

EMORY UNIVERSITY SCHOOL OF MEDICINE  
CURRICULUM VITAE

Revised: 8/15/06

1. Name: **Mark Joseph Mulligan, M.D.**

2. Office Address: The Hope Clinic of the Emory Vaccine Center  
Division of Infectious Diseases, Emory University  
603 Church Street; Decatur, GA 30030

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3. E-mail Address: mmulli2@emory.edu

4. Citizenship: United States

5. Current Titles and Affiliations:

a. *Academic appointments:*

1. *Primary appointments:*

<u>Year</u>	<u>Rank/Title</u>	<u>Institution</u>
2006 – present	Professor (Acting)	Division of Infectious Diseases Department of Medicine Emory University

2. *Joint and secondary appointments:*

2006 – present	Co-Director	Clinical and Translational Research Core, Center for AIDS Research (CFAR), Emory University
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2006 – present	Assoc. Director for Clinical Trials	The Emory Vaccine Center
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b. *Clinical appointments:*

2006 – present	Emory HealthCare
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2006 – present	Grady Health System
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c. *Other administrative appointments:*

2006 – present	Executive Director	The Hope Clinic of the Emory Vaccine Center
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6. Previous Academic and Professional Appointments:

A. Academic:

2001 - 2004	Professor	Division of Infectious Diseases
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		Departments of Medicine and Microbiology University of Alabama at Birmingham
1994 – 2004	Director	Alabama Vaccine Research Clinic (AVRC) at UAB
1997 - 2004	Director	Clinical Vaccine Program AIDS Center University of Alabama at Birmingham
2001 – 2004	Associate Director and Sr Sci	Center for Disaster Preparedness University of Alabama at Birmingham
2001 – 2004	Senior Scientist	AIDS Center, University of Alabama at Birmingham
1994 - 2004	Senior Scientist	Comprehensive Cancer Center University of Alabama at Birmingham
2001- 2004	Senior Scientist	Cystic Fibrosis Research Center University of Alabama at Birmingham
2003 - 2004	Senior Scientist	Gene Therapy Center University of Alabama at Birmingham
1994 – 2004	Graduate Faculty	Cellular and Molecular Biology (CMB) Graduate Program, UAB
1994 – 2004	Scholar	The John J. Sparkman Center for International Public Health Education, School of Public Health, University of Alabama at Birmingham
1990 - 2004	Graduate Faculty	Molecular Cell Biology Graduate Program Department of Microbiology, University of Alabama at Birmingham
1994 - 2001	Associate Professor	Division of Infectious Diseases Departments of Medicine and Microbiology University of Alabama at Birmingham
2000 - 2001	Scientist	Cystic Fibrosis Research Center University of Alabama at Birmingham
1994 - 2001	Scientist	AIDS Center, University of

		Alabama at Birmingham
1994 - 2001	Scientist	Comprehensive Cancer Center University of Alabama at Birmingham
1991 - 1994	Associate Scientist	Comprehensive Cancer Center University of Alabama at Birmingham
1990 - 1994	Assistant Professor	Departments of Medicine and Microbiology University of Alabama at Birmingham
1989 - 1994	Associate Scientist	UAB AIDS Center University of Alabama at Birmingham
1988 - 1990	Associate Physician Scientist	Division of Infectious Diseases Department of Medicine University of Alabama at Birmingham
1987 - 1988	Associate in Medicine	Division of Infectious Diseases Department of Medicine, University of Alabama at Birmingham

7. Previous Administrative and/or Clinical Appointments

2004 –2005	Physician/Consultant	Birmingham Infectious Disease, LLC (consultant in patient care and vaccine research)
1990 - 2004	Attending Physician	University of Alabama Hospitals
1990 - 2004	Attending Physician	UAB Outpatient AIDS Clinic
1999 - 2004	Attending Physician	Infectious Diseases Clinic, The Kirklin Clinic UAB
1984 - 1990	Staff Physician	University of Alabama Hospitals
1985 - 1993	Physician	Birmingham Healthcare for the Homeless Birmingham, AL
1988 - 1990	Staff Physician	UAB Outpatient AIDS Clinic
1994 - 1996	Board of Directors	AIDS Task Force of Alabama (ATFA)
1997 - 1998	Advisory Board	AIDS Task Force of Alabama

(ATFA)

8. Licensure:

State of Georgia, issued 5/5/06; active  
 State of Alabama, issued 10/23/85; active  
 State of Texas, issued 8/23/85; cancelled by licensee 6/14/88

9. Specialty Boards:

Internal Medicine, 1987 Recertified 2003  
 Infectious Diseases, 1990 Recertified 2003

10. Education:

<u>Institution</u>	<u>Degree</u>	<u>Year</u>
University of Notre Dame South Bend, IN	B.S.	1976 - 1980
University of Texas Southwestern Medical School, Dallas, TX	M.D.	1980 - 1984

11. Postgraduate Training:

<u>Institution</u>	<u>Degree</u>	<u>Year</u>
University of Alabama at Birmingham Birmingham, AL	Intern in Medicine	1984 - 1985
University of Alabama at Birmingham Birmingham, AL	Resident in Medicine	1985 - 1987
Richard W. Compans' Laboratory in Molecular Virology Department of Microbiology University of Alabama at Birmingham, Birmingham, AL	Post-doctoral Fellow	1987 - 1990
Division of Infectious Disease Department of Medicine University of Alabama at Birmingham, Birmingham, AL	Infectious Diseases Fellowship	1987 - 1990

12. Military or Government Service: NA13. Committee Memberships:a. *National and International:*

- Reviewer, Ad Hoc AIDS Review Committee, National Institute of Allergy and Infectious Diseases National Institutes of Health, 1989
- Extramural Reviewer, Veterans Administration Research Advisory Group, 1990, 1991, 1997
- Reviewer, General Clinical Research Center (GCRC) Site Visit, National Institutes of Health, 1993, 1994
- Member, Executive Committee, AIDS Vaccine Evaluation Group (AVEG), National Institute of Allergy and Infectious Diseases, National Institutes of Health, 1994 - 2000
- Chairperson, Ad Hoc Review Committee, AIDS Vaccine Clinical Trials Network, DAIDS,

NIAID, NIH, 1995

- Representative for AIDS Vaccine Evaluation Group Executive Committee, Vaccine Selection Group, AIDS Vaccine Clinical Trials Network, DAIDS, NIAID, NIH, 1995
- Reviewer, Special Review Committee, Family Health International and DAIDS, NIAID, NIH, Phase I HIV Vaccine Study in Uganda, 1996
- Chairperson, Special Review Committee (Env Protein Structures), Innovative Grant Program for Approaches in HIV Vaccine Research, DAIDS, NIAID, NIH, 1997
- Leader, Harriet Robinson DNA Vaccine Development Team, HIV Vaccine Trials Network (HVTN) DAIDS, NIAID, NIH, 2000-2004
- Member, Phase I/II Trials Committee, HIV Vaccine Trials Network (HVTN), DAIDS, NIAID, NIH, 2000-2002
- Chair, Network Evaluation Subcommittee, HIV Vaccine Trials Network (HVTN), DAIDS, NIAID, NIH, 2000-2004

*b. Regional and State:*

- Member, Advisory Committee on HIV/AIDS Prevention and Education, Birmingham City Council, 2003 – 2004
- Member, The Expert Panel of the Governor of Alabama's HIV Commission for Children, Youth, and Adults, 2003 – 2004

*c. Institutional:*

- Member, University Research Committee (URC), Biological and Health Sciences Subcommittee, Emory University, 2006 – 2009 (3 year term)
- Member, Institutional Review Board (IRB), Brookwood Medical Center, Birmingham, AL, 2004-2005
- Member, Research Development Group (RDG), Department of Medicine, University of Alabama at Birmingham, 2002 – 2004
- Member, Non-Academic Misconduct Hearing Committee, Office of Undergraduate Medical Education, School of Medicine, University of Alabama at Birmingham, 2001
- Reviewer, Core Programs, AIDS Center, University of Alabama at Birmingham, 2001
- Reviewer, Pilot Project Program, Cystic Fibrosis Center, University of Alabama at Birmingham, 2000
- Reviewer, Protocol Selection, General Clinical Research Center (GCRC), University of Alabama at Birmingham, 1997, 1998, 1999
- Judge, Annual Trainee Research Symposium, Department of Medicine, University of Alabama at Birmingham, 1996 – 2004
- Reviewer, Interdisciplinary Research Grant Program, Department of Medicine, University of Alabama at Birmingham, 1996
- Member, Working Group #6, Project Curriculum 2000, University of Alabama School of Medicine, University of Alabama at Birmingham, 1995
- Reviewer, Center for AIDS Research (CFAR) Developmental Award Committee, University of Alabama at Birmingham, 1989-91, 1993, 1995, 1999-2001, 2003
- Reviewer, Institutional Biosafety Committee, University of Alabama at Birmingham, 1990
- Intern Selection Committee, Department of Medicine, University of Alabama at Birmingham, 1991-1994
- Clinical Competence Committee, Department of Medicine, University of Alabama at Birmingham, 1991-1994
- Infectious Diseases Fellowship Committee, Division of Infectious Diseases, Department of Medicine, University of Alabama at Birmingham, 1993 –1998

14. Consultantships:

Consultant to NIH-sponsored HIV Vaccine Trials Network (HVTN) for Network Evaluation Committee Chair position, while working for Birmingham Infectious Disease, LLC, 2004-2005

15. Editorships and Editorial Boards:

-Member, Editorial Board, *Virus Research*, 2001 – 2004  
-Editor-in-Chief, Questions Newsletter, UAB AIDS Center, 1993 –1996

16. Manuscript reviewer:

Journal of Infectious Diseases, 2003  
  
Journal of Medical Virology, 2001-2004  
  
Virus Research, 1990-92, 1994-97, 1999; 2001-2004 (Editorial Board)  
  
Journal of Virology, 1992, 1997-99  
  
American Journal of Medicine, 1992-93, 1995-96  
  
American Family Physician, 1993, 1995-97  
  
Regional Immunology, 1993  
  
AIDS Research and Human Retroviruses, 1993-94, 1996-98  
  
Antiviral Research, 1996-97  
  
American Journal of Medical Sciences, 1990

17. Honors and Awards:

- Awardee (with M. Conry), Development of CTL Shared Facility, Shared Facilities Program, HHMI Institutional Research Grant, UAB School of Medicine, 1998-2000  
- Elected to Fellowship, American College of Physicians, 1997  
- American Foundation for AIDS Research (AmFAR) Research Award, “Glycoproteins in HIV-2 and HIV-1 Assembly”, American Foundation for AIDS Research, 1993-1994  
- Junior Faculty Developmental Award, Comprehensive Cancer Center, University of Alabama at Birmingham, 1993  
- NIH Physician-Scientist Award, "HIV-2 Envelope Glycoproteins and Cell Fusion", 1988-93  
- Winner, Sixth Annual Trainee Research Symposium, Department of Medicine, University of Alabama at Birmingham, "Mechanisms of In Vitro Cytotoxicity of HIV-2", 1990  
- Chief Fellow, Division of Infectious Diseases, University of Alabama at Birmingham, 1989-90  
- Walter B. Frommeyer, Jr. Fellowship in Investigative Medicine, Department of Medicine, University of Alabama at Birmingham, 1988-89  
- Honors Graduate, University of Notre Dame, South Bend, IN, 1980  
- Alpha Epsilon Delta Premedical Honor Society, 1977-1980  
- Fairchild Air Force Base Officers' Wives Club Scholarship, Spokane, WA , 1976

18. Society Memberships:

American Association for the Advancement of Science  
American College of Physicians (Elected to Fellowship, 1997)  
American Federation for Medical Research

American Medical Association  
American Society for Microbiology  
American Society for Virology  
Infectious Diseases Society of America  
International AIDS Society  
Southern Society for Clinical Investigation (Elected 1997)  
Birmingham Clinical Club (Elected 1998)

(Not all of the above currently active but most will be reactivated now with return to academics).

19. Organization of National or International Conferences:

a. Administrative positions:

-Chair, Network Evaluation Subcommittee sessions, Annual Meetings of the NIH HIV Vaccine Trials Network (HVTN), each May and October, from 2000 to May 2004.

b. Sessions as chair:

-Moderator, Session 32, Oral abstracts: Clinical and Preclinical Vaccine Studies, 11<sup>th</sup> Conference on Retroviruses and Opportunistic Infections (CROI), 2004, San Francisco

20. Research focus:

Vaccine clinical trials and translational studies of human immune responses to pathogens and/or vaccines.

21. Patents: NA

22. Grant Support:

Dr. Mulligan came to Emory in June 2006 and, as Executive Director of the Hope Clinic, and will be building a portfolio of federal and other research funding.

a. *Active support:*

1. Federally funded:

a) Co-Director, CFAR Clinical Research Core (PI: Curran)

NIH/NIAID: P30 AI 50409

Emory 2P30 -04A1

Emory Center for AIDS Research (CFAR)

Core annual direct costs for Hope Clinic \$106,396 for 2006. 2002-07.

Description: The Clinical Research Core of the CFAR is charged with fostering interdisciplinary AIDS-related clinical and translational research in Atlanta.

b) PI of Clinical Core (Overall PI: Ahmed).

NIH/NIAID: U19 057266.

Vaccine-induced immunity in the young and aged.

Total costs for Clinical Core: \$1,061,826 for 2003 – 2008.

Description: The major goal of this Clinical Core is to facilitate the design, development, and performance of translational research studies probing age-related effects on vaccine response.

c) PI of Clinical Core (Overall PI: Feinberg).

NIH/NIAID: U19 AI61728 (IPCAVD).

Optimizing the Immunogenicity of MVA-Based AIDS Vaccines.

Annual direct costs for Clinical Core: \$92,125 for 2006; 2004 – 2009.

Description: This IPCAVD will develop more immunogenic MVA-based AIDS vaccines, including regimens that are simpler but more potent. The Clinical core develops and performs Phase I clinical trials of the novel vaccine regimens.

2. Private foundation funded: NA
3. Contracts: NA
4. Other (industry-supported):

d) PI (a/o 7/06)

Sanofi Pasteur, Inc.

Randomized Controlled Double-Blind Trial of the Comparative Viremia, Immunogenicity, and Safety of a 17-D Live Attenuated Yellow Fever Vaccine (YF-VAX) Given Alone or in Combination with Human Immunoglobulin (BAYGAM).

Total costs: \$1,500,000 for 2006-07.

Description: A clinical trial to determine if ImmunoGlobulin improves the side effect profile of the Yellow Fever vaccine by decreasing the viral load while maintaining adequate immune response to the Yellow Fever virus.

e) Co-investigator (PI: del Rio)

Merck, Inc.

A clinical trial: Multicenter, Double-Blind, Randomized, Placebo-Controlled Phase II Proof-of-Concept Study to Evaluate the Safety and Efficacy of a 3-Dose Regimen of the Merck Adenovirus Serotype 5 HIV-1 Vaccine gag/pol/nef (MRKAd5 HIV-1 gag/pol/nef) in Adults at High Risk of HIV-1 Infection (Protocol V520/023-00).

Total costs for trial: \$1,022,940 for 2005 – 2011.

Description: The major goal of this study is to conduct an evaluation (proof of concept) for a novel HIV vaccine. This is a collaboration between Merck and the NIH (HVTN).

*b. Previous Support:*

“Alabama HIV Vaccine Trials Unit (HVTU)”

NIH-NIAID-DAIDS (AI-47996)

Principal Investigator

Total Support: \$6,131,035 for 2000-2005 (re-assigned to Dr. Paul Goepfert in 2004 when Dr. Mulligan moved to Birmingham Infectious Disease, LLC).

Description: One of the NIH-sponsored international clinical trials units for performance of phase I, II, and III human trials of preventive HIV vaccines. Successful competitive “renewal” after six years as a NIH AIDS Vaccine Evaluation Unit (AVEU), the precursor program to current network.

“Anthrax Vaccine Research Program: Human Trial Site”

CDC (200-2001-00130)

Principal Investigator

Total Support: \$5,092,534 for 2001-2006 (re-assigned to Dr. Scott Parker in 2004 when Dr. Mulligan moved to Birmingham Infectious Disease, LLC)

Description: Anthrax represents one of the major biological warfare threats. The current anthrax vaccination regimen is suboptimal for use in US military troops. The goal of this program is to develop better anthrax vaccine regimens. We enrolled 375 human volunteers—the highest enrolling site—in a trial of a new anthrax vaccine regimen, with 3.5 years of follow-up.

“A Phase III Trial to Determine the Efficacy of Bivalent AIDSVAX™ B/B Vaccine in Adults at Risk of Sexually Transmitted HIV-1 Infection in North America.”

VaxGen, Inc.

Principal Investigator

Total Support: \$562,500 for 1999-2004

Description: The first ever phase III trial of an HIV vaccine. 125 high-risk gay men enrolled in 5 months at UAB; 5407 participants nationally.

“Renovation for UAB Vaccine and T Cell Translational Research Facility”

University of Alabama at Birmingham Health Services Foundation

General Endowment Fund Award

Principal Investigator

Total Support: \$400,000 for 2000-2003

Description: Essential award that allowed us to obtain an additional \$1,300,000 in matching funding for renovation of the third floor (10,000 sf) of the UAB Community Care Building (CCB) for clinical, laboratory, and administrative home for the Alabama Vaccine Research Clinic (AVRC) at UAB and related clinical and laboratory programs.

“A Phase I Study of the Safety, Tolerability, and Immunogenicity of HIV-1 gag DNA in Healthy Subjects.”

Merck Research Laboratories, Inc.

Principal Investigator

Total Support: \$101,177 for 2000-2004

Description: First time in human trials of Merck’s first DNA HIV vaccine.

“A Probe Study of Safety, Tolerability, and Immunogenicity of a Three Dose Regimen of the Ad5 HIV-1 Gag Vaccine (Adenovirus Serotype 5 HIV-1 Gag vector) in Healthy Adults”

Merck Research Laboratories, Inc.

Principal Investigator

Total Support: \$109,611 for 2001-2004

Description: First human trial of Merck’s recombinant defective adenovirus HIV vaccine.

“HIV Vaccine Trials Network Leadership Group: Scientific Leadership”

NIH/Fred Hutchinson Cancer Research Center (AI46747-02)

Subcontract Principal Investigator (Center’s PI, L. Corey)

Total SUPPORT MJM: \$141,695 for 2000-2004

Description: Provide scientific leadership as the Chair of the Network Evaluation Subcommittee (NES) for the 15 active vaccine units of the NIH-sponsored HIV Vaccine Trials Network (HVTN).

“Preparation for the Evaluation of HIV/AIDS Vaccines In Rwanda”

International AIDS Vaccine Initiative (SC-1114-R)

Co-Investigator (P.I., Susan Allen)

Total support: \$7,850 for 2003-2004

Description: A vaccine preparedness grant for training and pilot study of HIV vaccine research in Rwanda.

“Leadership Group for the Adolescent Medicine Trials Network”

NIH-NICHD (HD40533)

Co-PI (PI, C. Wilson)

Total Support to MJM: \$40,405 for 2001 – 2002

Description: Consultant for HIV Vaccine trials development.

“HLA Typing and CTL Epitope Mapping to Guide HIV Vaccine Design”

NIH-NICHD (HD32842)

Co-Investigator (Subcontract PI, R. Kaslow; contract PI, C. Wilson)

Total support to MJM: \$425,000 for 2000-2003

Description: A major research project in the laboratory. In a cohort of 100 minority (mostly African-

American) adolescents, defining the magnitude, breadth, epitope specificity, and MHC restriction of HIV-specific CD8+ cytotoxic T lymphocytes (CTL). Utilizing interferon-gamma ELISPOT assays, standard chromium release lytic assay, and novel assays such as tetramer and intracellular cytokine detection by flow cytometry. Most known HIV CTL epitopes were defined in Caucasians. The focus of this work is on African-Americans and Hispanics, whose HLA alleles are significantly different.

“HLA Typing and CTL Epitope Mapping to Guide HIV Vaccine Design”  
NIH-NICHD (HD32842)

Co-Investigator (Subcontract PI, R. Kaslow; contract PI, C. Wilson)

Total support to MJM: \$84,963 for 2001-2003

Description: Additional support for analysis of data.

“HLA Typing and CTL Epitope Mapping to Guide HIV Vaccine Design”  
NIH-NICHD (HD32842)

Co-Investigator (Grant Supplement; Subcontract PI, R. Kaslow; contract PI, C. Wilson)

Total Support to MJM: \$199,950 for 2001-2003

Description: The specific focus of this grant supplement is to extend CD8+ T lymphocyte assays and epitope mapping beyond the limited existing work (primarily Gag, Pol, Env, and Nef) to include five ancillary HIV proteins: Tat, Rev, Vpu, Vpr, and Vif.

“Establishment of AIDS Vaccine Evaluation Units (AVEUs)”

NIH-NIAID-DAIDS (AI-45209)

Principal Investigator

Total support: \$8,153,291 for 1994-2000

Description: One of the six original national units for performance of phase I and II clinical trials of candidate HIV prevention vaccines. Precursor to the present HIV Vaccine Trials Network (HVTN). Supported clinical and laboratory research.

“Clinical Trials of Vaccine and Non-vaccine Interventions for HIV Prevention in Developing Countries Through The HIVNET”

NIH/NIAID/DAIDS/N01-AI-35173

Co-Investigator (P.I., Susan Allen)

Total Support to MJM, with S. Sabbaj (post-doctoral fellow): \$16,000 for 2000-2001

Description: Performance of T cell assays to characterize possibly protective immune responses in HIV exposed but HIV uninfected partners in discordant couples cohort in Lusaka, Zambia.

“A Probe Study to Obtain PBMC Samples from HIV-Infected Individuals.”

Merck Research Laboratories, Inc.

Principal Investigator

Total Support \$37,500 for 1999

“Evaluation of T Cell Immunity in Human Vaccine Trials and Viral Infections”

Howard Hughes Medical Institute (HHMI) Institutional Research Grant--Shared Facilities

Program, UAB School of Medicine

Co-Principal Investigator (With Marty Conry)

Total Support: \$200,000 for 1998-2000

“Heterosexual transmission in natural history of HIV in Africa”

NIH NIAID DAIDS (A1-4095 – S2)

Co-investigator (P.I., Susan Allen)

Total support (subproject): \$26,500 for 1997-1998

“Clinical Trials of Vaccine and Non-vaccine Interventions for HIV Prevention in Developing Countries Through The HIVNET”

NIH/NIAID/DAIDS/N01-AI-35173  
Co-Investigator (P.I., Susan Allen)  
Total Support: \$15,715, 1997-98

“Adult AIDS Clinical Trials Unit (ACTU)”  
NIH, NIAID, DAIDS (U01 AI 32775)  
Co-investigator (P.I., Michael Saag), Total Support (to Dr. Mulligan): \$51,090 for 1997-2002

“Recombinant Foamy Virus Vectors for C.F. Gene Therapy”  
Cystic Fibrosis Foundation Award (R464)  
Pilot project  
Principal Investigator, (C.F. Center P.I., Eric J. Sorscher)  
Total support (subproject): \$75,000 for 1997-1999

“Mucosal and Systematic Immunity to SIV and HIV”  
NIH, NIAID, National Cooperative Vaccine Discovery Group (NCVDG)  
(U01-AI28147)  
Co-investigator (P.I., Jiri Mestecky)  
Subproject 1B: Analysis of Virus Neutralizing Activity in Plasma and Secretions  
Total Support (subproject 1B): \$132,717 for 1994-1998

“Laboratory for Assessment of Mucosal Immune Responses Induced by AIDS Vaccines in Clinical Trials Volunteers”  
NIH, NIAID, AIDS Vaccine Clinical Trials Network (N01-AI35163)  
Co-investigator (P.I., Jiri Mestecky)  
Total Support (subproject): \$155,751 for 1993-98

“Glycoproteins in HIV-2 Assembly, Binding and Fusion”  
NIH, NIAID, RO1 Award (R01 AI33784)  
Principal Investigator  
Total Support: \$685,281 for 1993-97

“Amphipathic Helixes, Fusion and HIV Infectivity”  
NIH, NIAID, RO1 Award (AI28928)  
Co-investigator (P.I., Jere Segrest)  
Subproject for biological assays of virus inhibition  
Total support (subproject): \$125,529 for 1993-1997

“Glycoproteins in HIV-2 and HIV-1 Assembly”  
American Foundation for AIDS Research (AmFAR)  
Grant Award (02083-15-RG)  
Principal Investigator  
Total Support: \$59,400 for 1993-1994

“Mucosal and Systematic Immunity to SIV and HIV”  
NIH, NIAID, National Cooperative Vaccine Discovery Group (NCVDG)  
(U01-AI28147)  
Co-investigator (P.I., Richard Compans)  
Subproject 1B: Analysis of Virus Neutralizing Activity in Plasma and Secretions  
Total Support (subproject): \$204,612 for 1991-1994

“Adult AIDS Clinical Trials Unit (ACTU)”  
NIH, NIAID, Division of AIDS (U01 AI 32775)  
Clinical Trials of AIDS Treatments - Co-investigator (P.I., Michael Saag)  
Total Support (to Dr. Mulligan): \$20,000 for 1990-1994

“Junior Faculty Developmental Grant Award”  
University of Alabama at Birmingham Comprehensive Cancer Center  
(CA-13148)  
Principal Investigator  
Total Support: \$20,000 for 1993-1994

“HIV-2 Envelope Glycoproteins and Cell Fusion”  
NIH, NIAID, Physician Scientist Award (K11-AI00912)  
Principal Investigator  
Total Support: \$390,787 for 1988-1993

“HIV Replication and Pathogenesis”  
NIH, NIAID, Program of Excellence in Basic Research on AIDS (PEBRA)  
(PO1 AI27290)  
Co-Investigator (P.I., Beatrice Hahn)  
Subproject 1A: HIV-2 Glycoprotein Biology  
Total Support (subproject): \$61,487 for 1992-1993

“A Phase I Study of the Safety and Pharmacokinetics of rCD4-IgG in Patients with HIV-1 Infection and Documented In Vitro Sensitivity to rCD4-IgG”  
Genentech, Inc.  
Co-Investigator for In Vitro Studies (P.I., Michael Saag)  
Total Support: \$63,440 for 1991-1992

“HIV-2 Envelope Glycoproteins and Cell Fusion”  
University of Alabama at Birmingham  
Walter B. Frommeyer, Jr. Fellowship in Investigative Medicine  
Principal Investigator  
Total Support: \$20,000 for 1988-1989

“Basic Mechanisms in Virology”  
NIH, NIAID, T32-AI07150 (P.I., Richard Compans)  
Post-doctoral Fellow  
Total Support: \$30,070 for 1987-1988

23. Clinical Service Contributions:

*Birmingham Infectious Diseases, LLC, Birmingham, AL:*

Inpatient and outpatient infectious diseases consultation (private practice), 2004-2005

*UAB, 2004 (similar during each year 1990-2004—fourteen years on faculty):*

2 months per year attending on inpatient Clinical Scholars' Ward Service (General Internal Medicine) and/or Infectious Diseases Consultation Service, UAB University Hospital

1 month per year attending on the inpatient HIV/AIDS Consult Service, UAB University Hospital

1 half day per week attending at the outpatient UAB AIDS Clinic (1917 Clinic)

Participation in General Medicine, Infectious Diseases, and Department of Medicine weekly clinical conferences

24. Formal Teaching:

*a., b., and c. Medical Student, Resident, and Fellow Teaching:**- Inpatient - 2001-2004*

UAB Medical School, Hospital Teaching Service, Attending Physician  
Two months per year (General Medicine Clinical Scholars' Ward Service, University Hospital)  
Teaching medical students, Internal Medicine residents, and Infectious Diseases fellows

*- Inpatient - 2003-2004*

UAB Medical School, HIV/AIDS Consultation Service, Attending Physician  
One month per year  
Teaching medical students, residents, fellows

*- Inpatient - 1999-2001*

UAB Medical School, Hospital Teaching Service, Attending Physician  
Three months per year (one month Infectious Diseases Consultation Service, University Hospital;  
two months General Medicine Clinical Scholars' Ward Service, University Hospital)  
Teaching medical students, Internal Medicine residents, and Infectious Diseases fellows

*- Inpatient - 1990-1999*

UAB Medical School, Hospital Teaching Service, Attending Physician  
Two months per year (Infectious Diseases Consultation Service, or medicine ward, University Hospital)

*- Inpatient - 1990-1994*

Birmingham Veterans' Administration Hospital; one month General Medicine Ward, University Hospital)  
Teaching medical students, Internal Medicine residents

-Faculty, Microbiology Laboratory Course for Sophomore Medical Student, 12 hours, course director S. Moser, UAB School of Medicine, 1988 – 2004

*- UAB AIDS Outpatient Clinic (1917 Clinic), Attending Physician—1990-2004*

One half day per week  
Teaching residents and Infectious Diseases fellows

*- Infectious Diseases Clinic, The Kirklin Clinic at UAB, Attending Physician—1999-2002*

One half day per week  
Teaching Infectious Diseases fellows

*c. Other Graduate Program teaching:*

- Lecturer: "AIDS: Immunologic Issues and Vaccines", Epidemiology 606 course on AIDS, HIV, and STDs, 2 hours, course director S. Allen, Department of Epidemiology, School of Public Health, UAB, 1997 - 2004

- Lecturer: "HIV Vaccine Development", Vaccinology course, 2 hours, course director S. Vermund, Department of Epidemiology, School of Public Health, UAB, 1997 –2004

- Lecturer: "Antiviral Chemotherapy", Microbiology Course, course directors C. Morrow (1989-2000).Allan Zajac (2001), Cindy Luongo (2002 - Present), Sophomore Dental and Optometry Students, UAB, Birmingham, AL, 1989 - 2004

- Lecturer: "AIDS", Bioteach Summer Course for High School Science Teachers, 2 hours, course director S. Hajduk, Department of Biochemistry and Molecular Genetics (1996-2002); W. Ann Reynolds, UAB C.O.R.E. (2003), University of Alabama at Birmingham

- Lecturer: "HIV Vaccine Development", Infectious Diseases Fellows Lecture Series, Department

of Medicine, University of Alabama at Birmingham, 2001 – 2004  
 -Guest Lecturer, “HIV Vaccines”, HIV/AIDS Public Health Implications, Graduate student course, Directors Susan Allen and Kristen Dunkle, Rollins School of Public Health, Emory University, September, 2006

## 25. Supervisory Teaching:

a. *Ph.D. students directly supervised in my laboratory:*

<i>Student</i>	<i>Years</i>	<i>Position</i>	<i>Current/Last known Position</i>
Angela Giddings	1994-2001	Graduate Student Co-mentored with Eric Hunter	Industry
George Wang, M.D.,	1994-99	Graduate Student	Industry
Kit Shaw	1997-2002	Graduate Student Co-mentored with Paul Goepfert	Academics, UCLA

b. *Post-doctoral fellows directly supervised:*

Judith M. Ball, Ph.D.	1992-93	Post-Doctoral Fellow	Asst. Professor, Microbiology Texas Tech University
Yuan Zhang, M.D.	1994	Research Fellow	Research Assistant, Vanderbilt University
Paul Goepfert, MD	1994-97	Post-Doctoral Fellow	Associate Professor, UAB Awarded NIH Mentored Clinical Scientist Development Award, 1996-2001, Primary Sponsor, <b>M. Mulligan</b> ; Dr Goepfert Awarded NIH R01, 2002
Ildefonso Tellez, M.D.	1997-2000	Post-Doctoral Fellow	Physician, Grady Hospital, Atlanta
Steffanie Sabbaj, Ph.D.	1997-2002	Post-Doctoral Fellow	Research Associate, UAB
Kevin Perez, M.D.	1998-1999	Post-Doctoral Fellow	Infectious Diseases Practice Pittsburgh, PA
Javier Tello, M.D.	1994-95	Post-Doctoral Fellow	Infectious Diseases Practice Orlando, FL
Anju Bansal, Ph.D.	1996-2002	Post-Doctoral Fellow	Research Associate, UAB
Stephen Clark, MD	1989	Medicine Resident (4-month rotation in lab)	Infectious Diseases Practice, Medford, Oregon

c. *Residency Program:* See 24. Above.

*d. Other:**Graduate Student Committees Served On (University of Alabama at Birmingham):*

<i>Student</i>	<i>Department</i>	<i>Mentor</i>	<i>Years</i>
Karl Salzwedel	Microbiology	E. Hunter	1995-97
George Wang	Microbiology	<b>M. Mulligan</b>	1996-99
Angela Giddings	Microbiology	<b>M. Mulligan</b> /E. Hunter	1996-01
Donna Porter	Microbiology	C. Morrow	1993-95
Xuefen Huang	Microbiology	R. Compans	1992-94
Peter Spies	Microbiology	R. Compans	1991-93
Mallory Johnson	Psychology	T. Elliott	1996-98
Xiaoxu Lin	Microbiology	E. Hunter	1997-2002
Bryan Tillman	Molecular and Cellular Pathology	D. Curiel	1997-99
Kit Shaw	Microbiology	<b>M. Mulligan</b> /P. Goepfert	1997-2002

*Students Trained:*

<u>Name</u>	<u>Date</u>	<u>Position in Lab</u>	<u>Current/Last known Position</u>
Yen Deng-Ho	1991	Summer Student Harvard University (undergraduate)	Unknown
Stuart Cohen	1992-93	4th Year Medical Student	Assoc Professor, Department of Medicine UAB
Frank Holmes	1992	Summer Student (1st year UAB Medical School)	Unknown
Kelly Johnson	1994	Summer Student Auburn University (Undergraduate)	Unknown
Nicollete deVore	1994	CMB Rotation Student	Graduate Student, Cellular and Molecular Biology, UAB
Helen Harrison	1995	Summer Student (1st year med. student)	Unknown
Rusty Bishop	1996	CMB Rotation Student	Graduate student, CMB Program, UAB

*Research Assistants, Technicians Trained:*

<u>Name</u>	<u>Date</u>	<u>Position in Lab</u>	<u>Current/last known Position</u>
G. Douglas Ritter	1989-2004	Research Associate	Same
Galina Yamshchikov	1990-92	Research Assist I, II	Research Associate, FDA
Clinton D. Nail	1991-95	Research Assist I	Research Assoc, UAB
Anthony Gordon	1992	Laboratory Tech	Clinical Laboratory Tech. SmithKline Beecham Lab, Birmingham, AL
Zhong Li	1992-1994	Laboratory Assist	Data Manager, OB-Gyn, UAB
Anna Bickerstaff	1992-93	Laboratory Aide	Retired
Xiaobing Peng	1994-2000	Research Assistant	Research Assistant, VaxGen, Inc.
Honghong Yuan	1995-1999	Research Assistant	Computer Programmer, San Francisco
Veronica Owens	1997-2000	Research Assistant	Optometry School, UAB
Brad Edwards	1998-2001	Research Technician	UAB Medical School, Class of 2006
Christopher Perkins	1999-2004	Research Assistant	Same

26. Lectureships, Seminar Invitations, and Visiting Professorships:

- Invited Speaker, Translational Research in Progress Series (TRIPS), “The Trials and Epitopes of Human AIDS Vaccines”, Center for AIDS Research, Yerkes Primate Research Center of Emory University, 2000
- Invited Speaker, “HIV Vaccines in the Future”, Distinguished Faculty Series in HIV, State of Florida HIV/TB Grand Rounds Program, Florida Department of Health, The University of Miami, and The American Lung Association of Florida, West Palm Beach, Florida, January 2001
- Invited Speaker, Medical Grand Rounds, “Human Trials of HIV Vaccines at UAB”, Department of Medicine, University of Alabama at Birmingham, 2001
- Invited Speaker: “Development of an HIV Vaccine”, Okaloosa AIDS Support and Services (OASIS) meeting, Fort Walton Beach, FL, May 2001
- Panel Member, Anthrax Forum, “Anthrax Vaccine Update”, UAB School of Public Health November, 2001
- Invited Speaker: “Anthrax Vaccine Research at UAB”, Department of Family and Community Medicine Noon Conference, September, 2002
- Invited Speaker: “Old and New: Anthrax and AIDS Vaccine Trials at UAB”, UAB Comprehensive Cancer Center Seminar Series, January, 2002
- Speaker: “Anthrax Vaccine”, Staff Education Day, The Kirklin Clinic at UAB, April, 2002
- Invited Speaker: “The ‘Holey’ Grail: Two Decades of the AIDS Vaccine Quest”, CFAR Soiree, Center for AIDS Research, Emory University, May 2006

27. Invitations to National or International Conferences:

- Invited Speaker: “Progress on HIV Vaccines”, HIV/AIDS Update 11 Conference, course directors Michael Saag and Harold Kessler, Fort Lauderdale FL, March 2001

28. Other Activities:*Training:*

In 2002, Dr. Mulligan at UAB formally expanded the mission of the Alabama Vaccine Research Clinic to embrace training of vaccine researchers in clinical and laboratory research methods.

- 2002 Three Rwandan nurses trained in preparation for the first HIV vaccine clinical trial in their country; sponsored by the International AIDS Vaccine Initiative (IAVI); trial began in November 2005.
- 2003 Two physicians from Mali trained in vaccine trial methods in preparation for a trial of a candidate malaria vaccine in Mali; sponsored by NIH.
- 2003 Four physicians from Zambia were trained in vaccine clinical trials methodology; first HIV vaccine trial began in their country in 2006.

29. Bibliography:a. *Published and accepted research articles (clinical, basic science, other) in refereed journals:*

1. **Mulligan MJ**, Vasu R, Grossi C, Prasthofer EF, Griffin FM, Kapila A, Trupp JM, and Barton JC. Neoplastic meningitis with eosinophilic pleocytosis in Hodgkin's Disease: a case with cerebellar dysfunction and a review of the literature. *Amer J Med Sci* 1988; 296(5):322-327.
2. **Mulligan MJ**, Cobbs CG. Bacteriostatic versus bactericidal activity. *Inf Dis Clin N Amer* 1989;(3):389-398.
3. **Mulligan MJ**, Kumar P, Hui H, Owens RJ, Ritter GD, Hahn BH, and Compans RW. The *env* protein of an infectious noncytopathic HIV-2 is deficient in syncytium formation. *AIDS Res Hum. Retro* 1990; 6:707-720.
4. Owens RJ, Tanner CC, **Mulligan MJ**, Srinivas RV, Compans RW. Oligopeptide inhibitors of HIV-induced syncytium formation. *AIDS Res. Hum. Retro* 1990;11:1289-1296.
5. Wells D, Chatterjee S, **Mulligan MJ**, and Compans RW. Inhibition of HIV-1-induced cell fusion by recombinant human interferons. *J Virol* 1991; 65(11):6325-6330.
6. **Mulligan MJ**, Ritter D, Chaikin M, Yamshchikov GV, Kumar P, Hahn BH, Sweet R, and Compans RW. Human immunodeficiency virus type 2 envelope glycoprotein: differential CD4 interactions of soluble gp120 versus the assembled envelope complex. *Virology* 1992; 187:233-241.
7. **Mulligan MJ**, Yamshchikov GV, Ritter GD, Gao F, Jin MJ, Nail CD, Spies CP, Hahn BH, and Compans RW. Cytoplasmic domain truncation enhances fusion activity by the exterior glycoprotein complex of human immunodeficiency virus type 2 in selected cell types. *J Virol* 1992; 66(6):3971-3975.
8. Saag M, Powderly WG, Cloud GA, Robinson P, Grieco MH, Sharkey PK, Thompson SE, Sugar AM, Tuazon CU, Fisher JF, Hyslop N, Jacobson JM, Hafner R, Dismukes WE, and the NIAID Mycoses Study Group\* and the AIDS Clinical Trials Group (\***M. Mulligan**

- cited as contributing member). Comparison of amphotericin B with fluconazole in the treatment of acute AIDS-associated cryptococcal meningitis. *New England Journal of Medicine* 1992; 326:83-89.
9. Marx PA, Compans RW, Gettie A, Staas JK, Gilley RM, **Mulligan MJ**, Yamshchikov G, Chen D, and Eldridge JH. Protection against vaginal SIV transmission with microencapsulated vaccine. *Science* 1993; 260 (5112): 1323-1327.
  10. Ritter GD, **Mulligan MJ**, Lydy SL, and Compans RW. Cell Fusion Activity of the Simian Immunodeficiency Virus Envelope Protein is Modulated by the Intracytoplasmic Domain. *Virology*, 1993; 197:255-264.
  11. Spies CP, Ritter GD, **Mulligan MJ**, and Compans RW. Truncation of the cytoplasmic domain of the simian immunodeficiency virus envelope glycoprotein alters the conformation of the external domain. *J. Virol* 1994; 68(2):585-591.
  12. Belshe RB, Bolognesi DP, Clements ML, Corey L, Dolin R, Graham B, **Mulligan MJ**, Mestecky J, Stablein D. "HIV infection in vaccinated volunteers" *JAMA* 1994; 272(6):431.
  13. Ball JM, Moldoveanu Z, Melsen L, Kozlowski P, Jackson S, **Mulligan MJ**, Mestecky J, and Compans RW. A polarized human endometrial cell line that binds and transports polymeric IgA. *In Vitro* 1995; 31:196-206.
  14. Goepfert PA, Wang G, and **Mulligan MJ**. Identification of an E.R. Retrieval signal in a retroviral glycoprotein. *Cell* 1995; 82:543-544.
  15. Ritter GD, Yamshchikov G, Cohen SJ, **Mulligan MJ**. Human immunodeficiency virus type 2 glycoprotein enhancement of particle budding: role of the cytoplasmic domain. *J. Virol* 1996; 70:2669-2673.
  16. Goepfert PA, Ritter GD, Gbakima A, Zhang Y, **Mulligan MJ**. Analysis of west African hunters for foamy virus infections. *AIDS Res Hum Retro* 1996; 12:1725-1730.
  17. Ball, J.M., **Mulligan, MJ**, and Compans, R.W. Basolateral sorting of the HIV-2 and SIV envelope glycoproteins in polarized epithelial cells: role of the cytoplasmic domain. *AIDS Res Hum. Retro* 1997; 13 (8):665-675.
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  20. Tello J, Soong S-J, Hunter B, Meriwether R, Hook EW, and **Mulligan, MJ**. AIDS vaccine acceptance among heterosexual clients of a sexually transmitted diseases clinic. *Amer J MedSci* 1998; 315(1):11-16.
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- vaccines. *J. Infec. Dis* 1998; 177:310-319.
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  26. **Mulligan MJ** and Weber J. Human trials of HIV vaccines. *AIDS* 1999; 13 (Suppl A): S105-S112.
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  28. Evans TG, Keefer MC, Weinhold K, Wolff M, Montefiori D, Gorse GJ, Graham B, EcElrath J, Clements-Mann ML, **Mulligan MJ**, Fast P, Walker MC, Excler J-L, Duliege AM, Tartaglia J, and the NIAID AIDS Vaccine Evaluation Group. A canarypox vaccine expressing multiple HIV-1 genes given alone or with rgp120 elicits broad and durable CD8<sup>+</sup> CTL responses in seronegative volunteers. *J Infec Dis* 1999 ; 180:290-298.
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  33. The AIDS Vaccine Evaluation Group 022 Protocol Team\*. Cellular and humoral immune responses to a canarypox vaccine containing human immunodeficiency virus type 1 Env, Gag, and Pro in combination with RGP120. *J Infect Dis* 2001; 183:563-570. (\* **Mark Mulligan** listed as member of protocol team)
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- Self S, McNamara J, Flores J, Excler JL, Klein M, Habib R, Duliege AM, Burke D, Corey L, Keefer M, **Mulligan MJ**, Wright P, Celum C, Judson F, Mayer K, McKiran D, Marmor M, Metzger D. Safety and immunogenicity of a canarypox vectored HIV-1 vaccine with or without gp120: a phase II study in higher and lower risk volunteers. *J Infect Dis* 2001; 183(9):1343-52.
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39. Tang J, Wilson CM, Meleth S, Myracle A, Lobashevsky E, **Mulligan MJ**, Douglas SD, Korber B, Vermund SH, Kaslow RA, and the REACH Cohort Study Group. Host genetic profiles predict virological and immunological control of HIV-1 infection in adolescents. *AIDS* 2002; 16:2275-84.
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45. Bansal A, Sabbaj S, Edwards BH, Ritter GD, Perkins C, Tang J, Szinger JJ, Weiss H, Goepfert PA, Korber B, Wilson CM, Kaslow RA, and **Mulligan MJ**. T-Cell responses in HIV type 1-infected adolescent minorities share similar epitope specificities with whites despite significant differences in HLA class I alleles. *AIDS Res Hum Retro* 2003; 19:1017-1026.
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49. The rgp120 HIV Vaccine Study Group (**MJ Mulligan** listed as member of study group). Placebo-Controlled Phase3 Trial of a Recombinant Glycoprotein 120 Vaccine to Prevent HIV-1 Infection. *J Infect Dis*. 2005; 191:654-665
50. **Mulligan MJ**, Russell ND, Celum C, Kahn J, Noonan E, Montefiori D, Ferrari G, Weinhold K, Smith JM, Amara R, and Robinson HL, for the NIH/NIAID/DAIDS HIV Vaccine Trials Network. Excellent Safety and Tolerability of the Human Immunodeficiency Virus Type 1 pGA2/JS2 Plasmid DNA Priming Vector Vaccine in HIV-1 Uninfected Adults. *AIDS Res Hum Retro*. 2006; 22(7):678-683.
51. Tong-Ming Fu, Sheri A. Dubey, Devan V. Mehrotra, Daniel C. Freed, Wendy L. Trigona, Lisa Adams-Muhler<sup>1</sup>, James H. Clair, Thomas G. Evans, Roy Steigbigel, Jeffrey Jacobson, Paul Goepfert, **Mark J. Mulligan**, Spyros Kalams, Charles Rinaldo Jr., Christine Kalinyak, Lan Zhu, Kara Punt, Liming Guan, Rommie Long, Natasha Persaud, Michael J. Caulfield, Jerald C. Sadoff, Emilio A. Emini, Scott J. Thaler, and John W. Shiver. Evaluation of Cellular Immune Responses in Subjects Chronically Infected with HIV-1. In Press, *AIDS Res Hum Retro.*, 2006.

*b. Manuscripts submitted:*

*Manuscripts in preparation:*

1. Marano N, Plikaytis BD, Martin SW, Rose C, McNeil M, Quinn CP, Semenova V, Li H, Martin S, Babcock J, Keitel W, Keyserling H, Mulligan MJ, Parker S, Poland G, Perkins BA, Rosenstein N, and the Anthrax Vaccine Research Program Working Group. Anthrax Vaccine Adsorbed: New regimen elicits non-inferior antibody responses and improves adverse event profile. In preparation for submission to *New Engl J Med*.
2. Nina D. Russell, Barney S. Graham, Michael C. Keefer, M. Juliana McElrath, Steve G. Self, Mark Deers, Kent J. Weinhold, David C. Montefiori, Guido Ferrari, Helen Horton, Georgia D. Tomaras, Sanjay Gurunathan, Lynn Baglyos, Sharon E. Frey, Mark J. Mulligan, Clayton D. Harro, Susan P. Buchbinder, Lindsey R. Baden, William A. Blattner, Beryl A. Koblin, Lawrence Corey and the NIAID HIV Vaccine Trials Network.

A Qualifying Phase II Study of an HIV-1 Canarypox Vaccine (vCP1452), Alone and in Combination with rgp120, Fails to Trigger a Phase III Correlate of Efficacy Trial. In preparation for submission to Vaccine.

c. *Review articles:*

1. **Mulligan MJ.** Questions About AIDS Vaccines. Questions Newsletter, UAB AIDS Center, Winter Issue 1994
2. **Mulligan MJ.** AZT in Pregnancy Prevents Newborn Infections, Questions Newsletter, UAB AIDS Center, Fall Issue, 1994

d. *Symposium Contributions:* NA

e. *Book chapters:*

1. Srinivas RV, **Mulligan MJ**, Owens RJ, Srinivas SK, Anantharamaiah GM, Segrest JP, and Compans RW. Inhibitors of HIV-induced membrane fusion. In: Membrane Interactions of Human Immunodeficiency Virus, Advances in Membrane Fluidity. Aloia RC, Curtain CC, Gordon LM, eds., John Wiley & Sons, New York, NY 1992: Volume 6, 187-202.

f. *Books edited and written:* NA

g. *Book reviews:* NA

h. *Manuals, videos, computer programs, and other teaching aids:*

1. Appearance on Oprah Winfrey Show, 1997, to discuss progress on HIV vaccine development
2. Update on HIV Vaccine Research, 2004, audio recording for Medical Knowledge Self-Assessment Program (MKSAP)

i. *Other publications:*

a. *Published Abstracts:*

1. **Mulligan MJ**, Kumar P, Hui H, Ritter D, Hahn B, and Compans R. HIV-2 Envelope Glycoproteins and Cell Fusion. Abstract # 4589. V International Congress on AIDS, Montreal, 1989
2. **Mulligan MJ**, Kumar, P, Hui H, Owens R, Ritter D, Hahn B, and Compans RW. The env Gene Product of an Infectious, Noncytopathic HIV-2 is Deficient in Syncytium Formation. Abstract. 29th Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC), Houston, Texas, 1989
3. **Mulligan MJ**, Ritter D, Hahn B, Owens R, and Compans RW. Properties of Env proteins of HIV-1 and HIV-2. Abstract: #10, Second Annual Meeting of AIDS National Cooperative Vaccine Discovery Groups, Ft. Lauderdale, FL, 1989
4. **Mulligan MJ**, Kumar P, Hui, H., Ritter D, Hahn B, and Compans RW. HIV-2/ST env Gene Product is Unable to Fuse Cells. Abstract. American Society for Virology, London, Ontario, 1989
5. **Mulligan M**, and Ritter D. HIV Envelope Proteins, CD4, and Cytopathicity. Abstract. American Society for Virology 9th Annual Meeting, Salt Lake City, Utah, July 1990

6. **Mulligan MJ**, Ritter D, Chaikin M, Compans RW, and Sweet R. Correlation of CD4 Binding and HIV Cytopathicity. Abstract. Thirtieth ICAAC, Atlanta, GA, October 1990
7. Curiel TJ, Gorczyca PF, **Mulligan MJ**, Clark SJ, Compans RW, Schooley RT, Wong JT, and Walker BD. CD4+ Cytotoxic T-lymphocytes from an HIV-1 Infected Patient Cross-react with HIV-2 Envelope Antigens. Abstract. Third Annual Meeting of National Cooperative Vaccine Development Groups for AIDS, Clearwater Beach, FL, October 1990
8. Owens RJ, Dubay, JW, Bernstein BH, Ritter GD, **Mulligan MJ**, Hunter E, and Compans RW. The Human Immunodeficiency Virus Envelope Protein Determines the Site of Virus Release in Polarized Epithelial Cells. Abstract. Seventh International Conference on AIDS, Florence, Italy, June 1991
9. Ritter GD, **Mulligan MJ**, and Compans RW. Expression and Biological Activity of SIV Envelope Proteins. Abstract. American Society for Virology, 10th Annual Meeting Colorado State University, Fort Collins, July 1991
10. **Mulligan MJ**, Ritter GD, Yamshchikov G, Compans RW. Expression and Biological Activity of SIV<sub>mac</sub> Envelope Proteins. Abstract. International Conference on Advances in AIDS Vaccine Development: Fourth Annual Meeting of the National Cooperative Vaccine Development Groups for AIDS, Marco Island, FL, October 1991
11. Koziel M, Kanki PJ, MBoup S, Siby T, Dudley D, **Mulligan M**, Wong J, Panicali D, and Walker B. Detection of HIV-2-Specific Cytotoxic T Lymphocytes in Seropositive. Individuals. Abstract. VI International Conference on AIDS in Africa, Dakar, Senegal, December 1991
12. **Mulligan MJ**, Ritter GD, Chaikin MA, Yamshchikov GV, Hahn BH, Sweet RW, and Compans RW. Human Immunodeficiency Virus Type 2 Envelope Glycoprotein: Differential CD4 Interactions of Soluble gp120 versus the Assembled Envelope Complex. Abstract. Southern Society for Clinical Investigation, Southern Meeting, New Orleans, LA, January 1992
13. Hahn BH, Kumar P, Gao F, Brass L, Kappes JC, **Mulligan MJ**, Sweet RW, Shaw GM, and Hoxie JA. Mechanisms of Envelope Mediated Cell Fusion in HIV-2. Abstract. Cell Biology of Virus Entry, Replication and Pathogenesis, Keystone Symposium, Taos, New Mexico, February 1992
14. **Mulligan M**, Yamshchikov GV, Ritter GD Jr., Gao F, Jin MJ, Nail CD, Hahn BH, Compans RW. Cytoplasmic Domain Truncation Enhances Fusion Activity by the Exterior Glycoprotein Complex of Human Immunodeficiency Virus Type 2 in Selected Cell Types. Abstract. Prevention and Treatment of AIDS, NIH AIDS Post-Doctoral Fellows Meeting, Keystone, Colorado, March 1992
15. Ritter GD Jr., **Mulligan MJ**, Nail CD, Yamshchikov GV, and Compans RW. SIV Transmembrane Protein Truncation Enhances Cell Fusion Activity. Abstract. American Society for Virology, 11th Annual Meeting, Ithaca, New York, July 1992
16. Spies CP, Ritter GD, **Mulligan MJ**, and Compans RW. Effects of Transmembrane Protein Truncation on Surface Expression of SIV Envelope Proteins. Abstract. American Society for Virology, 11th Annual Meeting, Ithaca, New York, July 1992
17. Spies CP, Ritter GD, **Mulligan MJ**, and Compans RW. SIV Transmembrane Protein Truncation Enhances Syncytium Formation and Alters Glycoprotein Surface Expression. Abstract. A World United Against AIDS, VIII International Conference on AIDS/III STD World Congress, Amsterdam, the Netherlands, July 1992

18. Marx PA, Gettie A, Eldridge JH, Staas JK, Gilley RM, **Mulligan MJ**, Mestecky J, and Compans RW. Inactivated SIV in Biodegradable Microspheres Protects Rhesus Macaques From Vaginal Challenge. Abstract. Advances in AIDS Vaccine Development; Fifth Annual Meeting of the National Cooperative Vaccine Development Groups for AIDS, Chantilly, Virginia, September 1992
19. **Mulligan MJ**, Yamshchikov GV, Ritter GD Jr., Gao R, Jin MJ, Nail CD, Hahn BH, and Compans RW. Role of the Cytoplasmic Domains of HIV-2 and SIV<sub>mac</sub> Glycoproteins in Viral Fusion Activity and Assembly. Abstract. Infectious Diseases Society of America (IDSA) Annual Meeting, Anaheim, California, October 1992
20. Ball JM, Ritter D, **Mulligan MJ**, and Compans RW. Sorting of the Human Immunodeficiency Virus Envelope Glycoprotein in Polarized Epithelial Cells. Abstract. Second International Symposium, Immunobiology and Pathogenesis of Persistent Virus Infections, Savannah, GA, October 1992
21. Marx PA, Gettie A, Eldridge JH, Staas JK, Gilley RM, **Mulligan MJ**, Mestecky J, and Compans RW. Inactivated SIV in Biodegradable Microspheres Protects Rhesus Macaques From Vaginal Challenge. Abstract. Tenth Annual Symposium on Nonhuman Primate Models for AIDS, San Juan, Puerto Rico, November 1992
22. Yamschikov G, Ritter D, **Mulligan, MJ**, and Compans R. Simian Immunodeficiency Virus - Like Particles Produced by a Baculovirus Expression System. Abstract. American Society for Virology 12th Annual Meeting, University of California, Davis, CA, July 1993
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