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In Cooperative Effort, BWF Launches North Carolina Science, Mathematics, and Technology Education Center

With the aid of a group of policy and education experts from across the country and a year's worth of preliminary spadework, BWF has launched the North Carolina Science, Mathematics, and Technology Education Center and will provide start-up funds for the first two years of the Center's operation, which initially will be housed at BWF.

The impetus for this initiative came in 1995 when the Public School Forum of North Carolina surveyed the status of science and mathematics education in the state and found that despite a wealth of resources, education in mathematics and the sciences had failed to live up to its potential. Six years later, it was clear that some things had changed since the Forum's

report, but more needed to be done: A September, 2000 article in *The Chronicle of Higher Education* ranked North Carolina 48th nationally for its average SAT score (986).

The BWF Board of Directors convened education experts at a meeting in February 2001 to learn more about the impact of effective science, mathematics, and technology teaching and learning. They stressed that the future well-being of the nation depends not just on how well students are educated overall, but specifically on how well they are educated in science, mathematics and technology. As a result of their findings, the board directed Carr Agyapong, senior program and communications officer for BWF, to spearhead information gath-



ering from various stakeholders (educators, business leaders, key legislators, the state Board of Education, and the state superintendent) in the state's educational system and lead the effort to establish the Center.

Education Center (Continued on page 6)

The Focus of this Issue

Burroughs Wellcome Fund grants in action:

- ▶ The launch of the North Carolina Science, Mathematics, and Technology Education Center - p1
- ▶ 2002 Clinical Scientist Awards in Translational Research - p5
- ▶ Burroughs Wellcome Fund Career Awardee in Biomedical Sciences, Jody Baron - p2

New Grant Program Supports Fight Against Infectious Disease

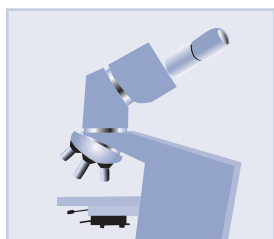
BWF has made the first round of nine grants in its new Investigators in Pathogenesis of Infectious Disease program, marking an exciting new chapter in the Fund's ongoing interest in finding ways to curb infectious disease worldwide.

Advances in genomics and immunology have the potential to shed new light on the infectious disease process. Building on those advances, future research will accelerate our under-

standing of how infectious agents exploit our bodies.

The Fund's philosophy has always been to use its grant dollars as a catalyst for innovation. In 2001, the Fund redirected its spending in infectious diseases to better support innovation, resulting in the launch of the Investigators in Pathogenesis of Infectious Disease program.

Infectious Disease (Continued on page 7)



Jody Baron, M.D., Ph.D.
Research Scientist
Departments of Microbiology and
Immunology, and Internal Medicine
University of California-San Francisco

2000 Burroughs Wellcome Fund Career Awardee in Biomedical Sciences

Dr. Jody Baron works with Hepatitis B, an infectious virus which attacks the liver and is estimated to have infected 400 million people worldwide, making it one of the most common human pathogens. In the U.S., roughly 240,000 people each year contract the virus. Ninety percent of adults infected with Hepatitis B clear the virus, while 10 percent go on to develop a chronic infection that can cause cirrhosis and cancer of the liver. According to Dr. Baron, the situation for infants is more severe: In infected newborns, only 10 percent clear the virus, and 90 percent develop chronic infections.

Dr. Baron is trying to understand the immunological mechanisms that lead either to chronic Hepatitis or to viral clearance. "It is actually the immune response to the virus that causes the liver pathology, not the virus itself," Dr. Baron says. "Hepatitis B research has lagged behind other areas because the animal models are limited. Hepatitis only infects outbred species, not genetically inbred animals," she explains.

Dr. Baron has used existing transgenic and knockout mice to develop a mouse model of Hepatitis B that more closely mimics primary infection, uncovering an innate immune response to Hepatitis B: natural killer

T-cells, which previously had no known function in hepatitis clearance.

"I work on disease models, and the experiments take a long time," Dr. Baron says, adding, "The funding from BWF has given me the security to have time to establish a system. Without the grant I would not be able to put in the time that is required to do this."

Focus recently talked with Dr. Baron about her life and career.

How did you first discover you wanted to be a scientist?

My father is a scientist. When I was 14 or 15, I volunteered for the summer to work in the lab. Then I entered the Westinghouse Talent Search, which allowed high school seniors to submit a project. This forced me to formulate a hypothesis and think about what I was doing. I really loved it. In college, I worked in various labs during the summers and then got my M.D.-Ph.D. The fact that my father really loved his work in antiviral research was a motivating factor.

Why did you choose to enter your particular field of study?

At Swarthmore, I took an undergraduate class in which we read the most recent journal articles on different top-



Dr. Jody Baron, physician, mountain biker, mother, and basic scientist, is trying to understand why some patients clear the Hepatitis B virus while others go on to develop a chronic infection.

ics. I fell in love with the study of immunology and became interested in studying human disease. I looked for an area where there was a clear overlap and infectious disease was a natural fit.

What is the best thing about your job?

What I do every day is different and interesting. I like the fact that what I do might impact human disease.

What kind of advice would you give a scientist just entering academic research?

My advice is to really love what you are doing. It is a long and bumpy road, so you have to have a ton of passion in the beginning.

What area of science is most in need of new researchers?

I would say research related to global health issues — to implement in other countries that are less developed the advances that we have here.

What do you feel is your biggest regret?

My greatest regret is that there isn't enough time in life to do everything. You have to prioritize and make choices.

What do you feel is your greatest accomplishment?

I'm able to juggle a lot of things at once. I'm a physician, a mountain biker, a mother, and a basic scientist. I live a diverse life.

Who is the person you admire most and why?

I don't admire too many people; I do admire different parts of different people. I admire my Ph.D. advisor, Dr. Charles Janeway, because he was intellectually so far above any person I had ever met. I admire passion in any field, and Dr. Janeway's whole being was devoted to immunology.

What do you do for fun?

My husband and I really like to mountain bike, camp, and be outdoors. I also belong to a book club. I like being with my family and cooking.

What do you plan to do when you retire?

I don't plan to retire. I plan to change my focus and help younger people make their careers, but I can't imagine retiring.

What is your favorite book?

The Custom of the Country by Edith Wharton.

Inaugural Course in Lab Management to Convene in July 2002

Despite a deluge of self-help books and courses on nearly every conceivable topic, there isn't much guidance for scientists who want to set up a laboratory from scratch. Talking with colleagues and mentors can help, but creating a lab still demands time and energy just when the pressure to teach, find grants, and publish is building.

Recognizing that the road to an efficiently run lab can be rocky for scientists just starting out, the Burroughs Wellcome Fund and Howard Hughes Medical Institute have developed a short course for their scientist-awardees.

Over the past year, award recipients helped shape the course — to be held July 27-31, 2002, at HHMI's headquarters in Chevy Chase, Maryland — through a series of focus groups. The three-and-a-half day course is designed to boost the research careers of advanced postdoctoral scientists and new faculty members by providing training in laboratory and personnel management techniques. Participants will learn how to set up a new laboratory, how to make an existing laboratory function more smoothly, and how to create a work environment that nurtures excellent science. Taught by national experts and experienced senior scientists, the course includes modules on project planning and budget management; grant writing essentials; time management; seeking and negotiating a faculty position; mentoring; managing collaborations; record keeping; data management and laboratory notebooks; technology transfer; and laboratory leadership skills, among others.

Course attendance is limited to 120 participants. Depending on evaluations by course participants, a second course may be offered in the future.

For more information, contact Martin Ionescu-Pioggia, senior program officer, Burroughs Wellcome Fund, 919-991-5100, or mionescu@bwfund.org.





BWF Makes \$8.5 Million in Grants to Promote Scientists' Careers

Seventeen scientists at the beginning of their independent careers got a career-promoting financial boost from the Burroughs Wellcome Fund's Career Awards in the Biomedical Sciences Program.

Launched in 1995, the career awards program identifies highly talented biomedical scientists during their formative periods and provides them the support they need to become independent investigators. Every year, the Fund makes career awards of \$500,000 each to degree-granting institutions in the United States and Canada on behalf of individual scientists. The award provides five years of salary and research support for biomedical scientists to see them through their advanced postdoctoral training and initial faculty years. To date, the Fund has provided almost \$80 million to support 166 U.S. and Canadian scientists.

BWF's career awards are made in honor of Dr. Gertrude B. Elion (1918-99) and Dr. George H. Hitchings (1905-98), two pioneering scientists who played major roles in the Fund's history. Dr. Elion served on the Fund's Board of Directors from 1991 to 1999, and Dr. Hitchings served as the Fund's president from 1974 to 1990. Among their numerous professional honors, Dr. Elion and Dr. Hitchings shared the 1988 Nobel Prize in Physiology or Medicine for a series of scientific breakthroughs that revolutionized the world of drug design.

The 17 grant recipients are working across a broad range of subjects from the origins of our sense of taste to how bacteria invade our intestines to cause food poisoning.

The deadline for the 2003 award series is October 1, 2002.

Complete program information can be found on our Web site at www.bwfund.org.

2002 Career Awards in the Biomedical Sciences Recipients

Suzanne J. Admiraal, Ph.D.
Harvard Medical School
Biosynthesis of hybrid natural products

Vahe Bandarian, Ph.D.
University of Michigan-Ann Arbor
Biosynthesis of deazapurine secondary metabolites

Cornelius F. Boerkoel, M.D., Ph.D.
Baylor College of Medicine
A *Drosophila* model for dissection of SMARCA1 function

Richard K. Bruick, Ph.D.
University of Texas Southwestern Medical Center-Dallas
Investigation of hypoxia sensing and signaling pathways

Erin C. Gaynor, Ph.D.
Stanford University School of Medicine
Molecular basis of colonization and invasion in the food borne enteric pathogen *Campylobacter jejuni*

Brian C. Lewis, Ph.D.
Weill Medical College of Cornell University
Modeling tumor initiation, progression, and metastasis using tissue-specific somatic gene transfer

Minmin Luo, Ph.D.
Duke University Medical Center
Integration of pheromonal signals and hormonal cues in mammalian reproduction

Margaret E. McLaughlin, M.D.
Massachusetts Institute of Technology
Effects of heterotypic cell interactions and blood-borne signals on tumors of the nervous system

Catherine L. Peichel, Ph.D.
Stanford University School of Medicine
The genetic and molecular basis of reproductive isolation in threespine sticklebacks

Matthew H. Porteus, M.D., Ph.D.
California Institute of Technology
The regulation of gene targeting in vertebrate somatic cells

Stephen W. Santoro, Ph.D.
Scripps Research Institute
Directed evolution of natural and unnatural proteins and oligomers for gene manipulation, drug discovery, and biochemical investigation

Bradley L. Schlaggar, M.D., Ph.D.
Washington University School of Medicine
Development of cognition: fMRI

Kristin E. Scott, Ph.D.
Columbia University College of Physicians and Surgeons
Taste representation in the *Drosophila* brain

Donald C. Sheppard, M.D.
University of California-Los Angeles School of Medicine
Isolation and characterization of genes involved in morphogenesis and virulence of *Aspergillus fumigatus*

John B. Wallingford, Ph.D.
University of California-Berkeley
Molecular control of cell motility during vertebrate gastrulation

Jennifer A. Zallen, Ph.D.
Princeton University
Molecular analysis of dynamic cell rearrangements in *Drosophila*

Karen M. Zito, Ph.D.
Cold Spring Harbor Laboratory
Regulation of synapse formation in the mammalian cortex

BWF Awards \$5.25 Million to Physician-Scientists

Bridging the Gap Between Research and Treatment

This year, seven physician-scientists will receive \$150,000 per year for five years through BWF's 2002 Clinical Scientist Awards in Translational Research. The awards are intended to free up physicians' clinic time so that they can link basic research with patient care as well as take their clinical insights into the lab for further testing.

Through its Translational Research awards, the Fund hopes to foster better understanding of disease mechanisms and new methods of diagnosing, treating, and preventing disease. The Fund is interested particularly in supporting physicians who bring novel ideas and new approaches to translational research, building on recent advances in biochemistry, cell biology, genetics, immunology, molecular biology, and pharmacology.

2002 Clinical Scientist Awards in Translational Research

David M. Altshuler, M.D., Ph.D.

Massachusetts General Hospital

Genomic approaches to the genetics of type 2 diabetes and response to antidiabetic medication

Judy H. Cho, M.D.

University of Chicago Pritzker School of Medicine

Characterization of expression patterns in monocyte-derived cells in inflammatory bowel disease

Barry A. Finette, M.D., Ph.D.

University of Vermont College of Medicine

Mechanisms of malignant transformation in humans

Thomas J. Hudson, M.D.

McGill University Faculty of Medicine

Genomic approaches to identify genes predisposing to asthma

Jonathan D. Licht, M.D.

Mount Sinai School of Medicine

Targeting aberrant repression as a therapeutic strategy in hematological malignancy

Hector D. Molina, M.D.

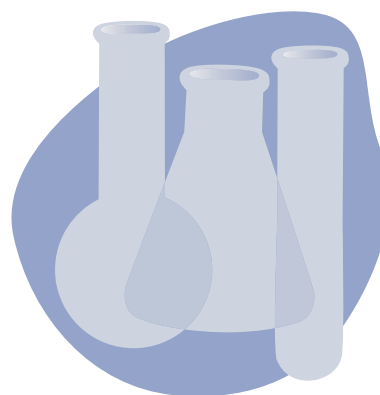
Washington University School of Medicine

Mechanisms of complement-induced abnormalities in fetomaternal tolerance

David T. Scadden, M.D.

Massachusetts General Hospital

Developing control mechanism-based stem cell therapies



New Communications Officer Joins BWF

Mirinda Kossoff has joined the Burroughs Wellcome Fund as communications officer. With over 20 years experience in communications, Ms. Kossoff spent 15 years in public relations and communications at Duke University, including five years at Duke Law School, three years as assistant managing editor at the Raleigh, N.C. News & Observer, and three years as public

affairs director in the administration of N.C. Governor Jim Hunt. Most recently, she served as communications manager at the Raleigh-Durham International Airport where she managed all communications and media relations in the wake of the September 11 terrorist attacks. As a writer, she has been published in newspapers and magazines, including *TIME*, *Psychology Today*

and *Discover Magazine*. She has been a newspaper columnist and public radio commentator as well as having taught essay writing for Duke University Continuing Education. As the Fund's communications officer, she will be responsible for all the Fund's external print and electronic communications.



Education Center

(Continued from page 1)

"The Forum's 1995 report generated effective initiatives across the state," Ms. Agyapong says, adding, "Many are doing good work, but collaboration can be strengthened. The Center is designed to provide a neutral venue to facilitate the coordination of many independent initiatives and pieces of the state's science and mathematics education puzzle."

The importance of science and mathematics education cannot be overemphasized. BWF President Dr. Enriqueta Bond has championed the creation of the Center, saying, "The best way to create a pipeline for future scientists and the research enterprise is through K-12 science and mathematics education. In order to realize our potential in North Carolina, science and

mathematics education must provide our children with the knowledge and skills they need to prepare for the high-tech jobs of the future, to become leaders in scientific research, and to participate in the global economy."

"Engaging students in hands-on science inquiry has been the primary focus of the BWF science education program since the Fund became an independent private foundation in 1994," Ms. Agyapong adds. "We have invested over \$7 million in North Carolina organizations, reaching over 23,000 middle and high school students through our Student Science Enrichment Program."

On June 26 and 27, the North Carolina Science, Mathematics and Technology Education Center Board of Directors met formally to begin its work. Philip R.

Tracy, attorney with Smith, Anderson, Blount, Dorsett, Mitchell and Jernigan, of Raleigh, will head the board as they craft a new vision for science, mathematics, and technology education in North Carolina.

The Center's mission is to systematically improve K-12 performance in science, mathematics, and technology education in order to provide North Carolina's children with the knowledge and skills needed to have successful careers, be good citizens, and advance the state's economy. Among its many roles, the Center will serve as an advocate for research-based, proven instructional programs that will be used system-wide and as a catalyst for innovation in science, mathematics, and technology teaching.

North Carolina Science, Mathematics, and Technology Education Center Board of Directors

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Manager of Community Relations
Nortel Networks

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Mitchell & Jernigan, L.L.P.

Mike Ward, Ph.D.

State Superintendent
North Carolina Department of Public
Instruction

Infectious Disease

(Continued from page 1)

The new awards encourage investigators early in their careers to pursue emerging avenues of research such as cell-pathogen interactions, host-pathogen interactions, and how infectious agents might trigger chronic or autoimmune disease. The program provides researchers at the assistant professor level an opportunity to bring aggressive, multidisciplinary approaches to investigating infectious disease. The awards provide \$400,000 over five years to researchers at the interface between human and pathogen biology.

The Investigators in Pathogenesis program sponsors work focused on the host, as well as the host-pathogen interaction in viral, bacterial, fungal, or parasite systems. Investigators in Pathogenesis awards give recipients the freedom and flexibility to pursue new avenues of inquiry and higher-risk research projects that hold potential for bringing about significant advances in the biochemical, pharmacological, immunological, and molecular biological understanding of how infectious agents and the human body interact.

The Investigators in Pathogenesis of Infectious Disease program is now the only BWF competitive award program specifically focused on funding investigator-initiated research in infectious disease. It supersedes several programs, including the New Investigator and Scholar Awards in Molecular Pathogenic Mycology, New Investigator and Scholar Awards in Molecular Parasitology, and New Initiatives in Malaria Awards. It does not replace these programs so much as it helps to move them forward, closer to the ultimate goal of understanding how humans and their pathogens coexist, in the

hope of some day eliminating the scourge of infectious disease.

The deadline for the 2003 award series is November 1, 2002. For complete program information visit our Web site at www.bwffund.org.

2002 Investigators in Pathogenesis of Infectious Disease

Barbara A. Burleigh, Ph.D.
Harvard School of Public Health
Functional characterization of the role of the host cell fibrogenic response in *Trypanosoma cruzi* infection

Zhijian J. Chen, Ph.D.
University of Texas Southwestern Medical Center-Dallas
Roles of TRAF5-regulated IKK activators in innate immunity

Maurizio Del Poeta, M.D.
Medical University of South Carolina College of Medicine
Roles for inositol phosphoryl ceramide synthase 1 (IPC1) in fungal-host interaction

Heidi Goodrich-Blair, Ph.D.
University of Wisconsin-Madison
Pathogenesis of *Xenorhabdus nematophilus* in insects: a model for the innate immune response to bacterial pathogens

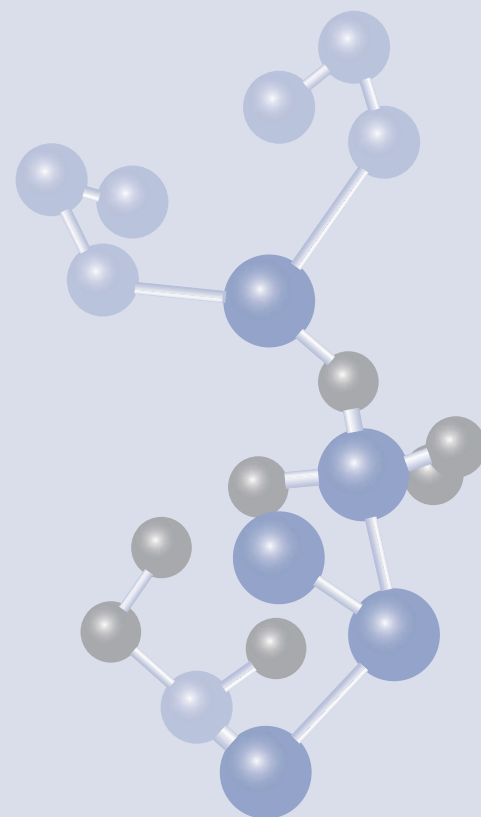
David B. Haslam, M.D.
Washington University School of Medicine
Mechanisms of Shiga toxin translocation and intoxication within host cells

Margarethe (Meta) J. Kuehn, Ph.D.
Duke University Medical Center
Toxin trafficking via vesicles

C. Erec Stebbins, Ph.D.
Rockefeller University
Structural studies of bacterial virulence factors

Ren Sun, Ph.D.
University of California-Los Angeles School of Medicine
Identification of cellular factors that determine the fate of herpes virus infection: latency versus lytic replication

Chloe L. Thio, M.D.
Johns Hopkins University School of Medicine
The identification of human genes associated with hepatitis B virus outcomes





Former BWF President Howard Schaeffer Dies

Dr. Howard J. Schaeffer, 75, a native of Rochester, N.Y., died at his home March 30, 2002. Dr. Schaeffer was a pioneer in the field of medicinal chemistry; his most famous discovery while working for Burroughs Wellcome Co. was Zovirax (acyclovir), the first selective drug for the treatment of herpes infection.

Dr. Schaeffer received numerous awards and honors including the Ebert Prize, the Bristol Award in Chemotherapy, the Discoverers Award from the Pharmaceutical Manufacturers Association, and the Esselan Award for Chemistry in the Public Interest. He also received an honorary Doctor of Science degree from the University of Arizona.

In 1985, Dr. Schaeffer became a member of the BWF board of directors and served as president of the Fund from 1991 to 1994. He helped shepherd the Fund's transition from a corporate philanthropy to an independent private foundation. In 1993, the Wellcome Trust endowed the Fund with a gift of \$400 million, made in large part through Dr. Schaeffer's efforts. Previously, the

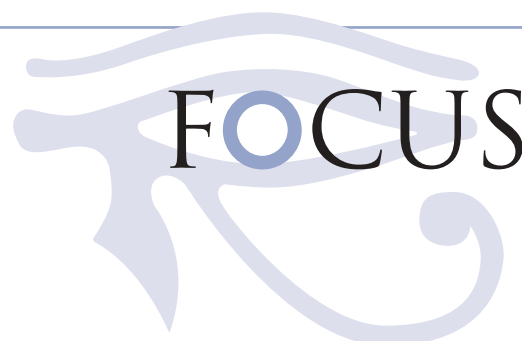


Fund's endowment had been approximately \$30 million.

Burroughs Wellcome Co. recognized Dr. Schaeffer's many contributions by endowing a Distinguished Professorship in Chemistry at North Carolina State University in his name, and in 1997 the Wellcome Trust provided a grant to the University of Arizona to endow the H.J. Schaeffer Chair in Pharmaceutical Sciences.

He is survived by Barbara, his wife of 51 years; children, Mark and wife Patricia, Dan and wife Robin, Dean and wife Karen, Tracey and husband Greg; and nine grandchildren.

In lieu of flowers, those wishing to do so may make a memorial contribution to Science House, North Carolina State University, c/o PAMS Foundation, Campus Box 8201, Raleigh, NC 27695.



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Information about BWF and our award programs is available at www.bwfund.org.

www.bwfund.org

Visit BWF's website:

- ▶ Directory of current awardees
- ▶ Awards brochures
- ▶ Interactive on-line application forms
- ▶ More FAQs for our programs

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