



2009

Investigators in the Pathogenesis of Infectious Disease

Awards for research that illuminate the interactions between pathogens and human hosts
Providing support for U.S. and Canadian Assistant Professor-level Scientists

Application Deadline: November 3, 2008

BURROUGHS
WELLCOME
FUND 

Program

The Investigators in the Pathogenesis of Infectious Disease program provides opportunities for assistant professors to bring multidisciplinary approaches to the study of human infectious diseases. This award provides \$500,000 over a period of five years (\$100,000 per year). The Burroughs Wellcome Fund will offer up to 16 awards this year.

The goal of the program is to provide opportunities for accomplished investigators still early in their careers to study the pathogenesis of infectious disease at its most fundamental level—the points where human and microbial systems connect. The program supports research that sheds light on the fundamentals that affect the outcomes of this encounter: how colonization, infection, commensalism and other relationships play out at levels ranging from molecular interactions to systemic ones.

BWF is particularly interested in work focused on the host, as well as host-pathogen studies originating in viral, bacterial, fungal, or parasite systems. Studies supported by the program may have their roots in the pathogen, but the focus of the work should be on the interplay of host and microbe.

While work on AIDS, malaria, tuberculosis, and microbes of interest for biodefense is allowed, the program emphasizes areas of research that open up unexplored areas of pathogenesis. Research on under-studied infectious diseases, including pathogenic fungi, protozoan and metazoan diseases, and emerging infections is especially of interest. In addition, excellent animal models of human disease, including work done in veterinary research settings, are within the program's scope. Interdisciplinary approaches are encouraged.

The awards are intended to give recipients the freedom and flexibility to pursue high-risk projects and new avenues of inquiry. Work supported will be efforts that have the potential to significantly advance the understanding of how microbes and the human system interact, especially in the context of infection. Biochemical, pharmacological, molecular, genetic, immunologic, and other approaches are all appropriate for support by the program. Areas of particular interest include:

- **Cell/Pathogen interactions**—studies of host responses at the cell surface, cell signaling in response to infection, microbial persistence in host cells, and other work.
- **Host/Pathogen interactions**—studies of how host genetics influences resistance and susceptibility to infection, innate and adaptive immune responses to microbes, pathogen modulation of the immune system, and other work.
- **Novel routes to disease causation**—studies of the role of infectious agents in the etiology of chronic, autoimmune, and immunologic diseases, and other work.

Approaches that fit into these frameworks might include the study of host susceptibility to particular pathogens, host

resistance to chronic or acute disease, or basic studies of infectious microbes—as long as the work is oriented toward understanding how the organism interacts with the host. Virulence factors, immune mechanisms, and genetic studies in microbes and the host all provide fertile ground for this kind of study. Work on AIDS, malaria, tuberculosis, and organisms of interest for biodefense may be submitted, but nominating institutions should note that research on under-funded and under-studied organisms is especially of interest: proposed work in well-funded systems may be viewed as less relevant to the program's goals.

The Burroughs Wellcome Fund must receive all application materials by 4:00 p.m., Eastern Time, November 3, 2008. BWF will interview finalists for these awards. Candidates will be notified mid-February 2009, about interviews, which will be conducted during the program's advisory committee meeting in April. Award recipients will be notified and announced in mid-May 2009 and grants will begin on July 1, 2009.

Guidelines

Candidate Eligibility Guidelines

- Candidates will generally have an M.D., D.V.M., or Ph.D. degree. (Throughout this brochure, references to degrees include all types of medical and scientific doctoral level degrees.) BWF particularly encourages human health-relevant applications from veterinary scientists.
- Candidates must have an established record of independent research and hold a tenure-track position as an **assistant professor** or equivalent (at the time of application) at a degree-granting institution. Researchers recently appointed to a faculty position may not have a demonstrated track record sufficient to compete successfully for this award.
- Candidates must be nominated by accredited, degree-granting institutions in the United States or Canada.
- Applications from non-tenure track investigators at tenure-offering, degree-granting institutions will not be accepted.
- Applications from institutions or departments that do not offer tenure may or may not be accepted. Please see **"Institutional Nomination Guidelines"** bullet five.
- Candidates must be citizens or permanent residents of the United States or Canada at the time of application. Documentation of permanent resident status must be provided with the application. Permanent residents of the United States must provide a copy of their Permanent Resident Card or a copy of a current passport with an I-551 stamp. Permanent residents of Canada must provide a copy of their Landed Immigrant Status form. Persons who have applied for permanent resident status but have not received their government documentation by the time of application are not eligible.

- Candidates at the appropriate career stage who have held or are currently holding a Burroughs Wellcome Fund award must contact BWF in advance to determine eligibility for this program. Candidates should contact Jean Kramarik, Senior Program Associate, at jkramarik@bwfund.org or 919-991-5122.

Institutional Nomination Guidelines

- A U.S. or Canadian institution—including its medical school, graduate schools, and all affiliated hospitals and research institutes—**may nominate up to two candidates.**
- To encourage applications from veterinarians, **institutions that nominate a researcher who holds the D.V.M. will be allowed three nominations.**
- Institutions may have a single **additional nomination** if they nominate a researcher working in pathogenic helminths, mycology, or reproductive science.
- BWF encourages institutions to nominate underrepresented minorities and women for this program.
- Applications from institutions or departments that do not offer tenure must demonstrate an extremely strong institutional commitment, congruent to the level of commitment that is traditionally dedicated to tenure-track hires.
- The institution must submit a statement of nomination for each candidate. In this statement, BWF expects that the institution will tangibly demonstrate its commitment to support each candidate it nominates, including the protection of 75 percent of the grantee's time for research.
- Questions regarding institutional eligibility should be directed to BWF in advance by contacting Jean Kramarik, Senior Program Associate, at jkramarik@bwfund.org or 919-991-5122.

Selection

BWF uses an outside advisory committee composed of distinguished scientists from relevant pathogen and human biology fields to review applications and make recommendations for approval by the Fund's board of directors. BWF does not provide critiques of unfunded proposals.

Selection is based on a number of factors, including:

- Candidate's qualifications and potential to conduct innovative research.
- Quality and originality of the proposed research and its potential to advance understanding of fundamental issues of how infectious agents and human hosts interact. Proposals that bring new, solid experimental approaches to understudied questions will be considered more competitive than proposals that primarily extend work under way.
- Demonstration of an established record of independent research. Most awardees have demonstrated independence

by publishing significant work without their advisors. It is not necessary to have an R01 to apply, but successful applicants have frequently obtained independent K or R-series NIH grants or early career grants from other funders.

This award can be used to stimulate multidisciplinary work tying together related fields that often have been isolated from one another in practice. For multidisciplinary proposals, applicants should describe how the work proposed takes advantage of prior multidisciplinary training, or should develop a plan for acquiring requisite expertise. This plan might involve collaboration, cross training, or strategies for developing productive ties to researchers in disciplines relevant to this multidisciplinary approach.

This is a career development program as well as a program in support of basic research. It is aimed only at researchers relatively early in their careers. BWF will give considerable weight to applicants' institutional environments. Institutions should provide detailed evidence that their facilities are adequate for the proposed research, that they are committed to research in areas in which the candidate will work, and that they have taken, or are prepared to take, exceptional steps toward fostering the candidate's career development.

Application Instructions

General Information

Candidates must be nominated by their dean or department chair. Applications must be approved by an official responsible for sponsored programs (generally from the grants office, office of research, or office of sponsored programs) at the degree-granting institution. Candidates should contact one of these offices for information about the nominating process at the institution.

BWF requires ALL applications for this program to be submitted electronically. **Applications not submitted electronically will not be reviewed.** The electronic application is submitted through proposalCENTRAL, a web-based grant application system developed and hosted by Altum. For further details, see links provided on BWF's website www.bwfund.org.

Burroughs Wellcome Fund must receive the following by 4:00 p.m. Eastern Time, November 3, 2008:

1. **A completed electronic application (including all letters of recommendation)**
2. **One hard copy of the two-page Signature Page form with original signatures**

No application will be considered complete without the original, signed hard copy Signature Page form (two pages) sent to BWF by the application deadline. A faxed copy is not acceptable. **Applications submitted electronically without also sending the original, signed hard copy Signature Page form by the deadline will not be**

reviewed. Unless otherwise noted, all documents listed must be submitted to complete the application and must be uploaded to proposalCENTRAL as Adobe Portable Document Format (PDF) files. This includes all letters of recommendation—no exceptions.

Application Sections

See “Completing the Application” box. For detailed descriptions of the application sections see Application/Grant Proposal Sections on the BWF website www.bwffund.org.

Using proposalCENTRAL

Candidates **MUST** register on proposalCENTRAL and create a professional profile, including a unique user ID and password. Demographic data in this section is for statistical use only. If a professional profile has already been created, then the applicant must verify the information for accuracy.

Candidates are **NOT** required to complete the online application in one sitting. The application may be accessed and changed multiple times as needed prior to the application deadline. However, once the deadline has passed, the application cannot be changed.

Assistance with Applications

Applicants are **strongly encouraged** to first read the descriptive program, Application/Grant Proposal Sections, and application materials, including the FAQs that can be found on the BWF website www.bwffund.org. If there are remaining questions, the BWF staff is available to assist you. For questions regarding eligibility, policies, and terms and conditions for this program, contact:

Jean Kramarik, Senior Program Associate
jkramarik@bwffund.org
 919-991-5122

For help with the electronic application process, contact:
 proposalCENTRAL Help Desk
pcsupport@altum.com
 800-875-2562
 703-964-5840

Print Signature Page

Candidates must print the Signature Page form, obtain the relevant signatures, and send one original hard copy of both pages to BWF for receipt by 4:00 p.m. Eastern Time, November 3, 2008. Prior to printing the Signature Page form, candidates should have completed at least the following sections on proposalCENTRAL, since the information will be included on the Signature Page form:

Title Page
 Applicant Information
 Nominating Institution & Contacts
 Recommenders
 Proposal Assurances

Faxed documents will not be accepted. Send one copy, with original signatures, of the two-page Signature Page form to:

For delivery by express courier service (recommended)

Burroughs Wellcome Fund
 Investigators in the Pathogenesis of Infectious Disease
 21 T.W. Alexander Drive
 Research Triangle Park, NC 27709
 919-991-5100

For delivery by U.S. Postal Service

Burroughs Wellcome Fund
 Investigators in the Pathogenesis of Infectious Disease
 P.O. Box 13901
 Research Triangle Park, NC 27709-3901

TERMS

Awards are made to institutions on behalf of the grantees. The institutions are responsible for disbursing the funds and for maintaining adequate supporting records and receipts of expenditures. Indirect costs may not be charged against the awards.

Grantees must devote at least 75 percent of their time to research-related activities (including those funded by other sources). Institutions must make a commitment in writing to honor this requirement.

Grantees must provide BWF with an annual progress report detailing scientific progress and mentoring activities. Institutions must provide an annual financial report. Both reports must be submitted within 30 days of the end of each award year. Forms are available at www.bwffund.org. Continued funding will depend on the favorable review of these reports by BWF and its program advisory committee.

Grantees may obtain funds from other sources for research in the same or similar areas as that conducted under these awards, so long as there is no conflict with meeting the terms of BWF's award. Award recipients may not hold concurrent BWF career development awards.

No more than 20 percent of the award may be used annually for the grantee's salary support, including fringe benefits. An institution may supplement the grantee's salary to a level consistent with its salary scale. There is no limit on use of the award for salary support for other laboratory or clinical personnel working with the grantee. Student tuition and fees are not allowed.

Completing the Application

Before applying, check with the institution regarding their candidate nomination process.

Applications must be completed electronically via proposalCENTRAL and include the sections below. An original signed hard copy Signature Page form (last section below) must be printed and sent directly to BWF **for receipt by 4:00 p.m. Eastern Time, November 3, 2008. Faxed documents will not be accepted.**

Sections Requiring Data Entry

- ☐ Title Page
- ☐ Applicant Information
- ☐ Nominating Institution and Contacts
- ☐ Recommenders
- ☐ EMAIL/Track Status of Recommenders
- ☐ Lay Abstract
- ☐ Proposal Assurances
- ☐ Applicant Demographics

Sections Requiring Upload of Attachments

- ☐ Bibliography (list of literature references relevant to the research plan)
- ☐ Budget (follows NIH format; justification required)

- ☐ Candidate's Biosketch (follows NIH biosketch format; four-page limit)
- ☐ Citizenship/Residency Documentation (U.S.: Permanent Resident Card, I-551 passport stamp; Canada: Landed Immigrant Status form)
- ☐ Facilities and Resources (Brief description of the resources available for research and training)
- ☐ Letter of Nomination (statement must be prepared and signed by the dean or department chair who signs the Signature Page form)
- ☐ Recommendation Letters (three confidential (blind) letters required)
- ☐ Reprints (minimum of one and up to three publications or manuscripts submitted for publication)
- ☐ Research Plan (Specific aims, background and significance, experimental methods and procedures, long term objectives; seven page limit including tables and graphs)
- ☐ Scientific Abstract (one page limit)

Section Requiring Printing

- ☐ Signature Page form (original signatures and the page with contact information for recommenders)

For in-depth application instructions visit our website:
www.bwffund.org

Research support, which is under the control of the grantee, may be used flexibly for items such as consumable supplies, equipment, publishing costs, travel to scientific meetings, and laboratory personnel working with the grantee. Prior approval by BWF is required when, within an award year, purchases of equipment will exceed \$20,000 or meeting and travel costs exceed \$8,000.

During the award period, unused research funds may be carried over to the succeeding year. Any unused funds (greater than \$500) held by institutions when awards expire or are terminated must be returned to BWF, unless the Fund has granted prior permission to retain the funds. Grantees may receive a no-cost extension of up to 24 months; requests explaining why an extension is needed must be submitted in writing at least three months prior to the end of the award.

Awards may be transferred to another institution only with the written approval of BWF. Requests explaining why a transfer is needed must be submitted by the grantee in writing at least three months prior to the transfer date.

Grantees who want to take a sabbatical year in order to acquire new research skills must submit to BWF a written request that includes appropriate justification.

Scientific publications or presentations that result from these awards must acknowledge the grantee's receipt of a Burroughs Wellcome Fund Investigator in the Pathogenesis of Infectious Disease award. Copies of journal articles and other publications should be sent to BWF along with the annual progress report.

BWF will not retain any rights to published results or patents that result from the research. Grantees should follow their institutions' patent, copyright, and intellectual property policies regarding discoveries that result from research conducted under these awards.

BWF expects the appropriate federal, state, and local guidelines with regard to scientific misconduct are in place and enforced at all institutions with which BWF grantees are affiliated. Grantees are expected to adhere to all federal, state, and local regulations regarding the participation of human subjects, and the use of animals, radioactive or hazardous materials, and recombinant DNA in their research projects.

Grantees should share scientific findings in a timely manner via the standard means of scientific communication, including publications and/or presentations in scientific forums.

Program Advisory Committee

Nina Agabian, Ph.D.

Professor of Cell and Tissue Biology
University of California-San Francisco

Terence S. Dermody, M.D.

Professor of Pediatrics and Microbiology and Immunology
Vanderbilt University School of Medicine

William E. Goldman, Ph.D.

Professor of Molecular Microbiology
Washington University School of Medicine

Kasturi Haldar, Ph.D.

Charles E. and Emma H. Morrison Professor of Pathology
and Microbiology-Immunology
Northwestern University Feinberg School of Medicine

Anne Moscona, M.D.

Professor of Pediatrics, Microbiology and Immunology
Weill Medical College of Cornell University

David G. Russell, Ph.D. (Chair)

Professor and Chair of Microbiology and Immunology
Cornell University College of Veterinary Medicine

Alan Sher, Ph.D.

Bethesda, Maryland

Joseph W. St. Geme, III, M.D.

Professor and Chair of Pediatrics
Professor of Molecular Genetics and Microbiology
Duke University Medical Center

Note: Two additional members will be appointed for the 2009 award cycle.

Recent Award Recipients

For a full listing of award recipients, visit the BWF website at www.bwffund.org

2008

David Artis, Ph.D.

University of Pennsylvania
Tracking helminth-specific immune responses in vivo

Richard Bennett, Ph.D.

Brown University
Phenotypic variation and host adaptation by the human fungal
pathogen *Candida albicans*

Miriam Braunstein, Ph.D.

University of North Carolina-Chapel Hill
Identification of in vivo-secreted proteins of *Mycobacterium tuberculosis* with roles in host-pathogen interactions

James Carlyle, Ph.D.

University of Toronto
MHC-independent recognition of infected cells by natural killer
cells of the innate immune system

Stephen Girardin, Ph.D.

University of Toronto
The Nod-like receptor Nod9 links mitochondrial dynamics and
innate immunity to bacterial pathogens

Chuan He, Ph.D.

University of Chicago
How *Staphylococcus aureus* senses host immune defenses

Kent L. Hill, Ph.D.

University of California- Los Angeles
Cell-cell communication and social motility in pathogenesis and
development of African trypanosomes

D. Borden Lacy, Ph.D.

Vanderbilt University Medical Center
Structural mechanisms of *Helicobacter pylori* pathogenesis

John MacMicking, Ph.D.

Yale University School of Medicine
Immune control of human phagosomal pathogens by a novel
GTPase superfamily

Adrie J.C. Steyn, Ph.D.

University of Alabama-Birmingham
Carbon monoxide and *Mycobacterium tuberculosis* persistence

Timothy L. Tellinghuisen, Ph.D.

The Scripps Research Institute
Subversion of a host kinase and vesicle trafficking components
for the production of infectious hepatitis C virus

David Wang, Ph.D.

Washington University School of Medicine
A genomics-based approach to novel viral etiologies of diarrhea

Marvin Whiteley, Ph.D.

University of Texas-Austin
Mechanistic insight into host modulation of bacterial group activities

Dong Yu, Ph.D.

Washington University School of Medicine
Modulation of the DNA damage response by human
cytomegalovirus

2007**Benjamin K. Chen, M.D., Ph.D.**

Mount Sinai School of Medicine
Dissemination of HIV through virological synapses

Andrew Darwin, Ph.D.

New York University School of Medicine
Mechanisms of *Pseudomonas aeruginosa* tolerance to secretin-induced stress during host infection

Michael R. Farzan, Ph.D.

Harvard Medical School
Parallel identification of obligate viral receptors

Britt Glaunsinger, Ph.D.

University of California-Berkeley
Global modulation of cellular gene expression by an oncogenic human herpesvirus

Karen J. Guillemin, Ph.D.

University of Oregon
Regulation of gut epithelial cell homeostasis by the microbiota

Lora V. Hooper, Ph.D.

University of Texas Southwestern Medical Center-Dallas
Innate immune responses to commensal bacteria at gut epithelial surfaces

Eckhard Jankowsky, Ph.D.

Case Western Reserve University
Molecular mechanisms of pathogen identification by the pattern recognition receptors RIG-I and MDA5

Barbara I. Kazmierczak, M.D., Ph.D.

Yale University
Role of injury in *Pseudomonas aeruginosa* pulmonary infection

Manuel Llinas, Ph.D.

Princeton University
Global analysis of the *Plasmodium falciparum* metabolome

Harmit S. Malik, Ph.D.

University of Washington
Evolution-based identification and functional study of intracellular host-virus interactions

Dorian B. McGavern, Ph.D.

The Scripps Research Institute
Chemical and molecular approaches to probe viral pathogenesis in real time

Yorgo Modis, Ph.D.

Yale University
Cell entry and innate immune recognition of flaviviruses

Neal Silverman, Ph.D.

University of Massachusetts Medical School
Intracellular bacterial recognition in the *Drosophila* innate immune response

Raphael H. Valdivia, Ph.D.

Duke University Medical Center
Role of secreted bacterial proteases in chlamydial pathogenesis

Andres Vazquez-Torres, D.V.M., Ph.D.

University of Colorado-Denver and Health Sciences Center-Fitzsimons Campus
Effects of nitrosative stress on bacterial two component regulatory systems in innate host defense

Ning Zheng, Ph.D.

University of Washington
Viral hijacking of host ubiquitin ligase machinery

Burroughs Wellcome Fund

The Burroughs Wellcome Fund is an independent private foundation dedicated to advancing the biomedical sciences by supporting research and other scientific and educational activities. Within this broad mission, BWF seeks to accomplish two primary goals—to help scientists early in their careers develop as independent investigators, and to advance fields in the basic biomedical sciences that are undervalued or in need of particular encouragement.

BWF's financial support is channeled primarily through competitive peer-reviewed award programs, which encompass six major categories—biomedical sciences, infectious disease, interfaces in science, translational research, population sciences, and science education. BWF makes grants to degree-granting institutions on behalf of individual researchers, who must be

nominated by their institutions. To complement these competitive award programs, BWF also makes grants to nonprofit organizations conducting activities intended to improve the general environment for science.

BWF is governed by a board of directors composed of distinguished scientists and business leaders. BWF was founded in 1955 as the corporate foundation of the pharmaceutical firm Burroughs Wellcome Co. In 1993, a generous gift from BWF's sister philanthropy in the United Kingdom, the Wellcome Trust, enabled BWF to become an independent foundation. BWF is not affiliated with any corporation.

BWF Board of Directors

J. Michael Bishop, M.D.

University of California-San Francisco

Enriqueta C. Bond, Ph.D.

Burroughs Wellcome Fund

Carlos J. Bustamante, Ph.D.

University of California-Berkeley

Geoff Gerber, Ph.D.

Twin Capital Management

Phil Gold, M.D., Ph.D. (Chair)

McGill University

George Langford, Ph.D.

University of Massachusetts-Amherst

I. George Miller, M.D.

Yale University School of Medicine

Mary-Lou Pardue, Ph.D.

Massachusetts Institute of Technology

Jerome F. Strauss III, M.D., Ph.D.

Virginia Commonwealth University

Judith L. Swain, M.D.

Singapore Institute of Clinical Sciences (A*STAR)

Philip R. Tracy, Esq.

Smith, Anderson, Blount, Dorsett, Mitchell & Jernigan, L.L.P.

Dyann F. Wirth, Ph.D.

Harvard School of Public Health

Other Program Deadlines

Career Awards at the Scientific Interface

Fostering the early career development of researchers with backgrounds in the physical/mathematical/computational sciences whose work addresses biological questions.

Application deadline for 2010 awards: **April 15, 2009**

Career Awards for Medical Scientists

Fostering the career development of physician scientists from the postdoctoral level to faculty appointment.

Application deadline for 2009 awards: **October 1, 2008**

Clinical Scientist Award in Translational Research

Providing physician-scientists the freedom and flexibility to explore fundamental scientific questions, to apply the resulting knowledge at the bedside, and to bring insights from the clinical setting back to the laboratory for further exploration.

Application deadline for 2009 awards: **October 1, 2008**

Institutional Program Unifying Population and Laboratory Based Sciences

New institutional training awards to stimulate new connections between the population and computational sciences and the laboratory based biological sciences.

Letter of Intent deadline for 2009 awards: **March 2, 2009**

Student Science Enrichment Program

Supporting creative inquiry-based science enrichment activities for primary and secondary students in North Carolina.

Application deadline for 2010 awards: **April 14, 2009**

For complete program information visit www.bwfund.org

t 919.991.5100
f 919.991.5160
www.bwfund.org

Mailing Address:
Post Office Box 13901
Research Triangle Park, NC 27709-3901

Shipping Address:
21 T. W. Alexander Drive
Research Triangle Park, NC 27709