review
- 2002 Member, Special External Expert Review Panel, Viral Epidemiology Branch (VEB), National Cancer Institute (NCI)
- 2002 - present Scientific and Research Advisory Committee (SRAC), Canadian Blood Services (CBS) (*pre-2005: Science, Technical, Research & Development. STRDC*)
- 2002 - 2004 Scientific Advisory Board, International Society of Blood Transfusion (ISBT), 2004 Annual Meeting.
- 2002 - present Member, Programme Committee, annual joint International Plasma Fractionation Association (IPFA) / Paul-Ehrlich Institute (PEI) NAT Workshop. (*prior to June 2005, the "European Plasma Fractionation Association, EPFA*)

- 2002 - present Member, West Nile Virus (WNV) Joint Task Force, AABB/ARC/ABC/CDC/FDA.
2003 - 2006 Scientific Committee on Transfusion Medicine, American Society of Hematology (ASH)
2003 - 2006 Biomedical Excellence for Safer Transfusion (BEST) Working Party, ISBT
2003 - present Affiliated Faculty Member, UCSF-UCB, Institute for Global Health (IGH)
2003 - present Member, Blue Ribbon Medical Panel, Blood Risk Catastrophe Medical and Litigation Model Update Policy, Canadian Blood Services Insurance Com., Ltd / Risk Management Consultants of Canada / Canadian Blood Services.
2003 - 2008 Transfusion-Transmitted Diseases Committee, AABB
2004 - 2008 Member, Board of Directors, Suzanne Ledin Memorial Foundation (SLMF)
2004 - present Steering Committee, Retrovirus Epidemiology Donor Study - Part II (REDS-II)
2004 - present Chair, Infectious Diseases Working Group of the Steering Committee, REDS-II
2004 - 2005 Member, Scientific Advisory Committee, International Association for Biologicals (IABs). Biennial Symposium 2005, Sydney, Australia.
2005 - present Member, Medical Advisory Council, American Red Cross (ARC)
2005 - present Member, Special Working Group on Transfusion-Transmissible Diseases, ISBT
2006 - present Honorary Member, Biomedical Excellence for Safer Transfusion (BEST) Collaborative (*formerly BEST Working Party of ISBT*)
2006 - 2008 Associate Editor, **BIOLOGICALS**
2006 - present Member, External Advisory Committee, P01-AI-066314, "Primate Core" (Adaptive Immunity, Mechanisms of Protection, in Live- Attenuated AIDS Vaccines). UC Davis.
2006 - present Associate Member, Liver Center, UCSF
2006 Member, Scientific Committee, International Association for Biologicals (IABs). World Congress 2007, Sao Paulo, Brazil.
2006 - present Member, Working Group on HIV Laboratory Algorithms, Association of Public Health Laboratories (APHL); CDC Western Blot Criteria Review Workgroup of the APHL/CDC HIV Steering Committee.
2006 - present Member, Special Working Group on Cost-Effectiveness Analysis of Blood Safety Interventions Worldwide, ISBT
2006 - present Member, International Working Group on Evaluation of Laboratory Tests for the Detection of Recent HIV Infection, World Health Organization (WHO)
2007 Invited Observer, Madrid & Geneva meetings, Global Collaboration for Blood Safety, WHO
2007 - present Chair, Donor Repository Allocation Working Group, NIH, NHLBI
2007 - present ad hoc Working Group on Transfusion Recipient Outcomes, NIH, NHLBI
2008 - present Resource Allocation Program (RAP) Committee, UCSF
2008 - present Scientific Committee, CBBS
2008 - present HIV Subtype Panel Working Group, NIH, NIAID, DAIDS, Vaccine Clinical Research Branch
2008 - present Member, Editorial Board, **Journal of Transfusion Medicine** (Poland). Inst of Hematology and Transfusion Medicine, Warsaw, Poland
2009 - present Consultant to Transfusion-Transmitted Diseases Committee, AABB
2009 - 2012 Member, Editorial Board, **Chimerism** (journal to launch 2010)
2009 - 2010 Member, Scientific Program Committee, ISBT, 2010 Annual Meeting
2009 - present Member, US DHHS Inter-Agency ad hoc Committee on Xenotropic Murine-Leukemia Virus-Related Virus (XMRV) / Chronic Fatigue Syndrome (CFS)
2010 - present ad hoc Member, NIAID Intramural Data and Safety Monitoring Board (DSMB)
2010 - 2012 Member, Awards Committee, AABB
2010 - present HIV Advisory Board, Ortho Clinical Diagnostics [Johnson & Johnson]

MEMBER, ADVISOR / EXAMINER COMMITTEES, for Graduate Students:

- 2000 - 2002 Doctoral Thesis Advisor ("MD with Thesis"), UCSF, *for* Eric Chow.
2007 - 2008 Examiner, PhD Thesis Defense, Karolinska Institut, Stockholm, *for* Gustav Edgren, .
2009 - present Member, Applied Research Project (ARP) Committee (Master's), A.T.Still Univ/AZ School Health Sciences, Mesa AZ, *for* Lori Lai.
2009 - present Examiner, PhD Thesis Defense, University of Western Australia, Crawley, *for* Clive Seed

INVITED REVIEWER, Professional Journals:

Acquired Immune Deficiency Syndrome (AIDS)
AIDS Research and Human Retroviruses
Anesthesiology
Annals of Haematology
Blood
Cancer
Clinical Chemistry
Hepatology
Journal of Acquired Immune Deficiency Syndrome (J AIDS)
Journal of the American Medical Association (JAMA)
Journal of Clinical Immunology
Journal of Clinical Microbiology
Journal of Human Virology
Journal of Infectious Diseases
Journal of Transfusion Medicine [Poland]
Journal of Virology
New England Journal of Medicine (NEJM)
PLoS Medicine (Public Library of Science)
Transfusion
Transfusion Medicine
Transfusion Medicine Reviews
Vox Sanguinis

RESEARCH INTERESTS:

- 1) The pathogenesis and clinical laboratory evaluation of transfusion-associated viral infections, including epidemiology and natural history of human retroviral (HIV-1/2; HTLV-I/II) and other (HBV, HCV, HHV-8, CMV, EBV) infections in blood donor and recipient populations, with special emphasis on new and emerging infectious agents (SARS, West Nile Virus, Dengue Virus, and influenza viruses); and mechanisms of viral latency, disease, and viral reactivation following transfusion or other immunological stimulus;
- 2) The development and implementation of improved or new laboratory assays and blood donor screening protocols, clinical evaluation and management, and possible prevention of blood-borne infections; development of new techniques (e.g. nucleic acid amplification testing, NAT; sensitive/less-sensitive enzyme immunoassay, S/LS-EIA, "detuned EIA") to reduce the infectious window period before infection is directly detectable;
- 3) Immunological and other consequences of transfusion (graft-vs-host disease, GvHD; transfusion-related acute lung injury, TRALI); the mechanisms of allogeneic donor leukocyte clearance post-transfusion, versus enhancement of persistent chimerism and tolerance, and approaches to their reduction or elimination.

These interests are pursued through individual and several multi-center collaborative epidemiologic, clinical, and laboratory-based studies with colleagues at university, government, and commercial research organizations. At BSRI, I am responsible for a growing staff of researchers and technologists; I take pride in our record of recruiting new scientists who are establishing their own research programs, and in mentoring students from universities and blood banking institutions around the world in pursuing their own studies at BSRI; some current investigations focus on the evolution of HIV quasi-species in donor/recipient clusters; development and use of the S/LS EIA to identify and "stage" very early HIV infection; and development of mathematical models for cost/benefit analysis of new screening strategies. Finally, all our activities are directed toward 1) enhancing the safety and availability of the blood supply, and of public health generally, worldwide; 2) developing better techniques to educate, counsel, and care for infected donors and recipients, and 3) taking an active part in national and international health policy development.

CURRENT FUNDED RESEARCH STUDIES:

1. R01-HL-076902 (Principal Investigator) 9/01/03-8/31/10
NIH / NHLBI
Natural History of Acute and Chronic HCV in Blood Donors
Clinical and epidemiologic research: 1) epidemiologic studies of 10,000 HCV seropositive donors identified at BSI/BCP since 1990 to ascertain long-term mortality, morbidity and health care utilization of infected donors relative to matched controls; 2) longitudinal laboratory-focused case-control study of HCV-positive persons with probable resolved versus persistent viremia to confirm long-term infection status, identify immunological and other correlates of viral resolution; 3) establish a prospective cohort of donors with acute HCV infection (RNA-positive / Antibody-negative) as detected by NAT screening – these donors will be followed carefully with extensive viral and immunological characterization to better understand the host-virus interactions during the processes of seroconversion and establishment of resolved or persistent infection.

2. N01-HB-57181 (co-Principal Investigator, UCSF; Principal Investigator, BSRI sub)
NIH / NHLBI 3/15/05 - 8/31/10
Retrovirus Epidemiology Donor Study, Part II (REDS-II) - **Central Laboratory**
Established and directs central laboratory for all REDS-II specimens (from 6 blood centers). Special attention is given to identification, detection, and characterization of new and emerging viruses, development of new assays for them.

3. 8067-S-002 (Principal Investigator, BSRI) 2/14/06-12/31/09
NIH / NHLBI
Retrovirus Epidemiology Donor Study, - Part II (REDS-II) - **International Component – Brazil**
Building upon 3 decades BSRI/UCSF blood safety & policy research, and 12+ years collaborative research and training with transfusion medicine (TM) colleagues in Brazil. Compilation of extensive blood donor/donation demographic & epidemiological data and specimens; oversee 4 separate transfusion medicine research projects in Latin America: 1) HIV relative to donation type, donor demographic & behavioral characteristics, residual risk of HIV transmission, impact of new screening technologies, track & characterize variant and drug-resistant strains; 2) Case-control & survey studies to analyze epidemiological and donor motivation factors impacting safety and availability of blood donations; 3) Retrospective cohort study of *T. cruzi* infection & Chagas' Disease in blood donors; 4) Studies of Dengue virus.

4. R01-DA-021550 (Principal Investigator, BSRI sub) 6/1/08 - 5/31/13
NIH / NIDA
Acute HCV Infection in Injection Drug Users
successor to R01-DA-016159, 11/1/04-5/31/08. Subcontract to Weill/Cornell AHI-IDU study. Selected blood samples from injection drug users shipped to BSRI Viral Reference Laboratory & Repository Core (VRLRC), for testing by ECi and other advanced assays. VRLRC also processes samples for further testing by dHCV TMA at Novartis/Chiron, and maintains a sample repository at BSRI.

5. R01-HL-08838 (Principal Investigator, BSRI) 9/1/06-7/31/11
NIH / NHLBI
Mechanisms and Clinical Effects of Microchimerism in Transfused Trauma Patients
Investigating the frequency of persistence of donor leukocytes in patients transfused following severe injury. The grant includes both retrospective (registry) and prospective studies of severely injured subjects with detailed laboratory and clinical studies to investigate mechanisms and clinical consequences of persistent donor leukocyte microchimerism.

6. RC2-HL-101632 (Principal Investigator) 9/30/09-8/31/11
NIH/NHLBI
Viral/immune parameters of Dengue and WNV in donors: blood safety implications
The goals of this grant are to establish the infectivity of low-level WNV viremic units in the early convalescent stage of infection not detected by current NAT screening, to implement sensitive NAT screening in Puerto Rico under an FDA IND, and to launch follow-up studies of DENV+ donors in

addition, we will establish an NHLBI repository of extensively characterized, longitudinal specimens from Dengue and WNV infected donors to advance research into the pathogenesis of these important agents.

7. U19-AI-067854 (Principal Investigator, BSRI) 9/1/09-6/30/10
NIH/NIAID

Study to characterize global HIV genetic diversity in recently infected donors
As part of CHAVI, the project proposes to study viral isolate sequences in conjunction with viral load and Fiebig stage from blood donors from 3-5 different countries.

COMPLETED RESEARCH STUDIES:

1. N01-HB-47174 (co-PI, UCSF; co-PI, BCP sub) 9/01/04-8/31/09
NIH / NHLBI

Retrovirus Epidemiology Donors Study, Part II (REDS-II) - **Blood Center**
A continuation of highly successful 15-year REDS-I epidemiological and clinical studies of transfusion safety and blood supply. Six blood centers participate in a network doing epidemiologic and clinical laboratory studies addressing multiple issues: transfusion-related infections, transfusion-related lung injury (TRALI), iron balance in blood donors, among others.

2. R01-HL-062235 (co-Principal Investigator, UCSF; Principal Investigator, BSRI)
NIH / NHLBI 4/12/99-1/31/09

Pathophysiology of HTLV-I and HTLV-II Infection "HOST"
A prospective cohort study of HTLV-I and HTLV-II health outcomes in former blood donors; builds upon REDS-I.

3. R01-CI-000214 (PI) 9/30/04 - 9/29/08
NIH / NCI, & CDC / NCID

Natural History and Pathogenesis of WNV in Viremic Blood Donors
Identify and enroll blood donors with early (pre-seroconversion), acute, and/or resolved WNV infection, characterize the dynamics and kinetics of acute viremia, and time course of immune response in primary WNV infection. Additional studies will investigate T-cell responses, antigen specificity, and cytokine perturbations, and attempt to define viral and humoral immune parameters that correlate with control of viremia.

4. R01-DA-016159 (PI, BSRI sub) 11/1/04 - 5/31/08 (succeeded by R01-DA-021550)
NIH / NIDA

Acute HCV Infection in Injection Drug Users
Subcontract to Weill/Cornell AHI-IDU study. Selected blood samples from injection drug users shipped to BSRI Viral Reference Laboratory & Repository Core (VRLRC), for testing by ECi and other advanced assays. VRLRC also processes samples for further testing by dHCV TMA at Chiron Corp, and maintains a sample repository at BSRI.

5. U01-AI-41531 (Principal Investigator, BCP/BSRI sub-contract) 7/1/02-6/30/07
NIH / NIAID

Immunologic and Virologic Features of Early HIV Infection
An HIV Primary Infection / Early Disease Research Unit has been established at UCSF as part of Acute Infection, Early Disease Research Program (AIEDRP) / , to assess disease stage/progression and conduct treatment trials. BSRI conducts extensive lab tests (PCR monitoring of viral load in blood, PBMC, and other body tissues; cytokine levels, T-cell activation, etc.) to establish timelines and markers of infection, study viral pathogenesis and reactivation, measure patient response to treatments, etc., for the unit, and participates in interpretation of data and publication of results.

6. P50-HL-54476 (Principal Investigator, BCP/BSRI sub-contract) 2/1/96-12/31/06
NIH / NHLBI

Specialized Center of Research (SCOR) Grant in Transfusion Medicine
(UCSF/BCP Project 6): Donor Leukocyte Activation/ Proliferation Post-Transfusion

Project 6 goals: define factors influencing newly observed proliferation/expansion of donor white cells in recipients; characterize immunophenotype and specificity of donor cells; determine minimum number of white cells needed to produce a detectable peak; correlate phenomenon with development of recipient immune activation and alloimmunization in humans.

7. N01-HB-47114 (co-Principal Investigator, UCSF; Principal Investigator, BCP sub)
NIH / NHLBI 1989 - 2004

Retrovirus Epidemiology Donor Study, REDS-I

Established/maintained various repositories of blood donor sera; enrolled and followed HTLV-I/II positive donors; studied demographics and behavioral characteristics of donors; determined current risk of viral transmission; responded to new concerns over infectious risks of blood transfusions. This project included multiple substudies:

a) REDS Allogeneic Donor and Recipient Repository - "RADAR" substudy, designed to permit future rapid, retrospective analysis of any new possible, transfusion-transmitted disease through storage of both the frozen donor samples and the matching recipient blood samples from both pre- and post transfusion.

b) Nucleic Acid Testing (NAT) Surveillance Study, the purpose of which was to assess the sensitivity of NAT assays for HIV and HCV, evaluate the optimal size for mini-pooling of specimens, and to evaluate performance of test kits from different manufacturers, with the overall goal of reducing or eliminating HIV and HCV transfusion transmissions.

c) West Nile Virus Prevalence Pilot Study. Characterized WNV serologic and viremic levels using RADAR Repository samples and developed a model of WNV residual risk for 2002 and 2003. Tested other RADAR 2002 and 2003 samples from around the country to collect data used to quantitate WNV incidence and prevalence in one or more selected regions and develop a model of WNV transfusion transmission risk.

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8. U64-CCU-902948 (Principal Investigator, BCP) 1987 - 2002
CDC

AIDS Epidemiologic Study of Blood Donors

Monitor HIV-1 infection in blood donors, assess risk factors and motivations of infected donors. In the early years of the epidemic transfusion recipients and their sexual partners were also involved. Current sub-studies include (1) genetic sequencing of HIV to identify geographic and newly-evolving variants, by use of the latest techniques (PCR DNA sequencing, HMA); and (2) development of a modified "de-tuned" antibody test to actually make it less sensitive. By identifying persons who test positive by standard assays but negative on the de-tuned assay, we can identify the sub-set of infected persons who are newly infected, allowing focused investigation into their demographics, risk factors, and viral strain characteristics, targeted contact tracing, and design of new treatment regimens and public education campaigns, since newly-infected persons present the greatest risk to the blood supply, and "drive" the over-all epidemic.

9. N01-HB-57126 (Principal Investigator, BCP) 1994 - 2000
NIH / NHLBI

Viral Activation in Transfusion Study, VATS - Central Laboratory

Virologic and immunologic studies for a clinical trial of blood transfusion (e.g. leukoreduced versus non-leukoreduced; whole blood versus packed red cells) in AIDS patients. Central laboratory performed all testing for multiple clinical centers, developed and optimized new PCR & other techniques.

10. R01-CA-59706 (Responsible Head of Lab, BCP; non-funded Supervisor/Consultant, IMBC sub)
NIH / NC 1994 - 1999

Pancreatic Cancer Case-Control Study in San Francisco

11. N01-AI-82515 (Principal Investigator, IMBC sub) 1988 - 1996
NIH / NIAID

Natural History of AIDS in Homosexual Men ("San Francisco Men's Health Study", SFMHS);

12. R01-HL-48367 (Principal Investigator, UCSF / IMBC) 1992 - 1996

NIH / NHLBI

HIV Diversity/Pathogenesis in Donor/Recipient Clusters

13. N01-HB-97074 (Principal Investigator, UCSF / IMBC sub) 1984 - 1996

NIH / NHLBI

Transfusion Safety Study (TSS)

14. no number assigned (Principal Investigator, IMBC) 1993 - 1995

Becton Dickinson Immunocytometry Systems, Inc. (BDIS

Retrospective Correlative Studies of Immune Activation and AIDS Progression" (2 studies)

15. 500339-14-PG (Principal Investigator, IMBC) 1993 - 1994

Pediatric AIDS Foundation/American Foundation for AIDS Research (PAF/AMFAR)

Mother-Fetal Transfusion and Perinatal HIV Infection

16. no number assigned (Principal Investigator, IMBC) 1993 - 1994

Pall Biomedical Products Corp

Effects of Leukodepleted Blood Transfusions" (2 studies)

17. no number assigned (co-Principal Investigator, IMBC) 1992 - 1994

American Red Cross

Impact of High Efficiency Leukocyte Filtration on HIV Burden in Cellular and Fluid Fractions of Blood from Asymptomatic, Seropositive Donors

18. no number assigned (Principal Investigator, IMBC) 1993 - 1994

American Red Cross (Holland Labs)

2 studies: 1) HIV Distribution in Donated Blood; 2) Removal of HIV from RBC/Platelets by Washing

19. no number assigned (co-Principal Investigator, IMBC) 1992 - 1993

American Association of Blood Banks (AABB) National Blood Foundation (NBF)

Impact of Homologous Blood Transfusion on HIV Replication and Disease in vivo

20. N01-HB-9-7024 (Principal Investigator, IMBC sub) 1986 - 1993

NIH / NHLBI

Effectiveness of HTLV-III HIV-1 Screening

[NOTE: HIV-1 was originally known as HTLV-III]

21. U62-CCU-902947 (Principal Investigator, IMBC) 1987 - 1992

CDC

Epidemiologic Study of Heterosexual Transmission of HIV from Persons with Transfusion-Associated Infections ("Partner Study").

22. N01-HB-6-7020 (Principal Investigator, IMBC sub) 1986 - 1992

NIH / NHLBI

Development/Evaluation of New Screening Tests for HTLV-III HIV-1 Antibodies/Antigens/Nucleic Acids

23. P01-36589, Program Project Grant (co-Principal Investigator, IMBC sub) 1986 - 1991

NIH / NHLBI

Transfusion-Related Viral Infections and Immune Response

24. R01-HL-41361 (Co-Investigator, UCSF; Princ. Investigator, IMBC sub) 1988 - 1991

NIH / NHLBI

Removal/Inactivation of Viruses in Blood

25. no number assigned (Principal Investigator, IMBC) 1990 - 1991

American Association of Blood Banks (AABB) National Blood Foundation (NBF)

Adaptation of Capillary Separation to PCR Amplification for Infectious Disease Screening of Blood Donors

26. no number assigned (Principal Investigator, IMBC) 1989 - 1990
UCSF AIDS Clinical Research Center
HIV Proviral Load: Prognostic Value and Pathogenic Relevance
27. CCU-900829 (Co-Investigator, IMBC sub) 1987 - 1989
CDC
Collaborative Study of Patients Transfused with Blood from Persons with Acquired Immunodeficiency Syndrome (AIDS) or AIDS-Related Conditions (ARC)
28. *number not available* (non-funded Consultant to SFSU researcher) 1995 - 1998
NIH Academic Research Enhancement Award program
Transcriptional Processivity in HIV-1 Latency