

## FELLOWSHIP TRAINING IN PEDIATRIC INFECTIOUS DISEASES AT YALE

The Yale Pediatric Infectious Diseases Fellowship offers clinical and research training for individuals who have completed a Pediatrics (or combined Medicine-Pediatrics) residency and are interested in an academic career. Fellows research is conducted under the guidance of faculty mentors working in three specific research tracks: Microbial Pathogenesis, Global Infectious Diseases, and Clinical/Molecular Epidemiology. Training faculty from within the Division and participating Yale Departments are accomplished investigators in the epidemiology and/or pathogenesis of a variety of infectious diseases, including viral infections (human herpes viruses, novel respiratory viruses, HIV, VZV), parasitic diseases (Helminth infections, malaria, leishmaniasis, trypanosomiasis), vector biology (ticks, tsetse flies) bacterial infections (nosocomially acquired gram negative infections, *S. pneumonia*, Lyme disease) and pathogenic yeast/fungal infections (Candidiasis). Clinical activities include inpatient and outpatient Infectious Diseases consultations at Yale-New Haven Children's Hospital, didactic conferences, journal clubs, weekly pediatric ID rounds, and monthly case presentations held jointly with our colleagues from the University of Connecticut.

**Length of training:** The period of training is generally 3 years, although individuals committed to a research career often stay for an additional (4<sup>th</sup>) year. Fellows are encouraged to apply for individual fellowship awards to support the later years of training and transition to faculty status.

**Stipend:** Fellows' stipends are determined by the current NIH-recommended level, with additional supplementation based on the number of years of previous training.

### **Requirements:**

- United States citizenship or permanent residence status.
- Completion of application form (available on request) including 3 letters of recommendation (see below).

### **Below is a representative 3 yr schedule for Pediatric Infectious Diseases Fellows**

Year 1	Clinical infectious diseases consultation service#	4 months
	Elective in Diagnostic Microbiology	1 month
	Elective in Clinical immunology	1 month
	Pediatric AIDS Clinic#	Weekly
	Elective in Infection Control and Hospital Epidemiology	1 month
	Mentored laboratory/clinical research#	8 months
	<i>Courses and seminars</i> Seminar on Responsible Conduct of Research# Pediatric Fellows weekly Research Seminar# Graduate level courses (Program in the Biological and Biomedical Sciences, Robert Wood Johnson Clinical Scholars Program, School of Epidemiology & Public Health, Investigative Medicine Program)	Concurrent with other activities
Years 2-3	Laboratory research#	8 months
	<i>Courses and seminars</i> Seminar on Responsible Conduct of Research# Pediatric Fellows weekly Research Seminar# Graduate level courses (Program in the Biological and Biomedical Sciences, Robert Wood Johnson Clinical Scholars Program, School of Epidemiology & Public Health, Investigative Medicine Program)	Concurrent with other activities
	Clinical infectious diseases consultation service#	4 months
	Outpatient Clinic (Pediatric AIDS, Winchester Tuberculosis, or International Adoption)	Weekly
	Elective in Clinical Adult Infectious Diseases	1 month

# Required activities

## **Training Faculty and Research Interests:**

### **Microbial Pathogenesis Track**

**\*I. George Miller Jr MD**, John F. Enders Professor and Chief of Pediatric Infectious Diseases. Molecular biology and pathogenesis of herpesvirus infections, including EBV and KSHV.

**\*Sumita Bhaduri-McIntosh MD PhD**, Associate Research Scientist, Pediatrics. Innate and acquired immunity to Epstein-Barr virus.

**Kim Bottomly PhD**, Professor of Immunobiology. The biology of T cells and T cell receptor signalling.

**Daniel Di Maio MD**, Professor of Genetics. Molecular basis of cell transformation by papillomaviruses.

**Erol Fikrig MD**, Professor of Internal Medicine. Molecular pathogenesis of vector borne diseases.

**Sankar Ghosh PhD**, Professor of Immunobiology. Cytokine signaling in innate and acquired immunity.

**Margaret K. Hostetter MD**, Professor and Jean McClean Wallace Chair of Pediatrics. Pathogenesis of infections caused by *Candida spp* and *S. pneumoniae*.

**\*Jeffrey Kahn MD PhD**, Associate Research Scientist, Pediatrics. Molecular epidemiology of respiratory viruses and development of novel diagnostics.

**Barbara Kazmierczak MD PhD**, Assistant Professor of Internal Medicine. Pathogenesis and virulence factors of *Pseudomonas aeruginosa*.

**John Rose PhD**, Professor of Pathology. Molecular biology of enveloped RNA viruses. Development of novel viral vaccine vectors.

### **Global Infectious Diseases Track**

**Serap Aksoy PhD**, Professor of Epidemiology and Public Health. Pathogenesis of vector borne diseases, including African trypanosomiasis and leishmaniasis.

**Karen Anderson PhD**, Professor of Pharmacology. Anti-parasitic drug development targeting TS-DHFR enzymes of protozoa.

**Richard Bucala MD PhD**, Professor of Internal Medicine. The role of Macrophage Migration Inhibitory Factor (MIF) in the pathogenesis of parasitic diseases.

**\*Michael Cappello M.D**, Professor of Pediatrics, Director of Yale Program in International Child Health. Molecular pathogenesis and immunoepidemiology of parasitic helminth infections.

**Gerald Friedland MD**, Professor of Internal Medicine. Epidemiology and integrated control of *M. tuberculosis* and HIV co-infection in South Africa.

**Diane McMahon Pratt PhD**, Professor of Epidemiology and Public Health. Pathogenesis of *Leishmania* infections and vaccine development.

**\*Elijah Paintsil MD**, Associate Research Scientist, Pediatrics. Molecular basis of HIV drug resistance; Epidemiology of mother to child transmission of HIV.

**Elisabetta Ullu PhD**, Professor of Internal Medicine. Molecular biology of African trypanosomes.

## Clinical and Molecular Epidemiology Track

**\*Warren A. Andiman MD**, Professor of Pediatrics; Director of the Pediatric AIDS Program. Epidemiology and management of Pediatric HIV/AIDS.

**\*Robert S. Baltimore MD**, Professor of Pediatrics; Associate Director of Hospital Epidemiology. Neonatal infections, nosocomial infections in infants and children.

**Louise-Maire Dembry MD**, Associate Professor of Internal Medicine. Director of Hospital Epidemiology, Yale New Haven Hospital. Infection control, epidemiology of vancomycin-resistant enterococci.

**\*Richard Martinello MD**, Clinical Instructor in Pediatrics and Internal Medicine; Hospital Epidemiologist, VA Connecticut Healthcare System. Virology of respiratory syncytial virus.

**\*Eugene D. Shapiro MD**, Professor of Pediatrics. Case control studies of vaccine effectiveness; Epidemiology of Varicella Zoster virus infections; Epidemiology of Lyme disease.

**\*Marietta Vazquez MD**, Assistant Professor of Pediatrics. Post licensure vaccine surveillance. Clinical studies of Lyme disease and respiratory virus infections in children.

*\*Pediatric Infectious Diseases Division Faculty member*

## Current Post Doctoral Fellows (2006-07):

**Thomas Murray MD, PhD**

**Nisha Manickam DO**

## **International Collaborations of Infectious Diseases Training Faculty**

Yale University is a truly global institution, and many of our Pediatric Infectious Diseases training faculty are engaged in international collaborative research. Trainees, especially those who choose the Global Infectious Diseases Research Track, may have opportunities to spend part of their fellowship working internationally under the guidance of a Yale faculty mentor and an international colleague. A listing of Pediatric Infectious Diseases training faculty and their international collaborators can be found below:

<u>Yale Training Member</u>	<u>International Collaborator</u>	<u>Institutional Affiliation</u>	<u>Area of investigation</u>
<b>Serap Aksoy</b>	Grace Murilla	Trypanosomiasis Research Centre, Kenya	Tsetse vector biology, functional genomics, population genetics and bioinformatics.
	Loyce Okedi	Livestock Health Research Institute, Tororo, UGANDA	Population genetics of tsetse flies and symbiotic infection
	Win Hide	South African National Bioinformatics Institute, CapeTown, South Africa	Collaborative training effort in bioinformatics for tsetse fly genome project
	Shen DeLang	Fudan University, China	Vector biology, invertebrate immunity
<b>Karen Anderson</b>	Yongyuth Yuthavong	National Center for Genetic Engineering and Biotechnology THAILAND	Malaria drug development
	Roger Hunter	University of Cape Town South Africa	HIV drug development

<b>Warren Andiman</b>	Celia Christie-Samuels	University of the West Indies Kingston, Jamaica	HIV epidemiology and treatment
<b>Richard Bucala</b>	Phil Thuma Macha	Macha Malaria Research Institute Zambia	Pathogenesis of malaria
	James Chipeta	University of Lusaka Zambia	Pathogenesis of malaria
<b>Michael Cappello</b>	Michael Wilson	Noguchi Memorial Institute for Medical Research Accra, Ghana	Immunoepidemiology of helminth infections; Capacity building in African research
	Deborah Bell	Refuge International Guatemala	Immunoepidemiology of helminth infections
	William Sorenson Robert Gilman	Johns Hopkins/University of Peru	Immunoepidemiology of helminth infections
<b>Louise Dembry</b>	Silvie Fonseca	Hospital Sao Francisco Ribeiro en Preto, Brazil	Epidemiology and transmission of nosocomial infections
<b>Gerald Friedland</b>	Wilhelm Sturm	Nelson Mandela School of Medicine, Durban South Africa	Integrated care of HIV- <i>M. tuberculosis</i> co- infection
	Umesh Laloo		
<b>Diane McMahon-Pratt</b>	Nancy Saravia	CIDEM Medillin, Colombia	Immunopathogenesis of leishmaniasis
	Selma Jeronimo Yara-Traub Cseko	Universidade Federal da Bahia, Salvador Brazil	Immunopathogenesis of leishmaniasis

### **Course offerings available to Pediatric Infectious Diseases Trainees**

As part of their fellowship, trainees are offered the opportunity complete formal didactic coursework offered by the following graduate programs at Yale University. Selected fellows will be eligible for a Master's in Public Health degree offered through the School of Public Health, or a PhD specifically developed for physicians awarded through the Yale Investigative Medicine Program.

#### The Yale Combined Program in the Biological and Biomedical Sciences (BBS)

Molecular biophysics and biochemistry 550a. Molecular Foundations of Medicine  
Cell Biology 727b. Advanced Seminar Course  
Genetics 620a. Topics in Medical Genetics  
Immunobiology 527b. Advanced Immunology Seminar  
Neuroscience 507b. Cellular and Molecular Mechanisms of Neurological Disease  
Cellular & Molecular Physiology 600b Principles of Mammalian Physiology

#### The Robert Wood Johnson Clinical Scholars Program at Yale

Multivariate Statistics  
Quantitative Clinical Epidemiology

#### The Yale Investigative Medicine (PhD) Program

IMED 625 Principles of Clinical Research  
IMED 650 Seminars in Clinical Investigation  
IMED 610 Translational Research and Molecular Tools  
IMED 640 Seminars in Molecular Medicine

#### Yale School of Epidemiology & Public Health

EMD 530b, Hospital Epidemiology  
EMD 536b, Investigation of Disease Outbreaks

EMD 557b, Public Health Issues in HIV/AIDS  
EMD 560b, Epidemiologic Methods in STD/HIV Research  
EMD 565a, Modeling the Epidemiology and Evolution of Infectious Diseases  
BIS 511a, GIS Applications in Epidemiology and Public Health  
CDE 517a, Developing a Research Protocol  
BIS 505a, Introduction to Statistical Thinking I  
BIS 505b, Introduction to Statistical Thinking II  
CDE 508a, Principles of Epidemiology  
CDE 550b, Evidence-based Health Care  
BIS 625b Categorical Data Analysis  
BIS 631a Topics in Genetic Epidemiology  
BIS 635b Topics in Statistical Epidemiology  
CDE 619a Advanced Epidemiologic Research Methods  
HPA 521a Epidemiology, Health Resources and Health Policy  
HIA 570b Cost Effectiveness Analysis and Decision Making

### **Application Process**

Applications are available upon request by email ([Karen.lavery@yale.edu](mailto:Karen.lavery@yale.edu)) or can be downloaded at: [http://info.med.yale.edu/pediat/infect\\_dis/education.html](http://info.med.yale.edu/pediat/infect_dis/education.html)

In addition to the completed application, prospective fellows are invited to have letters of recommendation sent by three of their academic or clinical supervisors to Dr. Michael Cappello, Director of the Yale Pediatric Infectious Diseases Fellowship Training program. Letters can be sent by email ([michael.cappello@yale.edu](mailto:michael.cappello@yale.edu)) or to the following address:

### **Michael Cappello MD**

Professor of Pediatrics, Microbial Pathogenesis, and Epidemiology & Public Health  
Yale Child Health Research Center  
464 Congress Avenue  
New Haven CT 06520