WEILL CORNELL MEDICAL COLLEGE
NEW YORK-PRESBYTERIAN HOSPITAL

DEPARTMENT OF MEDICINE

DIVISION OF INFECTIOUS DISEASES

DIVISIONAL PROGRAMS & FACULTY AND FELLOW PROFILES

2011-2012

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DIVISION OF INFECTIOUS DISEASES -- INTRODUCTION

The mission of the Division of Infectious Diseases (ID) at Weill Cornell Medical College and New York-Presbyterian Hospital (NYPH) is to conduct cutting-edge research; to provide outstanding clinical care; and to provide the highest quality education and training in infectious diseases. The Division has over 50 full-time, affiliated, voluntary and adjunct faculty members and includes basic, translational, clinical, and epidemiologic research programs; the ID clinical services at NYPH-Weill Cornell Medical Center; and the ID Fellowship Training Program.

The Division of ID facilities include over 12,000 square feet of research and administrative space. There are 10 research laboratories (7,500 sq. ft.) equipped for basic and translational molecular, microbiological, and immunologic studies and staff offices. Major laboratory research projects investigate antibiotic and antifungal drug development, bacterial pathogenesis, bioterrorism agents, influenza, leishmaniasis, malaria, and tuberculosis. Major clinical research projects investigate bacterial drug resistance, hepatitis, HIV/AIDS, hospital epidemiology/infection control, human papillomavirus, and transplantation ID. Current funding for sponsored research and training in the Division of ID in 2011-2012 exceeds $7 million.

The clinical facilities of the division serve both outpatients and inpatients from the New York City area. ID Associates, located across the street from the medical school at 450 East 69th Street, includes the ID faculty and fellows outpatient practices, serving both immunocompetent and immunosuppressed patients, and the Travel Medicine service that is staffed by the faculty and provides travel advice and immunizations for 3,000-4000 travelers annually. Inpatients are seen at New York Presbyterian Hospital, a large 867-bed tertiary care hospital, and the Hospital for Special Surgery, a 172-bed rheumatology and orthopedic specialty hospital, co-located on the Upper East Side of Manhattan. The HIV/AIDS Program provides care to over 2,500 HIV-infected persons, in addition to conducting translational and clinical research. The Center for Special Studies (the HIV primary care clinic, a New York State-designated AIDS Center) and the Cornell HIV Clinical Trials Unit (CCTU) outpatient facilities occupy two floors of NYPH as well as an off-site location in the Chelsea neighborhood of Manhattan (West 24th Street and 6th Avenue). Other major clinical programs in the division are the Transplantation/Oncology ID Service, serving patients with stem cell transplants, solid organ transplants (kidney, pancreas, liver) and/or malignancies, and the Hospital Epidemiology/Infection Control Program.

The Center for Global Health coordinates the division's international network of research and training programs, including our activities in Brazil, Haiti, and Tanzania, with faculty at each site. These sites offer clinical and research opportunities for Weill-Cornell medical students, residents, fellows and faculty. Research interests include HIV/AIDS, HTLV-1, leptospirosis, leprosy, malaria, leishmaniasis, leptospirosis, schistosomiasis, and tuberculosis.

The Fellowship Training Program in ID provides intensive clinical and research training for developing physician-scientists. Graduates of the program are highly qualified to conduct research, provide clinical care, and assume leadership roles in ID. Our fellows typically go on to academic faculty appointments and/or positions in state, federal, or international public health organizations. The ID fellowship training program emphasizes both inpatient and ambulatory clinical training during the first year. The second and third years emphasize basic, translational, clinical, or epidemiologic research at Weill-Cornell, Rockefeller University (including the Aaron Diamond AIDS Research Center), Memorial Sloan-Kettering Cancer Center, or other affiliated programs. Fellow research training is supported by an NIH-sponsored T-32 Training Grant. Additional training is available through Masters degree programs in clinical investigation or clinical epidemiology/health services research and other specialized training programs in clinical microbiology, preventive medicine, and public health. In addition, our division offers clinical electives in ID and HIV/AIDS for residents and medical students and sponsors educational programs for providers at NYPH and in the community.

DIVISION OF INFECTIOUS DISEASES FACULTY

Roy M. Gulick, MD, MPH
Professor of Medicine and Chief, Division of Infectious Diseases

Elizabeth L. Alexander, MD Instructor in Medicine	Staphylococcus aureus	**Catherine C. Hart, MD** Clinical Assistant Professor of Medicine	Clinical Infectious Diseases
Susan Ball, MD, MPH Associate Professor of Clinical Medicine	Clinical HIV	**Barry J. Hartman, MD** Clinical Professor of Medicine	Antibiotic Therapy
Barry Brause, MD Professor of Clinical Medicine	Bone and Joint Infections	**David C. Helfgott, MD** Clinical Assistant Professor of Medicine	Infections in Immunocompro-mised Hosts
David Calfee, MD, MS Associate Professor of Medicine (appointment pending) Chief Hospital Epidemiologist	Hospital Epidemiology/ Infection Control	**Jonathan L. Jacobs, MD** Professor of Clinical Medicine Executive Director, Center for Special Studies (HIV primary care clinic)	Clinical HIV
Macarthur Charles, MD, PhD [Haiti] Assistant Professor of Medicine	HIV Drug Resistance	**Stephen .G. Jenkins, PhD** Professor of Pathology and Laboratory Medicine Professor of Pathology in Medicine	Clinical Microbiology
Salvatore Cilmi, MD Assistant Professor of Medicine	Hospital Medicine	**Warren D. Johnson, Jr., MD** Professor of Medicine	Global Health
Jennifer A. Downs, MD [Tanzania] Instructor in Medicine	HIV and Schistosomiasis	**Sian Jones, MD** Assistant Professor of Medicine	Clinical HIV
Lewis M. Drusin, MD Professor of Clinical Medicine	Nosocomial Infections; STDs	**Laura A. Kirkman, MD** Instructor in Medicine Preceptor, ID Fellows Clinic	Malaria; Clinical Infectious Diseases
Laura L. Fisher, MD Clinical Assistant Professor of Medicine	Lyme Disease	**Kristen M. Marks, MD, MS** Assistant Professor of Medicine ID Fellowship Director	HIV / HCV Co-infection
Daniel W. Fitzgerald, MD Associate Professor of Medicine Co-Director, Center for Global Health	Global Health	**Samuel T. Merrick, MD** Associate Professor of Clinical Medicine Medical Director, Center for Special Studies (HIV primary care clinic)	Clinical HIV
Marshall J. Glesby, MD, PhD Associate Professor of Medicine Associate Chief, Division of Infectious Diseases	Clinical Trials of HIV, Hepatitis C and influenza	**Shari R. Midoneck, MD** Associate Professor of Clinical Medicine	Clinical Infectious Diseases; Women's Health
Linnie M. Golightly, MD Associate Professor of Clinical Medicine	Malaria; Bioterrorism Agents	**Andy O. Miller, MD** Assistant Professor of Clinical Medicine	Bone/Joint and Rheumatologic Disease-Associated Infections

Henry W. Murray, MD Professor of Medicine	HIV; Leishmaniasis	**Harjot K. Singh, MD** Instructor in Medicine	Clinical HIV
Thomas W. Nash, MD Clinical Assistant Professor of Medicine	Clinical Infectious Diseases	**Duane M. Smith, MD** Assistant Professor of Clinical Medicine Associate Medical Director, Center for Special Studies (HIV primary care clinic)	Clinical HIV
Oksana Ocheretina, PhD Instructor of Biochemistry in Medicine	Global Health	**Paul T. Smith, MD** Clinical Assistant Professor of Medicine	Clinical Infectious Diseases
Anthony Ogedegbe, MD Assistant Professor of Medicine	Hospital Medicine	**Rosemary Soave, MD** Associate Professor of Clinical Medicine	Transplant ID
Jean W. Pape, MD [Haiti] Professor of Medicine Director, GHESKIO Center	Tuberculosis; HIV	**Charles A. Steinberg, MD** Professor of Clinical Medicine	Clinical Infectious Diseases
Robert N. Peck, M.D. [Tanzania] Assistant Professor in Medicine and Pediatrics	Medicine/ Pediatrics Education	**Mark Y. Stoeckle, MD** Clinical Associate Professor of Medicine	Viral Diseases; Antibiotics
Kyu Y. Rhee, MD, PhD Assistant Professor of Medicine	Antibiotic Development; Drug Resistance	**Carlos Vaamonde, MD, MSPH** Assistant Professor of Clinical Medicine	Clinical HIV; Antibiotic Control
Richard B. Roberts, MD Professor Emeritus of Medicine	Antimicrobial Resistance	**Mary A. Vogler, MD** Associate Professor of Clinical Medicine	Clinical HIV; HIV Clinical Trials; pregnancy
Howard E. Rosenberg, MD Clinical Assistant Professor of Medicine	Clinical Infectious Diseases	**Thomas Walsh, MD** Professor of Medicine (appointment pending) Director, Transplant/Oncology Infectious Diseases Service	Transplant ID; Fungal Pathogenesis
Michael A. Rosenbluth, MD Clinical Assistant Professor of Medicine	Tropical Diseases	**Timothy J. Wilkin, MD, MPH** Associate Professor of Medicine	HIV Clinical Trials; HPV
Mirella Salvatore, MD Assistant Professor of Medicine	Immunology	**Stephen J. Wilson, MD, MPH** Associate Professor of Clinical Medicine (appointment pending) Hospital Epidemiologist	Hospital Epidemiology/ Infection Control
Audrey N. Schuetz, MD, MPH Assistant Professor of Pathology and Laboratory Medicine Assistant Professor of Medicine	Clinical Microbiology	**Cecilia Yoon, MD** Assistant Professor of Medicine	Clinical HIV; Medical Education
Lawrence Siegel, MD Instructor in Medicine	Clinical HIV; STDs		

DIVISION OF INFECTIOUS DISEASES FACULTY

Back Row – Left to Right: Howard Rosenberg, Jonathan Jacobs, Andy Miller, Stephen Wilson, Stephen Jenkins, Mary Vogler, Barry Brause, Lawrence Siegel **Second Row from top – Left to Right:** Mirella Salvatore, Laura Kirkman, David Helfgott, Charles Steinberg, Lewis Drusin, Sian Jones, Cecilia Yoon **Third Row from top – Left to Right:** Thomas Walsh, Kristen Marks, David Calfee, Kyu Rhee, Elizabeth Alexander, Barry Hartman **Front Row – Left to Right:** Linnie Golightly, Marshall Glesby, Roy (Trip) Gulick, Harjot Singh, Rosemary Soave

ADJUNCT FACULTY

Edgar M. Carvalho, MD, PhD **[Universidade Federal da Bahia, Brazil]** Adjunct Professor of Medicine	Immunology; Leishmaniasis	**Susan C. Nicholson, MD** Assistant Professor of Medicine (courtesy)	Skin and Soft Tissue Infections
R. Gordon Douglas, Jr., MD Adjunct Professor of Medicine	Vaccines	**Mina Pastagia, MD** **[Rockefeller U.]** Adjunct Assistant Professor of Medicine	Staphylococcus aureus
Thomas C. Jones, MD Adjunct Professor of Medicine	Clinical Trials	**Steven G. Reed, PhD** **[U. of Washington]** Adjunct Professor of Microbiology in Medicine	Antigen Discovery
Jose R. Lapa e Silva, MD, PhD **[Universidade Federal do Rio de Janeiro, Brazil]** Adjunct Professor of Immunology in Medicine	TB Pathogenesis	**Lee W. Riley, MD** **[U. California, Berkeley]** Adjunct Professor of Medicine	Molecular Epidemiology
Martin H. Markowitz, MD **[Rockefeller U.]** Adjunct Assistant Professor of Medicine	HIV		

INFECTIOUS DISEASES STAFF

Top (left to right): Leyla Pistone, Eduardo Baez, Glenn Sturge
Bottom (left to right): Donna Reyes, Roy Gulick, MD, MPH, Marisol Valentin

Staff Member	Title	Email Address
Eduardo Baez	Division Administrator	edb2005@med.cornell.edu
Roy (Trip) Gulick, MD	Division Chief	rgulick@med.cornell.edu
Leyla Pistone	Education Coordinator	lef2009@med.cornell.edu
Donna Reyes	Executive Assistant	dor2011@med.cornell.edu
Glenn Sturge	Grants and Finance Manager	gls2003@med.cornell.edu
Marisol Valentin	Operations Manager	mav2009@med.cornell.edu

INFECTIOUS DISEASES FELLOWSHIP TRAINING PROGRAM

Mission

The major goal of our program is the training of academic physician-scientists. We provide a wide variety of clinical training experiences in different venues including: the inpatient consult services of New York-Presbyterian (NYPH)/Weill Cornell (general and immunocompromised), the Hospital for Special Surgery (orthopedics, rheumatology), and Memorial Sloan Kettering Cancer Center; weekly outpatient clinic experiences encompassing general ID, HIV/AIDS, and travel medicine; clinical elective rotations; clinical microbiology laboratory and hospital epidemiology rotations; and a sexually transmitted disease rotation at the NYC Department of Health. All fellows develop a research project in collaboration with one or more faculty mentors from Weill-Cornell, Rockefeller University, or Memorial Sloan-Kettering Cancer Center. Fellows' research projects span basic, translational, clinical, and epidemiologic research in diverse areas of investigation. The majority of our fellowship graduates seek careers either in academia, government or with private foundations.

Clinical Rotations

The New York- Presbyterian Hospital-Weill Cornell Medical Center is the primary institution of our fellowship training program. The medical center is located in a large clinical and research complex on the Upper East Side of Manhattan. New York-Presbyterian Hospital (NYPH) is the current name of what were formerly two distinct institutions: the Cornell-New York Hospital and the Columbia-Presbyterian Medical Center. Currently, New York-Presbyterian Hospital is the largest health care facility in the New York Metropolitan area and one of the largest and most prestigious within the world. The Greenberg Pavilion of the New York-Presbyterian Hospital (Cornell campus) is a one million square foot facility with 867 patient beds. Weill-Cornell Medical College and Columbia College of Physicians and Surgeons remain independent institutions with separate infectious diseases fellowship programs.

The clinical rotations are concentrated in the first year of training. First-year fellows spend ~10 months on clinical rotations and second-year fellows spend ~2 months, with the majority of this time spent on the inpatient consultation service. Our active consultation service serves a broad range of complex medical and surgical patients. On average, the consult service manages 80-90 inpatient consults per month from both New York-Presbyterian Hospital as well as Hospital for Special Surgery (affiliated 172-bed hospital renowned for treatment of orthopedic and rheumatologic conditions). An infectious-disease trained specialty PharmD participates actively on the consult service as do Cornell's Internal Medicine residents and 4th year medical students. In addition to NYPH general ID consult service, fellows rotate on our immunocompromised host and transplant services (bone marrow and solid organ transplantation including kidney, liver, and pancreas). They also spend one month on the Memorial Sloan-Kettering Cancer Center (MSKCC) inpatient consultation service (MSKCC, located across the street, is a hospital specializing in oncologic evaluation and treatment). Fellows rotate through selected clinical electives including cardiovascular and neurologic infections, HIV/AIDS, orthopedic and rheumatologic infections, and pediatric infectious diseases. In addition, fellows also spend one month combined in NYPH's Clinical Microbiology Laboratory and in the Hospital Epidemiology/Infection Control Department. Fellows also have the option of an international elective at Weill Bugando Medical Center in Tanzania.

First- and second-year fellows participate in a weekly continuity outpatient clinic that alternates between care for patients with general infectious diseases and for patients with HIV/AIDS. Through the ambulatory care system, fellows build a panel of patients who they will follow over the course of the fellowship, with guidance from a faculty preceptor. Fellows also participate actively in the care of patients seeking consultation prior to international travel.

A sample schedule of the first two fellowship years follows:

Month	First Year	Second Year
July	NYPH Consult Service	Vacation Research
August	Vacation Microbiology Rotation	NYPH Consult Service
September	NYPH Consult Service	Research
October	NYPH Consult Service Research	Research
November	Memorial Sloan Kettering Cancer Center Consult Service	Research
December	Epidemiology Rotation Clinical Elective #1	Research Vacation
January	NYPH Consult Service	NYPH Consult Service
February	Immunocompromised Host Transplant Service	STD Clinic Rotation Research
March	Vacation Research	Research
April	NYPH Consult Service	Research
May	Clinical Elective #2 NYPH Consult Service	International Elective (Tanzania)
June	NYPH Consult Service Clinical Elective #3	Research

* During the epidemiology and microbiology rotations, the fellows see patients in Travel Medicine one evening per week.

Clinical Elective offerings:

- Cardiovascular/Neurosurgical Infections – Barry Hartman, MD
- HIV Outpatient Interdisciplinary Care Team – Harjot Singh, MD
- Orthopedic/Rheumatologic Infections – Barry Brause, MD
- Pediatric Infectious Diseases – Christine Salvatore, MD

Basic, Translational, Clinical, and Epidemiologic Research

Research training occupies the majority of the second and third years of fellowship. Fellows select from a broad range of research opportunities in basic, translational, clinical or epidemiologic research. Fellows conduct their research in the Weill-Cornell Division of Infectious Diseases, other divisions within the Department of Medicine (e.g. Gastroenterology/Hepatology), other departments within the Medical College (e.g. Department of Microbiology and Immunology, Department of Public Health), Rockefeller University, or the Memorial-Sloan Kettering Cancer Center. Faculty mentorship from these diverse institutions allows a wide diversity of research opportunities.

The Division has an NIH-sponsored T32 training grant to support research training of developing physician-scientists that supports fellows during their research years. The objective is to train physician-scientists in biomedical research, with an emphasis on the pathogenesis of infectious diseases. Weill Cornell also has an NIH-funded Clinical and Translational Science Center (CTSC) with state-of-the-art facilities for conducting translational and clinical research.

Our fellowship graduates have generally received independent research awards following their fellowship, primarily from the NIH, including K08 (Mentored Clinical Scientist Development Award), K23 (Mentored Patient-Oriented Research Career Development Award), and KL2 Post-doctoral Scholars awards. Of our past 14 fellows, 10 have received one of these awards (100% of those who applied) and 2 others have received foundation grants. Research topics for these awards have included agents of bioterrorism, HIV pathogenesis, HIV/TB coinfection, HIV & genital schistosomiasis, HIV vaccine development, HTLV-1, human papillomavirus, KSHV/HHV8, leishmania pathogenesis, leptospirosis, malaria, S. *aureus*, tuberculosis, and viral hepatitis.

Supplemental Training Programs

Other training programs within the medical college are available to supplement fellowship training, depending on the fellow's specific interests.

Clinical Research Training: Certificate and Masters Degree Programs
http://www.med.cornell.edu/clinicalresearch/ **–**The Graduate Program in Clinical and Translational Investigation at Weill Cornell Medical College trains patient-oriented researchers to conceive, design, and conduct independent clinical research in a well-structured cross-disciplinary team environment. The National Institutes of Health funds this program through their Clinical & Translational Science Award. The curriculum offers two tracks that are designed for rigorous training in clinical investigation. *Track I* is a core curriculum providing the basic skills of clinical investigation, leading to a **Certificate of Clinical Investigation**. It includes training in the development of research hypotheses and methods of hypothesis testing; grant writing and manuscript preparation; data collection, construction of databases and data management systems; computer programs for data analysis; statistical analysis and the appropriate use of various statistical techniques in clinical research; basic epidemiologic principles in clinical research; design and conduct of meta-analyses and clinical trials; ethics and human subjects protection in the conduct of patient-oriented research; regulatory requirements of clinical research; preparing protocols for the Institutional Review Board and other agencies; grants management and intellectual property; and general and specific state-of-the-art research tools and techniques. *Track II,* leading to a **Masters Degree in Clinical Investigation**, includes the core curriculum (Track I); additional electives in the trainee's area of interest; and a clinical research project mentored in its design and implementation by a clinical investigator. Members of the Infectious Disease Division (Drs. Glesby, Gulick, Wilkin) serve as faculty for this training program. Many of our fellows and junior faculty members have used this program to supplement their training as clinical researchers. A K30 training grant covers tuition for those accepted to the program.

Preventive Medicine Training
http://www.med.cornell.edu/public.health/res_gen.html **–** Weill Cornell's Department of Public Health offers a General Preventive Medicine Training Program, for which ID fellows are eligible after their initial year of clinical ID training. As part of the General Preventive Medicine Program, fellows are eligible to apply for an MPH program from the Columbia University School of Public Health and also are eligible for certification by both the American Board of Internal Medicine / Infectious Diseases and the American Board of Preventive Medicine. The program emphasizes epidemiology, biostatistics, clinical and preventive medicine, medical care organization, medical sociology, and health economics and education. Fellows take classes at Columbia and participate in Cornell's Public Health seminars and teaching program for undergraduate and medical students. Fellows also undertake an original research project.

Each fellow will have an individual program designed to meet his/her specific professional goals. Fellows have used this program to supplement their training in hospital epidemiology and public health.

Fellowship in Public Health Research

http://www.med.cornell.edu/publichealth/education_and_training/residencies_and_fellowships.html

In the second fellowship year, it is possible to facilitate a 1-2 year public health research experience in the Department of Public Health. Activities include mentored research and coursework in the Weill Cornell Masters Degree Program in Clinical Investigation. Supervised research including mentors from the Division of Infectious Diseases and faculty from the Department of Public Health is a key part of the training program. The fellowship also uses the conference and review procedures for post-graduate training in the Department of Public Health and leads to a certificate recognizing advanced public health research.

Graduate Program in Clinical Epidemiology & Health Services

http://www.cornellmedicine.com/clinical_practices_and_divisions/general_internal_medicine/education

The Graduate Program in Clinical Epidemiology & Health Services offers an 8-week intensive summer program or a 2-4 year Master of Science (MS) degree in Clinical Epidemiology & Health Services Research. The program is designed for fellows who wish to plan, implement and analyze quantitative and qualitative research studies, using appropriate research designs. The core of the curriculum includes research methodology, biostatistical techniques, data management, decision analysis, health economics and program evaluation. Graduates of the Masters program will be prepared to pursue academic careers in a variety of settings where data is required to answer complex questions. The emphasis is on training clinician researchers to teach research methods, conduct methodologically rigorous and scientifically sound studies, evaluate programs and perform cost-effectiveness and cost-benefit studies in a variety of populations. Many of our fellows doing international research have supplemented their clinical research training by participating in this program's Global Health track.

Medical Microbiology Fellowship Program

The Clinical Microbiology Laboratory offers a one-year ACGME-accredited fellowship in Medical Microbiology designed to train pathologists and infectious disease specialists for academic careers in Medical Microbiology, focusing on a combination of clinical research training and direction of laboratory services. Medical Microbiology fellows will primarily rotate through the Clinical Microbiology Laboratory of New York-Presbyterian Hospital-Weill Cornell Medical Center. In addition, fellows will spend time in the infectious disease-related serology section of the Central Laboratory and in the microbiology-related section of the Molecular Pathology Laboratory. The program provides individualized training through faculty guidance, mentored research, and didactic lectures. Trainees will gain hands-on experience in all aspects of clinical microbiology including bacteriology, mycobacteriology, mycology, parasitology, virology, antimicrobial susceptibility testing, infectious disease molecular testing, and serology through structured bench rotations. The fellows will participate in test development and evaluation as well as applied clinical research. The Medical Microbiology fellow not only will provide interfaces between Clinical Microbiology, Pathology, and Infectious Diseases, but will also aid in further education to clinicians and nursing staff on the importance of laboratory medicine in patient care, as well as the most appropriate methods for collection and transport of clinical specimens for diagnosis of infectious diseases. This fellowship will help prepare participants for a career in directing a clinical microbiology laboratory.

Divisional Conferences

A variety of conferences are offered to support education and training of Infectious Diseases Fellows. These include:

- Advanced Topics in Infectious Diseases (weekly lectures from WMC and MSKCC faculty or outside speakers on ID-related topics)
- Clinical Case Conference (weekly discussion of cases led by the fellows)
- Department of Microbiology and Immunology Research-In-Progress talks (monthly)
- Divisional Journal Club and Research Conference (alternating biweekly)
- Fellow Core Topics in Infectious Diseases (weekly basic lectures during the summer and every other week during the year)
- Fellow Journal Club (every other week)
- HIV Conference (weekly alternating with journal club, lectures, and discussion of ongoing clinical trials)
- ID Fellow Research-In-Progress talks (monthly)
- Intercity Infectious Disease Rounds (weekly rotating with other institutions in the New York area)
- Medical Grand Rounds (weekly)
- Microbiology Laboratory Plate Rounds (weekly review of interesting specimens, often from the clinical service)

CURRENT INFECTIOUS DISEASES FELLOWS (2011)

Name	Year of Fellowship	Medical School	Internal Medicine Residency	Research Project
Meera Pahuja, MD mep2002@med.cornell.edu	3	Virginia Commonwealth University	Weill Cornell	Stavudine-related peripheral neuropathy; Adolescent HIV Treatment in South Africa; Masters of Science program in Clinical Epidemiology and Health Services Research
Rituparna Pati, MD, MPH rip9009@med.cornell.edu	3	University of Connecticut	Weill Cornell	HIV care in Mozambique; Heterosexual anal intercourse in adolescents; Preventive Medicine Program
Michael Satlin, MD mjs9012@med.cornell.edu	3	University of Virginia	Weill Cornell	Treatment of multi-drug resistant gram-negative infections; Masters Program in Clinical Investigation
Kathryn Dupnik, MD kad9040@nyp.org	2	University of Virginia	Columbia	Leprosy in Brazil
Jyoti Mathad, MD jsm9009@nyp.org	2	Albany Medical College	University of Maryland	Latent TB and HIV in pregnancy in India; Masters of Science program in Clinical Epidemiology and Health Services Research
Selin Somersan, MD ses9022@nyp.org	2	Harvard	Weill Cornell	Pathogenesis of M. tuberculosis
Samantha Jacobs, MD sej9006@nyp.org	1	University of Pennsylvania	Mount Sinai	Transplant ID; Masters Program in Clinical Investigation (application pending)
Daniel Shirley, MD das9135@nyp.org	1	University of Kansas	University of Colorado Health Sciences Center	Tuberculosis; Preventive Medicine Program (application pending)

Matthew Simon, MD mss9008@nyp.org	1	Albert Einstein	Weill Cornell	Hospital-acquired infections; Preventive Medicine Program (application pending)
Bisrat Abraham, MD email pending	starts 7/11	Emory	Johns Hopkins	TBA
Leah Burke, MD email pending	starts 7/11	Boston University	Yale-New Haven Hospital	TBA
Matthew McCarthy, MD email pending	starts 7/11	Harvard	Columbia	TBA

Top Row – Left to Right: Selin Somersan, Michael Satlin, Meera Pahuja, Kathryn Dupnik, Daniel Shirley **Front Row – Left to Right:** Mathew Simon, Samantha Jacobs, Jyoti Mathad. Rituparna Pati (not pictured)

FORMER INFECTIOUS DISEASES FELLOWS (last 10 years)

Name	Medical School	Internal Medicine Residency	Period of Fellowship Training and Research Topic	Current Position / K Awards
Elizabeth Alexander, MD	Weill Cornell	Mt. Sinai	2007-2010 Staph. aureus	Instructor in Medicine, Weill Cornell KL-2 Post-doctoral Scholars Award
Jennifer Downs, MD	Weill Cornell	Columbia	2007-2010 Female genital schistosomiasis	Instructor in Medicine, Weill Cornell KL-2 Post-doctoral Scholars Award
Dahlene Fusco, MD	Albert Einstein	Massachusetts General Hospital	2006-2010 Immune responses to influenza	Instructor in Medicine, Harvard
Scott Weisenberg, MD	Tufts	University of California, San Diego	2005-2008 Tuberculosis	Staff Physician, Alta Bates Summit Medical Center, Oakland, CA; UCSF (faculty appointment pending) KL-2 Post-doctoral Scholars Award
Lawrence Siegel, MD	Brown	Beth Israel-Deaconess	2005-2008 HPV infection	Instructor in Medicine, Weill Cornell
Daniel Morgan, MD	University of Rochester	University of Rochester	2004-2008 HTLV-1; MRSA	Assistant Professor of Epidemiology and Preventive Medicine, Univ. of Maryland K08 Mentored Clinical Scientist Research Career Development Award
Laura Kirkman, MD	Albert Einstein	Yale-New Haven	2004-2008 Malaria	Instructor in Medicine, Weill Cornell K08 Mentored Clinical Scientist Research Career Development Award
Sandra Kesh, MD	Cornell	Weill Cornell	2004-2007 Antibiotic pharmacology	Instructor in Medicine, Weill Cornell; Westchester Medical Group

Macarthur Charles, MD, PhD	Albert Einstein	Weill Cornell	2003-2007 HIV drug resistance	Assistant Professor of Medicine, Weill Cornell K23 Mentored Patient-oriented Research Career Development Award
Marina Caskey, MD	Universidad Federal de Sergipe, Brazil	St. Luke's-Roosevelt	2003-2006 HTLV-1 epidemiology	Instructor in Clinical Investigation, Rockefeller University K23 Mentored Patient-oriented Research Career Development Award
Matthias Frank, MD, PhD	Free University, Berlin, Germany	University of Washington	2002-2006 Malaria antigens	Assistant Professor, Hamburg Institute for Tropical Medicine, Germany
Kristen Marks, MS, MD	Columbia	Weill Cornell	2002- 2005 HIV/HCV hepatic steatosis	Assistant Professor, Weill Cornell K23 Mentored Patient-oriented Research Career Development Award
Kyu Rhee, MD, PhD	University of California, Irvine	Weill Cornell	2001-2005 Tuberculosis	Assistant Professor, Weill Cornell K08 Mentored Clinical Scientist Research Career Development Award
David Gardiner, MD	Jefferson	Jefferson	2001-2004 HIV vaccines	Medical Director, Discovery Medicine, Virology Research and Development, Bristol-Myers Squibb K08 Mentored Clinical Scientist Research Career Development Award
Johanna Reina, MD	Escuela Colombiana de Medicina, Colombia	University of North Carolina	2000-2002 Leishmaniasis therapy	Physician, ID Associates of Central Virginia, Lynchburg, VA
Kiren Mitruka, MD	UMDNJ	Yale-New Haven	2000-2002 Malaria gene expression	Medical Officer and Epidemiologist, Division of Tuberculosis Elimination, CDC
Gonzalo Bearman, MD, MPH	SUNY Buffalo	SUNY Buffalo	2000-2003 Nosocomial infections	Associate Professor & Associate Hospital Epidemiologist, Virginia Commonwealth University

PUBLICATIONS RELATED TO FELLOWSHIP ACTIVITIES BY CURRENT AND RECENT FELLOWS

1. **Bearman G,** Fuentes L, Van Vorenkamp JL, Drusin LM. Vaccination without documentation: influenza immunization among medical residents at a tertiary-care medical center. Infect Control Hosp Epidemiol 2003 Aug;24(8):626-28.
2. **Bearman G,** Vaamonde C, Larone D, Drusin L, Zuccotti G. Pseudo-outbreak of multidrug-resistant Mycobacterium tuberculosis associated with presumed laboratory processing contamination. Infect Control Hosp Epidemiol 2002 Oct;23(10):620-22.
3. **Caskey MF, Morgan DJ,** Porto AF, Giozza SP, Muniz AL, Orge GO, Travassos MJ, Barrón Y. Clinical manifestations associated with HTV-1 infection: a cross-sectional study. AIDS Res Hum Retroviruses 2006;23:365-71.
4. Chookajorn T, Dzikowski R, **Frank M,** Li F, Jiwani AZ, Hartl DL, Deitsch KW. Epigenetic memory at malaria virulence genes. Proc Natl Acad Sci USA 2007 Jan 16;104(3):899-902.
5. Djimde AA, **Kirkman L,** Kassambara L, Diallo M, Plowe CV, Wellems TE, Doumbo OK. [In vitro cultivation of fields isolates of Plasmodium falciparum in Mali]. Bull Soc Pathol Exot 2007 Feb;100(1):3-5.
6. Dzikowski R, **Frank M,** Deitsch K. Mutually exclusive expression of virulence genes by malaria parasites is regulated independently of antigen production. PloS Pathog 2006 Mar;2(3):e22.
7. **Frank M,** Deitsch K. Activation, silencing and mutually exclusive expression within the var gene family of Plasmodium falciparum. Int J Parasitol 2006 Aug;36(9):975-85. Epub 2006 Jun 9. Review.
8. **Frank M,** Dzikowski R, Amulic B, Deitsch K. Variable switching rates of malaria virulence genes are associated with chromosomal position. Mol Microbiol 2007 June;64(6):1486-98.
9. **Frank M,** Dzikowski R, Costantini D, Amulic B, Berdougo E, Deitsch K. Strict pairing of var promoters and introns is required for var gene silencing in the malaria parasite Plasmodium falciparum. J Biol Chem 2006 Apr 14;281(15):9942-52.
10. **Frank M, Kirkman L,** Costantini D, Sanyal S, Lavazec C, Templeton TJ, Deitsch KW. Frequent recombination events generate diversity within the multi-copy variant antigen gene families of Plasmodium falciparum. Int J Parasitol 2008 Aug;38(10):1099-109.
11. **Fusco DN, Downs JA, Satlin MJ, Pahuja M,** Ramos L, Barie PS, Fleckenstein L, Murray HW. Non-oral treatment with ivermectin for disseminated strongyloidiasis. Am J Trop Med Hyg 2010 Oct;83(4):879-83.
12. **Fusco D,** Liu X, Savage C, Taur Y, Xiao W, Kennelly E, Yuan J, Cassileth B, Salvatore M, Papanicolaou GA. Echinacea purpurea aerial extract alters course of influenza infection in mice. Vaccine 2010 May 21;28(23):3956-62.
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22. **Rhee KY,** Soave R, Maltz C. Methicillin-resistant Staphylococcus aureus as a cause of antibiotic-associated diarrhea. J Clin Gastroenterol 2004 Mar;38(3):299-300.

23. **Satlin MJ,** Hoover DR, Glesby MJ. Glycemic control in HIV-infected patients with diabetes mellitus and rates of meeting american diabetes association management guidelines. AIDS Patient Care STDS. 2011 Jan;25(1):5-12.

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ID DIVISION CURRENT RESEARCH AND TRAINING GRANTS
2011 - 2012

Selected current research and training grants of the faculty and fellows in the Division of Infectious Diseases are listed below. There are opportunities for fellows to participate in these research projects, as well as with investigators at Rockefeller University or Memorial Sloan-Kettering Institute.

1. Multiplexed Detection of Food and Waterborne Pathogens. F Barany, **LM Golightly, D Larone**. NIH U01 AI075470. 2007-2012.
2. Epidemiology of KPC-Producing Enterobacteriaceae in New York City. **DP Calfee.** CDC AAMC MM-1085-09/09. 2008-2011.
3. Pathogenesis of Leishmaniasis: Host, Parasite and Vector – Tropical Medicine Research Center (TMRC). **E Carvalho, WD Johnson.** NIH P50 AI30639. 1991-2012.
4. Tropical Infectious Disease Training Grant. **E Carvalho, WD Johnson.** NIH D43 TW007127, 2004-2011.
5. Monitoring Response to ARV Therapy and Development of HIV-1 Drug Resistance. **M Charles**. 5K23 AI073190. 2008-2013.
6. Amos Medical Faculty Development Award. **M Charles**. Robert Wood Johnson Foundation. 2008-2012.
7. Female Genital Schistosomiasis. **J Downs.** Infectious Diseases Society of America and Pfizer Pharmaceutical. 2009-2011.
8. CTSC Global Health Fellowship Grant. **J Downs.** UL-1-RR024996. 2010-2011.
9. Fogarty International Clinical Research Scholars – Haiti. **D Fitzgerald, WD Johnson, JW Pape.** NIH 5R24 TW0007988. 2004-2011.
10. Haitian Research-Training Program in AIDS Related Cervical Cancer. **DW Fitzgerald.** NIH D43TW000018-21S1. 2006-2011.
11. AIDS International Training and Research Program. **DW Fitzgerald.** Fogarty International Center. 3 D43 TW000018-22S1. 2009-2011.
12. Natural History and Pathogenesis of HPV/HIV co-infection in Haiti. **DW Fitzgerald.** NIH R01 CA142422. 2010-2013.
13. Clinical Trials for HIV Infection and HIV-Related Diseases. **MJ Glesby, RM Gulick, K Marks, M Vogler, TJ Wilkin**. Multiple Sources. 1999-2013.
14. NY/NJ AIDS Education and Training Center (AETC). **MJ Glesby, RM Gulick.** Health Research Services Administration (HRSA), CU H4A HA00071. 2002-2014.
15. The Women's Interagency HIV Study (WIHS/subcontract). **MJ Glesby**. NIH UO1 AI35004. 2003-2012.
16. Growth Hormone and/or Rosiglitazone for Visceral Adiposity in HIV. **MJ Glesby**. NIH R01 DK065515. 2004-2011.
17. Fogarty International Clinical Research Scholars Program – The Salvador, Brazil Training Program for Tropical Disease Research. **MJ Glesby, E Carvalho, A Ko, WD Johnson.** NIH R24 TW007988. 2004-2012.
18. Complications of Chronic Viral Infections. Mid-Career Investigator Award in Patient-Oriented Research. **MJ Glesby.** NIH K24 AI07884. 2008-2013.

19. H1N1 Clinical Trials Site. **MJ Glesby, RM Gulick, M Salvatore, TJ Wilkin.** NIH Division of Clinical Research. 2009-2012.

20. Gut Microbiota and Visceral Adiposity in HIV-Infected Patients. **MJ Glesby.** NIH/CTSC Pilot Award. 2010-2012.

21. Microvascular Repair and the Pathophysiology of Cerebral Malaria Pfizer Investigator Initiated Research Award (IIR). **LM Golightly.** 2010-2011.

22. Research Initiative for Clinical Trials of Progenitor Cell Based Therapeutics for Cerebral *Malaria in S.E. Asia.* Einaudi Foundation Seed Grant. **LM Golightly.** 2010-2011.

23. Antiretroviral Therapy. Mid-Career Investigator Award in Patient-Oriented Research. **RM Gulick.** NIH K24 AI51966. 2003-2013.

24. Cornell HIV Clinical Trials Unit (ACTU). **RM Gulick, MJ Glesby, K Marks, M Vogler, TJ Wilkin.** NIH U01 AI69419. 2007-2014.

25. H1N1 Influenza - Observational Studies in Inpatients and Outpatients. **RM Gulick, MJ Glesby, M Salvatore, TJ Wilkin.** NIH-funded INSIGHT Clinical Trials Network. 2009-2011.

26. AIDS International Training and Research Program. **WD Johnson**. NIH D43 TW000018. 1988-2013.

27. Pathogenesis of Infectious Diseases Training. **WD Johnson**, MJ Glesby. NIH T32 AI07613.1999-2014.

28. Caribbean HIV/AIDS Regional Training/CHART Initiative (I-TECH). **WD Johnson**. HRSA UW U69HA00047. 2004-2011.

29. Haiti Research Training: Models to Implementation (ICOHRTA). **WD Johnson**. NIH U2R TW06901. 2004-2014.

30. Framework Program for Global Health. **WD Johnson**. NIH R25 TW007736. 2006-2011.

31. *M. tuberculosis* Proteins to Enhance the Sensitivity of TB Serodiagnostic Assay. **WD Johnson.** Foundation for Innovative New Diagnostics (Bill & Melinda Gates Foundation). 2007-2011.

32. Genetic Diversity in Virulence Genes of Plasmodium falciparum. **L Kirkman**. 1K08 AI076635. 2008-2013.

33. Emerging Infectious Diseases and Urbanization. **AI Ko, WD Johnson.** NIH D43 TW00919. 1997-2011.

34. Immunochemotherapy in Visceral Leishmaniasis. **H Murray.** NIH R01 AI083219. 2010-2015.

35. Comprehensive International Program of Research on AIDS (CIPRA). **JW Pape, WD Johnson, DW Fitzgerald.** NIH UO1 AI010018. 2003-2011.

36. Haiti Research Training: Models to Implementation (ICOHRTA). **JW Pape.** NIH U2R TW006901. 2004-2014.

37. International Clinical Trials Unit (Haiti CTU). **JW Pape, RM Gulick, DW Fitzgerald, WD Johnson.** NIH U01 AI069421-01. 2006-2014.

38. Caribbean, Central South America Network: CCASAnet (IEDEA). **JW Pape.** NIH 5 U01 AI06992303. 2007-2011.

39. Epidemiology of HPV Related Cervical Diseases in Haiti. **JW Pape.** International Development Research Centre (IDRC) of Canada. C111-2, HIT-05. 2009-2012.

40. Enzymes of Intermediary Metabolism in *Mycobacterium tuberculosis*: Anti-Mycobacterial Targets of Nitric Oxide. **KY Rhee.** Burroughs Wellcome Career Award in the Biomedical Sciences. 2005-2011.

41. Applied Research in Antimicrobial Resistance: Studies of Susceptibility Testing on Gram-negative Multidrug Resistant Organisms. **KY Rhee** (Co-PI), L Saiman (PI). NIH/CDC. 2007-2011.

42. Metabolosomes: The Organizing Principle of Latency in *Mycobacterium tuberculosis.* **KY Rhee.** Bill and Melinda Gates Foundation Grand Challenges Exploration. 2009-2011.

43. Metabolomics Approaches to TB Drug Development. **KY Rhee.** NIH/NIAID R21. 2009-2011.

44. Metabolomics Approaches to TB Drug Development. **KY Rhee.** Bill and Melinda Gates Foundation TB Drug Accelerator. 2010-2013.

45. Urinary Biomarkers for TB Diagnosis. **KY Rhee.** Lura Cook Hull Trust. 2010-2011.

46. Combination Antiviral Focus Group (subcontract). **M Salvatore.** NIRC 2009-2011.

47. AIDS Malignancy Consortium (subcontract). **TJ Wilkin.** NIH U01 CA121947. 2008-2011.

48. Supplement to ACTG for implementation of HPV test-and-treat for cervical cancer screening (subcontract). **TJ Wilkin.** 2010-2011.

49. EraMune: Clinical Trial on HIV Eradication (subcontract). **TJ Wilkin.** OrVACS/Northwestern University. 2010-2012.

PROFILES OF CORE FACULTY

Elizabeth L. Alexander, MD Instructor in Medicine. Dr. Alexander received her M.D. from Weill Cornell Medical College where she was a B.H. Kean Fellow in International Medicine. She completed her residency training in internal medicine at the Mount Sinai Hospital and her infectious disease training at the New York-Presbyterian Hospital/Weill Cornell Medical Center, where she trained in the laboratory of Dr. Kyu Rhee. Dr. Alexander continues to work extensively with Dr. Rhee in the Division of Infectious Diseases. Her research focuses on the molecular mechanisms underlying increasing antibiotic resistance in *Staphylococcus aureus.* Specifically, the use of the mass-spectrometry based technique of metabolomics to investigate the molecular mechanisms underlying increasing vancomycin resistance in *Staphylococcus aureus.* Dr. Alexander is the recipient of an NIH/Weill Cornell Medical College Clinical and Translational Science Center KL2 Award.

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Barry Brause, MD Professor of Clinical Medicine and Director of Infectious Diseases at Hospital for Special Surgery. Dr. Brause was trained in infectious diseases at Cornell and he has been a member of the Infectious Diseases division since 1973. His clinical research has focused on musculoskeletal infections and particularly on infections associated with indwelling foreign materials and prostheses. Dr. Brause has taken part in major national meetings and workshops as an invited participant including the National Institute of Arthritis and Musculoskeletal Disease, the American Dental Association, Council on Dental Therapeutics and the Infectious Diseases Society of America/ Interscience Conference on Antimicrobial Agents and Chemotherapy. He has authored chapters on bone and joint infections in the last five editions of Principles and Practice of Infectious Diseases and on "Osteomyelitis" in three recent editions of Cecil-Textbook of Medicine.

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David Calfee, MD, MS Associate Professor of Medicine (appointment pending) and Chief Hospital Epidemiologist. Dr. Calfee trained in internal medicine and infectious diseases at the University of Virginia, and received his MS in health evaluation sciences (epidemiology) at the University of Virginia. His research and clinical interests focus on the epidemiology and prevention of healthcare-associated infections. Dr. Calfee previously served as the deputy editor of *Infection Control and Hospital Epidemiology* and was the chair of the Patient Safety and Quality Improvement committee of the Society for Healthcare Epidemiology of America (SHEA). Specific research interests include the clinical and molecular epidemiology of multidrug-resistant bacteria (such as *K. pneumoniae* carbapenemase (KPC)-producing Enterobacteriaceae and methicillin-resistant *S. aureus* (MRSA)), surgical site infections in solid organ transplant recipients, and prevention of vascular access-associated bloodstream infections in hemodialysis patients.

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Macarthur Charles, MD, PhD Assistant Professor of Medicine. Dr. Charles received his MD and PhD degrees from the Albert Einstein College of Medicine. He received clinical training in internal medicine and infectious diseases at the New York Presbyterian-Weill Cornell Medical Center, where he was also the recipient of the Alpha Omega Alpha Medical Honor Society Teaching Award. Dr. Charles' research interests include response to antiretroviral therapy and the development of HIV drug resistance. Currently, he is based full-time at the GHESKIO Centers in Port-au-Prince, Haiti. He is the recipient of a NIH-sponsored Mentored Patient-Oriented Research Career Development Award (K23) and of the Harold Amos Medical Faculty Development Award (Robert Wood Johnson Foundation).

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Jennifer A. Downs, MD Instructor in Medicine. Dr. Downs received her M.D. from Weill-Cornell Medical College. She completed her Internal Medicine residency training at Columbia University College of Physicians and Surgeons, followed by her Infectious Diseases fellowship at New York-Presbyterian Hospital-Weill Cornell Medical College. Her research focuses on urogenital schistosomiasis in women of reproductive age in Tanzania, where she has worked since 2007. She is the recipient of the 2009 Infectious Diseases Society of America Fellowship Award in International Infectious Diseases. Dr. Downs is the recipient of an NIH/Weill Cornell Medical College Clinical and Translational Science Center KL2 Award.

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Daniel W. Fitzgerald, MD Associate Professor of Medicine and Co-Director, Center for Global Health. Dr. Fitzgerald trained in internal medicine and infectious diseases at the Massachusetts General Hospital. His areas of interest include HIV/AIDS prevention and therapeutic clinical trials and targeted evaluations of HIV/AIDS and TB service programs in Haiti. He is an investigator in: HIV Vaccine Trials to determine the efficacy of an adenovirus 5 recombinant HIV vaccine; a randomized study to determine the optimal time to start antiretroviral therapy in resource-poor countries; studies of drug resistance in Haiti and effects of tropical diarrhea/malnutrition on antiretroviral therapy. Other interests include improving informed consent and empirical studies to inform ethical guidelines for the conduct of clinical research in resource-poor countries. He is on the faculty committee for the Weill-Bugando Program in Mwanza, Tanzania. He is Chair of the Cornell International Education Committee, which oversees international medical student electives.

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Marshall J. Glesby, MD, PhD Associate Professor of Medicine and Public Health and Associate Chief, Division of Infectious Diseases. Dr. Glesby trained in internal medicine and in infectious diseases at Johns Hopkins and also received a Ph.D. in clinical investigation from the Johns Hopkins School of Hygiene and Public Health. His research interests include metabolic and cardiovascular complications of antiretroviral therapy and viral co-infections in HIV. Current projects include interventions for insulin resistance and increased visceral fat in HIV-infected patients with lipodystrophy, optimization of management of HCV/HIV co-infection, and epidemiology of HTLV-1 in Brazil. He is Vice Chair of the Hepatitis Committee of the AIDS Clinical Trials Group and a member of the group's Scientific Advisory Steering Committee. Dr. Glesby also directs the HIV/AIDS Clinical Trials Unit at Weill Cornell and serves on the Adult Translational Research and Multi-Institutional/ Disciplinary Advisory Committees of the Weill Cornell Clinical & Translational Science Center.

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Linnie M. Golightly, MD Associate Professor of Clinical Medicine and Microbiology. Dr. Golightly trained in internal medicine at Harlem Hospital and in infectious diseases and molecular parasitology at Harvard University. Dr. Golightly's research interests include: (1) The development and validation of ligase detection reaction (LDR) techniques combined with PCR, capillary electrophoresis, and Universal Arrays to simultaneously differentiate multiple microbial pathogens in a single sample. Dr. Golightly's laboratory is employing high throughput screening platforms using microbial signature profiles to detect Dengue, West Nile and other emerging pathogens in blood as well as food and waterborne pathogens in stool samples. The later studies are being performed in collaboration with the Noguchi Memorial Institute for Medical Research (NMIMR) in Accra, Ghana and GHESKIO in Port-au-Prince, Haiti. (2) Elucidation of the pathogenesis of cerebral malaria. These studies are being performed in collaboration with investigators at the NMIMR in Accra, Ghana.

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Roy (Trip) M. Gulick, MD, MPH Professor of Medicine and Chief of Division of Infectious Diseases. Dr. Gulick trained in internal medicine at Columbia and in infectious diseases at Harvard, and received his MPH in clinical trial design from the Harvard School of Public Health. His research focuses on clinical trials of antiretroviral therapies for treatment and prevention of HIV infection. Dr. Gulick currently serves as Principal Investigator of the Cornell Clinical Trials Unit of the NIH-sponsored AIDS Clinical Trials Group (ACTG). He also serves as a member of the U.S. Department of Health and Human Services Panel for Clinical Practices for Treatment of HIV Infection, and is a Board Member of the International AIDS Society-USA. Current projects include evaluating treatment strategies for both antiretroviral therapy-naïve and -experienced HIV-infected patients, and exploring antiretroviral therapy as a prevention strategy (PREP, pre-exposure prophylaxis).

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Barry J. Hartman, MD Clinical Professor of Medicine. Dr. Hartman completed his medicine and infectious disease fellowship training at Cornell. Dr. Hartman did his basic research in the Alexander Tomasz laboratory of the Rockefeller University in New York City studying the mechanism for methicillin-resistance in the Staphylococcus aureus. His current focus is clinical care and education and his interests include antibiotics and antibiotic resistance, surgical infections and endocarditis. He has received several teaching awards from students and house staff. He has been the Formulary & Therapeutics Committee Chairman and Co-Chairman at the New York-Presbyterian Hospital for the past 20 years.

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David C. Helfgott, MD Assistant Clinical Professor of Medicine. Received his B.A. at the University of Pennsylvania and his M.D. at the Yale School of Medicine. Dr. Helfgott did his internship and residency at The New York Hospital and his Infectious Diseases fellowship at Cornell University Medical College. During his fellowship, Dr. Helfgott was involved in the study of inflammatory cytokines, in particular IL-6, in the laboratory of Dr. Igor Tamm, and he continued this research as an Assistant Professor of Medicine at Cornell University Medical College for several years after completing his fellowship. Dr. Helfgott is an author on several peer-reviewed publications which studied interleukin-6. Since 1994, Dr. Helfgott has been involved in direct patient care and teaching as an Assistant Attending Physician at The New York-Presbyterian Hospital and an Assistant Clinical Professor of Medicine at Weill Medical College. Presently Dr. Helfgott is involved in clinical research studying new antifungal therapy in immunocompromised patients.

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Stephen G. Jenkins, PhD Professor of Pathology and Laboratory Medicine. Professor of Pathology in Medicine. Dr. Jenkins received his Ph.D. in Medical Microbiology from the University of Vermont. He completed his postdoctoral residency in Clnical and Public Health Microbiology at the Mount Sinai Medical Center in Milwaukee, WI. Dr. Jenkins' current research focuses on the epidemiology and detection of antimicrobial resistance as well as the rapid diagnosis of Infectious Diseases and related antibiotic resistance mechanisms.

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Warren D. Johnson, Jr., MD The B.H. Kean Professor of Medicine and Director, Center for Global Health in the ID Division. He is the former Chief of the Division of International Medicine and Infectious Diseases. Dr. Johnson's career has been committed to research and training in infectious diseases, particularly in resource poor countries. His research interests have included clinical and epidemiological studies of AIDS, tuberculosis, and leishmaniasis. His research has received uninterrupted NIH and Foundation support in Brazil (1969-2012) and in Haiti (1979-2014), including a NIH Merit Award (1990). He has also established outstanding training programs in Brazil, Haiti, and Tanzania. He has chaired numerous NIH Research Committees and served on the NIAID National Advisory Council. He also served as a Director of the ABIM, Chair of the ABIM Infectious Diseases Subspecialty Board, and as a Councilor of the Infectious Diseases Society of America. Dr. Johnson recently received the honor of having the new clinical facility of the GHESKIO Institute for Infectious Diseases and Reproductive Health in Haiti named for him.

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Laura A. Kirkman, MD Instructor in Medicine. Dr. Kirkman received her M.D. from Albert Einstein College of Medicine with distinction in research. She completed her clinical training in internal medicine at Yale-New Haven Hospital and her infectious disease training at the New York-Presbyterian-Weill Cornell Medical Center followed by a postdoctoral fellowship in the laboratory of Dr. Kirk Deitsch in the Department of Microbiology and Immunology. Dr. Kirkman's current research focuses on the DNA repair mechanisms in the human malaria parasite, *Plasmodium falciparum,* and how DNA damage and repair in the parasite relates to diseases pathogenesis. Specifically examining the generation of genetic diversity in genes that encode the key proteins implicated in antigenic variation and the generation of drug resistance. Dr. Kirkman is the recipient of an NIH K08 grant.

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Kristen M. Marks, MD, MS Assistant Professor of Medicine and ID Fellowship Director. Dr. Marks received internal medicine and ID fellowship training at New York-Presbyterian Hospital, where she focused her clinical training and research on HIV and hepatitis virus infections and completed Weill Cornell's Masters Degree in Clinical Investigation. Her current research focuses on improving treatment outcomes in patients with HIV and hepatitis virus co-infections and includes studies of acute HCV as well as new treatment strategies for chronic HCV. She also serves as a co-investigator in the Cornell HIV/AIDS Clinical Trials Unit and Center for Study of Hepatitis C.

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Andy O. Miller, MD Assistant Professor of Clinical Medicine and Assistant Attending Physician at the Hospital for Special Surgery. Dr. Miller received his B.Sc. at Yale College and his M.D. at Harvard Medical School. He then trained in Internal Medicine at Columbia-Presbyterian and in Infectious Diseases at NYU. From 2007 to 2010 he was an ID consultant and HIV primary care doctor at Bronx-Lebanon Hospital. He is the author of several peer-reviewed publications. Dr. Miller provides consultative ID services to patients at both HSS and NYH. He is interested in developing clinical research programs to study infections in patients receiving new biologic agents for rheumatologic disease, and to study outcomes of patients with surgical bone/joint infections.

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Henry W. Murray, MD The Arthur R. Ashe Professor of Medicine. Dr. Murray is an expert in macrophage activation, immunopathogenesis of infection caused by intracellular pathogens, in particular, *Leishmania*, and the chemo- and immunochemotherapy of leishmaniasis. Dr. Murray's long-term, NIH-supported research is currently focused on immunoregulation of the host response to antileishmanial chemotherapy in experimental visceral leishmaniasis (kala-azar). This work has in part formed the basis of experimental treatment trials in Indian patients at the internationally-recognized kala-azar clinical trials unit he co-directs in Bihar State, India. Dr. Murray received the Squibb Award (1989) from the Infectious Diseases Society of America for outstanding achievement in infectious diseases, and previously was Chief of the Division of Infectious Disease (1983-1995) and Associate Cha irman of Medicine for Clinical Research (1995-2007). Dr. Murray is currently Director of the Arthur Ashe Endowment for the Defeat of AIDS, Editor of the travel medicine web site, Tropimed U.S., and co-chairs the Department of Medicine's Quality Assurance Committee.

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Jean W. Pape, MD Professor of Medicine. Dr. Pape is a graduate of Weill Cornell who completed his medicine and ID training at Cornell prior to returning to his native Haiti in 1980. In 1982, he founded the "Haitian Study Group on Kaposi's sarcoma and opportunistic infections (GHESKIO)", the first institution in the world dedicated to the fight against AIDS. He currently directs NIH-supported HIV vaccine and therapy trials in Haiti. Dr. Pape is the recipient of numerous awards including the French "Legion d'Honneur" for "improvement of the health of the Haitian people and that of the people of the world" (2002). In 2003 he was elected to the Institute of Medicine of the National Academy of Sciences of the United States. In 2007 he was the first recipient of the N'Galy-Mann Lecture Award. In 2008 he received the "National Alive Treasure of Haiti" award by Foundation Francoise Canez Auguste. In 2010 Dr. Pape was the recipient of the Carlos Slim award for research, the Prix Christophe Mérieux for research from the Institut de Franc", the Gates 2010 award and the Clinton Global Initiative award.

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Robert N. Peck, MD Assistant Professor in Medicine and Pediatrics. Dr. Peck received his MD from Vanderbilt University, where he was Alpha Omega Alpha, as well as a Candy Robinson Scholar; he also received the Award of Excellence in Infectious Diseases. He completed a combined medicine/pediatrics residency program at Harvard/ Massachusetts General Hospital and the Children's Hospital in Boston. Dr. Peck currently supervises and teaches Weill Cornell medical students and NYPH residents and fellows rotating through Bugando University College of Health Sciences (BUCHS) and Bugando Medical Center (BMC). He also participates in the teaching and training of BUCHS medical students and interns, as well as the development of the BUCHS/BMC internal medicine and pediatrics residency programs. Dr. Peck is involved in collaborative clinical and operational research related to HIV and Tuberculosis. He is based full-time in Mwanza, Tanzania, at BUCHS and BMC.

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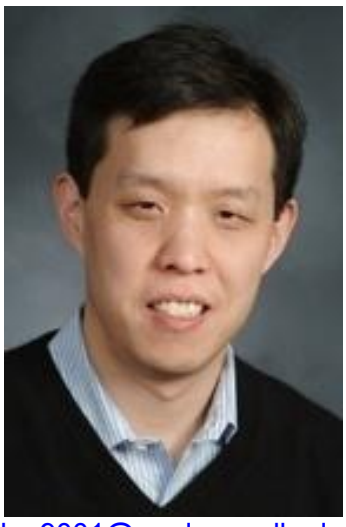
Kyu Y. Rhee, MD, PhD Assistant Professor of Medicine and Microbiology and Immunology. He received his M.D. and Ph.D. from the University of California, Irvine through a medical scientist training program. He then received clinical training in internal medicine and infectious diseases at the New York Presbyterian-Weill Cornell Medical Center where he also completed a postdoctoral fellowship in the laboratory of Dr. Carl Nathan (Department of Microbiology and Immunology). Dr. Rhee's current research focuses on biochemical approaches to drug target discovery against *M. tuberculosis*, the causative agent of tuberculosis, using novel mass spectrometry-based tools. In more recent work, Dr. Rhee has extended his work to translational studies of multidrug resistant gram-positive and gram-negative pathogens. Dr. Rhee is the recipient of an NIH K08 award, a Burroughs Wellcome Career Award in the Biomedical Sciences, and the first William Randolph Hearst Foundation Clinical Scholar in Microbiology and Infectious Diseases.



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Richard B. Roberts, MD Professor of Medicine (Emeritus); Adjunct Professor, Rockefeller University. Dr. Roberts has served as Chief of the Division of Infectious Disease, Vice Chairman of the Department of Medicine, and Associate Dean at the Medical College. He received the medical housestaff teaching award in 1981, the teaching award by the second year class in 1983-84 and 1993-94, and the senior year class list for commitment and excellence in teaching from 1996-1999. As of May 2009, Dr. Roberts is also Dean and Professor (Medicine) of Trinity School of Medicine, St. Vincent and the Grenadines, West Indies. In 2010, Dr. Roberts completed 14 years as Director of the Annual Infectious Diseases Seminars held in Salzburg, Austria. Over this period of time, 553 young ID physicians from 29 countries and 37 faculty attended the weekly seminars. In recognition of his program, Dr. Roberts recently received the American Austrian Foundation Humes Visiting Professorship at the University of Vienna, was inducted as an Honorary Member in Poland's Society of Epidemiology and Infectious Diseases (the first American to be honored), and was also decorated with the Austrian Cross of Honor for Science and Art 1st class by the Austrian government. His recent research interests include the molecular epidemiology of multidrug resistant gram-positive pathogens.

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Mirella Salvatore, MD Assistant Professor of Public Health in the Division of Community and Public Health Programs, and Assistant Professor of Medicine in the Division of Infectious Diseases at Weill Cornell Medical College. Dr. Salvatore completed her M.D. summa cum laude at the Catholic University Medical School in Rome, Italy. In the United States she completed Internal Medicine Residency training and a 3-year clinical and research fellowship in Infectious Diseases at Mount Sinai School of Medicine. Since her postdoctoral fellowship in the laboratories of Adolfo Garcia-Sastre at Mount Sinai School of Medicine, she has focused her research interest on host responses to influenza virus infection and influenza vaccines. She is currently Principal Investigator on an NIAID R21 award focusing on integrase-defective lentiviral based influenza vaccines and a CTSC pilot grant aiming in evaluating the immune responses to influenza vaccination in opioid users.

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Audrey N. Schuetz, MD, MPH Assistant Professor of the Clinical Microbiology Laboratory. Dr. Schuetz is Assistant Professor of Pathology and Laboratory Medicine and Assistant Professor in the Department of Internal Medicine. She obtained her M.D. from Emory University Hospital and completed Anatomic and Clinical Pathology at Emory. She is board-certified through the American Board of Pathology in Anatomic and Clinical Pathology, and in Medical Microbiology. Dr. Schuetz' interests in Microbiology primarily lie in mycology and in antimicrobial susceptibility testing of various organisms, including bacteria and fungi, as well as molecular typing of human pathogens. Having pursued a Masters of Public Health in Global Health during medical school, she is also interested in public health-related projects and international affairs, such as laboratory-related inspections and surveys overseas. She was recently awarded a Yale/Johnson & Johnson grant used in aiding a clinic laboratory in Borneo, Indonesia with general laboratory set-up, including infectious disease serology and malaria and tuberculosis testing.

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Rosemary Soave, MD Associate Professor of Clinical Medicine and Public Health. Following her graduation from Cornell University Medical College, Dr. Soave completed training in Internal Medicine and Infectious Diseases. She subsequently studied the enteric infections of HIV infected patients with a particular emphasis on the pathogenesis, detection, and treatment of cryptosporidiosis and other coccidial diseases. Dr. Soave subsequently expanded her clinical and research interests to include the epidemiology, diagnosis, treatment and immunopathogenesis of selected viral, fungal and bacterial infections in hematopoietic stem cell and solid organ transplant recipients She provides expert comprehensive infectious diseases care to patients receiving autologous and allogeneic hematopoietic stem cell transplantation, as well recipients of renal, pancreatic, and liver aollografts. Dr. Soave currently studies the epidemiology, diagnosis and treatment of enteric and viral infections complicating solid organ and bone marrow transplantation, as well as the management of fever and neutropenia in bone stem cell marrow transplant recipients.

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Mary A. Vogler, MD Associate Professor of Medicine. Dr. Vogler trained in internal medicine at the University of Connecticut School of Medicine and in infectious diseases at NYU (New York University School of Medicine) where she served on the faculty prior to coming to Weill Cornell. Dr. Vogler serves as an HIV/AIDS primary care provider in the Center for Special Studies both for HIV-infected adults and adolescents. She also participates actively as an investigator in the NIH-funded Cornell HIV/AIDS Clinical Trials Unit (CCTU) and in the Fogarty international research programs. Her area of expertise is in the area of HIV-infected women, including pregnancy and mother-to-child transmission. She received the AIDS Clinical Trials Group (ACTG) Women's Health Investigator award in 2007.

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Thomas Walsh, MD Professor of Medicine (appointment pending) and Director of the new Transplantation-Oncology Infectious Diseases Program. Following graduation from Johns Hopkins University School of Medicine, Dr. Walsh completed ten post-doctoral years of laboratory investigation, clinical research and patient care leading to boards in Medicine, Infectious Diseases and Oncology and laboratory expertise in pharmacology, innate host defenses, and medical mycology. Following a distinguished career in the Pediatric Oncology Branch of the National Cancer Institute, Dr. Walsh was recruited to direct the new Transplantation-Oncology Infectious Diseases Program of Weill Medical College of Cornell University and the New York Presbyterian Hospital. The mission of the Program is to provide leading edge multidisciplinary clinical care, translational research and training in diagnosis, treatment and prevention of life-threatening infections in immunocompromised patients with transplantation or cancer. Current laboratory and clinical investigations include antimicrobial pharmacology, immunopharmacology of innate host defense, and molecular diagnosis of emerging fungal, bacterial and viral pathogens in immunocompromised patients.

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Timothy J. Wilkin, MD, MPH Associate Professor of Medicine. Dr. Wilkin, who completed his internal medicine residency at the University of Chicago and a fellowship in Infectious Diseases and an MPH at Columbia University, joined the Cornell HIV/AIDS Clinical Trials Unit (CCTU) in 2002. He conducts clinical trials on treatment and prevention of HPV disease in HIV-infected populations. He chairs several protocols in the AIDS Clinical Trials Group and AIDS Malignancy Consortium. He has received grant funding from the National Institute of Allergy and Infectious Diseases, and the National Cancer Institute. He has an additional research interest in treatment strategies for HIV-related immune activation.

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Stephen J. Wilson, MD, MPH Associate Professor of Clinical Medicine (appointment pending) and Hospital Epidemiologist. Dr. Wilson trained in internal medicine at Duke University Medical Center. He completed his clinical training in infectious diseases at University of California, San Francisco, and then did his research training in infectious diseases back at Duke. During his research fellowship he received his MPH in epidemiology from the University of North Carolina School of Public Health. His research interests range from the molecular epidemiology of multidrug-resistant organisms to comparative effectiveness research of infection control interventions. He has a particular interest in pursuing research that elucidates new and better ways to deliver high quality of care in the hospital setting that also minimizes unintended consequences. As one of two new hospital epidemiologists at New York-Presbyterian Weill Cornell Medical Center, he is looking forward to developing a robust research and training program in infection control and hospital epidemiology.

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Research Training Faculty

ID Fellows have the opportunity to work in laboratories or programs within the Division of Infectious Diseases, other divisions in the Department of Medicine (e.g. GI, Immunology), other Departments at WMC (Microbiology and Immunology, Pathology, Public Health), as well as Memorial Sloan-Kettering Cancer Institute, and the Rockefeller University, including the Aaron Diamond AIDS Research Center.

EXAMPLES OF RESEARCH TRAINING FACULTY IN OTHER DEPARTMENTS & INSTITUTIONS

Francis Barany, PhD Weill Cornell Dept of Microbiology and Immunology	Multiplex detection of microbial pathogens by ligase chain reaction	http://www.med.cornell.edu/research/fbarany/
Ethel Cesarman, MD, PhD Weill Cornell Dept of Pathology	Molecular basis of viral oncogenesis in AIDS-related non-Hodgkin's lymphomas due to KSHV (HHV-8)	http://www.med.cornell.edu/research/ecesarman/
Andrew J. Dannenberg, MD Weill Cornell Division of Gastroenterology & Hepatology	Weill Cornell Cancer Center: Translational studies of cyclooxygenase-2 (COX-2) and chronic inflammation in cancer	http://www.med.cornell.edu/research/andrewdannenberg/
Kirk W. Deitsch, PhD Weill Cornell Dept of Microbiology and Immunology	Molecular basis of var gene-mediated antigenic variation in Plasmodium falciparum	http://www.med.cornell.edu/research/kdeitsch/
Sabine Ehrt, PhD Weill Cornell Dept of Microbiology and Immunology	Host-pathogen interactions of Mycobacterium tuberculosis and the macrophage: Mycobacterial survival strategies in the phagosome	http://www.med.cornell.edu/research/sehrt/
David D. Ho, MD Rockefeller University Aaron Diamond AIDS Research Center	Basic and Clinical Development of Vaccines and Other Prevention Strategies against HIV-1	http://www.adarc.org/david_ho_424.html
Carl F. Nathan, MD Weill Cornell Dept of Microbiology and Immunology	Molecular mechanisms of innate immunity against Mycobacterium tuberculosis	http://www.med.cornell.edu/research/cnathan/
Charles Rice, PhD Rockefeller University	Molecular virology and immunology of Hepatitis C	http://www.rockefeller.edu/labheads/rice/rice.php
Dirk Schnappinger, PhD Weill Cornell Dept of Microbiology and Immunology	Molecular genetic studies of Mycobacterium tuberculosis virulence and persistence	http://www.med.cornell.edu/research/dschnappinger/
Ralph M. Steinman, MD Rockefeller University	Dendritic cell-mediated regulation of lymphocyte function in tolerance and resistance and the development of dendritic cell-based therapies and vaccines	http://www.rockefeller.edu/research/abstract.php?id=15
Andrew H. Talal, MD, MPH Weill Cornell Division of Gastroenterology & Hepatology	Identification of biomarkers of histological progression and treatment outcome in Hepatitis C	http://www.weillcornell.org/ahtalal/
Thomas J. Templeton, PhD Weill Cornell Dept of Microbiology and Immunology	Host: parasite interactions of the malaria parasite, Plasmodium	http://www.med.cornell.edu/research/tjtempleton/
Alexander Tomasz, PhD Rockefeller University	Chemical structure, mode of assembly, and biological functions of bacterial cell walls and associated cell surface components in Gram positive bacteria	http://www.rockefeller.edu/labheads/tomasz/contact.php

ANTIBIOTIC DEVELOPMENT:

Biochemical Approaches to Drug Target Identification. *Rhee*. A defining interest of our laboratory is the identification and validation of new antibiotic targets. Unlike the case for virtually every other field of medicine, infectious diseases is the only discipline to become progressively less and less effective over time. In large part, this is due to the fact that bacteria replicate far faster and more abundantly than the hosts they infect. As a result, resistance has become the inevitable fate of every antibiotic ever developed. This problem has been further compounded by the fact that no new mechanistic classes of antibiotics have emerged in the last 40 years. While the reasons for this are multifactorial, it is a commonly overlooked fact that virtually all antibiotics in clinical use were discovered with little foresight and often serendipitously. As a result, we lack sufficient knowledge of what defines a good drug target and how to develop new antibiotics from it. We aim to address this deficiency by applying novel mass spectrometry-based metabolomics approaches to gain insight into the underlying biology of the microbes we wish to target and their responses perturbation at the pharmacologically relevant level of metabolites. Current efforts focus chiefly on Mycobacterium tuberculosis, Staphylococcus aureus and Enterococcus faecium.

Bryk R, Gold B, Venugopal A, Singh J, Samy R, Pupek K, Cao H, Popescu C, Gurney M, Hotha S, Cherian J, **Rhee K,** Ly L, Converse P, Ehrt S, Vandal O, Jiang X, Schneider J, Lin G, Nathan C. Selective killing of non-replicating Mycobacteria. Cell: Host and Microbe 2008;3:137-45.

de Carvalho L.P.S., Zhao H, Dickinson C.E., Arango N, Lima C.D., Fischer S, Ouerfelli O, Nathan C, **Rhee K.Y.** Activity-based metabolomic profiling of enzymatic function: identification of Rv1248c as a mycobacterial 2-hydroxy-3-oxoadipate synthase. Chem Biol 2010;17: 323-332. *feature article.

de Carvalho L.P.S., Fischer S.M., Marrero J, Nathan C, Ehrt S, **Rhee K.Y.** Metabolomics of Mycobacterium tuberculosis reveals compartmentalized co-catabolism of carbon substrates. Chem Biol.(in press).

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Pethe K, Sequiera P, Agarwalla S, **Rhee K.Y.**, Kuhen K, Phong WY, Beer D, Walker J, Duraiswamy J, Jiricek J, Keller TH, Chatterjee A, Tan MP, Ujjini M, Rao S, Camacho L, Bifani P, Mak PA, Ma I, Barnes W, Chen Z, Plouffe D, Thayalan P, Ng SH, Au M, Lee BH, Tan BH, Ravindran S, Nanjundappa M, Lin X, Goh A, Lakshminarayana S, Cynamon M, Kreiswirth B, Dartois V, Peters E, Glynne R, Brenner S, Dick T. (in press). A chemical genetic screen in Mycobacterium tuberculosis identifies carbon-source dependent growth inhibitors deprived of in vivo efficacy. Nature Communications.

Rhee KY, Erdjument-Bromage H, Tempst P, Nathan C. S-nitroso-proteome of *Mycobacterium tuberculosis*: enzymes of intermediary metabolism and anti-oxidant defense are targets of reactive nitrogen intermediates. Proc Natl Acad Sci USA 2005;102:467-72.

BIOTERRORISM:

Bioterror Agents. *Barany, Golightly, Larone.* The current biothreat to our nation requires the ability to rapidly detect and distinguish bioweapon agents from normal pathogens. Existing detection systems have a limited ability to simultaneously screen in a single sample for multiple agents and their antibiotic resistance, toxin or virulence genes. We are developing ligase detection reaction (LDR) techniques combined with PCR, capillary electrophoresis, and Universal Arrays, which we have already validated in the detection of cancer gene mutations and the diagnosis of genetic diseases. The study will initially test bacterial, fungal and viral nucleic acids and isolates in the laboratories of Drs. Barany and Golightly. Blood culture isolates from patients admitted to the NYP hospital, obtained through Dr. Davise Larone, former Head of clinical microbiology at the NYP hospital, will be tested to validate the clinical usefulness of the technique. Samples to test for viral pathogens (Dengue, West Nile and viral hemorrhagic fever viruses) are obtained from the CDC, NYC Department of Health, and sites of endemic disease.

Das S, Pingle MR, Muñoz-Jordán J, Rundell MS, Rondini S, Granger K, Chang GJ, Kelly E, Spier EG, Larone D, Spitzer E, Barany F, **Golightly LM**. Detection and serotyping of dengue virus in serum samples by multiplex reverse transcriptase PCR-ligase detection reaction assay. J Clin Microbiol 2008;46:3276-84.

Granger K, Rundell MS, Pingle M, Shatsky R, Larone DH, **Golightly LM,** Barany F and Spitzer E. Multiplex-PCR-LDR-CE assay for the simultaneous detection of drug resistance and toxin genes for Staphylococcus aureus, Enterococcus faecalis and Enterococcus faecium. J Clin Microbiol 2010;48(1):277-80.

Pingle MR, Granger K, Feinberg P, Shatsky R, Sterling B, Rundell M, Spitzer E, Larone D**, Golightly L,** Barany F. Multiplexed identification of blood-borne bacterial pathogens by use of a novel 16S rRNA gene PCR-ligase detection reaction-capillary electrophoresis assay. J Clin Microbiol 2007;45:1927-35.

Rondini S, Pingle MR, Das S, Tesh R, Rundell MS, Hom J, Stramer S, Turner K, Rossmann SN, Lanciotti R, Spier EG, Muñoz-Jordán J, Larone D, Spitzer E, Barany F, **Golightly LM.** Development of multiplex PCR-ligase detection reaction assay for detection of West Nile virus. J Clin Microbiol 2008;46:2269-79.

Multiplexed Detection of Food and Waterborne Pathogens. *Barany, Golightly, Larone.* The ability to rapidly detect food and waterborne pathogens is of utmost importance in preventing outbreaks associated with contamination of our nation's food and water supply. Existing detection systems have a limited ability to simultaneously screen a single sample for multiple agents. To meet this need we will use the ligase detection reaction (LDR) combined with PCR, and Universal Array detection. We will transfer our assays for distinguishing blood-borne bacterial and viral pathogens onto the Cepheid GeneXpert system, as well as evaluate their performance in modular microfluidic devices. We will extend the family of microbial PCR/LDR assays to the detection of category B bacterial, viral, and protozoan food and water-borne pathogens in stool specimens. The assay will be validated using samples obtained from the NYPH/Cornell as well as collaborators in Haiti (GHESKIO) and Ghana (NMIMR).

Pingle M, Rundell M, Das S, **Golightly LM,** Barany F. PCR/LDR/universal array platforms for the diagnosis of infectious disease. Methods Mol Biol 2010;632:141-57.

HEPATITIS:

Clinical Studies of Viral Hepatitis. *Marks, Glesby.* Hepatitis C infection is the leading cause of end stage liver disease and need for liver transplantation in this country. Studies have shown that patients with HIV/HCV coinfection have an accelerated course of progression to cirrhosis and end stage liver disease compared to patients with HCV infection alone. Strategies for improving treatment outcomes are needed for this population. Current studies being conducted at Cornell focus on initial treatment of HCV infection as well as treatment of refractory disease. CCTU investigators are conducting ACTG study utilizing nitazoxanide as part of initial HCV treatment (ACTG 5269) and leading another ACTG study examining the treatment of insulin resistance prior to HCV retreatment (ACTG 5239). We are also leading the development of a phase I clinical trial of a novel HCV entry inhibitor (ITX 5061) in HCV monoinfection through the ACTG. Completed studies include an epidemiologic investigation of risk factors for hepatic steatosis in HIV/HCV coinfection, a pilot study examining the safety and efficacy of treatment of acute HCV infection in HIV-infected patients, as well as additional clinical trials conducted with the ACTG. The Center for the Study of Hepatitis C, a multidisciplinary center involving Rockefeller University, Weill Cornell Medical College, and New York Presbyterian Hospital, provides additional opportunities for translational research, access to a serum and tissue bank, and collaboration with experts in the field of virology and hepatitis treatment (e.g. Drs. Ira Jacobson, Charlie Rice, Andrew Talal).

Brau N, Fox RK, Xiao P, **Marks KM**, Naqvi Z, Taylor LE et al. Presentation and outcome of hepatocellular carcinoma in HIV-infected patients: A U.S.-Canadian multicenter study. J Hepatol 2007;47:527-37.

Bussel JB, **Marks KM**. How effective is eltrombopag for the treatment of thrombocytopenia in patients with HCV infection? Nat Clin Pract Gastroenterol Hepatol 2008;5:424-25.

French AL, Lin MY, Evans CT, Benning L, **Glesby MJ,** Young MA, Operskalski EA, Augenbraum M, Peters M. Long-term serologic follow-up of isolated hepatitis B core antibody in HIV-infected and HIV-uninfected women. Clin Infect Dis 2009;49:148-54.

Jackson CB, Varon J, Ho A, **Marks KM, Talal AH,** Kreek MJ. Identification of substance use and dependence among patients with viral hepatitis. Dig Liver Dis 2010;42:650-6.

Wan D, **Marks KM**, Yantiss R, **Talal A**. Autoimmune hepatitis in the HIV-infected patient: a therapeutic dilemma. AIDS Patient Care and STDs 2009;23:407-13.

HIV/AIDS:

Observational Studies. *Glesby, Gulick, Jacobs, Marks, Merrick, Siegel, Singh, Vaamonde, Vogler, Wilkin.* The Center for Special Studies (HIV clinic) at New York-Presbyterian-Weill Cornell Center uses an electronic medical records system that is an invaluable resource for clinical research. Over 10,000 records of HIV-infected patients dating back to 1991 are available. Completed projects include case-control studies of osteonecrosis and diabetes mellitus in HIV-infected patients, a retrospective review of the safety and efficacy of antiretroviral regimens containing three protease inhibitors, temporal trends in hospital admission diagnoses, and hepatic steatosis. Other projects utilize data from the Women's Interagency HIV Study (WIHS, a cohort study of women with or at high risk for HIV infection) through ongoing collaboration. Fellows have the opportunity to design, conduct, and analyze studies using the databases.

Marks KM, Clarke RM, Bussel JB, **Talal AH, Glesby MJ**. Risk factors for thrombocytopenia in the era of potent antiretroviral therapy. JAIDS 2009;52:595-99.

Glesby, MJ, Hoover DR, Shi Q, Danoff A, Howard A, Tien PC, Merenstein D, Cohen M, Golub ET, DeHovitz J, Nowicki M, Anastos K. Glycated haemoglobin in diabetic women with and without HIV infection: data from the Women's Interagency HIV Study. Antivir Ther. 2010;15:571-77.

Tien PC, Schneider MF, Cox C, Cohen M, Karim R, Lazar J, Young M, **Glesby MJ.** HIV, highly active antiretroviral therapy and lipoprotein particle concentrations in the Women's Interagency HIV Study. AIDS 2010;24:2809-17.

Clinical Trials of HIV/AIDS. *Glesby, Gulick, Marks, Vogler, Wilkin.* The Cornell HIV/AIDS Clinical Trials Unit (CCTU) designs and conducts clinical trials in HIV-infected individuals and those at risk for HIV. The CCTU participates actively in studies sponsored by the NIH-funded AIDS Clinical Trials Group (ACTG), the HIV Prevention Network (HPTN), the NIH-funded AIDS Malignancy Consortium (AMC), the NIH-funded HIV Prevention Network, Objectif Recherche VaCcin SIDA (ORVACS, a French non-profit organization), and the pharmaceutical industry. Current clinical investigation centers on three broad areas: (1) antiretroviral agents for treatment and prevention; (2) immune-based therapies; and (3) treatment and prevention of HIV-related complications, including co-infections and complications of antiretroviral therapy. Additional areas of investigation are pharmacokinetics of HIV drugs and HIV-infected women's health. Current specific projects include studies of the initiation of antiretroviral therapy (ACTG study A5257); HIV therapy for treatment-experienced patients (ACTG A5241); evaluation of adherence interventions (ACTG A5251); studies of investigational antiretroviral drugs (GSK integrase inhibitor); approaches to reduce the immune activation thought to contribute to HIV complications (ACTG A5258; A5725); antiretroviral intensification and therapeutic vaccination to reduce the viral reservoir (Eramune 002); treatment of HPV-associated anal dysplasia (AMC 076); and prevention of HIV-related complications (HPV vaccine in ACTG A5240; herpes zoster vaccine in ACTG A5247). In addition, the pathogenesis and management of visceral adiposity in HIV-infected patients is the focus of an investigator-initiated, NIH-funded project. There are opportunities for fellows to participate in all aspects of HIV/AIDS clinical trials. Fellows may spend their fellowship research year(s) conducting HIV/AIDS clinical research as part of the clinical trials unit under the mentorship of one of the HIV clinical trials investigators, and participate in the K30 program (Masters Degree Program in Clinical Investigation).

Gulick RM, Lalezari J, Goodrich J, et al. Maraviroc for previously treated patients with R5 HIV-1 infection. N Engl J Med 2008;359:1429-41.

Schouten JT, Krambrink A, Ribaudo HJ, Kmack A, Webb N, Shikuma C, Kuritzkes DR, **Gulick RM.** Substitution of nevirapine because of efivarenz toxicity in AIDS Clinical Trials Group A5095. Clin Infect Dis 2010:50:787-91.

Shikuma C, Ribaudo HJ, Zheng Y, **Gulick RM,** Meyer WA, Tashima KT, Bastow B, Kuritzkes D, **Glesby M.** Change in high-sensitivity C-reactive protein (hsCRP) levels following initiation of efavirenz-based antiretroviral regimens in HIV-infected individuals. AIDS Res Hum Retroviruses. Epub 2010 Nov 23.

Vogler, MA, Patterson K, Kamemoto L, Park JG, Watts H, Aweeka F, Klingman KL, Cohn SE. Contraceptive efficacy of oral and transdermal hormones when co-administered with protease inhibitors in HIV-1-infected women pharmacokinetic results of ACTG trial A5188. JAIDS 2010;55:473-82.

Wilkin TJ, Su Z, Krambrink A, Long J, Greaves W, Gross R, Hughes MD, Flexner C, Skolnik PR, Coakley E, Godfrey C, Hirsch M, Kuritzkes DR, **Gulick RM.** Three-year safety and efficacy of vicriviroc, a CCR5 antagonist, in HIV-1-infected treatment-experienced patients. JAIDS 2010:15;54:470-76.

Wilkin T, Lee JY, Lensing SY, Stier EA, Goldstone SE, Berry JM, Jay N, Aboulafia D, Cohn DL, Einstein MH, Saah A, Mitsuyasu RT, Palefsky JM. Safety and immunogenicity of the quadrivalent human papillomavirus vaccine in HIV-1 infected men. J Infect Dis 2010;202:1246-53.

Wilkin TJ, McKinnon JE, Dirienzo AG, et al. Regimen simplification to atazanavir-ritonavir alone as maintenance antiretroviral therapy: final 48-week clinical and virologic outcomes. J Infect Dis 2009; 199:866-71.

Influenza Clinical Research Studies. Glesby, Gulick, Kaner, Salvatore, Ginzburg. The CCTU is a site for observational studies of influenza in outpatients and inpatients conducted through the NIH-funded INSIGHT network and is participating in clinical trials of influenza through the NIH's Influenza Research Collaboration in collaboration with investigators in the Pulmonary division (Robert Kaner) and New York Blood Center (Yelena Ginzburg).

HOSPITAL EPIDEMIOLOGY AND INFECTION CONTROL:

Healthcare-Associated Infections. *Calfee, Wilson.* The Hospital Epidemiology Program at New York Presbyterian Hospital-Weill Cornell Medical Center has research activities ranging from traditional epidemiologic studies of infection control risk factors and outcomes to intervention trials of infection control policies and procedures. The primary goal of the research program is to improve patient safety by reducing the risk of healthcare-associated infections. Observational studies can be carried out utilizing infection control surveillance data, clinical microbiology data, and a robust hospital-based clinical database, which can be queried electronically. Previous and ongoing projects have studied patient-oriented and systems-based factors associated with transmission of multidrug-resistant organisms, device-related infections, and procedure-related infections. In addition, the program has the potential for performing individual and cluster randomized trials of infection control interventions at Weill Cornell and in collaboration with Columbia Presbyterian Medical Center. Fellows, residents, and students interested in epidemiologic research can choose from a wide variety of large or small projects depending on their needs. For fellows interested in a career in hospital epidemiology, there is opportunity to receive intensive training in this exciting field by participating in the Masters of Science Clinical Research Program, the Masters of Public Health Program, or the Graduate Program in Clinical Epidemiology and Health Services.

Bontrager JA, **Wilson SJ.** Prevalence and attributable mortality of healthcare-associated infections in patients who die in the hospital. Fifth Decennial International Conference on Healthcare-Associated Infections. March 18-22, 2010, Atlanta, GA.

Calfee DP, Jenkins SG. Use of active surveillance cultures to detect asymptomatic colonization with carbapenem-resistant Klebsiella pneumoniae among intensive care unit patients. Infect Control Hosp Epidemiol 2008; 29:966-68.

Kho A, Johnston K, Wilson J, **Wilson SJ.** Implementing an animated geographic information system to investigate factors associated with nosocomial infections: a novel approach. Am J Infect Control 2006; 34:578-82.

Morgan DJ, Weisenberg SA, Augenbraun MH, **Calfee DP,** Currie BP, Furuya EY, Holzman R, Montecalvo MC, Phillips M, Polsky B, Sepkowitz KA. Multidrug-resistant Acinetobacter baumannii in New York City – 10 years into the epidemic. Infect Control Hosp Epidemiol 2009; 30:196-97.

Patel G, Huprikar S, Factor SH, **Jenkins SG, Calfee DP.** Outcomes of carbapenem-resistant Klebsiella pneumoniae infection and the impact of antimicrobial and adjunctive therapies. Infect Control Hosp Epidemiol 2008; 29: 1099-1106.

Young EM, Commiskey ML, **Wilson SJ.** Translating evidence into practice to prevent central venous catheter-associated bloodstream infections: a systems-based intervention. Am J Infect Control 2006; 34:503-06.

HUMAN PAPILLOMAVIRUS (HPV):

Human Papillomavirus Test and Treat in HIV-Infected Women. *Wilkin.* Cervical cancer is a major cause of morbidity and mortality in areas of the world without access to cervical cancer screening. Implementation of cytology-based screening is difficult in areas with limited resources. This clinical trial will investigate a promising alternative screening strategy: a direct test for high-risk HPV types with immediate cryotherapy for those women with HPV detected. This project will be conducted at clinical trials sites in Africa, Peru, India and Haiti. This study will randomize women to a conventional cytology-based cervical cancer screening or a novel HPV test-and-treat strategy. This is funded in part by a PEPFAR/NIH collaboration.

Human Papillomavirus Vaccination in HIV-1-Infected Men. *Wilkin.* Anal carcinoma is increased among HIV+ and HIV- men who have sex with men. Similar to the cervix, premalignant lesions of the anus (squamous intraepithelial lesions or SIL) are readily detectable by screening cytology and have high-risk types of human papillomavirus as the most important cofactor. This study evaluated the safety and immunogenicity of the quadrivalent HPV vaccine in HIV-1-infected men. The study found that the vaccine was safe and highly immunogenic. An extension of the clinical trial will evaluate whether this vaccine induces immune memory. A follow-up clinical trial is being developed that will test the efficacy of this vaccine in this population.

Wilkin T, Lee JY, Lensing SY, Stier EA, Goldstone SE, Berry JM, Jay N, Aboulafia D, Cohn DL, Einstein MH, Saah A, Mitsuyasu RT, Palefsky JM. Safety and immunogenicity of the quadrivalent human papillomavirus vaccine in HIV-1-infected men. J Infect Dis. 2010 Oct 15;202:1246-53.

LEISHMANIASIS:

Visceral Leishmaniasis: Immunoregulation of Host Response to Antileishmanial Chemotherapy and Immunochemotherapy. *Murray.* Various host immunologic mechanisms, largely T [Th1] cell-dependent, regulate the in vivo capacity to respond to antileishmanial chemotherapy. Using pentavalent antimony and amphotericin B as two distinct pharmacologic probes in *L. donovani*-infected mice, this project is examining the host mechanisms that determine or can enhance initial in vivo host responsiveness to chemotherapy and/or regulate subsequent prevention of posttreatment relapse. The work is focused on the interaction of antileishmanial chemotherapy with amplified cytokine-induced macrophage activation, chemokine-induced granuloma assembly, CD4 and CD8 cell responses, activating and deactivating mechanisms (cytokines, receptors, intracellular signaling) and immunologic effects induced by chemotherapy itself. The goal of the project is to employ immunochemotherapy to improve treatment-induced outcome in visceral leishmaniasis, both the initial host response to chemotherapy and the long-term prevention of relapse in this intracellular protozoal infection.

Murray HW. Accelerated control of visceral Leishmania donovani infection in IL-6$^{-/-}$ mice. Infect Immun 2008;76:4088-4091.

Murray HW, Xiang Z, Ma X. Responses to *Leishmania donovani* in mice deficient in both phagocyte oxidase and inducible nitric oxide synthase. Am J Trop Med Hyg 2006;74:1013-1015.

Murray HW, Tsai CW, Liu J, Ma X. Responses to Leishmania donovani in mice deficient in IL-12, IL-12/IL-23 or IL-18. Infect Immun 2006;74:4370-4371.

Murray HW, Tsai CW, Liu J, Ma X. Visceral Leishmania donovani infection in IL13$^{-/-}$ mice. Infect Immun 2006;74:2487-2490.

Sundar S, Chakravarty J, Agarwal D, Rai M, **Murray HW.** Single-dose liposomal amphotericin B for visceral leishmaniasis in India. N Engl J Med 2010;362:504-512.

Sundar S, Rai M, Chakravarty J, Agarwal D, Agrawal N, Vaillant M, Olliaro P, **Murray HW.** New treatment approach in Indian visceral leishmaniasis: single-dose liposomal amphotericin B followed by short-course oral miltefosine. Clin Infect Dis. 2008 Oct 15;47(8):1000-1006.

MALARIA:

Endothelial Progenitor Cells and Malaria Pathogenesis. *Golightly*. Despite its virulence, the pathophysiologic basis of *P. falciparum* disease and cerebral malaria are poorly understood. Sequestration of infected red blood cells (iRBCs) in the microvasculature is a major pathologic finding in *P. falciparum* infections. The repair of microvasculature damaged by infection may occur either by the proliferation or migration of local endothelial cells, or the recruitment of bone marrow-derived circulating endothelial progenitor cells (EPCs). We hypothesize that *P. falciparum* infection results in an imbalance between microvascular damage and repair. Cerebral malaria occurs when circulating EPCs are diminished and damaged endothelial cells cannot be replaced. To test this hypothesis, EPC levels and markers of bone marrow activation in *P. falciparum*-infected patients with different degrees of disease severity are being compared with normal uninfected controls. These studies are being performed in collaboration with the Noguchi Memorial Institute for Medical Research in Accra, Ghana. Studies to further validate

this hypothesis are being performed using a mouse model system of cerebral malaria in collaboration with investigators at the Albert Einstein College of Medicine.

Desruisseaux MS, Machado FS, Weiss LM, Tanowitz HB, **Golightly LM**. Cerebral malaria, a vasculopathy. Am J Pathol 2010;176(3):1075-78.

Gyan B, Quarm Goka B, Adjei GO, Tetteh JKA, Kusi KA, Aikins A, Dodoo D, Lesser ML, Sison CP, Das S, Howard ME, Milbank E, Fischer K, Rafii S, Jin D, **Golightly LM**. Cerebral malaria is associated with low levels of circulating endothelial progenitor cells in African children. Am J Trop Med Hyg 2009;80:541-46.

Genetic variation in the human malaria parasite, *Plasmodium falciparum*. *Kirkman.*
Malaria, a vector borne disease, causes great morbidity and mortality in tropical and subtropical regions of the world. Infection with the parasite leads to one to two million deaths and 300 to 500 million clinical cases per year. Crucial to the continuing burden of disease is the parasite's ability to evade clearance in the host; both the ability to evade the host immune system by changing surface proteins inserted into the host red blood cell, a process termed antigenic variation, and the ability to develop drug resistance. Underlying both is the ability of this eukaryotic pathogen with a haploid genome for most of its lifecycle to generate and incorporate DNA mutations. We aim to study malaria DNA recombination and repair in the context of disease pathogenesis focusing on antigenic variation and the development of drug resistance.

Antigenic Variation: After invading a red blood cell the malaria parasite modifies its host cell in different ways including inserting parasite derived proteins into the surface of the parasitized red blood cell. These parasite proteins bind to receptors on host endothelial cells, a process termed cytoadherence and is one of the key pathogenic and virulence factors of *P. falciparum* infections. A surface protein termed *Plasmodium falciparum* erythrocyte membrane protein 1 (PfEMP1) was identified as the protein responsible for cytoadherence. This protein is encoded by the large multi-copy gene family termed *var*. There is great diversity within this gene family and the mechanisms creating this diversity are a focus of our work. To better understand the generation of genetic diversity within this multi-copy gene family we are manipulating the parasite genome to determine how the parasite repairs damaged DNA.

Drug Resistance: We are studying the mechanisms by which a parasite becomes resistant to antimalarials by focusing on the ways in which the parasites acquire mutations in DNA. Using genetically modified parasites we are studying the ability of the parasite to generate point mutations and gene duplications that have been previously associated with drug resistance in the field. We are able to manipulate both copy number and specific sequence in order to further study the interplay of different aspects of pathways implicated in parasite drug resistance.

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TRANSPLANTATION-ONCOLOGY INFECTIOUS DISEASES:

Translational Research: *Walsh, Helfgott, Soave, Petraitiene, Petraitis*. Infectious diseases are important causes of morbidity and mortality in immunocompromised patients with cancer and those undergoing transplantation. The mission of the transplantation-oncology infectious diseases program is to develop new strategies for diagnosis, treatment, and prevention of life-threatening infections in immunocompromised children and adults with transplantation and neoclassic diseases through multidisciplinary translational research. The tools of this research include epidemiology, pathogenesis, antimicrobial pharmacology, immunopharmacology, molecular diagnostic microbiology, and studies of innate host defenses.

Following the observations at the bedside, we work systematically through in vitro systems, laboratory animal models, phase I-II clinical trials, and, where applicable to multicenter phase III clinical trials. Our clinical trials are conducted with consortia composed of seasoned clinical investigators with expertise in immunocompromised patients. Among the pediatric and adult patient populations studied within the Program are those hematological malignancies, aplastic anemia, myelodysplasia, hematopoietic stem cell transplantation, and solid organ transplantation. Our strategy for translational research is predicated on an iterative process of bedside to bench to bedside with an emphasis on the critical role of the physician-scientist in this process. These studies are conducted in collaboration with our colleagues in Pediatrics, Oncology, Hematology, Nephrology, Hepatobiliary Surgery, Clinical Microbiology, Pharmacology, and Microbiology & Immunology.

Invasive Fungal Infections: Recognizing the severe morbidity and mortality cause by invasive mycoses, the study of invasive fungal infections with specific emphasis on *Candida* spp., *Aspergillus* spp., the Mucorales (Zygomycetes), and emerging pathogens such as *Fusarium* spp., *Scedosporium* spp., and *Cryptococcus neoformans* is a critical element of our mission. We conduct translational research in three major areas of medical mycology: antifungal pharmacology, molecular diagnosis, and innate host defenses. Among the recent advances in 2010, are the identification of the critical role of antifungal therapy in improving survival in patients with severe aplastic anemia, the pharmacology of echinocandin compounds in infants, the intrapulmonary pharmacokinetics of an echinocandin in lung transplant recipients, mathematical modeling of antifungal agents against *Aspergillus*, results of an NHLBI sponsored study of antifungal prophylaxis in HSCT recipients, pharmacokinetics of voriconazole in children, development of an in vitro blood-brain barrier system for the study of host defenses and pharmacology of CNS mycoses, and transcriptional profiles of innate host defenses molecules of phagocytes in response to filamentous fungi. On going clinical trials include pharmacokinetic studies of triazoles and echinocandins in immunocompromised children and adults.

Resistant Bacterial Infections: The Program is developing new strategies for pharmacodynamically rational methods for administration of existing antibacterial agents, as we well as development of new compounds. We are currently investigating molecular diagnostic approaches to rapid identification of resistant bacteria as a guide to management of critically patients. As *Clostridium difficile* represents a serious threat to our patients, international trials are being initiated in the immunocompromised Transplant Oncology Program.

Viral Infections: Studies of anti-influenza and parainfuenza compounds will provide our patients with new agents that may improve outcome from these serious infections. The epidemiology of respiratory viral infections in these patients continues to evolve and will be the subject of further study.

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INTERNATIONAL PROGRAMS

BRAZIL:

The collaboration between Cornell University and the Federal University of Bahia started in 1964 and may be the longest collaboration of its type in the world today. To date, over 20 Cornell faculty members and ~120 students and fellows have participated in the program, and over 250 peer reviewed journal publications have emerged from the research. The program has been funded by the Commonwealth Fund and the Rockefeller Foundation, and since 1979, by the NIH. The current NIH funding supports our Tropical Medicine Research Center and a research training program in infectious diseases in Salvador, Brazil.

Leishmaniasis and HTLV-I: *Carvalho, Johnson, Glesby.* This is a multi-disciplinary research program with investigators from Brazil and the United States. We seek to define the pathogenesis of these diseases and to develop intervention measures. Research is conducted at field study sites in the state of Bahia, Brazil, the University of Bahia, and the Division of Infectious Diseases at Cornell. We are working to identify host and parasite factors that determine the outcome of leishmania infection. Based on the immunological studies previously performed, clinical trials have been performed using immunomodulatory agents combined with antimony therapy in cutaneous and mucosal leishmaniasis. Ongoing studies are also investigating the spectrum and natural history of subclinical and clinical disease in HTLV-I infection in relation to cytokine profiles and co-infections.

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HAITI:

The Cornell program in Haiti began in 1980 with the establishment of a unit for the study and treatment of infantile diarrhea at the State University Hospital in Port au Prince. The Cornell team began its AIDS research in 1982 and was instrumental in the formation of Groupe Haitien d'Etude du Sarcome de Kaposi et des Infections Opportunistes (GHESKIO). Since 1983, Cornell and GHESKIO have had uninterrupted NIH support resulting in over 100 publications, including the first detailed description of AIDS in a developing country (NEJM, 1983). Cornell-GHESKIO conducts NIH-sponsored HIV and tuberculosis clinical trials. With support from the US Presidents Emergency Program for AIDS Relief (PEPFAR) GHESKIO provides AIDS, TB, and other services to ~500,000 persons annually. In 2010, GHESKIO received the Gates Award as the most outstanding global health institution in the world.

Research at GHESKIO: HIV/AIDS, Tuberculosis, and STDs

Through clinical and operational research, GHESKIO seeks to define treatment and prevention models for HIV/AIDS and related diseases that are appropriate and effective for Haiti. The main focus of the research is HIV, sexually transmitted infections, and tuberculosis. The GHESKIO research program has evolved from early observational studies to large clinical trials and its designation as an NIH clinical trials unit. In 1983, GHESKIO received its initial funding from the National Institutes of Health to define the epidemiology, natural history, risk factors, and associated co-infections of HIV/AIDS. Since then, GHESKIO's consistent research productivity has been recognized by uninterrupted support from the National Institutes of Health, a MERIT award in 1990, and twenty new or competitive renewal grants. GHESKIO also conducts research with support from the World Health Organization and the French Government's National Agency for AIDS Research.

HIV/AIDS: *Charles, Fitzgerald, Gulick, Johnson, Pape.* Ongoing research projects include a randomized controlled clinical trial of early vs. late antiretroviral therapy for AIDS patients (NIH-sponsored CIPRA study; 2003 – 2010). The research is focused on finding the optimal time to start antiretroviral therapy in patients with CD4 counts between 200 and 350 cells/ml. GHESKIO is a member of an international collaboration of scientists and educators searching for an effective and safe HIV vaccine (NIH-sponsored HIV Vaccine Trials Network; 2001 – 2013). GHESKIO Director Dr. Jean Pape is the Principal Investigator of the HIV Vaccine Trials Network in Haiti and GHESKIO investigators conduct clinical trials of promising new HIV vaccine candidates. GHESKIO also is a member of an international group of scientists dedicated to developing treatment strategies for HIV and related disorders (NIH-sponsored AIDS Clinical Trials Group; 2002 – 2013). GHESKIO conducts clinical trials to evaluate the efficacy of antiretroviral treatment for HIV infected individuals in resource-limited countries. Research continues to evaluate the efficacy and feasibility of other AIDS prevention and treatment programs. GHESKIO investigators are evaluating the cost-effectiveness of HIV prevention and care services to maximize efficiency and demonstrate the feasibility of treatment programs in developing countries.

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TUBERCULOSIS: *Fitzgerald, Johnson, Pape.* GHESKIO currently treats over 1,000 patients with active tuberculosis as well as patients with multi-drug resistant tuberculosis. Research includes studies of the interactions between HIV and tuberculosis and optimal treatment for co-infected patients, new diagnostic tests for tuberculosis, and the epidemiology of multi-drug resistant tuberculosis in Haiti.

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SEXUALLY TRANSMITTED DISEASES: *Fitzgerald, Johnson, Pape.* Studies of sexually transmitted diseases include the evaluation of rapid syphilis diagnostics for the elimination of congenital syphilis in Haiti (2002 – 2011); the goal of this project is to improve syphilis screening throughout the country to reduce deaths due to congenital syphilis. Support is from the United Nations Development Program, the World Bank, and the World Health Organization's Special Program for Research and Training in Tropical Disease. STD studies also include NIH sponsored research on the natural history of HIV and HPV co-infection and AIDS related cervical cancer.

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INDIA:

Visceral Leishmaniasis in India: The Kala-Azar Medical Research and Treatment Center. *Murray.* In 1994, we established the Kala-Azar Medical Research Center (KAMRC) in rural India, in Bihar State (the epicenter of India's visceral leishmaniasis epidemic), to test new treatments and develop new diagnostic and therapeutic approaches. Some of these new clinical approaches were the direct result of experimental work carried out in parallel in *Leishmania*-infected animals in our Weill-Cornell laboratory in New York City.

Visceral leishmaniasis (kala-azar) is a worldwide parasitic infection that involves the liver, spleen and bone marrow in children and adults. One-half of the world's 500,000 new cases occur in India. The treatment trials work at KAMRC has been remarkably successful, and our unit is the world's leading treatment center for this infection. More than 35 separate clinical trials have now been carried out in over 5,000 children and adults. For injectible treatments, we have defined the usefulness of combination immunochemotherapy, short-course cost-effective treatment, and single-dose therapy using liposomal amphotericin B (heretofore, 21-28 days had been the usual prior treatment duration). Equally important, we identified and tested miltefosine, the first effective oral therapy for this disease, representing, along with single-dose parenteral therapy, a second major breakthrough in treatment in kala-azar. Recently, we have tested short-course combination chemotherapy, using a single dose of a parenteral agent (liposomal amphotericin B) followed by 7 days of oral therapy (miltefosine). Separate results from a series of other trials have also demonstrated the sensitivity, specificity and clinical usefulness of rapid non-invasive diagnosis of kala-azar using fingerstick blood and the K39 antibody strip test. This reliable diagnostic method spares patients with kala-azar splenic or bone marrow aspiration.

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TANZANIA:

In 2006, a formal affiliation was established between WCMC and the Bugando University College of Health Sciences (BUCHS) and Bugando Medical Center (BMC) in Mwanza, Tanzania. BMC is a 900-bed tertiary care center serving a population of ~13 million Tanzanians. BUCHS was founded in 2003 with a first class of ten students, and now admits approximately 150 medical students per class, per year. Since 2005, the philanthropic TOUCH foundation has supported the BUCHS and the BMC. The TOUCH foundation has provided Weill Cornell with a matching grant for a pilot program addressing the educational needs of BUCHS/BMC.

The common goal of the TOUCH foundation and WCMC is to make BUCHS/BMC the best medical school and teaching hospital in East Africa. The goal of the Weill Cornell collaboration is to aid in the development of the BUCHS/BMC infrastructure and training programs by the exchange of faculty, fellows, residents and students. Long-term goals are to create a platform for self-sustaining research programs and clinical knowledge transfer as in our Haiti and Brazil programs. Each year since 2007 WCMC rotates approximately 50 senior teaching residents and fellows in medicine, pediatrics, surgery, and obstetrics and gynecology to Tanzania and brings 10 Tanzanian physicians to New York for clinical and research training. Two WCMC faculty members have been recruited and are based in Mwanza to serve as mentors, for both the Tanzanian and WCMC medical students and physicians at BUCHS/BMC. Plans for the involvement of WCMC pre-clinical faculty and graduate student tutors at BUCHS are being implemented.

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