

BWF Launches New Award Program in Functional Genomics

Genomic sequencing and structural mapping projects for many organisms, including human beings, are nearing completion. The next and greater scientific challenge will be to define not only the functions of genes but also how they interact within the context of the whole organism.

The Burroughs Wellcome Fund has committed \$3 million for a new program—Innovation Awards in Functional Genomics—to draw new and exciting ideas into this emerging field. The goal of this program is to accelerate the integration of the vast amount of genetic sequence and expression data being generated in the world's laboratories into functional and clinically relevant information that will yield insights into mechanisms of human disease.

Awards will be offered in two areas:

Animal model development.

Better animal models of multigenic traits and human disease are needed to assess the functional effects of complex gene interactions and multiple genetic mutations, as well as the efficacy of therapeutic interventions in individuals with different genetic backgrounds. Awards in this area are intended to stimulate the development of innovative animal systems that capitalize on the availability of significant genome sequence data to model complex human genetic traits, or phenotypes, and disease. The awards will be limited primarily but not exclusively to projects to develop vertebrate models. Proposals that forge collaborations between geneticists working on a particular model system and clinicians investigating therapeutic approaches to related clinical phenotypes particularly are encouraged.

Computational methods development.

New theoretical and mathematical models are needed to extract meaningful information from genomic sequence and expres-

sion data, as well as to synthesize the structural and functional data coming from different gene expression networks and model systems. Such models, for example, may refine the prediction of phenotypes and the identification of genetic regulatory mechanisms, and they may generate hypotheses regarding mechanisms of human disease that can be tested in experimental systems. Collaborative proposals encompassing experimental validation of theoretical models are encouraged.

Two levels of awards are offered in each of the targeted areas: \$400,000 over a period of up to four years (generally

more appropriate for proposals involving the development of animal models) and \$200,000 over a period of up to four years (generally more appropriate for proposals involving the development of computational methods).

BWF intends to make from eight to 20 awards during the 2000 award series. The deadline for receipt of all application materials is December 1, 1999. Awards will be announced in May 2000 and will begin in August 2000.

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\$12 Million Awarded for Career Development in the Biomedical Sciences

They are probing the signaling systems in neurons that might go awry in long-term depression, studying how the complex genetic code is packed into the tiny heads of sperm cells, and monitoring the molecular genetics that regulate daily rhythms like the sleep-wake cycle.

Working across a range of disciplines, 24 U.S. and Canadian biomedical scientists early in their careers are using new Burroughs Wellcome Fund awards to conduct research projects that share a common goal—discovery of basic knowledge that will underpin broader efforts to improve human health and well-being.

The researchers are 1999 recipients of Career Awards in the Biomedical Sciences. BWF has awarded a total of \$12 million to foster the development and productivity of these promising researchers and help them make the critical transition to becoming independent investigators.

The awards provide support ranging from \$445,000 for four years to \$574,000 for six years to bridge advanced postdoctoral training and the first three years of faculty service. Recipients may spend part of the award period at institutions in the

United Kingdom or the Republic of Ireland. It is expected that by the end of the award, recipients will be engaged in productive research programs and will be able to compete effectively for support from government and other extramural sources.

"Unlike most programs offered by government and other private organizations, which typically provide a year or two of postdoctoral training or beginning faculty support, these longer-lasting awards are expected to provide the freedom and funding security that will enable investigators to develop innovative and independent research programs during a critical time in their careers," says BWF President Enriqueta C. Bond, Ph.D.

BWF initiated this program in 1995, and we have made a total of 101 awards—an investment of more than \$50 million in the careers of biomedical investigators. Six of the awards have gone to investigators in reproductive science, which BWF considers to be seriously understudied and therefore a special target for support.

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These awards are not intended to support ongoing funded research. We acknowledge that proposals submitted for Innovation in Functional Genomics Awards may be qualitatively different from more traditional research proposals, in that proposals to explore truly novel hypotheses and approaches may lack pilot data. Despite the inherent risk-taking nature of these projects, however, they must nonetheless demonstrate solid scientific judgment and the potential for high impact.

Proposals should focus on the modeling of complex multigenic traits, rather than on determining the functions of individual genes.

Applications must be submitted by accredited degree-granting U.S. or Canadian institutions on behalf of individual candidates. An institution—including its medical school, graduate schools, and all affiliated hospitals and research institutes—may nominate up to two candidates in each of the two award areas. There is an overall limit of four nominations per institution.

In addition to applications submitted on behalf of individual candidates, applications may be submitted on behalf of small groups of collaborators (not to exceed three investigators). Coinvestigators need not be at the same institution; however, one institution must assume the lead in applying for and administering the award. We encourage institutions to submit pairs of coordinated proposals that build a bridge between computational methods and animal model development within one system.

As with most BWF programs, candidates must be citizens or permanent residents of the United States or Canada at the time of application. Candidates must have a Ph.D., M.D., or D.V.M. degree and hold a tenure-track faculty appointment at the assistant, associate, or full professor level. BWF believes that diversity within the scientific community enhances the well-being of the research enterprise; therefore, we encourage applications from women and from members of underrepresented minority groups.

BWF has appointed an outside advisory committee composed of distinguished scientists to review the applications and make recommendations for approval by our Board of Directors. The committee is chaired by Victor A. McKusick, M.D., University Professor of Medical Genetics at Johns Hopkins University School of Medicine.

Selection of awardees will be based on a number of factors. These factors include the candidate's qualifications and track record in conducting innovative research, as well as the quality, significance, and originality of the proposed research. We are interested especially in candidates who propose novel ideas and new approaches that hold great potential to advance understanding of human disease pathogenesis by exploiting genomic information and technology in the two specified areas.

Candidates in the animal-model area will be judged, in part, on their plan for analyzing and disseminating the data generated.

Candidates in the computational-methods area will be judged, in part,

on their description of experimentally verifiable hypotheses.

Collaborative proposals will be judged on the expertise of each of the coinvestigators, as well as on their collaborative history. BWF will not view collaborative proposals as having "primary" investigators and "secondary" investigators; all coinvestigators will be considered to be on an equal level.

Coordinated proposals that link work on computational methods and on animal models will be judged on the merits of the individual proposals as well as on their perceived joint impact.

BWF also will give considerable weight to the institutional environment, including the laboratory and technological facilities that will be available to the candidate.

The program brochure and application form are on our website at <http://www.bwfund.org>. For additional information, contact BWF program associate Debi Linkous at 919/991-5116 or at dlinkous@bwfund.org.

More Than \$1 Million Awarded for Science Education

Thousands of middle school and high school students across North Carolina are digging into a variety of science activities, thanks to \$1.2 million in new grants from the Burroughs Wellcome Fund.

The students are learning firsthand about science and the excitement of research. Among their activities, the students are working alongside leading health scientists, exploring aquatic environments, and assisting in museums.

BWF made Student Science Enrichment Program (SSEP) awards, which provide up to \$180,000 over three years, to 10 nonprofit educational and community organizations statewide.

"These science-enrichment projects enable students to participate in a variety of hands-on, inquiry-based avenues of exploration—an educational approach that the Fund believes to be an effective way to increase students' understanding of science," says BWF President Enriqueta C. Bond, Ph.D. "We hope the projects will nurture

students' enthusiasm about science, expose them to the excitement of scientific discovery, and interest them in pursuing careers in research or other science-related areas."

The new awards bring to almost \$5 million the total that BWF has invested through its science-enrichment program in North Carolina during the past four years, in support of 38 organizations. These programs have reached more than 20,000 middle school and high school students.

Through its SSEP awards, BWF seeks to encourage the widespread use of creative inquiry-based science education and to foster the development of effective materials and methods for teaching science.

"BWF's resources are not sufficient to change the nation, but we feel that these enrichment projects can produce measurable results on a smaller scale—our home state of North Carolina—that will directly

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and immediately affect real students in real schools," Dr. Bond says. "Our broader goal is to see the lessons learned from these projects incorporated into nationwide efforts to improve science and mathematics education—at all levels, in all schools, and beyond classroom doors."

Children of all ages are natural scientists. They observe, ask questions, gather information, solve problems. Somewhere during the school years, however, they often lose their zeal. Science and mathematics become "too abstract," "too hard," or even worse, "boring." The results show up in the disappointing performance of American students on science and mathematics tests at the state, national, and international levels.

BWF's science-enrichment awards mark an attempt to help remedy such problems. The awards go to projects across the state that will encourage students to realize an interest in science, which will help them both in their career opportunities and in their eventual role as citizens participating in public decisions about issues involving science and medicine.

The 1999 award recipients and their projects are:

Bennett College

Mathematics, Science, Engineering, and Technology Scholars Program

Charlotte Area Health Education Center

Shadow Hands—Minority Workforce Development Project

Cumberland County Schools

Cape Fear Natural Science Academy

Durham Academy

Durham Public Schools Summer Institute

Mountain Area Gardens in Community (MAGIC) Inc.

Middle School Apprenticeship Program in Garden-Related Sciences

North Carolina Museum of Life and Science

Museums and Universities for Science Enrichment of Students (MUSES)

North Carolina State Museum of Natural Sciences

Girls in Science Statewide Project

Roanoke Rapids City Schools

Summer Science Explorations in the Roanoke Valley

University of North Carolina-Wilmington

Oceanographic Field Support for Summer Ventures in Science and Mathematics

Warren Wilson College

Environmental Science Camp

Program Application Deadlines

For 2001 award series, except as noted

Career Development of Scientists

Career Awards in the Biomedical Sciences	October 1, 2000
Hitchings-Elion Fellowships	See note below*
Life Sciences Research Fellowships	October 1, 2000
BWF Research Travel Grants	March 1/July 1/November 1 of each year

Emerging Infectious Diseases (2000 award series)

Molecular Parasitology Scholar Awards	
and New Investigator Awards	January 15, 2000
New Initiatives in Malaria Research	January 15, 2000
Molecular Pathogenic Mycology Scholar Awards	
and New Investigator Awards	January 15, 2000

Therapeutic Sciences

Clinical Scientist Awards in Translational Research	September 1, 2000
New Investigator Awards in the Pharmacological	
or Toxicological Sciences	November 1, 2000
Innovation Awards in Functional Genomics (2000 award series)	December 1, 1999

Reproductive Science

Career Awards in the Biomedical Sciences	October 1, 2000
Obstetrics and Gynecology Research Fellowships	October 1, 2000
Reproductive Scientist Development Program Research Grants	October 1, 2000

Interfaces between the Physical/Chemical/Computational Sciences and the Biological Sciences (2000 award series)

April 10, 2000[†]

Science Education

Student Science Enrichment Program	October 15, 2000
BWF Visiting Professorships	
in the Basic Medical Sciences (2000-01 award series)	March 1, 2000
BWF Visiting Professorships	
in the Microbiological Sciences (2000-01 award series)	March 1, 2000

Environment for Science

Received all year

* Contact BWF after January 1, 2000, regarding application deadline.

[†] It is anticipated that Interfaces Program awards will be made approximately every two years.

Note: If a date falls on a weekend or holiday, the deadline is the next business day.

Therapeutic Sciences Receive \$9 Million in Awards

Twenty U.S. and Canadian researchers are sharing more than \$9 million in new Burroughs Wellcome Fund awards for work in the therapeutic sciences. BWF has awarded \$6.75 million to nine physician-scientists who will bridge the gap between the laboratory bench and patient care, and \$2.31 million to 11 researchers who are early in their careers in the pharmacological or toxicological sciences.

BWF's Clinical Scientist Awards in Translational Research, given in 1999 for the second time, provide \$750,000 over five years. The awards are intended to foster the development and productivity of physician-scientists who will strengthen translational research—the two-way transfer between basic research and the treatment of patients.

"Although recent years have seen an explosion of fundamental insights into the mechanisms of disease, transferring this knowledge into practical advances in health care has moved more slowly," says BWF President Enriqueta C. Bond, Ph.D. "The National Institutes of Health and other public and private organizations support a significant amount of basic biomedical research, while industry supports the commercial development of medicines and medical products—yet the vital bridge between these areas remains underserved."

BWF's awards will enable recipients to explore important 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.

The awardees are testing new strategies for preventing and treating diabetic complications, exploring the mechanisms that lead to heart disease and colon cancer, and studying new avenues for fighting the AIDS virus, among other projects. These efforts, it is hoped, will lead to a better understanding of the mechanisms of disease, as well as to new methods of diagnosing, treating, and preventing disease.

BWF's New Investigator Awards in the Pharmacological or Toxicological Sciences,

which continue the Fund's history of support for these areas, provide \$210,000 over a period of three years. The awards are intended to foster the development and productivity of scientists at the assistant-professor level who will bring new ways of thinking and new experimental approaches to their respective fields.

"Pharmacology and toxicology share much in common: both are inherently multidisciplinary, and both are well-positioned to capitalize on the new ideas and experimental approaches emerging from

Therapeutic (Continued on page 5)

New Science Career Resource Guide Debuts on Web

The greatest mysteries facing many aspiring biomedical researchers have nothing to do with biology. Rather, postdoctoral students and junior faculty who hope to succeed in science need to uncover the secrets of funding, networking, and the peer-review process.

A new Career Development Center on the World Wide Web solves many of these mysteries, exploring such practical questions as how to set up and maintain a laboratory, negotiate for space, and assemble a staff.

Part of *Science's* Next Wave, a site for people interested in science careers, the Career Development Center fills an important niche by helping postdoctoral students and junior faculty get ahead in the tough academic job market. Access is free. The Burroughs Wellcome Fund (<http://www.bwfund.org>) and the Howard Hughes Medical Institute (<http://www.hhmi.org>) provided support for the center.

The new site's address is <http://nextwave.sciencemag.org/feature/careercenter.shtml>.

"The Career Development Center will increase communication among postdoctoral students and help them establish their own niche within the scientific community, which is ultimately what they want to do," says Vid Mohan-Ram of *Science's* Next Wave, a not-for-profit project of the journal *Science* and the American Association for the Advancement of Science (AAAS).

The job market for postdoctoral students is more competitive than ever before. According to the National Science Foundation, the number of science and engineering postdoctoral students increased 32 percent between 1988 and 1995. "The Career Development Center at *Science's* Next Wave helps give these students a competitive edge by preparing them for the transition to careers in traditional research or alternative fields," says Ellis Rubinstein, editor of *Science*.

The federal government funds 75 percent of all postdoctorates, primarily in the form of research grants. But information on applying for and, more importantly, on winning these grants is scarce. The Career Development Center includes features on such topics as grant writing and grant management. It offers insight into what makes a good proposal and how government agencies make funding decisions. A "GrantDoctor" column tells how to appeal a grant proposal that has been reviewed unfavorably, or how to find money for research on "alternative medicine."

The Career Development Center also offers a "reading list" of online reprints and selected resources associated with postdoctoral and junior faculty career development. Reprints are cited from a variety of sources, including the *Chronicle of Higher Education*, *Science*, and the HMS Beagle Web magazine. The site also includes a concise bibliography of offline references.

Science's Next Wave is a weekly online magazine written by and for young scientists. More than 100 universities, private research laboratories, and government facilities in the United States have subscribed to *Science's* Next Wave. Academic institutions and government labs in the United Kingdom, Canada, New Zealand, and China are eligible for free access to the site thanks to grants from a variety of national organizations in those nations.

Therapeutic (Continued from page 4)

such frontiers of investigation as the computational sciences, animal models, and molecular genetics," says Dr. Bond. "BWF believes that fostering the career development of tomorrow's leading scientists offers an effective way to strengthen and expand interactions between the pharmacology and toxicology communities."

Supporting new investigators flows naturally from BWF's goal of leveraging scientific investigation and knowledge—promoting creative interaction among scientists, as well as among disciplines, for the benefit of all.

By program area, the 1999 award recipients, along with their institutions and research projects, are:

Clinical Scientist Awards in Translational Research**Nina Bhardwaj, M.D., Ph.D.**

Rockefeller University
Vaccination of HIV-1 positive individuals by antigen-pulsed dendritic cells

Eva Guinan, M.D.

Harvard Medical School
Dana-Farber Cancer Institute
Extending the donor pool by inducing alloantigen specific T-cell anergy ex vivo for human hematopoietic stem cell transplantation

Barbara Hempstead, M.D., Ph.D.

Weill Medical College of Cornell University
Growth factor regulation of coronary angiogenesis

Jason D. Morrow, M.D.

Vanderbilt University School of Medicine
The isoprostanes as markers and mediators of oxidant stress in humans

W. Edward Robinson Jr., M.D., Ph.D.

University of California-Irvine
College of Medicine
Structure-function analyses of clinically relevant HIV integrases

Antony Rosen, M.B., Ch.B.

Johns Hopkins University School of Medicine
Altered structure and clearance of autoantigens during apoptosis: implications for autoimmunity

Ann Marie Schmidt, M.D.

Columbia University College of Physicians and Surgeons
Novel therapeutic strategy for the prevention and treatment of diabetic complications: antagonism of receptor for advanced glycation end products

Mark H. Siegelman, M.D., Ph.D.

University of Texas Southwestern
Medical Center-Dallas
Functionally activated lymphocyte CD44 in the initiation and perpetuation of autoimmune disease

Dennis J. Templeton, M.D., Ph.D.

Case Western Reserve University
School of Medicine
Stress signaling inhibitors potentiate genotoxin-induced apoptosis in a human colon tumor model

New Investigator Awards in the Pharmacological or Toxicological Sciences**Pharmacological Sciences****Lee S. Bardwell, Ph.D.**

University of California-Irvine
Novel roles for protein-protein interactions in mitogen-activated protein kinase signaling

Graeme W. Davis, Ph.D.

University of California-San Francisco
School of Medicine
Molecular and genetic analysis of synaptic homeostasis

Andres V. Maricq, M.D., Ph.D.

University of Utah
Dominant activation of neurons: a genetic approach to uncover mechanisms of neuronal signaling and control of behavior

Ram Sasisekharan, Ph.D.

Massachusetts Institute of Technology
Heparin-like glycosaminoglycans as a target for therapeutic intervention

Natalie C. Strynadka, Ph.D.

University of British Columbia
Faculty of Medicine
Antibiotic discovery targeting essential proteins on the bacterial outer membrane

Beverly R. Wendland, Ph.D.

Johns Hopkins University
New pathways to the cell interior: dominant negative and positive effects of endocytosis

Toxicological Sciences**Karlene A. Cimprich, Ph.D.**

Stanford University School of Medicine
Exploring DNA damage checkpoints using a cell-free system

Fang Liu, Ph.D.

Rutgers-the State University of New Jersey
College of Pharmacy
Role of TGF- β -inducible gene regulation in tumorigenesis

Thomas W. Muir, Ph.D.

Rockefeller University
Structure-activity analysis of the autoinducing peptides from *Staphylococcus aureus* responsible for virulence

Tomas A. Prolla, Ph.D.

University of Wisconsin Medical School
Genetic characterization of the DNA mismatch repair system in induced mutagenesis

Zhengui Xia, Ph.D.

University of Washington School of Public Health and Community Medicine
Mechanisms of arsenite neurotoxicity

Biomedical (Continued from page 1)

The 1999 award recipients, along with their institutions, disciplines, and research projects, are:

Ravi Allada, M.D.

Brandeis University

Discipline: Genetics

Molecular and genetic analysis of the circadian rhythm gene, *Clock*, in *Drosophila*

Oscar M. Aparicio, Ph.D.

Massachusetts Institute of Technology

Discipline: Cell biology and regulation

Understanding the relationship of DNA replication to cell cycle control of cellular proliferation and chromosomal organization

Nenad Ban, Ph.D.

Yale University

Discipline: Structural biology

Determination of the high resolution structure of the large ribosomal subunit

Azad Bonni, M.D., Ph.D.

Harvard Medical School

Discipline: Neuroscience

Regulation of glial fate specification in the central nervous system

Thomas R. Clandinin, Ph.D.

University of California-Los Angeles

School of Medicine

Discipline: Neuroscience

Dissecting neuronal target selection in the *Drosophila* visual system

Michael K. Cooper, M.D.

Johns Hopkins University School of Medicine

Discipline: Developmental biology

Modulation of sonic hedgehog signal transduction by cholesterol homeostasis

Paul De Koninck, Ph.D.

Stanford University Medical Center

Discipline: Neuroscience

Decoding rhythms in the nervous system

Elizabeth A. Finch, Ph.D.

Duke University Medical Center

Discipline: Neuroscience

Postsynaptic calcium signaling by inositol trisphosphate in neuronal dendrites

Robert C. Flaumenhaft, M.D., Ph.D.

Harvard Medical School

Discipline: Cell biology and regulation
SNARE proteins in platelet alpha-granule secretion

Timothy P. Galitski, Ph.D.

Massachusetts Institute of Technology

Discipline: Genetics

Genetic networks

Patrick A. Grant, Ph.D.

Pennsylvania State University

Discipline: Biochemistry

Analysis of histone acetyltransferase/transcriptional adaptor complexes in the regulation of gene expression

Michael Graziano, Ph.D.

Princeton University

Discipline: Neuroscience

From eye to hand: sensory-motor integration in the primate brain

Matthias Gromeier, M.D.

State University of New York-Stony Brook

Discipline: Microbiology

Principles of polio neuropathogenesis: exploiting poliovirus for the treatment of brain cancer

Zhigang He, M.D., Ph.D.

University of California-San Francisco

School of Medicine

Discipline: Neuroscience

Signaling mechanisms mediating the repulsive effects on developing and regenerating axons

Laura J. Knoll, Ph.D.

Stanford University Medical Center

Discipline: Parasitology

Molecular genetic approaches to investigate developmental regulation in *Toxoplasma gondii*

Bruce T. Lahn, Ph.D.

Massachusetts Institute of Technology

Discipline: Reproductive science

Systematic investigation of mammalian spermatogenesis

Thomas Perkins, Ph.D.

Stanford University

Discipline: Biophysics

Measurements of single DNA-based molecular motors

Jill Rafael, Ph.D.

Ohio State University

Discipline: Genetics

The role of muscle proteins in synaptic structure and neuromuscular disease

Matthew Redinbo, Ph.D.

University of Washington

Discipline: Structural biology

Structural and functional characterization of human topoisomerase I and the Werner syndrome helicase

Maria A. Schumacher, Ph.D.

Oregon Health Sciences University

Discipline: Structural biology

Structural biology of cell growth, development, and regulation

Krishna V. Shenoy, Ph.D.

California Institute of Technology

Discipline: Neuroscience

Early reach plans in posterior parietal cortex

Theodore S. Steiner, M.D.

University of Virginia Health Sciences Center

Discipline: Microbiology

Isolation and characterization of an interleukin 8 releasing protein from enteroaggregative *Escherichia coli*

Michael Yaffe, M.D., Ph.D.

Harvard Medical School

Discipline: Biochemistry

Scaffolding and chaperone proteins in signal transduction: 14-3-3 regulation of mitosis and programmed cell death

Deborah L. Yelon, Ph.D.

University of California-San Francisco

School of Medicine

Discipline: Genetics

Patterning during organogenesis: genetic analysis of cardiac chamber formation

\$4.9 Million Awarded for Emerging Infectious Diseases

Margaret A. Phillips, Ph.D., an associate professor of pharmacology at the University of Texas Southwestern Medical Center-Dallas, is designing inhibitors to thwart the parasite *Trypanosoma brucei*, which plagues Africa and South America and causes the disease trypanosomiasis.

Scott G. Filler, M.D., an assistant professor of medicine at the University of California-Los Angeles School of Medicine, is exploring how the body's sensitive endothelial cells respond when infected by *Candida albicans*, a fungus that can prove deadly for individuals whose immune systems have been damaged by disease or other factors.

Walter H. Lewis, Ph.D., a professor of biology at Washington University, and Daniel E. Goldberg, M.D., Ph.D., a professor of medicine and molecular microbiology at Washington University School of Medicine, have teamed up to search for new antimalarial drugs by studying plants being used medicinally by an indigenous tribe in South America.

These thumbnail sketches illustrate the range of research under way by the 1999 recipients of the Burroughs Wellcome Fund's award programs in emerging infectious diseases. BWF awarded a total of approximately \$4.9 million to 24 U.S. and Canadian scientists. It is hoped that new and more efficient methods for preventing and treating these diseases will be developed as a result of these programs.

"The Fund considers research on emerging infectious diseases to be an undervalued area of science, and supporting such areas is one of our primary missions," says BWF President Enriqueta C. Bond, Ph.D. "We believe that work on these diseases is rich in opportunity for achieving fundamental advances, and that foundations may be able to apply just enough support at certain critical points to shift the balance toward a positive payoff for human health."

Two scholar awards and four new investigator awards went to scientists working in molecular parasitology. The

awards are intended to encourage novel approaches to the study of parasitic diseases, such as trypanosomiasis and leishmaniasis, which are responsible for devastating human health in many developing and tropical countries.

Worldwide, parasitic diseases afflict more than 850 million persons and kill 2 million to 3 million persons annually, and they also often undermine economic development in areas where a significant number of persons are affected.

Two scholar awards and six new investigator awards went to scientists working in molecular pathogenic mycology. The awards are intended to encourage scientists to use modern techniques from molecular biology, biochemistry, immunology, pharmacology, and genetics to advance fundamental knowledge of virulent disease-causing fungi.

Fungal infectious diseases pose a serious and growing health problem, in part because of the relative scarcity of safe and effective antifungal drugs, the rise in the number of people whose immune systems have been compromised by disease or drug therapy, and the relative lack of basic research on fungal pathogens.

Fourteen scientists are sharing 10 awards made through the New Initiatives in Malaria Research program. The awards are intended to attract more investigators to work on malaria, to encourage them to bring novel approaches to studying the parasites and mosquitoes responsible for causing the disease, and to enhance scientific collaborations between investigators at the same or different institutions.

Efforts to control malaria, which kills more than 2 million persons each year, have become less and less effective during the past two decades as drug-resistant strains of the parasites have spread rapidly and mosquitoes have become increasingly resistant to insecticides.

Scholar awards, which provide \$425,000 over five years, are open to scientists who have established a record of independent research and hold a tenure-track position as an associate professor or its equivalent.

New investigator awards, which provide \$210,000 over three years, are open to scientists who hold a tenure-track position as an assistant professor or its equivalent and have established a record of independent research at the faculty level.

The malaria awards, which range from \$100,000 over two years to \$400,000 over four years, are open to scientists holding any type of tenure-track faculty appointment.

By program area, the 1999 award recipients, along with their institutions and research projects, are:

Scholar Awards and New Investigator Awards in Molecular Parasitology

Scholars

Margaret A. Phillips, Ph.D.

University of Texas Southwestern Medical Center-Dallas
Design of inhibitors for *Trypanosoma brucei* ornithine decarboxylase using a combination of structure-based approaches and combinatorial chemistry

Samuel L. Stanley, M.D.

Washington University School of Medicine
Pathways for amebic induction of inflammation and programmed cell death

New Investigators

Michael Cappello, M.D.

Yale University School of Medicine
The molecular pathogenesis of hookworm anemia

Silvia N. J. Moreno, Ph.D.

University of Illinois at Urbana-Champaign
College of Veterinary Medicine
Pyrophosphate metabolism in *Toxoplasma gondii*

Emerging (Continued on page 8)

Emerging (Continued from page 7)**Scholar Awards and
New Investigator Awards
in Molecular Pathogenic Mycology****Scholars****Martin Bard, Ph.D.**

Indiana University-Purdue University
at Indianapolis
Characterization of new target sites
for antifungal intervention in
the *Candida albicans* ergosterol pathway

James W. Kronstad, Ph.D.

University of British Columbia
Temperature-regulated and
infection-regulated gene expression
in *Cryptococcus neoformans*

New Investigators**Gary M. Cox, M.D.**

Duke University Medical Center
Antisense repression in *Cryptococcus
neoformans*

Scott G. Filler, M.D.

University of California-Los Angeles
School of Medicine
Stimulation of endothelial cells
in *Candida albicans*

Anita Sil, M.D., Ph.D.

University of California-San Francisco
School of Medicine
A genetic analysis of pathogenesis
in *Histoplasma capsulatum*

A. George Smulian, M.B., B.Ch.

University of Cincinnati College of Medicine
The role of MAP kinase Mkp1 in the
regulation of cell wall synthesis
in *Pneumocystis carinii*

**New Initiatives in Malaria
Research Awards****James P. Allen, Ph.D.**

Elizabeth J. Davidson, Ph.D.
Arizona State University
Structure-based design of mosquitocidal
toxins

Russ B. Altman, M.D., Ph.D.

Stanford University School of Medicine
A knowledge base of biological function
for malaria

Sailen Barik, Ph.D.

University of South Alabama
College of Medicine
Signal transduction in *Plasmodium*

John B. Dame, Ph.D.

University of Florida
College of Veterinary Medicine

Thomas C. Rowe, Ph.D.

University of Florida
College of Medicine
Discovery of a novel malarial DNA gyrase
and its development as a drug target

Roberto Docampo, M.D., Ph.D.

University of Illinois at Urbana-Champaign
College of Veterinary Medicine
Acidocalcisomes in *Plasmodium*

Christopher A. Hunter, Ph.D.

University of Pennsylvania
School of Veterinary Medicine
Role of NF κ B in resistance to malaria

Walter H. Lewis, Ph.D.

Washington University
Daniel E. Goldberg, M.D., Ph.D.
Washington University School of Medicine
Optimizing the search for new antimalarial
therapeutics

Thomas V. McDonald, M.D.

Albert Einstein College of Medicine
K⁺ channels as therapeutic targets
in malaria

Paul D. Roepe, Ph.D.

Georgetown University
James A. Martiney, Ph.D.
Kenneth S. Warren Laboratories
Single-cell photometric analysis
of drug-resistant malaria

Dyann F. Wirth, Ph.D.

Harvard School of Public Health
The *Plasmodium falciparum*
transcriptome: analysis of drug response

FOCUS

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programs is available on the World Wide
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