

Bringing Ideas Together ■ 2012 Annual Report



BURROUGHS
WELLCOME
FUND 

Burroughs Wellcome Fund

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About the 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 biomedical sciences that are undervalued or in need of particular encouragement.

Financial support is channeled primarily through competitive peer-reviewed award programs. Grants are made primarily to degree-granting institutions on behalf of individual researchers. To complement these competitive award programs, grants are also made to nonprofit organizations conducting activities intended to improve the general environment for science.

BWF was founded in 1955 as the corporate foundation of Burroughs Wellcome Co., the U.S. branch of the Wellcome pharmaceutical enterprise, based in the United Kingdom. In 1993, BWF received a \$400 million gift from the Wellcome Trust to become a fully independent foundation.

Legacy The Wellcome enterprise was established in 1880 by two young American pharmacists, Henry Wellcome and Silas Burroughs, who moved to London to manufacture and sell “compressed medicines”—that is, pills—which they believed could replace the potions and powders of the day.

The firm prospered. After Burroughs died in 1895, Wellcome directed the growth of the company into an international network with subsidiaries in numerous countries on several continents. As the business grew, Wellcome held firm to his belief that research was fundamental to the development of excellent pharmaceutical products and established the industry’s first research laboratories.

When Wellcome died in 1936, his will vested all of the corporate shares in a new organization—the Wellcome Trust—devoted to supporting research in medicine and allied sciences and to maintaining museums and libraries dedicated to these fields. The Trust grew to become the world’s largest charitable foundation devoted exclusively to the biomedical sciences.

The importance of curiosity-driven research, as endorsed by Henry Wellcome, guides the mission of the Burroughs Wellcome Fund and its commitment to the belief that fostering research by the best and brightest scientists offers the fullest promise for improving human health.

President's Message

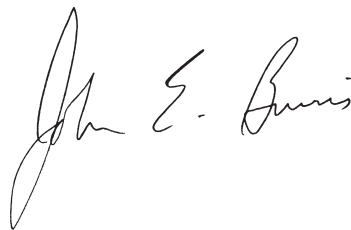
We at the Burroughs Wellcome Fund continue to advance our mission of supporting biomedical research and its environment. Since biomedical research in the United States is so heavily dependent on federal funding, we need to continue to present our strong case for the value of research to a bipartisan audience. At the same time we in the foundation world need to remain committed to providing as much funding as we can to support the ever more exciting research and discoveries.

We are never going to be able to provide dollars approaching those of the National Institutes of Health, but we can provide funding for innovative research in a nimble fashion. This will be particularly important as doubts are now being raised about the sustainability of a federally funded research system where universities and research hospitals have looked to the NIH to continue to increase its budget to support an ever-increasing number of faculty and staff, as well as the construction of new facilities. As we finally confront this central issue, there may be major changes in the federal funding patterns as increases in budgets grow less certain.

With these concerns, the flexibility of BWF, our targeted approach to areas, and our nontraditional selection of areas have and will continue to help us maintain an important spot in the universe of funding for biomedical and medical research and education.

To fulfill our role in science, we need to continue to spend our resources wisely, so that in the future we will be able to trumpet the successes of our awardees. We must continue our commitment to education where we have made important contributions in North Carolina, and where I see us disseminating more of our exciting efforts to a broader national audience.

Our periodic review of our programs, our prudent expenditures of funds, and our conservation of our capital have positioned us to be even more important in the biomedical community. Our role as a foundation is to support research and education in biomedicine and medicine. We have weathered our share of uncertain stock markets and economies. We must, though, continue to recognize that our goal and responsibility is to provide funding—we are constituted to give away money. In so doing, we will continue to support the best and the brightest as we fulfill this responsibility and mission.



John E. Burris, Ph.D.
President
Burroughs Wellcome Fund

BWF distributed \$30.8 million in grants during fiscal year 2012.



Biomedical Sciences (\$8.3 million)

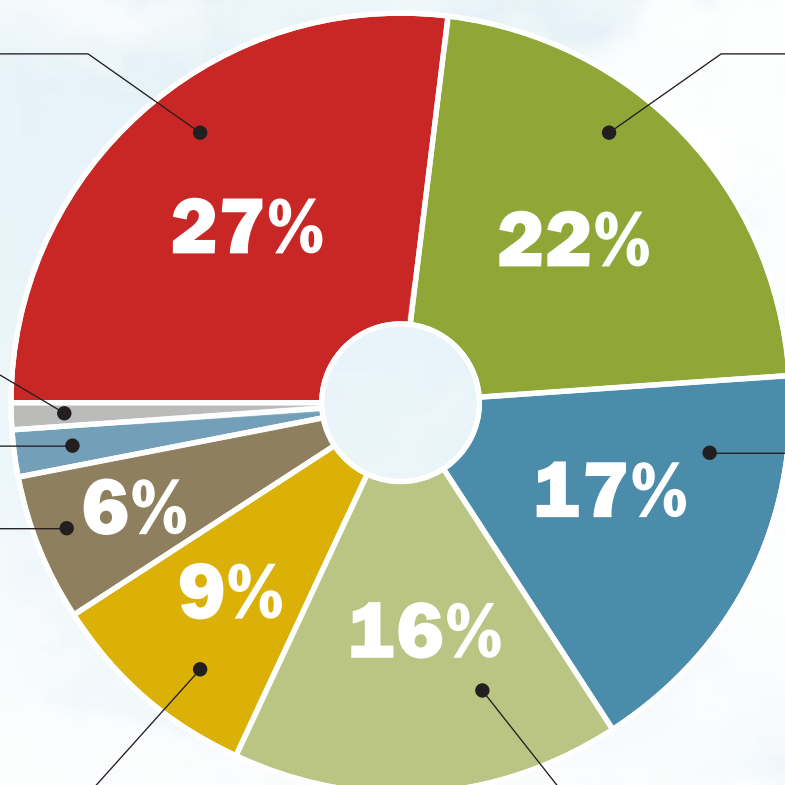
Science & Philanthropy (\$0.27 million)

Reproductive Sciences (\$0.75 million)

Population Sciences (\$1.7 million)



Science Education (\$2.8 million)



For audited financial statements and evaluations of our grant programs,
visit www.bwfund.org/annualreport or scan the QR code.



Infectious Diseases (\$6.8 million)



Interfaces in Science (\$5.1 million)



Translational Research (\$5.0 million)

Information for Applicants

The Burroughs Wellcome Fund makes 90 percent of our grants through competitive award programs that support investigators in targeted areas of basic biomedical research relevant to human health.

Most of BWF's award programs are open only to citizens or permanent residents of the United States and Canada. Programs with different requirements are noted in the descriptions that follow. Awards are made with the advice of our advisory committees, which are comprised of scientists and educators selected for their expertise in the program areas.

Most grants are made only to degree-granting institutions on behalf of individual researchers, who must be nominated by their institution. Institutions receiving grants must be tax-exempt 501(c)(3) organizations. Government agencies, such as the National Institutes of Health and the Centers for Disease Control and Prevention, generally are not eligible for grants.

Throughout the following program descriptions, references to M.D. and Ph.D. degrees include all types of medical and scientific doctoral degrees.

BWF does not support activities that are primarily related to health care and health care policy. We generally do not provide support for research projects or other activities outside our competitive programs, nor do we generally support endowments, development campaigns, ordinary operating expenses, capital facilities and equipment, or publications.

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.

Visit www.bwffund.org for current information.

Biomedical Sciences



Research in the medical sciences provides a firm foundation for improving human health. The Burroughs Wellcome Fund is committed to fostering the development of the next generation of academic medical scientists. By providing funding to help bridge the gap between the postdoctoral and early faculty years, BWF hopes to bolster the careers of the most promising up-and-coming scientists. But BWF's support doesn't stop with its funding. Through biennial meetings and mentoring networks, BWF helps provide vital career advice to give scientists, early in their careers, the information they need to be successful.

CAREER AWARDS FOR MEDICAL SCIENTISTS

Five-year awards for physician scientists provide \$700,000 to bridge advanced postdoctoral/fellowship training and the early years of faculty service. This award addresses the on-going problem of increasing the number of physician scientists and will help facilitate the transition to a career in research.

COLLABORATIVE RESEARCH TRAVEL GRANTS

Provide up to \$15,000 in support for researchers from degree-granting institutions to travel to a laboratory to acquire a new research technique or to facilitate a collaboration. Consideration is given to applicants who hold a Ph.D. in mathematics, physics, chemistry, computer science, statistics, or engineering who are interested in investigating research opportunities in the biological sciences or to biologists interested in working with physical scientists, mathematicians, engineers, chemists, statisticians, or computer scientists to incorporate their ideas and approaches to answering biological questions.

CAREER AWARDS IN THE BIOMEDICAL SCIENCES (CABS), 1995 – 2006

The Career Awards in the Biomedical Sciences program was modeled after the Markey Charitable Trust's Scholars program that was the original bridging award and established the benchmark for other bridging programs that followed. Markey made awards to 113 young investigators in seven cycles from 1985 through 1991. An evaluation of this program can be found in *Enhancing Philanthropy's Support of Biomedical Scientists, Proceedings of a Workshop on Evaluation* (The National Academies Press, 2006).

CABS became an official BWF program in October 1993 and the BWF Board of Directors approved the first awards in April 1995. The CABS program provided bridging support for young scientists to assist them in making the critical transition from postdoctoral fellows to academic independent investigators. This program was part of the BWF grants portfolio from 1995 to 2006 and provided support to 241 young scientists for a financial commitment in excess of \$100 million.

Of the 241 starting the program 221 (92%) completed the program and have tenure-track faculty appointments. The remaining 20 awardees left the program before completing the award—six joined the intramural program at NIH, two took positions in the pharmaceutical industry, two went to the Janelia Farm Research Campus, three took faculty positions outside of North America, two became science writers, one left to work on The Bill & Melinda Gates Foundation Grand Challenges project, one left to attend law school, and one left the program because of family reasons. Two awardees were unable to transition to tenure-track faculty appointments within a reasonable amount of time and their grants were cancelled.

CAREER AWARDS FOR MEDICAL SCIENTISTS (CAMS), 2007 – DATE

Because of NIH's Bridges to Independence program (K99/R00 award) that was introduced in 2006, the CABS program was reformulated to a physician scientist only program and renamed Career Awards for Medical Scientists (CAMS). The focus of the CAMS program is the physician scientist who is making the transition from a mentored position to that of an academic independent investigator. The program provides \$700,000 in support over five years.

The CAMS program has gone through five award cycles—2007, 2008, 2009, 2011, and 2012. The program was not run in 2010 because of a downturn in the financial markets. For the five award cycles a total of 62 awards have been made. Two awardees left the program early to enter private practice. Of the 60 active awardees, 47 (78%) have transitioned to tenure-track faculty appointments.

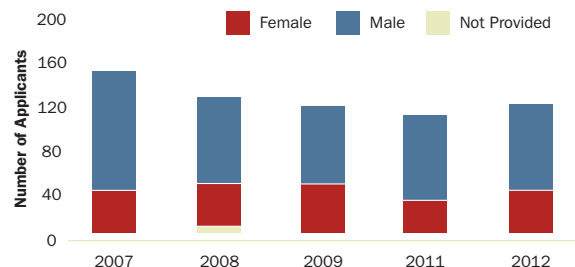
The majority of the active awardees are located in medical schools (54). One is at a dental school, one is in a school of public health, and one is at Cold Spring Harbor. For those located in a medical school, 60 % have their primary appointment in one of four departments (Internal Medicine 25%, Neurology 15%, Pathology 12%, and Dermatology 8%).

The range of disciplines among the 60 awardees is broad. Cell Biology (17%) is the largest represented discipline followed by Genetics (15%), Oncology (12%), Neuroscience (10%), and Immunology (10%). An interesting demographic is the age of the awardee at the time of the award. The average for the 62 receiving awards is 36 (range: 32 to 40).

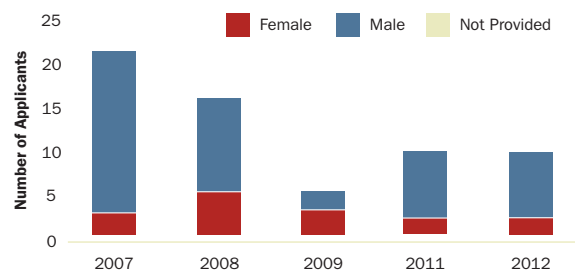
The 60 active awardees are at 23 institutions. The top three institutions with the most awardees are Harvard with 13 (22%) followed by Stanford with 6 (10%) and University of Texas Southwestern with 5 (8%).

OTHER DEMOGRAPHICS:

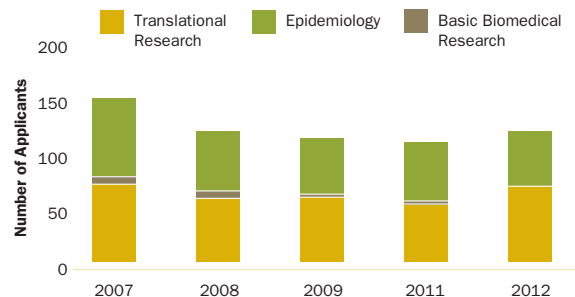
Gender: All Eligible Applicants



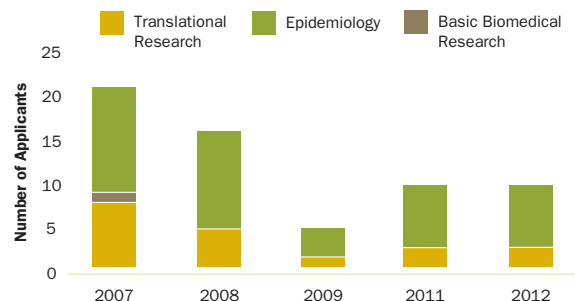
Gender: Awardees



Category of Research: All Eligible Applicants



Category of Research: Awardees



COLLABORATIVE RESEARCH TRAVEL GRANTS (CRTG), 2010 – DATE

To capitalize on an opportunity to provide relatively unrestricted travel funds to academic scientists and trainees and to provide a stimulus for those working at the interface of science, the BWF Board approved in May 2010 a new program to provide travel grants that can be used both domestically and internationally to acquire new research techniques or to promote collaborations. Special consideration is given to candidates who hold a Ph.D. in mathematics, physics, chemistry, computer science, or engineering and are interested in investigating opportunities in the biological sciences.

The program has gone through two cycles. Thirty-three proposals were funded for the initial cycle and the average award was \$7,688 (range: \$2,010 to \$12,000).

For the second cycle 173 proposals were received and 56 were funded. The average award was \$6,250. Of the 56, 43% were faculty, 14% postdocs, and 43% graduate students. Most of the recipients (54%) traveled domestically and the remaining traveled to a total of 14 different countries.

OTHER ACTIVITIES

BWF partnered with the Doris Duke Charitable Foundation to have the Federation of American Societies for Experimental Biology (FASEB) update their study, “The physician scientist: career issues and challenges in the year 2000” that appeared in the *FASEB Journal* 14(2): 221-230, 2000. This is one of the first studies that analyzed the composition of physician scientists in the biomedical research workforce. Much has happened since the 2000 publication and an update is warranted to look at new trends. It is anticipated that the new study will appear in the *FASEB Journal* in 2013.

Infectious Diseases



The Burroughs Wellcome Fund has supported research in infectious disease since 1981, when it began funding modern molecular approaches to understanding what have been called the great neglected diseases—malaria, the pathogenic fungi, and human parasites—that primarily affect people in underdeveloped countries. Since that time, much more attention has been paid to the urgent needs of these fields. In 2000, the Fund decided to turn its attention to the larger issues of human-pathogen interactions in these infectious diseases and others, opening the door for funding work in bacterial and viral diseases. BWF's Investigators in the Pathogenesis of Infectious Disease program is designed to incorporate elements of previously funded areas of research, and to focus primarily on the interaction of pathogens with their human hosts.

INVESTIGATORS IN THE PATHOGENESIS OF INFECTIOUS DISEASE

Five-year awards provide \$500,000 for opportunities for accomplished investigators at the assistant professor level to study infectious disease pathogenesis, with a focus on the intersection of human and microbial biology. The program is intended to shed light on the overarching issues of how human hosts handle infectious challenge. The awards are

intended to give recipients the freedom and flexibility to pursue new avenues of inquiry and higher-risk research projects that hold potential for advancing significantly the biochemical, pharmacological, immunological, and molecular biological understanding of how infectious agents and the human body interact.

NINETY-EIGHT GRANTS HAVE BEEN MADE TO RESEARCHERS CHOSEN FROM 1063 APPLICANTS IN NINE CYCLES SINCE THE PROGRAM WAS LAUNCHED IN 2002. A TOTAL INVESTMENT TO DATE OF \$46,900,000.

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. The award encourages and supports ambitious early career faculty to take on problems at the points where human and microbial systems connect. The program supports research that sheds light on the fundamentals that affect the outcomes of hosts' and microbes' ongoing colloquy and commerce, for example on how colonization, infection, commensalism and other relationships play out at levels ranging from molecular interactions to systemic ones. By pressing toward an in context understanding of how pathogenesis begins, the program aims to stimulate broader thinking about the unifying principles by which health is maintained or pathology is developed in our microbe filled lives.

The program was launched after discussions that formed part of the 2000 terrain mapping. It continues the Fund's investment in infectious disease research, which has had a long tradition of supporting work in under-served systems, particularly where toolsets are not fully developed and where driven young researchers can play an important role in building emerging fields. Our support in the 1980s focused on work in parasitology, and was broadened in the 1990s to include mycology. After the 2000 Terrain Mapping, the program shifted to its current focus on the study of pathogenesis itself, providing opportunities for researchers working in viral and bacterial systems as well as those in the eukaryote systems funded before.

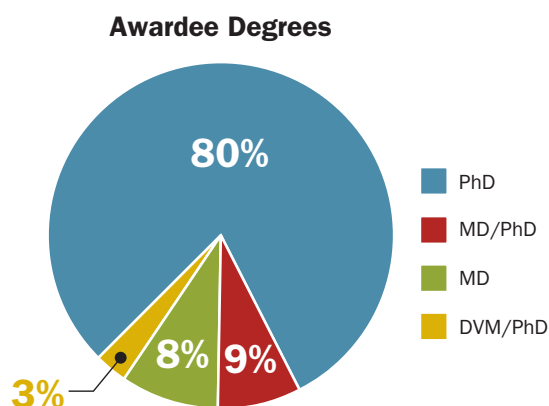
PROGRAM STATISTICS

Gender Ninety-eight Investigators in the Pathogenesis of Infectious Disease have been named since the program's inception, including 65 men and 33 women. This program and our earlier assistant professor-focused programs since the mid-1990s have attracted applicant pools that are about 2/3 male and 1/3 female. This year's new awardees include five men and five women; last year's awardees included three women and seven men.

Country None of this year's new awardees work in Canada. The program's most recent Canadian awardee was funded in 2009. Since the program's inception, we have supported 93 awards in the United States and five in Canada.

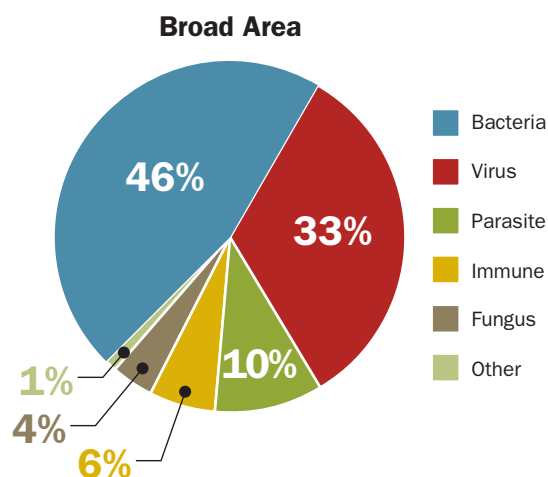
Race/Ethnicity None of this year's awardees are under-served minorities. Over time the program has funded under-represented minorities but several have not chosen to indicate their race/ethnicity.

Degree Twenty percent of pathogenesis awardees have a clinical degree and 80% are non-clinically trained Ph.D.s. Seventy-eight of the awardees are Ph.D.s; eight are M.D.s, nine hold M.D./Ph.D.s and three are D.V.M./Ph.D.s. This year's awardees include five PhDs, two MDs, and three M.D./Ph.D.s.



Research areas Work supported by the program can be roughly divided into five areas—viral, bacterial, fungal, parasite, and immune. Those labeled as “immune” are, in general, looking at how the immune system recognizes pathogens rather than how it interacts with a particular pathogen. A researcher whose work is labeled “bacteria” does not necessarily consider himself or herself a bacteriologist. One award, which focuses on a regulatory element found in both prokaryotes and eukaryotes, is classified as “other”. This year we supported seven proposals working with bacteria and three with viruses. We have not supported a fungal proposal since 2008 and have not supported work in parasitology since 2009. This has caused considerable concern in both research communities.

We have addressed this concern by adding new committee members who are viewed by their colleagues as strong advocates for their fields.



AD HOC GRANTS

We supported 45 ad hoc proposals in infectious diseases this year, including 20 grants of \$1000 each to support seminar visits between awardees, for a total of \$426,600.

Some highlights include:

American Society for Microbiology

11th Conference on Candida and Candidiasis

Cornell University

11th International Symposium on Double-Stranded RNA Viruses

Medical College of Wisconsin

19th Annual Midwest Microbial Pathogenesis Conference (MMPC)

Gordon Research Conferences

2012 Gordon Research Conference on Host Parasite Interaction

Gordon Research Conferences

2012 Gordon Research Conference on Microbial Toxins and Pathogenicity

North Carolina State University

2013 Mid-Atlantic Microbial Pathogenesis Meeting (MAMPM)

University of Notre Dame

2nd annual Midwest Neglected Infectious Diseases meeting

American Society for Microbiology

American Society for Microbiology Beneficial Microbes Conference

Gordon Research Conferences

Gordon Research Conference on Cellular and Molecular Fungal Biology

Washington University

Molecular and Cellular Biology of Helminth Parasites meeting

OTHER ACTIVITIES

Career Guidance Awards This year we offered for the first time a competitive program to support career development efforts organized by academic institutions, professional societies, or other non-profits. Thirty-five eligible proposals were submitted by the March 15 deadline. On review, six clearly rose to the top and were supported. Three focus on teaching, two on careers in industry, and one on improving students' career skills over the course of graduate school.

Earlier, we had provided ad hoc support for workers at the Medical College of Wisconsin, UCSF, and FASEB to develop an online career development resource, an individual development plan (IDP) for exploring and understanding an individual's skills, strengths, and possible careers. This resource, called *myIDP*, is housed at *Science Careers*. It launched in September 2012.

The Pan-fungal Database The Pan-fungal database supported in 2009/2010 was launched on schedule in 2011 with 18, rather than the promised 12, organisms loaded. An upgraded version was released this fall with 31 fungal genomes loaded and three others in progress. The new version includes more automation in data analysis. Microarray and RNA-Seq data from five systems including the important models *Candida albicans*, *Saccharomyces cerevisiae*, *Schizosaccharomyces pombe*, and *Neurospora crassa*, have also been included in this release.

Veterinarian Scientists In August 2012, we ran another round of "Becoming Faculty," the career development short course aimed at veterinarian scientists who are preparing for academic research careers. Participants included 12 D.V.M./Ph.D.s, including three assistant professors and several postdocs who will soon go on the job market. This year's applicant pool was notably larger, stronger, and more senior than in previous years. The course shares an applicant pool with a substantial (\$2500) research prize competition. Course attendees all state that they applied not because of the research prize but because of the good reputation of the course.

Convening Awardees We hosted a BWF family dinner at the annual meeting of the American Society for Microbiology (ASM), and for the first time will be convening new awardees at the Fund headquarters in early October 2012. The next large BWF infectious diseases awardee meeting will be held in Calgary August 5-7, 2013.

Interfaces in Science



The biological sciences are changing. Advances in genomics, quantitative structural biology, modeling of complex systems, and nanotechnology have opened up new realms of research for ambitious investigators with backgrounds in physics, mathematics, computer science, and engineering who want to explore the new frontier of biology. In recognition of the vital role such cross-trained scientists will play in furthering biomedical science, the Burroughs Wellcome Fund has made a major investment in the training and support of young investigators with backgrounds in the physical, chemical, or computational sciences whose work addresses biological questions and who are dedicated to pursuing a career in academic research.

CAREER AWARDS AT THE SCIENTIFIC INTERFACE

Five-year awards provide \$500,000 to bridge advanced postdoctoral training and the first three years of faculty service. These awards are intended to foster the early career development of researchers with backgrounds in the physical/mathematical/computational sciences whose work addresses biological questions. BWF has moved to a self-nomination format for this award only.

The Interfaces in Science Focus area has had four competitive programs: the Career Awards at the Scientific Interface (CASI; ongoing since 2001), the Institutional Awards at the Scientific Interface (IASI; not awarded since 2000), the Interfaces Short Course Awards (ISCA, offered in 2011-2012), and the Innovation Awards in Functional Genomics, which were offered once in 2000. Since the program began in 1997, a total of \$77,833,980 has been awarded through competitive programs and adhoc grants.

The CASI program was modeled closely on BWF's Career Awards in the Biomedical Sciences (CABS) program, but is distinguished by the requirement that applicants have doctoral level training or evidence of significant expertise in a computational, theoretical, or physical science discipline outside of biology. The program began in 2001 but was suspended in 2003, and again in 2010. A total of 89 awards have been made to date, in nine cycles. The applicant pool has grown stronger during the years, as more institutions have hired faculty who work at this interface. For the past two years, at the request of the program advisory committee, BWF opened the application process to allow self nominations.

At the direction of the BWF Board, a new competitive program, the Interfaces Short Course Awards (ISCA), was implemented during FY 2012. Proposals were accepted by invitation only, reviewed by the six-member advisory committee, and two awards were made for a total of \$800,000.

Lastly, adhoc efforts in this focus area have included support for training and other programs that bring biologists and physical scientists together, as well as support for career development and networking sessions at professional society meetings.

CAREER AWARDS AT THE SCIENTIFIC INTERFACE (CASI)

The program Advisory Committee for CASI met April 25-26, 2012, at which time 20 finalists were interviewed. The Board approved ten awards recommended by the committee in FY2012. The meeting agenda included discussion of program issues, including the self-nomination process. Table 1 shows the demographics of the applicants at each stage of the selection process for the two years of the self-nomination process. Among the 2012 awardees, three are women; three are trained in engineering, and one each in the fields of applied mathematics, biochemistry, bioengineering, bioinformatics, biophysics, chemistry, and physics.

Table 1: Demographics of CASI Applicants and Institutions, 2011 and 2012

	2012 Award Cycle			2011 Award Cycle			All Awardees
	Pre-proposals	Invited Semifinalists	Finalists	Pre-proposals	Invited Semifinalists	Finalists	
Total	376	71 (19%)	20	445	79 (18%)	20	89
Women	93 (25%)	20 (28%)	6 (30%)	122 (27%)	23 (29%)	6 (30%)	31 (35%)
Underrepresented Minorities	21 (6%)	2 (3%)	1 (5%)	17 (4%)	3 (4%)	2 (10%)	4 (4%)
Temporary Residents	152 (40%)	22 (31%)	4 (20%)	155 (35%)	21 (27%)	5 (25%)	20 (22%)
Institutions	98	23 (23%)	7 (7%)	106	40 (38%)	13 (33%)	35
Canadian Institutions	7	1	0	7	0	0	0

2013 APPLICANT POOL: INDIVIDUALS

The preproposal deadline for the 2013 award cycle was September 4, 2012. Table 2 provides data on the applicant pool, compared to prior years of the program (2003, 2005, 2006, and 2007 cycles are not shown).

The proportion of underrepresented minority (URM) candidates for the program stood at 12% during the 2009 cycle, after years of allowing institutions an extra nomination slot. With the first year of self-nominations, the proportion dipped to 4%, the lowest in the history of the

program. However, the proportion of underrepresented minorities in the next two years of self-nominations rose as high as 7%. Among the 89 current CASI awardees, four (4%) are from URM backgrounds.

CASI is the only BWF program that extends eligibility to foreign nationals holding temporary visas. Last year, a high of 41% of the applicants were temporary visa holders, with this year's number dropping to 39%. Among the 89 current CASI awardees, 20 (22%) are temporary visa holders.

Table 2: Profile of CASI Applicant Pool, 2002-2012

Applicants	2013 Cycle	2012 Cycle	2011 Cycle	2009 Cycle	2008 Cycle	2002 Cycle
Took Eligibility Quiz	1524	1851	1713	n/a	n/a	n/a
Qualified	631	802	827	n/a	n/a	n/a
(Pre) Proposals Received	296	376	446	148	146	75
Eligible for Review	296	374	445 (99%)	142 (96%)	143 (98%)	72 (96%)
Female Applicants	82 (28%)	93 (25%)	122 (27%)	41 (29%)	34 (23%)	17 (23%)
Temporary Visa Holders	114 (39%)	152 (41%)	155 (35%)	50 (35%)	47 (32%)	11 (15%)
Underrepresented Minorities	22 (7%)	21 (6%)	17 (4%)	17 (12%)	13 (9%)	4 (5%)

Note: 2003, 2005, 2006, and 2007 cycles not shown to save space.

2013 APPLICANT POOL: INSTITUTIONS

The number of institutions submitting candidates has almost doubled since the program's inception. In the past, applicants were nominated by degree-granting institutions (DGIs), and postdocs at independent research institutes could not apply unless they were offered a nomination slot from an associated DGI. Under the new self-nomination

guidelines, postdocs based in non-DGI entities can apply, if the mentor has a faculty appointment at a DGI. Exceptions were made for applicants from NIH and HHMI's Janelia Farm Research Campus, as NIH and HHMI will cover costs of the postdoc portion of their awards. Of the 99 distinct institutions from which candidates self-nominated, 10 had not previously submitted applicants to the CASI program.

Table 3: CASI Institution Submission Statistics

Institutions	2013 Cycle	2012 Cycle	2011 Cycle	2009 Cycle	2008 Cycle	2002 Cycle
Number Submitting Candidates	99	98	106	85	75	52
Canadian Institutions Submitting Candidates	5	4	7	7	2	1

BWF anticipated that again a few institutions would dominate the applicant pool, and this proved to be the case. Table 4 lists the institutions from which ten or more preproposals were submitted—a total of six institutions, which is down from eight last year. Harvard, Stanford, and MIT represent 26% of the applicant pool, compared to 29% last year. Number of submissions from these institutions from last year is shown in parentheses.

Table 4: Institutions Submitting 10 or More Preproposals to CASI, 2013

36 (47)	Harvard (& affiliates)	11 (5)	Princeton
22 (36)	Stanford	11 (13)	Yale
18 (26)	MIT	10 (16)	Johns Hopkins University (& affiliates)

2013 APPLICANT POOL: DISCIPLINES

Table 5 shows the distribution of doctoral training disciplines within the 2013 preproposal applicant pool, compared to the first two years of self nominations (2011 and 2012), and to 2009 and 2008 when candidates were

nominated by their institutions. The most noticeable difference is probably the reduction in the proportion of physicists applying, accompanied by a rise in the proportion of engineers applying.

Table 5: Doctoral Training Disciplines among CASI Applicants, 2008-2013

	2013 (Preproposals)					
Doctoral Discipline	#	%	2012 (%)	2011 (%)	2009 (%)	2008 (%)
Applied Math	8	3	1	4	6	4
Bioengineering	37	13	18	13	11	10
Bioinformatics	14	4	3	3	1	3
Biology	8	3	6	5	2	6
Biophysics	14	5	6	7	6	8
Chemistry	55	18	16	15	16	24
Computational Biology	19	6	4	2	1	2
Computational Neuroscience	5	2	1	1	1	NA
Computer Science	11	4	6	7	7	4
Engineering	58	20	21	19	19	10
Mathematics	7	2	1	2	4	3
Neuroscience	9	3	2	2	1	1
Other	6	2	1	1	NA	3
Physics	38	13	12	16	22	19
Bio/Statistics	7	2	2	1	4	3
Total	296	100	100	100	100	100

AWARDEE TRANSITIONS

The 89 successful applicants to the program have come from 35 different institutions, and as of October 2012, 75 of the awardees (84%) have been appointed to tenure-track faculty positions at 39 institutions, including one institution outside of North America. Twelve have yet to obtain a faculty position, and two left the program before transitioning. Nine negotiated their transition during FY2012.

BWF staff review the faculty offer letter for every transition, providing context for the salary range, startup, teaching commitment, space, and other aspects of the offer. Five awardees have been recruited to a faculty position at Stanford University. Four awardees have been recruited to faculty positions at Georgia Tech, the University of Chicago, and the University of Michigan. Three each have been recruited to Boston University, Duke University, Massachusetts Institute of Technology, the University of California-Berkeley, the University of Pennsylvania, and the University of Washington, with eleven other institutions recruiting two awardees each. One awardee moved to a faculty position in Israel, thus our analysis of faculty data includes 74 awardees.

The distribution of hiring departments is shown in Figure 1. Of the 74, 31 (42%) have been recruited to physical science departments and 16 (22%) to engineering departments, reflecting an openness within these departments to faculty whose work addresses biological questions. Average salaries and startup conditions for awardees are shown in Table 6, however it should be noted that this includes all awardees since 2002, thus the average will not be restricted to current offers. Salaries for awardees appointed in engineering departments were higher than those appointed in physical science or biological science departments on average (note that 12-month, not nine-month salaries are shown), while biological science start-up packages are higher on average. Broader ranges for start-up packages were seen in the physical sciences. A narrower range for salaries was seen in the engineering departments. Overall, the total length of the postdoctoral training period averaged a little over four years. BWF will continue to track these awardees as they move toward tenure.

Figure 1: Hiring Departments of CASI Awardees, n=74

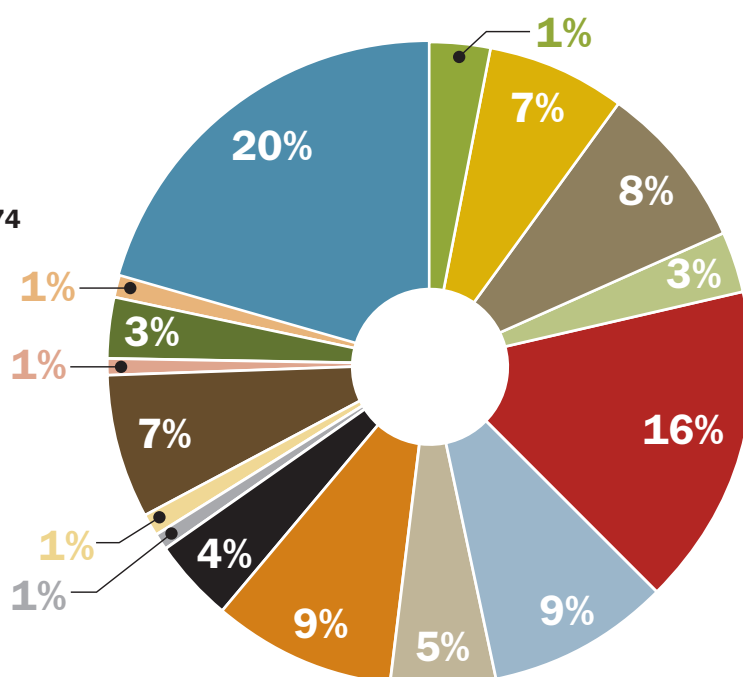
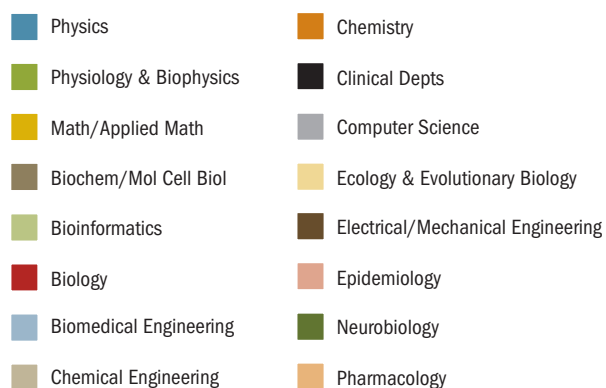


Table 6: CASI Faculty Appointment Data as of October 1, 2012

	Range	Average	Median
Biological Science/Medical School Departments (n=27)			
12-month salary	\$78-129 K	\$101 K	\$105 K
Startup funds	\$150 K-2.5 Mil	\$866 K	\$800 K
Total months postdoc before moving to faculty position	29-78	50	46
Mathematics/Physical Science Departments (n=31)			
12-month salary	\$65-147 K	\$98 K	\$99 K
Startup funds	\$10 K-2.4 Mil	\$754 K	\$750 K
Total months postdoc before moving to faculty position	25-108	54	48
Engineering Departments (n=16)			
12-month salary	\$104-136 K	\$120 K	\$119 K
Startup funds	\$385 K-1.7 Mil	\$820 K	\$795 K
Total months postdoc before moving to faculty position	26-85	54	54
Overall (n=74)			
12-month salary	\$65-147 K	\$104 K	\$105 K
Startup funds	\$10 K-2.5 Mil	\$809 K	\$766 K
Total months postdoc before moving to faculty position	25-108	53	48

INTERFACES SHORT COURSE AWARDS (ISCA)

While many institutions have launched formal interdisciplinary training programs, there is a need for introductory short courses that will immerse scientists from non-biological backgrounds in the questions and techniques of the biological sciences. In an effort to address this need, BWF launched a new competitive program in FY2011, the Interfaces Short Course Awards (ISCA). These awards provide up to \$200,000 per year for two years to support the development and execution of a new interdisciplinary biology short course. A select group of non-profit institutions or organizations in the United States or Canada was invited

to submit proposals to fund courses which introduce scientists with backgrounds in the physical, mathematical, and engineering sciences to biology, including a strong laboratory experience. Letters of intent (LOIs) were received for 11 courses from nine different institutions, and a total of 10 full applications were received in October 2011 (91% of the LOI submissions). The program advisory committee reviewed and submitted scores for the applications, then convened via conference call to discuss the proposals and make recommendations for awards. Two proposals were recommended for awards and approved by BWF's Board of Directors in November 2011 via electronic ballot, as shown below.

Institution:	Princeton University
Course Title:	Biophysics and Computations in Neurons and Networks
Planned for:	Summer 2012 & Summer 2013
Co-Directors:	David W. Tank, Ph.D., Henry L. Hillman, Professor in Molecular Biology, Michael J. Berry, Ph.D., Associate, Professor, Dept. of Molecular Biology
Institution:	University of California-Santa Barbara
Course Title:	Santa Barbara Advanced School of Quantitative Biology
Planned for:	Summer 2013 & Summer 2014
Co-Directors:	Boris I. Shraiman, Ph.D., Susan F. Gurley, Professor of Theoretical Physics and Biology, Joel Rothman, Ph.D., Professor and Chair, Dept. of Molecular, Cellular and Developmental Biology

Population and Laboratory Based Sciences



The Burroughs Wellcome Fund launched an institutional award program in 2008 supporting graduate education in programs that will train students for simultaneous expertise in both population approaches (for example, epidemiology) and science done “at the bench.” These students should emerge well-positioned to take on complex problems currently beyond the reach of most traditionally trained individual investigators.

PROGRAM UNIFYING POPULATION AND LABORATORY BASED SCIENCES (PUP)

Provides five-year institutional training awards at \$500,000 a year to bridge the gap between the population and computational sciences and the laboratory-based biological sciences. The award supports the training of researchers between existing concentrations of research strength in population approaches to human health and in basic biological sciences. The goal is to establish training programs by partnering researchers working in schools of medicine and schools (or academic divisions) of public health. The first Grant Recipients were awarded in 2009.

New students have matriculated to all three programs in September 2012 for academic 2012/2013.

HUMAN HEALTH: MOLECULES TO MANKIND (EMORY UNIVERSITY)

During the 2011/2012 academic year there were eight graduate students funded by Emory's Molecules to Mankind (M2M) program, as well as one associated grad student who is involved in program activities but not supported. Students enter during their second year of graduate school, and are recruited from the School of Public Health and relevant basic science programs.

Four of the current students used BWF support to travel to meetings this year. Two bought lab equipment. One traveled to an outside laboratory (at St. Jude's) to do some work. The program hosted two headliner seminars this year, one with Paul Ehrlich and the other with Lita Proctor, the program coordinator for the Human Microbiome Project.

There have been two faculty/student socials and an annual research retreat where students all present their work and discuss with faculty the challenges, obstacles, needs, and opportunities presented by their interdisciplinary training. Faculty have continued work on the common core curriculum and the separate curricula for the program's four tracks. The core course is a two hour seminar, M2M 700. In it, each of the four track leaders lead discussions on topics bridging the population and laboratory sciences, outside speakers are brought in, and students each lead a seminar on his or her own research as part of this course, as well. The Atlanta locale provides a terrific slate of outside speakers with international insight: former CDC directors Bill Foege and Jeff Kaplan have spoken, as has Carter Center CEO John Hardman.

BWF INTER-SCHOOL TRAINING PROGRAM IN METABOLIC DISEASES (UCLA)

This year, the UCLA program's website has been revised, a new program brochure has been created, and a program newsletter, delivered on campus and externally, has also been launched.

At UCLA's Inter-school Training Program in Metabolic Diseases, there were five graduate students supported by the program in 2011/2012, as well as five unsupported associates, all postdoctoral fellows. All trainees attend weekly Endocrine Grand Rounds as part of the program's core course, EPI 297-Topics in Genomics and Nutrition. Because of student interest in women's health, the group also participated in OB/GYN grand rounds. To balance the medical exposure with basic science, students also took part in the UCLA Institute for Molecular Medicine Seminar series. The program itself supported 3 speakers this year: JoAnna Manson (Harvard), Kai Wong (USC) and Massimo Pietropaolo (Michigan).

Trainees also gathered for biweekly meetings where they took turns presenting their own work, with a focus on the interface between the two mentors' labs. (This was in part because of concerns during a first-year site visit that students perceived themselves as "in" one lab but gaining advice from the co-mentor.) They have also presented their work at a joint symposium with UCLA's Genomic Analysis Training program. There are plans to continue bringing the students trained by these two programs together annually. UCLA did not report on student travel to meetings.

Two graduate students, Brian Chen and Sara Chacko, have finished their doctoral education and moved on to postdoctoral fellowships. Chen has moved on to work with the Framingham Heart Study, with support from NHLBI, and Chacko is working in Integrative Medicine at Harvard.

HOUSTON LABORATORY AND POPULATION SCIENCE TRAINING PROGRAM IN GENE-ENVIRONMENT INTERACTION

The Houston Laboratory and Population Sciences Training Program in Gene-Environment Interaction (GxE) had 11 students and 2 unfunded associates in the program through academic 2011/2012. Students can work with more than 40 faculty from the University of Texas Health Sciences Center at Houston (recently rebranded as “UTHealth”) Schools of Medicine, Public Health, Health Information Sciences, and Graduate School of Biomedical Sciences, The Brown Foundation Institute of Molecular Medicine for the Prevention of Human Diseases, M.D. Anderson Cancer Center, and Baylor College of Medicine. Six of the students presented at seven national or international meetings.

The Houston program brings students together around several training opportunities including an annual informatics workshop and a separate DNA sequencing workshop. The students report to the faculty on their work quarterly and have an annual review with faculty. At the annual review, the students present a written report and an informal, conversational oral presentation in front of the program’s co-directors and steering committee. The program maintains an external advisory committee which visits once a year, and graduate students present short talks at that meeting as well.

Co-director Tom Caskey retired from UTHealth and moved to Baylor. He retains a UTHealth appointment and remains on the GxE faculty. Hope Northrup, MD, a professor and Director of Pediatric Genetics at UTHealth has replaced him as a co-director of the program. Eric Boerwinkle continues in his original role as co-director.

Regulatory Science



It has become clear that a critical area within translational research is regulatory science. Turning discoveries into innovative new approaches to therapies requires that the science of regulation keep up with the advances in biomedical science and technology. In recent years the FDA has become dramatically overburdened and underresourced, as outlined clearly in the 2007 FDA Science Board Report, *Science and Mission at Risk*.¹

OVERVIEW

Now responsible for regulating over \$2 trillion in consumer products across 150 countries, funding and manpower at the FDA have not kept up with the rising responsibility. Of relevance to BWF, many of our awardees will depend on modern regulatory science to enable the translation of their lab-based and pre-clinical work into innovative therapies. FDA Commissioner Margaret Hamburg has made regulatory science a centerpiece of the agency's strategy for fostering innovation, and has called for the academic and foundation communities to take an active role in building this emerging field.

The area had come to BWF's attention through our involvement in the IOM Forum on Drug Discovery, Development, and Translation, as well as the Health Research Alliance (HRA). In their October 2010 discussions, the BWF Board identified this area as one that BWF should explore for the possibilities of making a strategic investment. Consequently, outside experts were invited to address the Board to build the rationale and provide ideas for BWF consideration.

An outcome of these conversations was the Board's decision for BWF take the initiative in developing and implementing a new award program in the regulatory science area—one that would best serve BWF's mission and address this scientific need. As a result, the Innovation in Regulatory Science Awards (IRSA) program was developed in FY2012 and launched in early September 2012.

INNOVATION IN REGULATORY SCIENCE (IRSA)

The program is progressing, with an advisory committee having been recruited and the description of the program having been posted on the web.

Notice of the program has been widely distributed, including an opinion piece by Nancy Sung (who recently left BWF) and President John Burris in *Science Translational Medicine*, an announcement at the inaugural lectureship at the FDA sponsored by Health Research Alliance, and direct mailings to a number of individuals and institutions working in this research area.

Since this is the first time that the program has been run, we do not know how many applications we will receive. Since it is a self-nomination process, we are following the format of the CASI program and asking for brief pre-proposals to use to select whom we will ask to submit full proposals. The deadline for the pre-proposals is November 19, 2012.

With input from the advisory committee a decision will then be made on how many and who to ask to submit full proposals. The deadline for receipt of full proposals is April 3, 2013.

We have received considerable feedback that this is an important, yet underfunded area, so it will be interesting to see how many applications we receive. Depending on the quality of the applications, we will fund at least five and may fund up to ten awards, each of which will provide up to \$500,000 over five years.

¹FDA Science Board. 2007. FDA Science and Mission at Risk. Rockville, MD Report of the Subcommittee on Science and Technology.

Reproductive Sciences



Many health and social problems in the United States can be attributed to preterm births. The Burroughs Wellcome Fund launched an award initiative in 2009 to expand the limited understanding of the biological mechanisms underlying childbirth and spontaneous preterm birth using multidisciplinary approaches.

RESEARCH CONSORTIUM ON PRETERM BIRTH

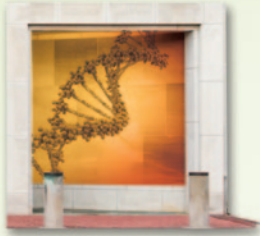
In 2007 the BWF Board approved a \$600,000 grant to support a series of international meetings to foster discovery in the area of preterm birth and to focus particularly on the mechanisms behind both preterm and full-term delivery. To date three meetings have been held in conjunction with the March of Dimes. The initial meeting was held in Dallas in 2008. In 2010 and 2012, the meeting was held in Newport Beach, California. The cost for the meetings has been shared by BWF and MoD. The first meeting resulted in an article that was published in the *New England Journal of Medicine*.

PRETERM BIRTH INITIATIVE

In 2008 the BWF board approved the BWF Preterm Birth Initiative competitive grant program to look at the basic mechanisms of preterm birth and parturition. In the initial round 69 proposals were received and five \$600,000 full grants were awarded in January 2011. Two of the awards went to physician scientists and three to Ph.D.s. The topics of the funded proposals ranged from mitochondrial genome/microbiome interactions to the assessment of cervical ripening by sodium magnetic resonance imaging in the mouse model.

The deadline for the second round was December 1, 2012. We anticipate that five awards will be made.

Science Education



Engaging children in science has been a focus of the Burroughs Wellcome Fund since it became an independent, private foundation in 1994. We are convinced that all children, regardless of their future career path, need basic science literacy to participate fully in civic life. We believe that the best method for achieving the goal of science literacy is to get students involved in the scientific process and let them do what comes naturally: ask questions and participate in hands-on activities and experiments that convey basic scientific principles.

CAREER AWARDS FOR SCIENCE AND MATHEMATICS TEACHERS

Five-year awards provide \$175,000 to eligible science or mathematics teachers in the North Carolina public primary and secondary schools. The purpose of this award is to recognize teachers who have demonstrated solid knowledge of science or mathematics content and have outstanding performance records in educating children. The award is a partnership between the North Carolina State Board of Education and BWF.

PROMOTING INNOVATION IN SCIENCE AND MATHEMATICS

Awards provide teachers with funding for materials, equipment, and training to conduct hands-on, inquiry-based science and mathematics projects in North Carolina public schools.

STUDENT SCIENCE ENRICHMENT PROGRAM

Three-year awards provide up to \$180,000 to North Carolina nonprofit organizations, including public/private schools, universities, colleges, and museums. This program supports creative inquiry-based science enrichment activities that occur outside the typical school day for K-12 students. The program's goals are to nurture students' enthusiasm about science, expose them to the excitement of scientific discovery, and interest them in pursuing careers in research or a variety of other careers in science.

OVERVIEW

The Burroughs Wellcome Fund has invested over \$48 million in science education since 1996 to help build systemic reform in science, technology, engineering, and mathematics education primarily in North Carolina. We focus on the following areas:

- **Informal Learning**
Student Science Enrichment Program
- **Formal Learning**
CASMT/Singapore Math Pilot/FastTrack/PRISM
- **Public Policy and Research**
NC Institute for Education Policymakers/NRC
- **Capacity/Partnership Building**
Annual Meetings/Workshops/Forums

Our initial investment in science education began in the informal learning environment with the establishment of the Student Science Enrichment Program (SSEP) to engage scientists and science teachers in working with primary and secondary students in out-of-school time programs. We have reached every county (100) across the state.

In the formal education realm, we are working with the university system in North Carolina to produce quality teachers with degrees in science and mathematics who will teach K-12 students. We found that many teachers are unable to provide quality science learning in the classroom due to a lack of supplies and equipment. BWF is helping teachers purchase these items and receive training to utilize them. We have also found that having teachers apply for small grants build their confidence in pursuing larger ones. Many teachers want to help their students but require training to do so. BWF is offering intense training for teachers who want to learn mathematics strategies used in Singapore.

Although the majority of our work in science education is done in our home state of North Carolina, BWF is engaged with national organizations including the National Research Council, the National Science Resources Center, and the American Association for the Advancement of Sciences to broaden our knowledge and to bring best practices to North Carolina.

The following sections provide details of our work in the Science Education program area.

BWF Science Education Funding Quick Facts (1996-2012)		North Carolina Education Landscape Quick Facts (2012)	
\$23.6 m	SSEP – 162 awards/36,968 students	100	Counties
\$ 1.8 m	CASMT – 10 awards/8 counties	115	School Districts
\$ 1.2 m	Singapore Math Pilot – 5 awards/5 counties	2,544	Public and Charter Schools
\$ 0.3 m	PRISM – 75 awards	95,377	Teachers
\$ 5.4 m	UNC FastTrack – 120 Scholars (38 teachers)	1.5 m	Students – Charters Excluded
\$ 1.0 m	Grassroots Museum Collaborative	17	Public Universities/NCSSM
\$ 1.3 m	Project SEED (20 students doctoral programs)	36	Private Universities/Colleges
\$ 1.2 m	Visiting Professorships	33	Science Museums
\$12.4 m	Adhoc grants		
\$48.2 m	TOTAL		

INFORMAL EDUCATION

Student Science Enrichment Program (SSEP) BWF has invested nearly \$24 million since 1996 through 15 series of SSEP award cycles with 162 awards to 80 different nonprofit organizations across North Carolina. SSEP has reached nearly 37,000 students, along with parents, teachers, and school administrators. Although students in each of our 100 counties in North Carolina have been touched in some way, there is more work to be done as the majority of SSEP grants are concentrated in the Piedmont area where BWF is located.

The most recent deadline was April 16, 2012, where a total of 98 eligible SSEP applications were reviewed by the advisory committee. They selected 35 finalist applications to discuss at their August 16 meeting. The committee recommended and the Board approved at the August 20 conference call 12 SSEP awards including public/private schools (6), university/ colleges (4), museum (1), and community organization (1). The awards are spread across North Carolina regions, piedmont (5), mountains (3), statewide (3), and coast (1). For the first time, a program (UNC-Chapel Hill Healing and Hope through Science) will reach students in a medical setting to engage them in active learning beyond their health challenges.

SSEP grants provide up to \$180,000 payable over three years. We generally make up to 10 awards per year. We convene awardees annually to network with potential partners and keep them abreast of advances in the informal and formal STEM education areas. This year, 21 SSEP award recipients attended the annual August 2012 conference with 17 presenting posters.

FORMAL EDUCATION

PRISM (Promoting Innovations in Science and Mathematics) BWF has invested \$247,522 in the PRISM program reaching 75 public school K-12 teachers and nearly 1,900 students in 42 different school districts across North Carolina. PRISM was designed for three key purposes 1) to build the capacity of teachers in applying for grants, 2) to offer access to quality hands-on, inquiry-based resources for students, and 3) to provide relationship building between BWF and teachers.

PRISM provides a grant up to \$3,000 to cover the costs of equipment, materials, and supplies to implement hands-on, minds-on science and mathematics curriculum in the classroom. Recognizing the need for materials and equipment training, additional funds up to \$1,500 may be requested for professional development related to the implementation of these new purchases. Teachers must have the appropriate licensure in science, mathematics or general education (elementary teachers) and be employed in N.C. public schools to apply for these grants.

The most recent deadline for PRISM was September 5, 2012. BWF received 50 eligible applications.

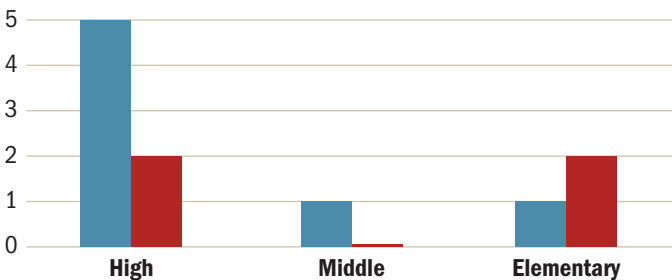
Career Award for Science and Mathematics Teachers (CASMT) BWF has invested nearly \$1.8 million since 2010 through the CASMT program to develop the careers of outstanding North Carolina K-12 science and mathematics teachers. The North Carolina State Board of Education and Department of Public Instruction are partners with BWF on this program and provide annual 12-month contracts for these award winning teachers.

BWF received 31 applications for the September 18, 2012, deadline. The application demographics include four elementary teachers, 11 middle school teachers, one middle/high teacher, and 15 high school teachers. There are 21 different school districts from across the state represented, including one charter school and the Cherokee Central School. The following are additional stats to show connections among BWF Science Education Programs.

- Five repeat CASMT applicants (three interviewed last year)
- Four CASMT applicants associated with or previously applied for SSEP programs
- Three CASMT applicants previously received PRISM grants
- Two have PRISM grants pending

This is the third cycle for the CASMT program. The advisory committee will meet February 5-6, 2013, prior to the BWF Board meeting, to review nominations for awards.

We currently have 10 CASMT award recipients. These grants have been made primarily to high school science teachers followed by mathematics teachers in high schools and elementary schools. The awards have been spread across the state, representing eight different North Carolina counties—Winston-Salem (2), Buncombe (2), Warren, Cumberland, Haywood, Charlotte/Mecklenburg, Guilford, and Transylvania.



CASMT recipients were convened with other Science Education award recipients during the annual August 2012 conference. They participated in an afternoon session guided by education evaluator Dr. Rita O'Sullivan and team of UNC-Chapel Hill. Three CASMT Advisory Committee members attended this session where they learned more about the teachers' logic models and plans for the coming year.

Singapore Mathematics Pilot (SMP) BWF is investing \$1.2 million into a six-year pilot to support the following elementary schools across North Carolina. I am pleased to report that site visits to Bladen County schools and Gallberry Farm Elementary School were successful in recruiting SAS to fund Y.E. Smith Elementary School in Durham to join the pilot. There is a verbal commitment by SAS to fund additional elementary schools in Durham and Wake Counties for the coming year.

1. Bladen County School District

(Elizabeth Primary School and East Arcadia School)

2. Eastfield Global Magnet School (McDowell County)

3. Gallberry Farm Elementary School (Cumberland County)

4. Murphey Traditional Academy (Guilford County)

5. North Wilkesboro Elementary School (Wilkes County)

6. Y. E. Smith Elementary School (Durham County)

SAS Funded

SMP is a partnership with the State Board of Education and the Department of Public Instruction. A long-term goal is to scale this pilot beyond the selected schools and districts. We are waiting for the SMP students to reach the third grade to take End of Grade exams to develop a comparative study with similar schools in their districts not participating in the pilot. We are anticipating high outcomes for these students. SMP provides teacher training, curriculum materials for students, and networking opportunities for teachers, parents, local school boards, and other community stakeholders.

FastTrack-University Program to Prepare Science and Mathematics Teachers

BWF has invested \$5.4 million with the University of North Carolina General Administration to produce 120 K-12 teachers with degrees in the sciences or mathematics through the FastTrack Program. Students are given scholarships in their junior and senior years with the goal of graduating with teaching certification within a four-year timeframe. Upon graduation, FastTrack provides \$5,000 salary supplements for five years once these teachers enter the workforce.

FastTrack now has 38+ (see notes) teachers in the classroom and 24+ (see notes) scholars in junior and senior years gearing up to teach in North Carolina public schools. FastTrack scholarships have been awarded to 67+ (see notes) students on four UNC campuses, North Carolina Central University (3) North Carolina State University (20), UNC-Asheville (19), and UNC-Chapel Hill (25). We have 38+ FastTrack teachers in the workforce with degrees in the sciences and mathematics, 38+ (8 first year teachers, 19 second year teachers, and 11 teachers in their 3rd year of teaching) scholars are still in school. This past summer, 10 FastTrack teachers were taken abroad to study the school system in Singapore. Some of their experiences included sharing individual teaching experiences and educational views with peer scholars and teachers from a different culture; reflection and discussion on educational ideas and practice with NC and Singapore teachers/educators; exchange of teaching concerns/challenges with peer teachers; and opportunity to discuss and react to differing educational environments.

BWF Scholars had the opportunity to think about their role as an educator in the classroom, school, district, and state. Scholars are preparing personal statements of their International experience and how the experience is being applied in their practice.

Notes:

(1) NC public schools are still hiring for the 2012-13 year. It's a dynamic process and we do not always get notified right away by the Scholars when they are hired. Typically, they begin checking in by spring as to their employment status. The number of Scholars teaching will increase (from 38) for this year as we are notified by the Scholars of their employment.

(2) We do not have 10 day census enrollment data back from campuses for fall 2012. Enrollment numbers will be greater than 24 when fall 2012 enrollment data are available. Total scholarships awarded will increase as well when the census data is available and fall 2012 awards are included. Also, awards are not always issued in the fall term.

(3) Several of the Scholars have entered graduate school prior to seeking employment after graduation; three of the Scholar graduates have joined the Peace Corp; and a few have moved out of state.

(4) A total of 91 BWF scholars have graduated (67) and/or are currently enrolled (24+) on a campus as a Scholar preparing to enter the classroom (67 graduated/24+ enrolled). Does not include fall 2012 enrollment census data.

PUBLIC POLICY AND RESEARCH

BWF has an ongoing partnership with the Public School Forum of North Carolina, a think tank for policymakers and educators. In 1996, we partnered with the Forum and Kenan Trust to create a North Carolina Institute for Education Policymakers. The Institute is designed to help break down barriers in communications, impact policies that influence school-based improvements, and demonstrate value of engaging students in pursuing careers in STEM learning. Policymakers have studied global models in science and mathematics education, replicating best practices in North Carolina, and have been given access to a wealth of education data and research to make better policy decisions.

This past year, the Institute for Education Policymaker made notable accomplishments including a study of the Finland school system. Seven members of the General Assembly, two members of the State Board of Education, five members of the UNC system and 17 others including BWF President John Burris participated on this study. Other efforts included education policy briefings (six) held across the state (Wilmington, Greenville, Asheville, Cary, Charlotte, and Greensboro) for 2012 candidates running for public office or currently in office. Senate Bill 724: An Act to Improve Public Education resulted from a Forum study titled, *Our Kids Won't Wait: They Need World-Class School Today*, which was released February 2011. The Bill provides five instructional days be added to the school calendar beginning with the 2013-14 school year.

Science and Philanthropy



The Burroughs Wellcome Fund makes noncompetitive grants for activities and career development opportunities for scientists that fall outside of our competitive award programs, but are closely related to our targeted areas.

We place special priority on working with nonprofit organizations, including government agencies, to leverage financial support for our targeted areas of research, and on encouraging other foundations to support biomedical research. Proposals should be submitted to BWF by email. Mailed requests should be no more than five pages.

Applicants should describe the focus of the activity, the expected outcomes, and the qualifications of the organization or individuals involved; provide certification of the sponsor's Internal Revenue Service tax-exempt status; and give the total budget for the activity, including any financial support obtained or promised. Proposals are given careful preliminary review, and those deemed appropriate are presented for consideration by BWF's Board of Directors.

Applications are accepted throughout the year.

Report on Finance

The Burroughs Wellcome Fund's investments totaled \$651.1 million at August 31, 2012, the end of our fiscal year. BWF's primary financial goal is to pursue an investment strategy that will support annual spending needs and maintain a constant real level of assets over the long term. To achieve this goal, a high percentage of our investments are placed in strategies that derive the bulk of their returns from exposure to U.S. and international capital markets. Hence, fluctuations in BWF's investment results will be due largely to variability in capital market returns.

BWF's investment policies are developed with the recommendations and review of the Investment Committee, which is appointed by and reports to BWF's Board of Directors. The committee, which meets three times a year, has six voting members, including three representatives from outside BWF and two representatives of our board. The board's chair, BWF's president, and BWF's vice president for finance also serve on the committee as nonvoting members.

As part of BWF's investment strategy, we have established "allocation targets"—that is, percentages of our total assets to be invested in particular asset classes. Investment managers hired by BWF pursue more focused mandates within each sector. As of the end of the fiscal year, BWF's asset mix and market values were:

- U.S. large capitalization equity assets had a market value of \$143.8 million. The sector's target allocation was 25 percent, and actual holdings stood at 22.1 percent.
- U.S. small capitalization equity assets had a market value of \$99.0 million. The sector's target allocation was 18 percent, and actual holdings stood at 15.2 percent.
- International equity assets had a market value of \$152.1 million. The sector's target allocation was 32 percent, and actual holdings stood at 23.4 percent.
- Fixed income assets had a market value of \$119.4 million. The sector's target allocation was 22 percent, and actual holdings stood at 18.3 percent.
- Cash equivalent assets had a market value of \$9.8 million. The sector's target allocation was 3 percent, and actual holdings stood at 1.5 percent.
- Alternative assets had a market value of \$127.0 million. The sector did not have a target allocation, and actual holdings stood at 19.5 percent. The maximum permitted allocation to alternative assets stood at 20.0 percent at cost.

The total market value of BWF's investments increased by \$5.9 million, or 0.9 percent, from the end of the previous fiscal year. This small increase in assets was due mainly to good returns for U.S. equities and bonds during the year. Returns to international equities were slightly negative. BWF's total investment return before investment management fees for the fiscal year was +7.2 percent. The U.S. large capitalization equity sector returned +15.5 percent, the U.S. small capitalization equity sector had a +17.4 percent result, the international equity sector lost -1.9 percent for the fiscal year, and fixed income produced a +9.0 percent result.

STATEMENTS OF FINANCIAL POSITION**August 31, 2012 and 2011**

(All dollar amounts presented in thousands)

	2012	2011
Assets		
Cash and cash equivalents	\$ 13,038	\$ 18,460
Investments	657,122	639,933
Accrued interest and dividends receivable	1,545	1,703
Other assets	60	88
Property and equipment, net	9,303	9,673
<u>Total assets</u>	<u>\$ 681,068</u>	<u>\$ 669,857</u>
Liabilities and Net Assets		
Transactions payable, net	\$ 18,959	\$ 15,934
Accounts payable and other liabilities	566	995
Federal excise tax payable	134	588
Deferred federal excise taxes	940	645
Unpaid awards	74,665	83,538
<u>Total liabilities</u>	<u>95,264</u>	<u>101,700</u>
Unrestricted net assets	585,804	568,157
<u>Total liabilities and net assets</u>	<u>\$ 681,068</u>	<u>\$ 669,857</u>

STATEMENTS OF ACTIVITIES

August 31, 2012 and 2011

(All dollar amounts presented in thousands)

	2012	2011
Revenues and Realized Gains		
Interest and dividends, less investment expenses of \$2,572 and \$3,237 in 2012 and 2011, respectively	\$ 9,323	\$ 9,278
Net realized gain on sale of marketable securities	18,001	32,756
Total revenues and realized gains	27,324	42,034
Expenses		
Program services	21,730	24,979
Management and general	5,652	6,817
Total expenses before net unrealized appreciation and deferred federal excise tax	27,382	31,796
Net unrealized appreciation of investments, net of provision for deferred federal excise tax of \$295 and \$645 in 2012 and 2011, respectively	17,705	31,582
Change in net assets	17,647	41,820
Net assets at beginning of year	568,157	526,337
Net assets at end of year	\$ 585,804	\$ 568,157

For full audited financials visit bwfund.org/annualreport.

Grants Index

BWF makes all grants to nonprofit organizations. For most of the programs, the name of the individual on whose behalf the grant is made is listed first, the title of the award recipient's project is listed second, and the name of the organization that received the money is listed third.

For programs that may have coaward recipients, the award recipients and their organizations are listed first, followed by the project title. For grants made directly to organizations and not on behalf of an individual, the name of the organization is listed first, followed by the title of the project or a brief description of the activity being supported.

In addition to making competitive awards, BWF makes noncompetitive grants—Ad Hocs—for activities that are closely related to our major focus areas. These grants are intended to enhance the general environment for research in the targeted areas.

For full audited financials visit bwfund.org/annualreport

PROGRAM SUMMARY

August 31, 2012

	Awarded Net of Cancelled	Amount Paid	Percentage of Total Paid
Biomedical Sciences			
Career Awards in the Biomedical Sciences	\$ (1,435,287)	\$ 2,910,246	
Career Awards in the Medical Sciences	7,164,328	4,184,250	
Research Travel Grant	347,430	356,104	
Ad Hoc	1,106,944	889,407	
Total	\$ 7,183,415	\$ 8,340,007	27%
Infectious Diseases			
Career Guidance	\$ 267,264	\$ 220,259	
Investigators in Pathogenesis of Infectious Disease	5,000,000	6,045,000	
Ad Hoc	426,600	571,948	
Total	\$ 5,693,864	\$ 6,837,207	22%
Interfaces in Science			
Career Award at the Scientific Interface	\$ 5,041,410	\$ 4,547,025	
Interfaces Short Courses	800,000	400,000	
Ad Hoc	46,000	149,000	
Total	\$ 5,887,410	\$ 5,096,025	17%
Population Sciences			
Institutional Program Unifying Population and Laboratory-Based Sciences	\$ —	\$ 1,747,000	
Ad Hoc	5,000	5,000	
Total	\$ 5,000	\$ 1,752,000	6%
Reproductive Sciences			
Preterm Birth Initiative	\$ —	\$ 750,000	
Total	\$ —	\$ 750,000	2%

PROGRAM SUMMARY

August 31, 2012

	Awarded Net of Cancelled	Amount Paid	Percentage of Total Paid
Science and Philanthropy			
Science and Philanthropy	\$ 324,369	\$ 275,850	
Total	\$ 324,369	\$ 275,850	1%
Science Education			
Career Award for Science and Mathematics Teachers	\$ —	\$ 225,000	
PRISM	247,522	243,501	
Student Science Enrichment Program	1,751,890	801,190	
Ad Hoc	480,053	1,505,906	
Total	\$ 2,479,465	\$ 2,775,597	9%
Translational Research			
Clinical Scientist Award in Translational Research	\$ 61,830	\$ 4,974,330	
Ad Hoc	48,000	48,000	
Total	\$ 109,830	\$ 5,022,330	16%
Grand Total[†]	\$ 21,683,353	\$ 30,849,016	100%

Biomedical Sciences

CAREER AWARDS IN THE BIOMEDICAL SCIENCES

Derek W. Abbott, M.D., Ph.D.

Regulation of innate immunity via non-traditional ubiquitin linkages
Case Western Reserve University School of Medicine

Geoffrey K. Aguirre, M.D., Ph.D.

fMRI studies of the process architecture of face perception
University of Pennsylvania Perelman School of Medicine

Karl Mark Ansel, Ph.D.

Endogenous RNA interference and gene silencing in T cell differentiation
University of California-San Francisco

Kaveh Ashrafi, Ph.D.

Comprehensive analysis of regulatory mechanisms of fat biology
University of California-San Francisco School of Medicine

Vahe Bandarian, Ph.D.

Biosynthesis of deazapurine secondary metabolites
University of Arizona

Aaron P. Batista, Ph.D.

Neural gating within the cerebral cortex during sensory-motor behavior
University of Pittsburgh

Bradley E. Bernstein, M.D., Ph.D.

Proteomic studies of post-translational histone modifications
Harvard Medical School

Ben E. Black, Ph.D.

Epigenetic mechanisms for centromere specification
University of Pennsylvania Perelman School of Medicine

Mark M. Churchland, Ph.D.

Experimental study of settling neural processes in the primate brain
Columbia University Medical Center

Leah E. Cowen, Ph.D.

Hsp90 and the evolution of pathogens and their hosts
University of Toronto Faculty of Medicine

Levi A. Garraway, M.D., Ph.D.

Linking genetic alterations to tumor dependencies in human melanoma
Dana Farber Cancer Institute

Matthew C. Gibson, Ph.D.

Design principles in metazoan epithelia: the molecular control of growth and form
Stowers Institute for Medical Research

Steven T. Kosak, Ph.D.

The genomic organization of hematopoietic differentiation
Northwestern University Feinberg School of Medicine

Mondira Kundu, M.D., Ph.D.

Role of Ulk1 and autophagy in erythroid maturation
University of Tennessee Health Science Center College of Medicine

Eric C. Lai, Ph.D.

Genomewide analysis of microRNA function in *Drosophila*
Memorial Sloan-Kettering Cancer Center

Yaping Joyce Liao, M.D., Ph.D.

Neurophysiological dysfunction in calcium channelopathies
Stanford University School of Medicine

Stephen B. Long, Ph.D.

Atomic structures of open and closed voltage-dependent potassium channels and other eukaryotic membrane proteins
Memorial Sloan Kettering Cancer Center

Aaron W. McGee, Ph.D.

Inhibition of plasticity in the adult central nervous system by Nogo-66 receptor signaling
University of Southern California Keck School of Medicine

Suzanne M. Noble, M.D., Ph.D.

Identification of virulence genes in *Candida albicans*, a diploid, commensal human fungal pathogen
University of California-San Francisco School of Medicine

Stephanie A. Pangas, Ph.D.

Defining the role of TGF β superfamily in ovarian cancer through mouse models
Baylor College of Medicine

Matthew H. Porteus, M.D., Ph.D.

Regulation of gene targeting in vertebrate somatic cells
Stanford University

Margot E. Quinlan, Ph.D.

Collaboration between two actin nucleators – Spir and Capu
University of California-Los Angeles

Oliver J. Rando, M.D., Ph.D.

Time scales of epigenetic inheritance: How and why
University of Massachusetts Medical School

Jeremy F. Reiter, M.D., Ph.D.

Tectonic: discovery of novel signal directing mammalian development
University of California-San Francisco

Kyu Y. Rhee, M.D., Ph.D.

Enzymes of intermediary metabolism in *Mycobacterium tuberculosis*: Anti-mycobacterial targets of nitric oxide
Weill Cornell Medical College

Noah A. Rosenberg, Ph.D.

Efficient genome-based inference of ancestry for use in genetic association studies
Stanford University

Pardis C. Sabeti, M.D., D.Phil.

Evolutionary genomics and its applications to human disease
Harvard University

Alvaro Sagasti, Ph.D.

Development of morphological diversity in trigeminal sensory neurons
University of California-Los Angeles

Alan Saghatelian, Ph.D.

Identifying functional connections between the proteome and metabolome by global metabolite profiling
Harvard University

Michael D. Shapiro, Ph.D.

Genetic and developmental basis of skeletal diversity in ninespine sticklebacks
University of Utah

Benjamin P. Tu, Ph.D.

Logic of the yeast metabolic cycle
University of Texas Southwestern Medical Center-Dallas

CAREER AWARDS IN THE MEDICAL SCIENCES

Antonios O. Aliprantis, M.D., Ph.D.

Novel regulators of the osteoclast differentiation program
Harvard Medical School

Chetan Bettgowda, M.D., Ph.D.

Translational molecular profiling of oligodendrogliomas
Johns Hopkins University

James Elliott Bradner, M.D.

Design and characterization of highly potent inhibitors of HDAC6
Harvard Medical School

Kathleen H. Burns, M.D., Ph.D.

Investigating the role of retrotransposons in hematopoietic neoplasias
Johns Hopkins University School of Medicine

Daniel P. Cahill, M.D., Ph.D.

Translational molecular genetic analyses of chemotherapeutic resistance in human brain tumors
Harvard Medical School

Clark C. Chen, M.D., Ph.D.

The molecular basis and therapeutic implications of genome instability during brain tumor progression
University of California-San Diego School of Medicine

Alice Siau-In Chen-Plotkin, M.D.

Genomic approaches to frontotemporal dementia
University of Pennsylvania Perelman School of Medicine

Sandeep Robert Datta, M.D., Ph.D.

Characterization of neural circuits that drive innate behaviors
Harvard Medical School

Arlene Dent, M.D., Ph.D.

Acquisition of immunity to blood stage *Falciparum* malaria in infants
Case Western Reserve University

Mahalia Sabrina Desruisseaux, M.D.

Neuroparasitology: neurological complications of cerebral malaria
Albert Einstein College of Medicine of Yeshiva University

Jay F. Dorsey, M.D., Ph.D.

Identification of mSin3b and Mad4 as novel p53 target genes directing p53-mediated transcriptional repression
University of Pennsylvania

Joseph Alexander Duncan, M.D., Ph.D.

Dissecting cryopyrin-mediated inflammatory signaling and its role in the pathogenesis of infectious Diseases
University of North Carolina-Chapel Hill

Benjamin Levine Ebert, M.D., Ph.D.

Genomic approaches to disorders of erythroid differentiation
Harvard Medical School

Brian Todd Edelson, M.D., Ph.D.

Macrophage and dendritic cell development
Washington University

Scott Richard Floyd, M.D., Ph.D.

Insulating chromatin from DNA damage signaling: epigenetic modifications and connections to human cancer
Massachusetts Institute of Technology

Rene L. Galindo, M.D., Ph.D.

Genetic dissection of the Rhabdomyosarcoma initiator PAX-FKHR and PAX-related signaling in skeletal muscle development
University of Texas Southwestern Medical Center-Dallas

Benjamin Elison Gewurz, M.D., Ph.D.

Identification of novel NFkB pathway components important for lymphomagenesis
Harvard Medical School

Pradipta Ghosh, M.D.

Modulation of G-protein activity during oncogenic and metastatic progression
University of California-San Diego

Jeffrey Parker Henderson, M.D., Ph.D.

Iron acquisition by bacterial siderophores as a pathogenic determinant in urinary tract infections
Washington University School of Medicine

Darnell Kaigler, D.D.S., Ph.D.

Cell therapy for the treatment of alveolar bone defects
University of Michigan-Ann Arbor

Douglas Sun Kwon, M.D., Ph.D.

New technologies for the study of HIV mucosal immunity and compartmentalization in the female genital tract
Harvard Medical School

Michael Z. Lin, M.D., Ph.D.

Elucidating mechanisms of synaptic plasticity and learning by visualizing and controlling local protein turnover
Stanford University School of Medicine

Roger Lo, M.D., Ph.D.

Melanoma in the skin: initiation, progression, and crosstalk with dermal fibroblasts
University of California-Los Angeles

Ravindra Majeti, M.D., Ph.D.

Identification and targeting of human acute myeloid leukemia stem cell-specific cell surface molecules
Stanford University

Heather Christy Mefford, M.D., Ph.D.

Novel genomic rearrangements in developmental pediatric disorders
University of Washington School of Medicine

Eric Matthew Morrow, M.D., Ph.D.

Identification of autism genes in special founder populations using high-density SNP microarrays
Brown University

Nikhil Vilas Munshi, M.D., Ph.D.

Genomic Approaches to Understanding the Cis-Regulatory Architecture of the Atrioventricular Node
University of Texas Southwestern Medical Center-Dallas

Ken Nakamura, M.D., Ph.D.

Physiologic and pathologic interactions of alpha-synuclein with mitochondria in Parkinson's disease
University of California-San Francisco

Christopher Newton-Cheh, M.D.

Genomic dissection of QT interval duration and sudden death
Harvard Medical School

Dao Nguyen, M.D.

The stringent response in *Pseudomonas aeruginosa* biofilm formation and antibiotic tolerance
McGill University

Quyen T. Nguyen, M.D., Ph.D.

Testing surgery guided by molecular fluorescence imaging
University of California-San Diego

Robert M. Plenge, M.D., Ph.D.

Genotype-phenotype studies of rheumatoid arthritis susceptibility genes
Harvard Medical School

David Tevis Pride, M.D., Ph.D.

Bacteriophage communities in oral health and disease
University of California-San Diego

Frank J. Probst, M.D., Ph.D.

Generation of mouse models for X-linked diseases
Baylor College of Medicine

Michael D. Rosenblum, M.D., Ph.D.

Memory regulatory T cells in inflammatory and autoimmune disease
University of California-San Francisco

Agata Smogorzewska, M.D., Ph.D.

Role of the Fanconi Anemia and other DNA crosslink repair pathways in genome maintenance and cancer prevention
Rockefeller University

Michael Thomas Spiotto, M.D., Ph.D.

Identification of chromosomal aberrations that cooperate with the human Papillomavirus to cause cancer

David Tsai Ting, M.D.

Characterization of non-coding RNAs in pancreatic adenocarcinoma
Harvard Medical School

Matthew Vander Heiden, M.D., Ph.D.

Metabolic control of cancer cell proliferation by pyruvate kinase M2
Massachusetts Institute of Technology

Richard Chih-Chien Wang, M.D., Ph.D.

Akt-mediated regulation of autophagy & tumorigenesis through formation of a beclin 1/keratin intermediate filament complex
University of Texas Southwestern Medical Center-Dallas

Joseph C. Wu, M.D., Ph.D.

Molecular and cellular mechanisms of cardiac regeneration
Stanford University

Mark Nan Wu, M.D., Ph.D.

Identification of novel genes that regulate sleep in *Drosophila melanogaster*
Johns Hopkins University School of Medicine

Kelley Yan, M.D., Ph.D.

Regulation of active and quiescent intestinal stem cells
Stanford University

Ellen Yeh, M.D., Ph.D.

Function of the plastid organelle in *P. falciparum*: beyond isoprenoid precursor biosynthesis and blood stage
Stanford University School of Medicine

Hao Zhu, M.D.

Investigating the Lin28/let-7 pathway in mouse models of liver cancer and regeneration
University of Texas Southwestern Medical Center-Dallas

Ann C. Zovein, M.D.

Hemogenic endothelium: hematopoietic stem cell emergence from the vasculature
University of California-San Francisco

COLLABORATIVE RESEARCH TRAVEL GRANTS

Tarek M Abdel-Fattah, Ph.D.

Nanostructured Labeling Materials for Molecular Recognition
Christopher Newport University

Michelle Adan, Ph.D. Candidate

High-Speed Imaging of Drug Delivery via Acoustic Droplet Vaporization
University of Michigan-Ann Arbor

Aadeel Akhtar, Ph.D. Candidate

Modeling neuroprosthetic reaching strategies for transhumeral amputees
University of Illinois-Urbana-Champaign

Ayna Nasser Alfadhli, Ph.D.

Nuclear Magnetic Resonance (NMR) Analysis of HIV-1 Matrix and RNA Interactions
Oregon Health and Science University

David Altman, Ph.D.

A collaboration to develop measurements of the biodynamic response of muscle fibers exposed to vibrations
Willamette University

Ramu Anandakrishnan

Computational study of nucleosome post translational modifications
Virginia Polytechnic Institute and State University

Jeremy Beau

Instruction of novel solid-tumor assay for the discovery of anticancer agents from natural sources
University of South Florida

Fred Kofi Boadu, Ph.D.

Soil properties and their influence on larval development, abundance and species richness in aquatic habitats
Duke University

Philippe Boudreau

Sleep and circadian regulation of heart rate: a novel wavelet transform cardiorespiratory coherence approach
McGill University

Gerd Brunner, Ph.D.

Magnetic Resonance Imaging of Atherosclerotic Plaques
Baylor College of Medicine

Stephanie Josephine Bryant, D.Phil.

Decoding biochemical and biophysical cues for engineering musculoskeletal tissues
University of Colorado-Boulder

Holly Elizabeth Carpenter Desai, Ph.D.

BioPaints: The biochemistry and characterization of color in nature
North Georgia College & State University

Hyuck Choo, Ph.D.

Nanophotonics-Based, Implantable IOP Sensor with Remote Optical Readout
California Institute of Technology

Andrew Ryan Denninger, Ph.D. Candidate

Neutron Diffraction of Nerve Myelin: Applications in Biomedical Research
Boston College

Seth Wayne Dickey, Ph.D. Candidate

Integrating differentially reactive amine chemistry coupled with mass analysis to profile mechanisms of gut-inhabiting bacteria
Johns Hopkins University

Theresa Freeman, Ph.D.

Enhancement of MSC Differentiation and Skeletal Growth by Nonthermal DBD Plasma
Thomas Jefferson University

Amy Fu

Composite scaffolds comprised of protein nanofibers to prevent corneal blindness
California Institute of Technology

Michael Francis Hagan, D.Phil.

Collaborative experimental and computational studies of viral capsid assembly
Brandeis University

Gregory Hardy

Understanding Lipid Reactivity of HIV-1 Neutralizing Antibodies: Lipid Patterning by Dip Pen Nanolithography and Characterization by Sum Frequency Generation Spectroscopy
Duke University

Katherine R Heal

Importance of Nitrification in the Euphotic Zone
University of Washington

Kristen K. Irwin

Estimating Genetic Covariance between a Univariate and a Function-Valued Trait
Washington State University

Erik Christopher Johnson

Developing Localization Algorithms for Extracellular Neural Recordings
University of Illinois-Urbana-Champaign

Jesse Vincent Jokerst, Ph.D.

A Biodegradable Contrast Agent for Ultrasound-Guided Stem Cell Therapy
Stanford University School of Medicine

Kevin Kahn

Network Analysis for Motor/Sensory Areas during Fast Loaded Movements
Johns Hopkins University

Maria Kamenetska

Quantifying Histone Control over DNA Transcription Using Single Molecule Force Spectroscopy
Columbia University

April M Kloxin, Ph.D.

Responsive hydrogels for controlled therapeutic release and regenerative medicine
University of Delaware

Liisa Tiina Kuhn, Ph.D.

Active nanostructured composite biomaterials for bone and cartilage regeneration
University of Connecticut Health Center

Markita Patricia Landry, Ph.D. Candidate

Development of Novel Instrumentation to Study Biomolecular Interactions at the Nano-Bio Interface
University of Illinois-Urbana-Champaign

Andrew Lee

Wnt mediated self renewal of cardiac progenitor cells
Stanford University

Rachel Louise Lenhart

Biomechanical Implications of Surgical Correction of Crouch Gait
University of Wisconsin-Madison

Sheng Lin

Fluorescence Methods for Investigating Biological Processes in Trypanosomes
Clemson University

Huinan Liu, Ph.D.

Determine Biological Responses to Engineered Resorbable Metallic Implants In Vivo
University of California-Riverside

Heather Dawn Maynard, Ph.D.

Nanopatterning Proteins for Enhancement of Bone Cell Adhesion
University of California-Los Angeles

Daniel McDonald

Building bridges: linking genomes to a well-characterized evolutionary history.
University of Colorado-Boulder

Charles S McHenry, Ph.D.

Determination of the three-dimensional structure of supramolecular assemblies involved in DNA replication
University of Colorado-Boulder

Mehruke Mehrubeoglu, Ph.D.

Investigating Imaging Modalities for Characterizing Vascular Pathophysiology
Texas A&M University-Corpus Christi

Meghan M Mensack, Ph.D.

Microfluidic tissue culture system for studying endocrine signaling
Colorado State University

Craig A Milroy

Improving the mechanical and electrical properties of conducting polymers for biomaterials, tissue regeneration scaffolds, artificial muscles, and membranes.
University of Texas-Austin

Timothy J Muldoon, M.D., Ph.D.

High-speed depth-sensitive imaging for subepithelial cancer detection
Columbia University

Brian Mulloney, Ph.D.

Conductance-based models of encoding and decoding in distributed neural circuits
University of California-Davis

Lina Maria Nilsson, Ph.D.

Establishing a mobile microscopy partnership in Vietnam for detection of pathogenic organisms
University of California-Berkeley

Clarissa Jane Nobile, Ph.D.

Biophysical Properties of Candida albicans Biofilms on Mucin Hydrogels
University of California-San Francisco

Tsuneyuki Ozaki, Ph.D.

Dynamic Laminometre: Canada-Japan collaboration for the fight against glaucoma
Institut national de la recherche scientifique

Sam Popwell

Development of Biocompatible, Polymer-based Radionuclide Therapies for Treating Metastatic Cancer
University of Florida

Dan Logan Romany

Development of a Model for the Midpalatal Suture during Maxillary Expansion
University of Alberta

Molly Rossow, Ph.D.

Microtubule Based Transport and the Microtubule Microenvironment
Northwestern University

Michael John Schnieders, D.Sc.

Force Field X: Pharmaceutical Applications of the Polarizable AMOEBA Force Field
University of Texas-Austin

Chelsey Simmons

Dynamic Cell Culture System with Vogel Lab at ETH Zurich
Stanford University

Wei Tan, Ph.D.

Nanomaterial-based Endothelial Regeneration for Hemodialysis
Vascular Access
University of Colorado-Boulder

Amelia Taylor, Ph.D.

Collaborative Research at the Biomathematics Research Centre
in New Zealand
Colorado College

Richelle C Thomas

In Vitro Cellular Response to Anti-inflammatory Therapeutics
and Cytokines for Diabetic Wound Healing
University of Texas-Austin

Sam Walcott, Ph.D.

Characterization of intermolecular interactions in myosin ensembles
University of California-Davis

Jason A. Wertheim, M.D., Ph.D.

A Collaborative Program in Liver Tissue Engineering
Northwestern University

John Widloski

Attend Methods in Computational Neuroscience lecture course
at Woods Hole, MA
University of Texas-Austin

Ming Xian, Ph.D.

Collaborative Research to Develop New Chemical Tools for
Signaling Molecules
Washington State University

Jie Zheng, Ph.D.

Developing an infrared laser-based rapid microscopic heating
method
University of California-Davis

Jie Zhou, Ph.D.

Automatic image analysis for identifying regulators of subcellular
synapse distribution
Northern Illinois University

AD HOC**American Physician Scientists Association (APSA)**

Support for the APSA annual meeting, policy initiatives, website
development, and diversity surveys

American Society for Cell Biology

Support for the Women in Cell Biology career discussion
and mentoring roundtables and the WICB workshop

American Society for Cell Biology

Support for the Minorities Affairs Committee activities
at the annual meeting

**American Society for Clinical Investigation/Association
of American Physicians (ASCI/AAP)**

Support for the 2012 ASCI/AAP joint meeting

Association for Clinical Research Training (ACRT)

Support for the annual meeting

American Society for Reproductive Immunology

Support for the 2nd clinical reproductive immunology symposium

Association of Military Surgeons of the United States

Support for the AMSUS Sir Henry Wellcome Medal and Prize

Baylor College of Medicine

Support for the Alexander R. Matzuk lecture in drug discovery

California State University-East Bay

Support for the 2011 College of Science Scholarship Fund

Clinician Investigator Trainee Association of Canada

Support for the 2012 annual meeting of CITAC-ACCFC

Endocrine Society

Support of the Hormone Assay Standardization Project

Federation of American Societies for Experimental Biology

Support for a publication update entitled: The Physician-Scientist
at the Year 2012

Federation of Clinical Immunology Societies

Support for the annual meeting

Gairdner Foundation

Support for the Gairdner National Program

George Mason University

Support for the 2013 workshop entitled: NeuroMorpho.Org—an inspiring success story in neuroscience data sharing

Hereditary Breast and Ovarian Cancer Foundation

Support for the BRCA: from theory to practice—the fourth international symposium on hereditary breast and ovarian cancer

Marine Biological Laboratory (MBL)

Support for the 2010-2012 sessions of the Frontiers in Reproduction course

Marine Biological Laboratory (MBL)

Support for the 2012 FIR symposium

National Academy of Sciences

Support for a study of the postdoctoral training system and to support the travel for David Proctor the fellow working on building bridges to the international scene

National Postdoctoral Association

Support for the National Institute of Environmental Health Sciences (NIEHS) 15th Annual NIEHS/NTA (NIEHS Trainees Assembly) Biomedical Career Fair

National Postdoctoral Association

Support for travel for delegates from national research staff associations to attend the International Consortium of Research Staff Associations

New York Academy of Sciences

Support for a scientific symposium “Fetal programming and environmental exposures: Implications for prenatal care and pre-term birth”

North Carolina Research Campus Catalyst Group

Support for the programs and events of the North Carolina Research Campus Catalyst Group

Research!America

Support for the Research!America Internship Program

Sisters of the Academy Institute

Support for the Intensive Grantsmanship Workshop

Society for Gynecologic Investigation

Support for the annual meeting

Society for Neuroscience

Support for the professional development committee postdoctoral travel awards to the annual meeting

Society for the Advancement of Chicanos and Native Americans in Science

Support for travel scholarship awards for the annual conference

Society for the Study of Reproduction

Support for SSR's Minority Affairs Committee (MAC) activities at the annual meeting

Teratology Society

Support for the annual meeting

University of California-San Francisco

Support for the 2012 Reproductive Scientist Development Program scholar's annual research conference/retreat

University of California-San Francisco School of Medicine

Support for a Reproductive Scientist Development Program junior faculty scholar

University of Cincinnati Children's Hospital Medical Center

Burroughs Wellcome Fund research consortium on preterm birth

University of Colorado-Boulder

Support for the 2013 Single Molecule Biophysics conference

University of North Carolina-Chapel Hill

Support for the annual UNC Lineberger Comprehensive Cancer Center Symposium, “Cancer Therapies and New Drug Targets”

University of North Carolina-Chapel Hill

Support for the second annual Oliver Smithies Nobel Symposium

Infectious Diseases

CAREER GUIDANCE

Steven Casper, Ph.D.

“Bridging the Gap” Summer Boot-camp to Prepare Ph.D. Scientists for Careers in the Life Science
Industrieste Institute of Applied Life Sciences

Amy L. Chang

ASM-BWF Science Teaching Fellows Program
American Society for Microbiology

Philip S. Clifford, Ph.D.

Careers in Industry: Real World Training for Ph.D. Scientists
Medical College of Wisconsin

Jennie B. Dorman, Ph.D.

Integrating Career Development into the Graduate Curriculum
University of California-San Francisco

Lisa M. Kozlowski, Ph.D.

Mentored Teaching Experience in Health Professional Courses
Thomas Jefferson University

Virginia Miller, Ph.D.

Career Guidance for Trainees-the Ph.D./Educator Track
University of North Carolina-Chapel Hill

INVESTIGATORS IN THE PATHOGENESIS OF INFECTIOUS DISEASES

Neal M Alto, Ph.D.

The systems architecture of bacterial effector/host membrane interactions
University of Texas Southwestern Medical Center-Dallas

David M. Aronoff, M.D.

Prostaglandin E2 synthesis and signaling in the pathogenesis of puerperal Group A Streptococcus infections
University of Michigan-Ann Arbor

David Artis, Ph.D.

Tracking helminth-specific immune responses in vivo
University of Pennsylvania

Anna I Bakardjiev, M.D.

Pregnancy-related pathogenicity determinants of listeria monocytogenes
University of California-San Francisco School of Medicine

Jody L. Baron, M.D., Ph.D.

Understanding immunopathogenesis of Hepatitis B virus
University of California-San Francisco School of Medicine

Gregory M. Barton, Ph.D.

Interactions between TLRs and intracellular pathogens
University of California-Berkeley

Choukri Ben Mamoun, Ph.D.

Function and regulation of host and parasite nutrient transporters during malaria infection
Yale University

Richard J. Bennett, Ph.D.

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

Julie Magarian Blander, Ph.D.

Innate immune recognition of vita-PAMPs: a new class of pathogen associated molecular patterns that signifies microbial viability
Mount Sinai School of Medicine

Miriam Braunstein, Ph.D.

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

Juliane Bubeck Wardenburg, M.D., Ph.D.

Tuning of the host-bacterial interaction by a pore-forming toxin
University of Chicago

James R. Carlyle, Ph.D.

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

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

Dissemination of HIV through virological synapses
Mount Sinai School of Medicine

Sara R. Cherry, Ph.D.

Systems biology of Alphavirus infection
University of Pennsylvania

Jen-Tsan Ashley Chi, M.D., Ph.D.

The sequence determinant of the *Plasmodium falciparum* gene regulation by human microRNAs
Duke University Medical Center

Carolyn B. Coyne, Ph.D.

The actin cytoskeleton and antiviral innate immune signaling
University of Pittsburgh School of Medicine

Blossom Damania, Ph.D.

Role of viral signaling proteins in the pathogenesis of Kaposi's sarcoma-associated herpes virus (KSHV)
University of North Carolina-Chapel Hill

Andrew Darwin, Ph.D.

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

K. Heran Darwin, Ph.D.

Ubiquitin-like proteins in bacterial pathogens
New York University School of Medicine

Manoj T Duraisingh, Ph.D.

Epigenetic control of virulence gene expression in *Plasmodium falciparum*
Harvard School of Public Health

Jonathan Dworkin, Ph.D.

Characterization of a novel family of receptors mediating metazoan recognition of microbes
Columbia University

Peter J. Espenshade, Ph.D.

Oxygen-sensing and adaptation to host tissue hypoxia in the human fungal pathogen *Cryptococcus neoformans*
Johns Hopkins University

Michael R. Farzan, Ph.D.

Parallel identification of obligate viral receptors
Harvard Medical School

Sarah M. Fortune, M.D.

Quick change: polarity, diversity and virulence in *mycobacterium tuberculosis*
Harvard University

Stephen Girardin, Ph.D.

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

Britt Glaunsinger, Ph.D.

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

Karen J. Guillemin, Ph.D.

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

Chuan He, Ph.D.

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

Ekaterina Heldwein, Ph.D.

Structural mechanism of herpesvirus egress
Tufts University School of Medicine

Kent L. Hill, Ph.D.

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

Lora V. Hooper, Ph.D.

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

Chyi-Song Hsieh, M.D., Ph.D.

Host discrimination between pathogenic and commensal bacteria in the colon
Washington University School of Medicine

Eckhard Jankowsky, Ph.D.

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

Jonathan C. Kagan, Ph.D.

Novel approaches to study RIG-I like receptor mediated antiviral immunity
Harvard Medical School

Robert F. Kalejta, Ph.D.

Cellular and viral determinants of human cytomegalovirus lytic and latent replication cycles
University of Wisconsin-Madison

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

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

D. Borden Lacy, Ph.D.

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

Manuel Llinas, Ph.D.

Global analysis of the *Plasmodium falciparum* metabolome
Princeton University

John D. MacMicking, Ph.D.

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

Sarkis K. Mazmanian, Ph.D.

Novel probiotic therapy for microbial infections
California Institute of Technology

Yorgo Modis, Ph.D.

Cell entry and innate immune recognition of flaviviruses
Yale University

Denise M. Monack, Ph.D.

Host-pathogen interactions during persistent *Salmonella* infection
Stanford University

Joseph D. Mougous, Ph.D.

Breaching the commensal barrier to infection with type VI secretion
University of Washington

Kim Orth, Ph.D.

VopL, a *Vibrio* effector that nucleates actin
University of Texas Southwestern Medical Center-Dallas

Julie K. Pfeiffer, Ph.D.

How gut microbes enhance enteric virus infectivity
University of Texas Southwestern Medical Center-Dallas

Ana Rodriguez, Ph.D.

The role of hypoxanthine degradation in malaria-induced
pathogenesis
New York University School of Medicine

Maya Saleh, Ph.D.

Regulation and molecular mechanisms of NLR-mediated innate
immunity
McGill University

Erica O. Saphire, Ph.D.

Arenavirus GP: architecture, receptor binding sites,
and immune recognition
Scripps Research Institute

Karla Fullner Satchell, Ph.D.

A mouse model for the role of toxins in cholera pathogenesis
Northwestern University

Luis M Schang, D.V.M., Ph.D.

Silencing and antisilencing in the regulation of viral gene expression
University of Alberta

Neal Silverman, Ph.D.

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

Eric Skaar, Ph.D.

In vivo identification of *Staphylococcus aureus* proteins that
defend against host neutrophils.
Vanderbilt University Medical Center

Justin L. Sonnenburg, Ph.D.

Mechanisms of intestinal microbiota-conferred protection from
enteric pathogens
Stanford University School of Medicine

Vanessa Sperandio, Ph.D.

Interkingdom signaling in bacterial pathogenesis
University of Texas Southwestern Medical Center-Dallas

Adrie J.C. Steyn, Ph.D.

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

Christopher S. Sullivan, Ph.D.

Herpesvirus immune evasion via non-coding RNA
regulatory elements
University of Texas-Austin

Timothy L. Tellinghuisen, Ph.D.

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

Benjamin R. tenOever, Ph.D.

Small RNA-mediated control of microbes
Mount Sinai School of Medicine

Billy Tsai, Ph.D.

How cholera toxin hijacks cellular machineries to transport across
the ER membrane
University of Michigan Medical School

Raphael H. Valdivia, Ph.D.

Role of secreted bacterial proteases in chlamydial pathogenesis
Duke University

Russell Vance, Ph.D.

Innate immune cytosolic immunosurveillance pathways for sensing bacterial pathogens
University of California-Berkeley

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

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

David Wang, Ph.D.

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

Sing Sing Way, M.D., Ph.D.

Maternal regulatory T cells control the immune pathogenesis of prenatal infection
University of Cincinnati Children's Hospital Medical Center

Marvin Whiteley, Ph.D.

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

Dong Yu, Ph.D.

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

Ning Zheng, Ph.D.

Viral hijacking of host ubiquitin ligase machinery
University of Washington

AD HOC

American Society for Microbiology

Support for the 11th Conference on Candida and Candidiasis

American Society for Microbiology

Support for the ASM Kadner Institute and the Scientific Writing and Publishing Institutes

American Society for Microbiology

Support for the ASM Beneficial Microbes Conference

American Society of Tropical Medicine and Hygiene

Support for the annual ASTMH meeting

American Society of Tropical Medicine and Hygiene

Support for the ASTMH American Committee of Molecular, Cellular and Immunoparasitology scientific program

Anaerobe Society of the Americas

Support for the 11th Biennial Congress

Association for Women in Science

Support for the renewal of AWIS membership dues

Baylor College of Medicine

Support for Investigator of the Pathogenesis of PATH awardee, Vanessa Sperandio, to present a seminar

Colorado State University Foundation

Support for the 2012 Merit-NIH National Veterinary Scholars Symposium

Colorado State University Foundation

Support for the Becoming Faculty workshop held in conjunction with the Merit-NIH Veterinary Student Scholars Symposium

Cornell University

Support for the 11th International Symposium on Double-Stranded RNA Viruses

Foundation for the National Institutes of Health, Inc.

Support for Research Fellow, Michael Peace, working at the National Institute of Nursing Research

Genome Research Ltd

Support for the Genomic Epidemiology of Malaria (GEM) meeting

Gordon Research Conferences

Support for the conference on Cellular and Molecular Fungal Biology

Gordon Research Conferences

Support for the conference on Host Parasite Interaction

Gordon Research Conferences

Support for the conference on Microbial Toxins and Pathogenicity

Grants Managers Network

Support for the Grants Managers Network

Harvard Medical School

Support for PATH awardee, Erica Saphire, to present a seminar

Institute of Medicine

Support for the IOM Forum on Microbial Threats

Johns Hopkins University Bloomberg School of Public Health

Support for PATH awardee, Raphael Valdivia, to present a seminar

Marine Biological Laboratory (MBL)

Support for the Biology of Parasitism Course

McGill University

Support for PATH awardee to present a seminar

McGill University

Support for PATH awardee, John MacMicking, to present a seminar

McGill University

Support for a PATH awardee to present a seminar

Medical College of Wisconsin

Support for the 19th Annual Midwest Microbial Pathogenesis Conference

National Academies

Support for the IOM Forum on Microbial Threats

New York University School of Medicine

Support for PATH awardee, Julie Pfeiffer, to present a seminar

North Carolina State University College of Veterinary Medicine

Support for the 2013 Mid-Atlantic Microbial Pathogenesis Meeting

Northwestern University

Support for PATH awardee to present a seminar at the Frontiers in Immunological Research symposium

University of California-San Francisco

Support for PATH advisory committee member, Joe St. Geme, to give a seminar

University of California-San Francisco School of Medicine

Support for seminar presentations at the Bay Area Microbial Pathogenesis Symposium

University of California-San Francisco School of Medicine

Support for building and sustaining collaborations and support training amongst laboratories working on the Schistosomiasis Molecular Toolbox

University of Florida College of Medicine

Support for PATH awardee, Linda van Dyk, to present a seminar

University of North Carolina-Chapel Hill

Support for PATH awardee, Julie Blander, to present a seminar

University of North Carolina-Chapel Hill

Support for PATH awardee, Vanessa Sperandio, to present a seminar

University of North Carolina-Chapel Hill

Support for PATH awardee, Erica Saphire, to present a seminar

University of North Carolina-Chapel Hill

Support for PATH awardee, Andres Vazquez-Torres, to present a seminar

University of Notre Dame

Support for the 2nd annual Midwest Neglected Infectious Diseases meeting

University of Texas Southwestern Medical Center-Dallas

Support for Investigator in the Pathogenesis of Infectious Disease awardee, Andrew Darwin, to present a seminar

Walter and Eliza Hall Institute of Medical Research

Support for the Molecular Approaches to Malaria Conference

Washington University

Support for the Molecular and Cellular Biology of Helminth Parasites meeting

Yale University

Support for PATH awardee, Barbara Kazmierczak, M.D., Ph.D., to present a seminar at the National Institute of Allergy and Infectious Diseases

Yale University

Support for PATH awardee, Joseph Mougous, to present a seminar

Yale University

Support for CABS awardee, William Clemons, to present a seminar

Interfaces in Science

CAREER AWARD AT THE SCIENTIFIC

Buz M. Barstow, Ph.D.

Evolving the limits of metabolism and *in vivo* catalysis
Harvard Medical School

David Biron, Ph.D.

Understanding small neural circuits
University of Chicago

Julie S. Biteen, Ph.D.

Superresolution imaging in live cells using single-molecule active-control microscopy
University of Michigan-Ann Arbor

Paul C. Blainey, Ph.D.

From single cells to populations: using microfluidics, genomics, and culture to better understand infectious disease in the post-genomic era
Stanford University

Nicolas E. Buchler, Ph.D.

Gene duplication and the evolution of function in regulatory networks
Duke University

Lynette Cegelski, Ph.D.

Mapping the structural and functional landscape of the microbial extracellular matrix
Stanford University

ShiNung Ching, Ph.D.

Towards treatments in disorders of consciousness and new models of general anesthesia
Harvard Medical School / Massachusetts General Hospital

Kwanghun Chung, Ph.D.

Clear, Lipid-exchanged, Anatomically Rigid, Imaging/immunostaining-compatible, Tissue hydrogel (CLARITY) technology for high-throughput and high-content whole tissue analysis
Stanford University

L. Stirling Churchman, Ph.D.

Regulation of the RNA polymerase motor mechanism *in vivo*
Harvard Medical School

Derek Cummings, Ph.D.

Natural and vaccine-induced immunity and spatiotemporal dynamics of epidemic dengue
Johns Hopkins University

Rhiju Das, Ph.D.

High resolution prediction of new RNA folds
Stanford University

Shawn Michael Douglas, Ph.D.

Self-assembled DNA devices for nanoscale manipulation of immune signal transduction
Harvard Medical School

Alfredo Dubra-Suarez, Ph.D.

Understanding glaucoma through structural and functional *in vivo* cellular imaging of the retina
University of Rochester

Alexander R Dunn, Ph.D.

Single molecule characterization of the energetic landscape underlying myosin force generation
Stanford University

Surya Ganguli, Ph.D.

The expression and acquisition of sequence memory in neuronal networks
Stanford University

Margaret L. Gardel, Ph.D.

Dynamic force generation in cell migration
University of Chicago

Timothy J. Gardner, Ph.D.

Tracking neural programs for song
Boston University

Maria Neimark Geffen, Ph.D.

Perception and neural encoding of textured sounds
University of Pennsylvania Perelman School of Medicine

Keisuke Goda, Ph.D.

Development of high-throughput blood screening technology for real-time noninvasive cancer diagnostics and therapy
University of North Carolina-Los Angeles

Andrea Mitchell Goforth, Ph.D.

Bimodal, luminescent/magnetic nanoparticle assemblies targeted to alpha-4-beta-1 integrin for tumor imaging and therapy
Portland State University

Robert De Moss Gregg, IV, Ph.D.

From machine to biomimetic control in robot-assisted walking
Northwestern University

Ming Hammond, Ph.D.

Large-scale discovery and analysis of regulatory RNAs using computational and chemical approaches
University of California-Berkeley

Christopher D. Harvey, Ph.D.

Neural circuit mechanisms underlying decision-making in mice
Harvard Medical School

Christine E. Heitsch, Ph.D.

A combinatorial and computational approach to deciphering the biological information encoded by single-stranded nucleotide sequences
Georgia Institute of Technology

Maureen E. Hillenmeyer, Ph.D.

In vivo synthetic evolution of bioactive natural products
Stanford University

Alan Horsager, Ph.D.

Using genetically-targeted neural modulation to examine retinal circuits and restore vision in the blind
University of Southern California

Ajit P. Joglekar, Ph.D.

Building a mechanistic model of the structure and function of a kinetochore-microtubule attachment
University of Michigan Medical School

Harold D. Kim, Ph.D.

Understanding the mechanisms of sensitivity in gene expression
Georgia Institute of Technology

Gavin M. King, Ph.D.

The dynamic structural biology of ion channel proteins: an ultra-stable atomic force microscope study
University of Missouri-Columbia

Allon Moshe Klein, Ph.D.

Defining patterns and mechanisms of stem cell fate choice
Harvard Medical School

Mary L. Kraft, Ph.D.

Composition analysis of the influenza virus pre-envelope by multiple isotope imaging mass spectrometry (MIMS)
University of Illinois-Urbana-Champaign

Mark A. Kramer, Ph.D.

Population rhythms of epilepsy
Boston University

Sergey A. Kryazhimskiy, Ph.D.

Predicting evolution in microbial populations
Harvard University

Heather J. Kulik, Ph.D.

Deciphering the role of the protein scaffold in enzyme catalysis with fast and accurate computation
Stanford University

Alison L. Marsden, Ph.D.

Engineering new treatments for cardiovascular disease via optimal design and physiologic simulation
University of California-San Diego

Celeste M. Nelson, Ph.D.

Biophysical dynamics in the regulation of tissue morphogenesis
Princeton University

Astrid A. Prinz, Ph.D.

Models of activity-dependent homeostatic regulation in neural networks on the basis of brute force explorations of high-dimensional parameter spaces
Emory University

Lulu Qian, Ph.D.

Exploring and re-realizing the principles of information processing in biology using artificial nucleic-acid systems
California Institute of Technology

Arjun Raj, Ph.D.

Stochastic gene expression in development: from phenomena to function
University of Pennsylvania

Benjamin J. Raphael, Ph.D.

High-resolution analysis of tumor genome architectures
Brown University

Tobias J. D. Reichenbach, Ph.D.

Low-frequency hearing in mammals
Rockefeller University

Erin C. Rericha, Ph.D.

Fluid flows in cell mechanosensitivity and cell motion
Vanderbilt University

Jason T. Ritt, Ph.D.

Active sensing in natural and robotic organisms
Boston University

Michael Rust, Ph.D.

Nonlinear dynamics underlying the cyanobacterial circadian clock
University of Chicago

Sridevi Vedula Sarma, Ph.D.

Improved therapies for Parkinson's disease using advanced engineering methods
Johns Hopkins University

Georg Seelig, Ph.D.

Nucleic acid logic circuits for conditional gene regulation
University of Washington

Eric T. Shea-Brown, Ph.D.

Neurobiological dynamics of timing and decisions
University of Washington

Alexander Sher, Ph.D.

Investigation of retinal processing through large-scale
multielectrode recordings
University of California-Santa Cruz

Hadley D. Sikes, Ph.D.

Well-defined, supramolecular assemblies of redox enzymes via
templated self-assembly for use in mechanistic electron
transport studies and targeted apoptosis
Massachusetts Institute of Technology

Jonathan Rodolfo Silva, Ph.D.

Applying molecular spectroscopy to derive multi-scale cardiac
bioelectricity models
Washington University

Jan M. Skotheim, Ph.D.

A systems level approach to cell cycle control: from molecules
to motifs to physiology
Stanford University

Megan T. Valentine, Ph.D.

Establishing the mechanism of kinesin processivity
University of California-Santa Barbara

Lauren J. Webb, Ph.D.

Electrostatic fields at the protein-protein interface
University of Texas-Austin

Joshua S. Weitz, Ph.D.

Evolutionary ecology of bacterial viruses
Georgia Institute of Technology

Jesse G. Zalatan, Ph.D.

Entropic contributions to efficiency in biochemical networks
University of California-San Francisco

INTERFACES SHORT COURSES

Boris I. Shraiman, Ph.D.

Santa Barbara Advanced School of Quantitative Biology
University of California-Santa Barbara

David W. Tank, Ph.D.

Biophysics and Computations in Neurons and Networks
Princeton University

AD HOC

Aspen Center for Physics

Support for the Growth and Form: Pattern Formation in Biology

Biophysical Society

Support for a special symposium for young researchers, the
postdoc and graduate student breakfasts, and postdoc travel
awards

Biophysical Society

Support for the one-day Motility Subgroup meeting

Corcoran Gallery of Art

Support for the CCA+D scholarship fund

Georgia Institute of Technology

Support for a soft matter workshop

Georgia Institute of Technology

Support for a networking session at the Locomotion Systems
Science Workshop

Gordon Research Conferences

Support for the Single Molecule Approaches to Biology

Marine Biological Laboratory (MBL)

Support for the course "Physiology: Modern Cell Biology Using
Microscopic, Biochemical and Computational Approaches")

Rutgers, The State University of New Jersey

Support for an international DIMACS conference titled "Effects of
Genome Structure and Sequence on the Generation of Variation
and Evolution"

Virginia Polytechnic Institute and State University

Support for an international conference titled "Computational Cell
Biology: From the Past to the Future"

Population and Laboratory Based Sciences

INSTITUTIONAL PROGRAM UNIFYING POPULATION AND LABORATORY-BASED SCIENCES

Eric Boerwinkle, Ph.D.

The Houston laboratory and population sciences training program
in gene-environment interaction
University of Texas-Houston Health Science Center

Simin Liu, M.D., Sc.D.

University of California-Los Angeles inter-school program
in metabolic diseases
University of California-Los Angeles

Nael A. McCarty, Ph.D.

Human health: molecules to mankind (M2M)
Emory University

AD HOC

Society of Toxicology

Support for five graduate student travel awards
for the annual meeting

Reproductive Science

PRE-TERM BIRTH INITIATIVE

Kjersti M. Aagaard-Tillery, M.D., Ph.D.

Contributions of maternal-fetal mitochondrial genome and microbiome interactions to preterm birth
Baylor College of Medicine

Julie Baker, Ph.D.

Genomic networks that guide trophoblast invasion and disease
Stanford University

Mala S. Mahendroo, Ph.D.

Assessment of cervical ripening by sodium magnetic resonance imaging
University of Texas Southwestern Medical Center-Dallas

Jeffrey C. Murray, M.D.

Genomic signatures of gene expression and alternative splicing in preterm birth
University of Iowa

Indira Mysorekar, Ph.D.

Occult infections in the etiology of preterm birth
Washington University School of Medicine

Science Education

CAREER AWARD FOR SCIENCE AND MATHEMATICS TEACHERS

Wendy Elizabeth Bartlett

Using Technology to Engage Students in the Mathematics Classroom
Winston-Salem Forsyth County Schools

Michael J Bowman, Ed.D.

From Inquiry To STEM, Reforming My Classroom, My School,
My District.
Buncombe County Schools

Gregory Scott Fisher

Strengthening the Math Instruction in Forsyth County
Winston-Salem Forsyth County Schools

William Hendrickson

Science at New Tech, the Impetus for a New Future
for Warren County
Warren County Schools

Heather M Kaiser

Simulations that Stimulate Student Scientists
Cumberland County Schools

Stuart Thomas Miles

Career Awards in Science and Mathematics
Evergreen Community Charter School

Amanda Northrup

Enriching Elementary STEM Teaching and Learning Through
Professional Development and Science Equipment Rooms
Haywood County Schools

Tamica Stubbs

Phillip O. Berry Academy of Technology
Charlotte/Mecklenburg Schools

Claudia Isabel Walker

Murphey's Math and Technology Initiative
Guilford County Schools

Jennifer Williams

Brevard High Schools
Transylvania County Schools

PRISM AWARD

Leigh Horton Austin

Plankton Watch
Weeksville Elementary School

Michelle Wendy Beard

Winds of Change
Alleghany High School

Sonja Patricia Brown

Lost in Space
Bruns Academy

Jennifer Browndorf

Teaching Science and Math with Technology to Develop
the Next Generation of Scientists and Engineers
Leesville Road Elementary School

Cynthia C Bullard

Nanoscience in the Middle School
John R. Kernodle, Jr. Middle School

Carol Bumgarner

Science Explosion
Webb A. Murray Elementary School

Marni Cartiff

Engineering is Elementary
Beverly Woods Elementary School

Amanda G Clapp

Creek Watchers
Cullowhee Valley School

Roberta Clifton

Opening Minds To Number Sense
New Hope Elementary

Marie Antonia Collins

What's on your Plate?
Global Scholars Academy

Josh Cooper

Technological Innovations in the Early College Classroom:
Training Students With 21st Century Skills
Caldwell Early College High School

Elizabeth Davis

Let's Investigate Science
Global Scholars Academy

Lizette Day

Expanding STEM Opportunities
Rachel Freeman School of Engineering

Max Edward Dooley

MHS EV Team
J.M. Morehead High School

Kenneth Eaton

The Outdoor Classroom Project
Spring Valley Elementary School

Derek Edwards

Solar Hydroponic extension to the "Green" Field House
William Randolph School Program

Jennifer Howard Evans

SPARK Science Learning System
Cape Fear High School

Deborah Gaul

Using Technology to Model Biology
South Granville High School of Integrated Technology
and Leadership

Sharryl Jean Hagerman

Successful Engagement Elicits Knowledge
Micaville Elementary

Staci Hester

Science Kits for Inquiry Learning at Lacy (SKILL)
Frances Lacy Elementary School

Brian Hill

Trout in the Classroom
Mountain Heritage High School

Michael Wayne Holleman

Harnessing the Wind
North Wilkes Middle School

Gary W. Horton

Go Fish
Red Springs High School

Leigh Ann Hudson

Seeing is Believing: Using Models to investigate microscopic
cellular processes and genetics
North Pitt High School

Laura E Ingersoll

Core Plus Mathematics
School of Inquiry and Life Sciences at Asheville

Rhonda S. Johnson

Shaky, Bumpy, Speedy Engineering
North Johnston Middle School

Meredith Katz

PS:STEM
Kannapolis Intermediate School

Michael Kolczynski

Astronomical Connections
Rocky River High School

Scott M Kyles

Meteorological Investigations
North Surry High School

Jeffrey P LaCosse, Ph.D.

Rocketry: Applied Science, Mathematics and Electronics
Charles E. Jordan High School

Margaret P Ledford

The Bone Zone
Grover Elementary

Bobbie Lynn Lequire

Bring a Friend to Math Day
C.G. Credle Elementary School

Karen Lindley

Essential Knowledge and Materials to Master
the Essential Standards
West Pender Middle School

Cristal MacLamroc

A Field Study of various Aquatic and Terrestrial Ecosystems
along High Point's Greenway
Welborn Academy of Science and Technology

Zulma D Marin-Cortes

Active Slates as a Tool to Develop Critical Thinking
Sampson Middle School

Marilee DeLuca Mauser

Measuring with Vernier
Rutherford College Elementary School

Kathleen Melious

How Green is the Greenway
T Wingate Andrews High School

Robert B Mercer

High Tech Labs
Polk County High School

Ted Miracle

Engineering is Elementary at Endhaven
Endhaven Elementary

Shawn Christopher Moore

The Maker School - Engineering Your World
Hibriten High School

Rebecca Gayle Myers

Children's Book
Rogers-Herr Middle School

Monica Watson Neal

On your MATH set GO
West Johnston High School

F Nink

Modeling Mathematical Literacy
Southern School of Engineering

Natalie A Oransky, Ph.D.

Wild About Birds
Two Rivers Community Charter School

Mandy Carole Parfitt

Going Green
Turrentine Middle School

Jevonda Perkins

Five Alive Math with the Core Curriculum
Sandy Ridge Elementary

Nelda G Phillips

F.I.N.D. Furthing Inquiry through Navigating Discovery
Cane River Middle School

Jessica Prayer

Nurturing the Next Generation of Scientist
Northside Elementary School

Joanne Preece

Robotics Rocks
Wake Forest Elementary

Laura King Roberson

Biotechnology Bonanza
Riverside High School

Leslie Shelise Ross

Wetland Adventures Project
Ben L. Smith High School

John D Scarfpin

Probing Science
West Craven Middle School

Leslie B. Schoof

Madison Early College Honeybee Project
Madison Early College High School

Kelly Lynn Sears

Continuing to Probe into Our Bolin Creek Data
Smith Middle School

Sabrina Sears

The Science of Hands On Learning
Northside Elementary School

Kathy Shelley

Location, Location, Location – The GPS Way!
Spring Hill Middle School

Lisa C. Smith

Measuring Body Functions
Brevard Middle School

Julie Smith

Classy Cat Weather Spotters
North Canton Elementary School

Jaala S Smith

Environment Friends Project
Global Scholars Academy

Edward Spann

Virtual Lab Access
North Brunswick High School

Rachel Strivelli

6th Grade Soil Science Experiments: Getting our Hands Dirty
Rugby Middle School

Linda Simpson Sutton

The Study of Life
Polk County Early College High School

Danion Terauds

Creating an Inquiry Based Curriculum
East Alexander Middle School

Loretta L Thomas

Hands on Equations Learning System
West Alexander Middle School

Angela Totten

Planting a Seed to Grow Through STEM
West View Elementary

Robert E Tufts

Hands on Ecology Studies
Cranberry Middle School

Linda P. Tugurian

Forest View For the Birds
Forest View Elementary School

William R Vincent

Physics Modeling
Voyager Academy Charter School

Jenny M Waite

FIRST Lego League Team
Zeb Vance Elementary

Richard Donn White, Ph.D.

Researching Radiation
Wayne Early Middle College High School

Melinda Wiggins

Becoming a meteorologist – Using inquiry suitcases to support weather and climate concepts in the classroom
Forest Hills Global Elementary School

Jennifer Williams

Reynolds Rockets Science Lab Enrichment Project
AC Reynolds Middle School

John R Winecker

Microscopes Make Learning Fun!
JS Waters School

Brian L Wood

Energetic Bioreactors
W. G. Enloe High School

Debbie Wood

First Ward Sense & Science Garden
First Ward Creative Arts Academy

STUDENT SCIENCE ENRICHMENT

Appalachian State University

Appalachian: Merging Math and Science in Intentional Natural Gains (AMMASING)

North Carolina School of Science and Mathematics Foundation

Step Up to STEM

Wake Forest University

Cherokee MedCaT Academy Medical Career and Technology: Enriched Student Experiences in Health Careers

North Carolina State University

The Engineering Place

Webb A. Murray Elementary School

Aventuras de Ciencia (Adventures in Science)

North Carolina State University

North Carolina Floating Classroom Program

Foundation of the Carolinas

Sixth Grade Science Sleuths

Discovery Place Inc.

After-School STEM Enrichment Program

West Marion Elementary School

G.O.A.L. – Get Outside And Learn

Durham Public Schools

Scientifica: DPS Nurturing Future Scientists

Boys and Girls Club of Pitt County

Science Alive

Cherokee Boys Club, Inc.

Cherokee Science Investigation

Girl Scouts-North Carolina Coastal Pines

Girl Scouts Design and Discover

Durham Academy

MONS (Mars Outreach for NC Students)

Elon University

Let's Move Elon Academy

North Carolina A&T State University

Case Studies in the Sciences and Engineering Enrichment Laboratories Program

Shodor Education Foundation Inc.

Computing MATTERS: Sowing the Seeds of SUCCEED

Asheville City Schools Foundation

Bug Campers and Stargazers: Expanding the Science Capacity of In Real Life

Carolina Electric Vehicle Coalition

The EV Challenge: Promoting Science Education through Renewable Transportation Technologies

Burke County Public Schools

Sensational STEM Project

North Carolina Society of Hispanic Professionals

Good Stewards of the Environment Program

Elizabeth City State University

Teaching Earth Science to Inspire New Geologist

Eno River Association

iWalk the Eno II and Outdoor Science Labs: Year-round Science, Engineering, and Nature Inquiries

University of North Carolina-Chapel Hill

Healing and Hope Through Science

Wake County Public School System

STEM Extensions

Hyde County Schools

STEM 4 ME! Academy

AD HOC**BattelleEd.org**

Support for the STEMx Collaborator

Bladen County Schools

Singapore Math Pilot - Bladen County School System

Bladen County Schools

Supplemental support for the Singapore Math Pilot program

Council Of State Science Supervisors

Support for the efforts of the Council of State Science Supervisors and the Tidemark Institute to disseminate and provide capacity building in support of the National Research Council's Framework for K-12 Science Education Standards

Council Of State Science Supervisors

Support for a national training meeting to support the implementation of the national science standards

Cumberland County Schools

Singapore Math Pilot Project at Gallberry Farm Elementary School

Four Oaks Middle School

Support for the Barrett Rose Scholarship

Friends of the North Carolina State Museum of Natural Sciences

Support for the 2012 North Carolina International Science Challenge

Grantmakers for Education

Support for 2012

Guilford County Schools

Singapore Math Pilot at Murphey Traditional Academy

Hamner Institutes for Health Sciences

Continued support for Project SEED

James B. Hunt Jr. Institute for Educational Leadership and Policy

Support for efforts to promote North Carolina's adoption and effective implementation of the next generation science standards under development by the National Research Council and Achieve

James B. Hunt Jr. Institute for Educational Leadership and Policy

Support for Institute's work to promote effective adoption and implementation of the Next Generation of Science Standards in North Carolina

Marine Biological Laboratory

Support for the Sheldon Segal Endowed Friday Evening Lecture

McDowell County Schools

Building a Strong Math Foundation Through Constructing, Drawing, and Solving, a proposal by Eastfield Global Magnet School

National Academy of Sciences

Support for the Teacher Advisory Council

National Association of Academies of Science

Support for the American Junior Academy of Science's annual meeting for high school delegates

Nature Conservancy in Alabama

General support

North Carolina Association for Biomedical Research

Support for “Bridging the Gap: Uniting North Carolina K-16 STEM Education”

North Carolina Association of School Administrators

Support for 2012

North Carolina Chamber

Support for the annual education summit

North Carolina Community Foundation/North Carolina Network of Grantmakers

Support for education collaboration initiatives for 2011-12 and an education session at the annual meeting in February 2012

North Carolina Community Foundation/North Carolina Network of Grantmakers

Support for 2013

North Carolina Council of Teachers of Mathematics

Support for the annual meeting

North Carolina Principal and Assistant Principals’ Association

Support for the Distinguished Leadership in Practice program

North Carolina School of Science and Mathematics Foundation

Continued support for the Summer Leadership and Research Experience

North Carolina School of Science and Mathematics Foundation

Continued support for the North Carolina Student Academy of Science

North Carolina Science Fair Foundation

Support for the 2012 North Carolina Science and Engineering Fair

North Carolina Science Leadership Association

Support for fellows program

North Carolina Science Teachers Association

Support for the NCSTA Professional Development Institute

Public School Forum of North Carolina

Support for the Institute for Educational Policymakers

Tidemark Institute

Support for the development and implementation of the Meeting on Science Assessments for the new national science standards

University of North Carolina General Administration

Support Science Education “Fast Track” Initiative

University of North Carolina-Chapel Hill

Support for DNA Day

University of North Carolina-Chapel Hill

Support for the annual NC OPT-ED Alliance Day Conference

University of North Carolina-Chapel Hill School of Education

Continued support for the Career Awards for Science and Mathematics Teachers Evaluation

Watauga Education Foundation

General support

Wilkes County Schools

Singapore Math Project – North Wilkesboro Elementary School
Wilkes County School District

Wilson County Schools

Support for the North Carolina Leadership and Assistance for Science Education Reform (LASER) Demonstration and Professional Development Center

Winston-Salem Foundation

Support for the North Carolina Governor’s School

Translational Research

CLINICAL SCIENTIST AWARD IN TRANSLATIONAL RESEARCH

Jayakrishna Ambati, M.D.

Target-independent suppression of angiogenesis by siRNAs
University of Kentucky

Mark Stuart Anderson, M.D., Ph.D.

Translating AIRE-control of immune tolerance to human autoimmunity
University of California-San Francisco

Richard J. Auchus, M.D., Ph.D.

Pharmacogenomics of hypertension
University of Michigan-Ann Arbor

Arul M. Chinnaiyan, M.D., Ph.D.

Autoantibody profiles for cancer diagnosis, prognosis, and therapy
University of Michigan-Ann Arbor

Bruce E. Clurman, M.D., Ph.D.

Diagnostic and therapeutic approaches to cell cycle-associated cancer
University of Washington

Kathleen Loretta Collins, M.D., Ph.D.

Viral mechanisms of persistence in HIV infected people
University of Michigan-Ann Arbor

Laurence J Cooper, M.D., Ph.D.

Tumor-specific alloantigen-nergic donor-derived T-cell therapy after hematopoietic stem-cell transplantation
University of Texas M.D. Anderson Cancer Center

Kenneth Cusi, M.D.

Non-alcoholic fatty liver disease in type 2 diabetes: a novel intervention strategy targeting metabolic & molecular defects
University of Florida

Michael R. DeBaun, M.D.

Cysteinyl leukotriene receptor inhibitors: a target for decreasing sickle cell disease-related morbidity
Vanderbilt University

Michael S. Diamond, M.D., Ph.D.

Epitope-based immunogens and diagnostics for dengue virus
Washington University

William M. Grady, M.D.

Novel biomarkers for the prevention and treatment of colon cancer
University of Washington

Thomas Richard Hawn, M.D., Ph.D.

Variation and regulation of innate immunity to Mycobacteria
University of Washington

Robert O. Heuckeroth, M.D., Ph.D.

Genetic and non-genetic risk for Hirschsprung disease
Washington University

Anna Huttenlocher, M.D.

Diagnosis and treatment of autoinflammatory disease
University of Wisconsin-Madison

S. Ananth Karumanchi, M.D.

Soluble endoglin in the pathogenesis and prediction of preeclampsia
Harvard Medical School

Francis Lee, M.D., Ph.D.

Role of BDNF in therapeutic strategies for affective disorders
Weill Cornell Medical College

Ernst Robert Lengyel, M.D., Ph.D.

Development of novel therapeutic and diagnostic strategies for ovarian cancer
University of Chicago

Dean Y. Li, M.D., Ph.D.

Therapeutic potential of vascular guidance cues
University of Utah

Ali J. Marian, M.D.

Molecular genetics and pathogenesis of human arrhythmogenic right ventricular cardiomyopathy/dysplasia
University of Texas Health Science Center-Houston

Daniel L. Marks, M.D., Ph.D.

Maternal nutrition and fetal metabolic programming
Oregon Health and Science University

Ari M. Melnick, M.D.

Differentiation therapy for B-cell lymphomas
Weill Cornell Medical College

Branch Moody, M.D.

Human T-cell responses to CD1 and lipid antigens from *M. tuberculosis*
Harvard Medical School

Jonathan R. Pollack, M.D., Ph.D.

Pathogenesis and diagnosis of clinically-indolent prostate cancer
Stanford University

Kerry J. Ressler, M.D., Ph.D.

Neurobiology of fear, neuroplasticity and posttraumatic stress disorder
Emory University

Annabelle Rodriguez, M.D.

Deficiency of the lipoprotein receptor, scavenger receptor class B type I, in women with infertility
Johns Hopkins University School of Medicine

Theodora S. Ross, M.D., Ph.D.

Abnormal HIP1 and cancer biology
University of Texas Southwestern Medical Center-Dallas

Charles M. Rudin, M.D., Ph.D.

Novel therapeutic strategies for small cell lung cancer
Johns Hopkins University

Jean E. Schaffer, M.D.

Lipotoxic cardiomyopathy: from molecular mechanisms to human disease
Washington University

Norman E. Sharpless, M.D.

The p16INK4 a tumor suppressor in stem cell aging
University of North Carolina-Chapel Hill

Warren D. Shlomchik, M.D.

Memory T cells for improved immune reconstitution and GVL in allogeneic hematopoietic stem cell transplantation
Yale University

Pradeep Singh, M.D.

Gallium as an antimicrobial and anti-biofilm agent: a trojan horse strategy that disrupts bacterial iron metabolism
University of Washington

Jeffrey A. Toretsky, M.D.

Novel cancer therapeutics based upon oncogenic fusion-protein transcription factors
Georgetown University

Russell Van Gelder, M.D., Ph.D.

Pathogenesis of inflammatory eye disease
University of Washington

Stephanie Ware, M.D., Ph.D.

Uncovering novel genetic causes and risks in congenital heart disease patients
University of Cincinnati

Edus Houston Warren, M.D., Ph.D.

Toward immune therapy for colon cancer: identification of antigens recognized by CD8+ T lymphocytes on colon cancer stem cells
University of Washington

William A Weiss, M.D., Ph.D.

Combination therapy against EGFR and PI3-kinase in glioma
University of California-San Francisco

Cassian Yee, M.D.

Adoptive therapy of cancer: strategies to augment the antigen-specific T cell response
University of Washington

Kang Zhang, M.D., Ph.D.

Define novel genes for diabetic microvascular complications
University of California-San Diego

AD HOC

Health Research Alliance

Support for operation

Institute of Medicine

Support for the Forum on Drug Discovery, Development, and Translation

United Mitochondrial Disease Foundation

Support for annual symposium

Science and Philanthropy

COMMUNICATIONS/SCIENCE

American Association for the Advancement of Science

Support for the 2012 Mass Media Science and Engineering Fellows Program

Duke University

Support for ScienceOnline 2012

Duke University

Support for the development of ScienceOnline

Science Spark

Support for an outreach effort at the U.S.A. Science and Engineering Festival in Washington, DC

GENERAL PHILANTHROPY

Council on Foundations

Support for 2012-13

Duke University

Support for the 2012 Science Writers Conference

Foundation Center

Support for 2012

Friends of the Mountains to Sea Trail, Inc.

General support

National Academies

Support for the Committee on Science, Technology, and Law (CSTL) core activities

National Institute for Quality Improvement and Education

Support for the development of a web module for health care professionals focusing on the core competencies of patient care and interpersonal communication skills

National Postdoctoral Association

Support for the National Postdoctoral Association (NPA) in the following areas: updating some NPA online resources; improving the institutional policy database; and establishing an international postdoc consortium

Neuse River Golden Retriever Rescue

General support

University of North Carolina Foundation

Support for the inauguration of Tom Ross as president of the University of North Carolina System

SCIENCE POLICY

National Academies

Support for the Christine Mirzayan Science and Technology Policy Graduate Fellowship Program

University of Maryland-College Park

Assessing the Determinants of Career Choice in Recent Ph.D. Biomedical Scientists from Underrepresented Minority (URM) Backgrounds

SPECIAL AWARD

Universidad Peruana Cayetano Heredia

Support for student travel to the university for training in the laboratory of Dr. Guerra-Giraldez, as well as to support for students in their applications for graduate school

Advisory Committees

The Burroughs Wellcome Fund uses advisory committees for each competitive award program to review grant applications and make recommendations to BWF's Board of Directors, which makes the final decisions. We select members of these committees for their scientific and

educational expertise in the program areas. In addition, BWF uses a financial advisory committee to help in developing and reviewing the BWF's investment policies. This committee is appointed by and reports to the Board of Directors.

CAREER AWARDS AT THE SCIENTIFIC INTERFACE

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

Professor of Bioengineering, Genetics and Medicine
Director, Program in Biomedical Informatics
Stanford University

William Bialek, Ph.D.

John Archibald Wheeler/Battelle Professor, Department of Physics
Associate Director, Lewis-Sigler Institute for Integrative Genomics
Princeton University

Nancy J. Kopell, Ph.D. (Co-chair)

William Goodwin Aurelio Professor of Mathematics and Science
Boston University

John Kuriyan, Ph.D.

Investigator, Howard Hughes Medical Institute
Chancellor's Professor
Department of Molecular and Cell Biology
Department of Chemistry
University of California-Berkeley

Cato T. Laurencin, M.D., Ph.D.

University Professor
Director, Institute for Regenerative Engineering & the Raymond and Beverly Sackler Center for Biomedical, Biological, Physical and Engineering Science
University of Connecticut Health Center

Alan S. Perelson, Ph.D.

Senior Fellow
Los Alamos National Laboratory

Rob Phillips, Ph.D. (Co-chair)

Professor of Applied Physics and Bioengineering
California Institute of Technology

Brent R. Stockwell, Ph.D.

Associate Professor Biological Sciences and Chemistry
Early Career Scientist of the Howard Hughes Medical Institute
Columbia University

Shankar Subramaniam, Ph.D.

Joan and Irwin Jacobs Endowed Chair in Bioengineering and Systems Biology
University of California-San Diego

Julie A. Theriot, Ph.D.

Associate Professor
Department of Biochemistry
Department of Microbiology and Immunology
Stanford University School of Medicine

Michelle D. Wang, Ph.D.

Investigator, Howard Hughes Medical Institute
Professor of Physics
Cornell University

Raimond L. Winslow, Ph.D.

Director, Institute for Computational Medicine
Professor, Department of Biomedical Engineering
Johns Hopkins University

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North Carolina General Assembly
House of Representatives

Enriqueta C. Bond, Ph.D.

Past President
Burroughs Wellcome Fund

David Marsland

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Discovery Education

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Deputy Chief Academic Officer
State Board of Education

Pat Shane, Ph.D. (Chair)

Associate Director
University of North Carolina-Chapel Hill
Center for Mathematics and Science Education

Dave Smith

Director
Center for Inquiry Based Learning

CAREER AWARDS FOR MEDICAL SCIENTISTS

Jack Antel, M.D.

Professor of Neurology and Neurosurgery
McGill University

Leslie J. Berg, Ph.D.

Professor, Department of Pathology
University of Massachusetts Medical School

Aravinda Chakravarti, Ph.D.

Director, Center for Complex Disease Genomics
McKusick - Nathans Institute of Genetic Medicine
Johns Hopkins University School of Medicine

Tamara L. Doering, M.D., Ph.D.

Professor, Dept. of Molecular Microbiology
Washington University School of Medicine
BWF Career Awardee in the Biomedical Sciences – 1996

H. Shelton Earp, III, M.D.

Professor and Director, Lineberger Comprehensive Cancer Center
University of North Carolina-Chapel Hill School of Medicine

Kelsey C. Martin, M.D., Ph.D.

Chair and Professor
Dept. of Biological and Chemistry and Dept. of Psychiatry
and Biobehavioral Sciences
University of California-Los Angeles
BWF Career Awardee in the Biomedical Sciences – 1997

Martin M. Matzuk, M.D., Ph.D.

Stuart A. Wallace Chair and Professor
Dept. of Pathology and Molecular & Cellular Biology
Baylor College of Medicine

Elizabeth McNally, M.D., Ph.D. (Co-Chair)

Professor of Medicine and Human Genetics
University of Chicago
BWF Clinical Scientist Awardee in Translational Research – 2001

Louis Muglia, M.D., Ph.D.

Co-Director, Perinatal Institute, Division of Neonatology
University of Cincinnati Children's Hospital Medical Center
Director, Center for Preterm Birth Research
Professor, UC Dept. of Pediatrics
BWF Career Awardee in the Biomedical Sciences – 1995

Jeffrey A. Whitsett, M.D. (Co-Chair)

Chief, Section of Neonatology, Perinatal and Pulmonary Biology
University of Cincinnati Children's Hospital

John York, Ph.D.

Investigator, Howard Hughes Medical Institute
Professor, Pharmacology and Cancer Biology
Duke University Medical Center
BWF Career Awardee in the Biomedical Sciences – 1995

CLINICAL SCIENTIST AWARDS IN TRANSLATIONAL RESEARCH

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Frederick H. King Professor and Chair
Dept. of Medicine
Professor of Microbiology
New York University Medical Center

Andrea Dunaif, M.D.

Charles F. Kettering Professor of Medicine
Chief, Division of Endocrinology, Metabolism,
and Molecular Medicine
Northwestern University Feinberg School of Medicine

Gail Jarvik, M.D., Ph.D.

Head, Division of Medical Genetics
Arno G. Motulsky Professor of Medicine and Genome Sciences
University of Washington Medical Center

Shannon C. Kenney, M.D.

Wattawa Bascom Professor of Cancer Research
University of Wisconsin-Madison

Alan M. Krensky, M.D.

Northwestern Medicine Executive for Development
Vice Dean for Development and Alumni Relations
Northwestern University Feinberg School of Medicine

Beverly S. Mitchell, M.D.

George E. Beckman Professor of Medicine
Deputy Director, Comprehensive Cancer Center
Stanford University

Wayne M. Yokoyama, M.D.

Investigator, Howard Hughes Medical Institute
Sam J. Levin and Audrey Loew Levin Professor
Depts. of Internal Medicine, Rheumatology, Pathology,
and Immunology
Washington University School of Medicine

COLLABORATIVE RESEARCH TRAVEL GRANTS

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Professor and Chair, Department of Chemistry
University of North Carolina-Chapel Hill
BWF Career Awardee in the Biomedical Sciences – 1999

Keith Weninger, Ph.D.

Associate Professor, Department of Physics
North Carolina State University
BWF Career Awardee at the Scientific Interface – 2001

John York, Ph.D.

Investigator, Howard Hughes Medical Institute
Professor, Pharmacology and Cancer Biology
Duke University Medical Center
BWF Career Awardee in the Biomedical Sciences – 1995

INSTITUTIONAL PROGRAM UNIFYING POPULATION AND LABORATORY BASED SCIENCES

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University of Toronto

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University of Texas Medical Branch-Galveston

Joseph S. Pagano, M.D.

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University of North Carolina-Chapel Hill

Leona D. Samson, Ph.D.

Ellison American Cancer Research Professor
Massachusetts Institute of Technology

H. Steven Wiley, Ph.D.

Director, Biomolecular Systems
Pacific Northwest National Laboratories

Lynn Zechiedrich, Ph.D.

Associate Professor
Baylor College of Medicine

INVESTIGATORS IN THE PATHOGENESIS OF INFECTIOUS DISEASE

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Stanford University

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Vanderbilt University School of Medicine

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University of Pennsylvania School of Medicine

JoAnne L. Flynn, Ph.D.

Professor of Microbiology and Molecular Genetics
University of Pittsburgh School of Medicine

Daniel E. Goldberg, M.D., Ph.D.

Professor of Medicine and Co-chief, Division of Infectious Diseases
Washington University School of Medicine

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Professor of Pathology-Medical
Tufts University School of Medicine

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Albert Einstein College of Medicine of Yeshiva University

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Carnegie Mellon University

Anne Moscona, M.D.

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

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

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

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Frederick P. Zuspan Professor and Endowed Chair,
Division of Maternal Fetal Medicine
Vice Chair, Department of Obstetrics and Gynecology
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Co-Director, Perinatal Institute, Division of Neonatology
University of Cincinnati Children's Hospital Medical Center
Director, Center for Preterm Birth Research
Professor, UC Dept. of Pediatrics

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Alumni Distinguished Professor of Microbiology and Immunology
Lineberger Comprehensive Cancer Center
University of North Carolina at Chapel Hill

Jeffrey A. Whitsett, M.D.

Chief, Section of Neonatology, Perinatal and Pulmonary Biology
University of Cincinnati Children's Hospital

STUDENT SCIENCE ENRICHMENT PROGRAM

Yolanda S. George

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Associate Professor
Department of Biology
Elizabeth City State University

UNDERREPRESENTED MINORITY POSTDOCTORAL ENRICHMENT PROGRAM

David J. Asai, Ph.D.

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Howard Hughes Medical Institute

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Former Director, Science Education Initiatives
United Negro College Fund

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and Physical Sciences
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Fisk University

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Director, Training, Workforce Development and Diversity Division
National Institute for General Medical Sciences
National Institutes of Health

Charmaine Royal, Ph.D.

Associate Research Professor, Institute for Genome Sciences
and Policy
Department of African and African American Studies
Duke University

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HHMI Investigator Professor of Chemistry and Biochemistry
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Wendell Jones
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Program Contact Information

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PROGRAM INFORMATION

The most up-to-date information about our programs, including complete application information, can be found on our website at www.bwfund.org.



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