

Summer Awardee Meeting Fosters Career Growth

by Susanna Smith, Communications Intern

Forty-four Burroughs Wellcome Fund (BWF) Career Awards in the Biomedical Sciences recipients in 2000 and 2001 came together to present their BWF-sponsored work, participate in career development panels, and develop professional networks at the biennial career awards meeting, held June 17-19 at the Fund's headquarters building in Research Triangle Park, North Carolina. Several Fund board members and staff, and former career awardees joined the group for two days of presentations, panel discussions, and opportunities to form career connections.

The meeting began with a panel session titled "Insider Insights—Seeking and Negotiating Your Faculty Position," which was aimed at helping postdoctoral researchers find the type of faculty position they are seeking.

Chris Golde, Ph.D., of the Carnegie Foundation for the Advancement of Teaching, began the panel talk by suggesting to the crowd, "Know yourself and your priorities; different people want different things. You are in an incredibly powerful position, and that is the best time to negotiate."

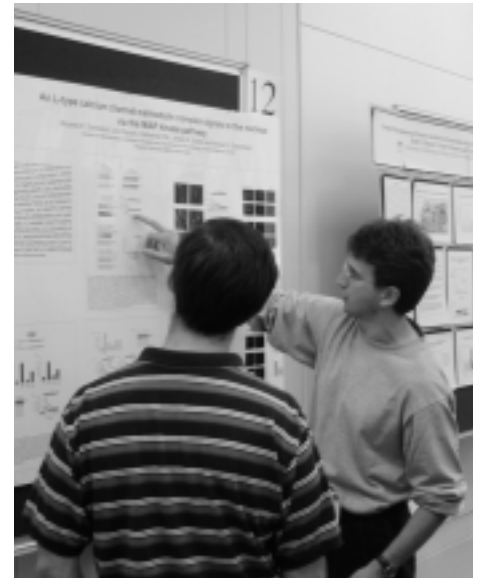
About 89 percent of career awardees from 1995 to 1999 have received faculty

positions, all of which were tenure track or its equivalent. The current average start-up package approaches \$500,000.

A 1996 career awardee, Tamara Doering, M.D., Ph.D., assistant professor of molecular microbiology at Washington University School of Medicine, spoke on the challenge of finding faculty positions for dual-career couples. Doering explained that in her experience it is usually best to tell the institution early on that both you and your spouse are looking for positions.

"It gives the department time to help you," she said. "It can be a plus for the institution by creating stability within the faculty, and it can be an added bonus to the institution to gain two faculty members."

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Career Awardees discuss research during poster session

Translational Research Awardee Named to Prestigious Canada Research Chair

by Susanna Smith, Communications Intern

Joyce Slingerland, M.D., Ph.D., an assistant professor of medicine at the University of Toronto, and the recipient of a 1998 Clinical Scientist Award in Translational Research, was recently named a Canada Research Chair (CRC) in Molecular Biology.

Dr. Slingerland, whose research on the molecular mechanisms of breast cancer has provided powerful tools for tailoring treatment, was one of nine scientists named by the Medical Research Council of Canada to this position in 2001. The CRC program is an effort to promote groundbreaking research at universities, research institutions, and hospitals within Canada. Dr. Slingerland will receive \$500,000 over five years during her CRC appointment, which she will use to further

her research into the molecular mechanisms of malignant tumor progression.

Dr. Slingerland has been a leader in the field of breast cancer research, working both as a basic scientist and a physician.

"A lot of my clinical work involves caring for patients from diagnosis to death," Dr. Slingerland explains. "One develops very close connections with these women; providing meaningful support to these women represents a real challenge at times."

As a postdoctoral fellow, Dr. Slingerland discovered a protein called p27 that is essential to maintain normal cell division. In normal cells, p27 binds to an enzyme called cyclin-dependent kinase, causing

Slingerland (Continued on page 7)

The Focus of this Issue...

Burroughs Wellcome Fund grants in action. In this issue of Focus we:

- Report on our summer meeting for career awardees. p. 1
- Highlight the work of one of our top-notch translational research awardees. p. 1
- Profile a reluctant geneticist who once planned to play the tuba as a career. p. 2
- Show how students are learning the scientific method through a program supported by a Student Science Enrichment Program grant. p. 4

Portrait of a Reluctant Geneticist: Joseph D. Terwilliger, Ph.D.

by Susanna Smith, Communications Intern

He is an anomaly in the world of science, a man who never intended to be a scientist but seems to have a knack for genetics. Joseph D. Terwilliger, Ph.D., assistant professor in the psychiatry department at Columbia University, and one of the Fund's Hitchings-Elion Fellows, ended up in graduate school at Columbia University because it paid better than a fast-food restaurant.

"Honestly, I never wanted to be a scientist," Dr. Terwilliger insists. "I did not take any science classes in high school to speak of, and I did my undergraduate work at the Peabody Conservatory of Music. I took a few genetics courses there because it was kind of interesting, but I never imagined going into science."

After receiving a Bachelor's of Music in tuba performance, Dr. Terwilliger headed to New York City with the hopes of pursuing a career in music. After applying to a number of graduate schools in different fields, he handed his life over to the course of fate, which directed him down his current career path.

"Columbia accepted me in genetics, much to my surprise," Dr. Terwilliger explains. "I could not believe they were actually going to pay me to go to grad school. In music you have to teach classes just to pay your tuition, and then you have to get a job to pay the rent. While in science they actually were going to pay me, which seemed like an unbelievable scam at the time."

An unbelievable scam perhaps, but it worked out well for Columbia University since Dr. Terwilliger seemed to have an innate ability, as well as a driving interest in statistical genetics.

"I went to grad school since it was better than working at McDonalds like most people with a degree in music. I was amazed to find out I was good at it, and actually enjoyed it. After a few years of auditions and trying to pursue the music career, I realized that science was a much more reliable way to make a living."

Dr. Terwilliger still plays the tuba in a few working music groups. Science, however has become his primary career

through what he calls "a series of fortuitous accidents, not any real life plan."

Initially Dr. Terwilliger decided statistical genetics might be a good fit for him because he knew he was good in math, viewing genetics as "fun math games."

"When I first came for my interview, my future advisor told me he worked on linkage analysis and gene mapping, I smiled, and said 'great.' Actually I was wondering in my head what the heck linkage analysis and gene mapping was," Dr. Terwilliger states.

Dr. Terwilliger subsequently completed a M.A, M.Phil., and a Ph.D. in genetics and development at Columbia University. After completing his work at Columbia he received a Burroughs Wellcome Fund Hitchings-Elion Fellowship.

During his time in the United Kingdom as a Hitchings-Elion fellow, Dr. Terwilliger worked with Dr. G. Mark Lathrop at the Wellcome Trust Center for Human Genetics, developing statistical methods and writing software.

"I work with development statistical genetics, as well as the application and design of genetic experiments," Dr Terwilliger explains. "I'm a statistician. I work on ways of analyzing data; helping people design experiments and trying to find the best way of collecting data."

Dr. Terwilliger says that he feels the Hitchings-Elion fellowship he received offered him the flexibility to free up his time, to gather pilot data and coordinate international collaboration for a study to investigate the Korean diaspora.

"Koreans are a unique natural experiment in this regard, as the Kazakhstan Koreans were forcibly relocated there by Stalin in 1937. Today there are about 250,000 Koreans in central Asia as a result of that forced migration event," says Dr. Terwilliger. There are more than 100,000 Korean adoptees in Europe and the United States who are biologically Korean and culturally European, according to Dr. Terwilliger.

"These populations provide a unique laboratory to look at gene-environment interactions in humans," he says. "We can

So What's New?

BWF wants to expand communications about the research conducted by the scientists we support.

We therefore encourage award recipients to notify us of papers you are about to publish, major lectures you will make, patents you will receive, or any other notable achievements that have resulted, totally or in part, from BWF-funded research. We would like to hear about such items as early as possible.

Also, if your institution's public-information officer has reported on your work, or if it has been described in a local publication, please send us copies of the articles.

Spreading the word about your work, through FOCUS and other media outlets, is one way BWF can help make the case for supporting basic medical research. We'd like your assistance in this important task. We will, of course, check with you before releasing any information.

Send the information to the FOCUS editor at the address on page 8.

make more realistic estimates of how genetically linked some of these traits really are. It is easy to show that most study designs currently used systematically bias the estimates of heritability upwards, making everything appear more genetic than it really is. We are proposing a study design that will show that phenotypes are not as genetic as we think they are."

Dr. Terwilliger is setting the stage for research that will investigate the normal variation in quantitative traits that are risk factors for chronic disease in later life. The Korean diaspora project will target large families of Koreans living in Kazakhstan, Korea, the United States, overseas adopted Koreans in Europe and, where possible, their families both biological in Korea, and non-biological in Europe.

"As a theoretician, my research costs are minimal on a day to day basis, paper and pencil and an old computer are all

Terwilliger (Continued on page 8)

Questions for Joseph D. Terwilliger, Ph.D.



Read this profile online at BWF 24x7
www.bwfund.org/news_bwf24x7.htm

BWF award: Hitching-Elion Fellowship

Academic title: Assistant Professor

Affiliation: Columbia University

What is the best thing about your job?

Freedom.

What is your philosophy with respect to your research?

Think about everything from first principles, and never believe anything anyone tells you unless they can prove it to you from first principles, not from mere extension of existing ideas, which may be flawed from first principles themselves.

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

Don't believe anything unless you can prove it yourself... Always be critical!

If you had unlimited resources, what one big scientific question would you pursue?

At the moment, I am mostly involved in the Korean diaspora project. We hope to simplify some of the questions people are asking about genetics, and at the same time to get a more educated idea about the effects of gross cultural and environmental differences on the genetic correlations in families for numerous quantitative traits.

What do you feel is your greatest failure? Why?

That I did not get a job as an orchestral tuba player as I always wanted to do!

What do you feel is your greatest accomplishment? Why?

That I managed to successfully switch careers when circumstances presented themselves, going from musician to scientist in a relatively short time, and being fairly successful

in statistical genetics despite that when I started this program in grad school in 1987, I did not know what an integral, a probability, a lod score, or really even what recombination was.

Who do you admire? Why?

The scientist I most admire is Dr. Ken Weiss from Pennsylvania State University, because he really thinks about everything from first principles, and has influenced my thinking more than anyone I have met in my scientific career. He has been a meteorologist, a cartoonist, an anthropologist, and a geneticist, among other things in his career. The way he ties it all together is by thinking conceptually rather than focusing on the details, which is where I think most scientists get lost. They become expert at the minutiae but sometimes forget why they are doing what they are doing. Ken Weiss has helped me step back and think about the big picture at all times, so that I have drifted away from detail-oriented research into more conceptual research, focusing on how the various issues come together to solve the larger problem.

What do you do for fun?

I enjoy music, obviously. I continue to play professionally when I am home, though lately my work has me traveling a bit more than I would like. As a result of the traveling I also have developed an interest in lots of different languages and cultures, which I think is critical to really getting involved in genetic projects, which aim to study those people. The look on the faces of people last month in China when I gave my lecture at a genetics conference there in Chinese was worth the effort I put into learning that, for example. Then, of course, there are the other silly things, like two years ago, I decided to enter the Nathan's hot dog eating contest. I actually came in second, beating one former world champion, which was pretty exciting, though I have not eaten a hot dog since, as I was uncomfortable for a week. Eating nineteen foot long hot dogs with buns in twelve minutes can be a bit taxing! But it was certainly fun the first time!

What do you plan to do when you retire?

I thought the best part about scientific academic careers is that you are not required to retire.

What is your favorite book?

Lun Yu of Confucius.

Summer Ventures Program Teaches Patience, Perseverance Pay off in Science

by Susanna Smith, Communications Intern

Nervous, bubbling adolescents in dress clothes filled the room. Parents mingled while searching for their budding scientists. One teenage girl told her mother about the stench of brackish marsh water. Another young man told his younger brother in true fisherman style about the size fish they caught on the research vessel.

It was the final day of the Summer Ventures 2001, a four-week summer science program at the University of North Carolina-Wilmington (UNC-W). The program is funded in part by a Student Science Enrichment Program award from the Burroughs Wellcome Fund, which paid for the cost of offshore research,

including the use of boats and a crew to collect data on Masonboro Island, North Carolina.

Summer Ventures is held at six state university campuses and is aimed at academically talented students who may pursue science- or math-based careers. The program, which brings rising high school juniors and seniors to live in a residential setting for four weeks, is intended to supplement high school courses by allowing students to conduct hands-on experiments outside of the traditional boundaries of high school science and mathematics classes.

With prodding from the coordinator, Dr. Michael S. Smith, a UNC-W professor of earth sciences, the teens headed into the lecture hall to begin their presentations.

Two students, Sarah Boyce of the North Carolina School of Science and Mathematics, and Joshua Haislip of Bear Grass High School, worked together on a project titled "Reactions of Sea Urchins to Dark and Light." During their presentation they explained that they were the running class joke. Having tried two experiments before settling on the work they presented, Ms. Boyle and Mr. Haislip learned that science requires patience and persistence.

Originally the two set out to investigate color change in the bodies of octopi due to chromatophores in their skin. After doing background research that involved studying Greek fishing techniques, they designed an octopus trap that included PVC pipes and a clay pot to lure their underwater specimen.

It didn't work. Day after day when they pulled the traps the bait was gone, the trap empty.

The two were able to catch two squid, which also have chromatophores and would have been a decent substitute for the absentee octopi, but both died in the laboratory tank the day after they were caught.

They decided the conclusion of their experiment would be that there are no

Visiting Professorships Encourage Scientific Exchange, Collaboration

With the approval of the 2001-2002 awards, the Burroughs Wellcome Fund will be supporting its final round of Visiting Professorship Awards in the Basic Medical Sciences and the Microbiological Sciences.

Since 1975, the Fund has invested nearly \$3 million to bring national and international distinguished scientists to four-year degree-granting institutions, including small colleges and large universities in the United States and Canada to lecture and teach. The awards are made to increase scientific exchange and collaboration among students, faculty, and these visiting scientists, according to BWF program officer Carr Agyapong.

Each award provides \$5,000 for a visiting scientist to come to a campus for several days of lectures and informal interactions. As well, the visiting professor delivers a public lecture on a subject pertinent to his or her discipline.

The first visiting professorship program was established in 1974 to support clinical pharmacology, an area that BWF targeted at that time as undervalued and in need of funding. It was named after William N. Creasy, one of the Fund's founding fathers and past presidents, as a tribute to his many contributions to the discipline and to the ongoing development of the Burroughs Wellcome Fund.

The final series of BWF Visiting Professorships were awarded to 44 insti-

tutions in the United States and Canada—33 in the basic medical sciences and 11 in the microbiological sciences. These awards were made on recommendations from three program administrators, the Federation of American Societies for Experimental Biology (FASEB), the Canadian Federation of Biological Societies (CFBS), and the American Society for Microbiology (ASM). BWF is grateful for their commitment and dedication over the years to attract the best applicants to receive our visiting professorship awards.

FASEB has been administering the BWF Visiting Professorships in the Basic Medical Sciences since 1977, offering visiting professorships to a total of 538 institutions; including 104 visits from international scientists. In 1998, CFBS began offering visiting professorships in the basic medical sciences to Canadian institutions, making a total of nine awards to nine different Canadian institutions.

Since 1979, ASM has administered the nearly 100 BWF Visiting Professorships in the Microbiological Sciences to institutions both in the United States and Canada, targeting smaller campuses as a focus of the program.

For a complete listing of 2001-2002 Visiting Professorship award recipients, please visit our web site (www.bwffund.org/sci_edu_previous_programs.htm).

Summer Ventures (Continued on page 5)

Summer Ventures (Continued from page 4)

octopi and only feeble squid in North Carolina's coastal waters. Their advisors vetoed that idea, so the team started from scratch on a project about sea urchins' preference for a light versus a dark environment.

"Not all science experiments turn out as planned," commented Mr. Haislip, who is thinking of pursuing medicine as a career. "When your high school teacher gives a hand out with the directions for an experiment, it works 99 percent of the time. From Summer Ventures we learned that experiments don't always go that way. Maybe someone next year will benefit from our work."

In their final experiment, Ms. Boyce and Mr. Haislip hypothesized that sea urchins would prefer a dark environment to a light environment, given that they are normally found at about 50 meters below the surface. To test their hypothesis they set up a tank with a divider creating light and dark halves.

Yet like their other experiments, they ran into difficulties, of the five sea urchins they caught, only one showed any inclination towards motility.

"We had five different urchins," Mr. Haislip explained. "All except for one didn't move. It's frustrating to sit and watch an urchin for a half hour, knowing that the second you walk away it may move around."

Other students, such as Brook Woodward of South Johnston High



Joshua Haislip presents the results of his project for Summer Ventures 2001



Octopus trap created by Joshua Haislip and Sarah Boyce for Summer Ventures 2001

School and Megan Stone of Lumberton Senior High found their conclusion proved their hypothesis false.

The two worked together on a project, "Species Diversity in Tidal Creeks," in which they hypothesized that species diversity would decrease with increasing distance from the mouth of the tidal creek. The researchers tested their idea at a tidal creek on Figure Eight Island, collecting data on species diversity at the mouth of the creek and 50 meters and 100 meters up stream from the mouth. Their findings, that species diversity was greatest at 50 meters from the mouth of the tidal creek, contradicted their hypothesis.

Other student projects included Lauren Phillips of West Carteret High School, who presentation was titled, "Herbal Eggs Anyone?" She used the herbal supplements Tribulus and Black Kohosh, which mimic hormones, to show that in the presence of these supplements the eggs of ribbon worms develop into larvae more quickly.

Molly Hamrick of Kings Mountain High School and Jennifer Wu of W.G. Enloe High School worked together on a project they ironically titled, "Don't Worry, There Are Plenty of Fish in the Sea!" They hypothesized that the majority

of the catches on fishing boats is wasted because what is not shrimp is normally thrown away.

For their experiment, Ms. Wu and Ms. Hamrick did six trawls of North Carolina waters to determine what type of fish are normally caught. They then called local fish markets to find out what the local population actually eats. Based on their data the young women estimate that between 60 and 85 percent of shrimp trawlers' catches are wasted.

Some students, such as David McPherson, a rising junior at South Columbus High School, are considering a career in science after participating in the program.

"I don't have a clue about what I want to do," Mr. McPherson commented with a hesitant laugh. "But this program has made me more interested in science."

About 75 percent of the students who participate in Summer Ventures go to public schools. About 97 percent of these students attend college, said Dr. Smith.

"It is challenging to track these kids, but personally I have seen a lot of them go into science," he continued. "This program gives them an introduction to the rigor of science. Science is hard work, not something that comes out of a box."

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She also mentioned that, “money doesn’t dictate everything.” In some cases an institution that can offer a spouse a position may be more valuable than an institution that offers only one of the two a higher salary.

Another 1996 career awardee, George Daley, M.D., Ph.D., an assistant professor of medicine at Harvard Medical School and a Whitehead Fellow at the Whitehead Institute for Biomedical Research, then spoke about the specific challenges facing researchers with a M.D. and Ph.D. He outlined three specific and common requirements of M.D.-Ph.D. faculty members: clinical work, teaching requirements, and “service responsibilities.” Dr. Daley pointed out that there can be tremendous variation in workload and that it must be negotiated in the beginning of the appointment in concrete terms.

“I suggest you double whatever number an institution quotes you on the amount of clinical work you will do,” Dr. Daley commented. Suggesting that young researchers postpone their teaching responsibilities as much as possible Dr. Daley said, “you need protected time, and it needs to be negotiated up-front.”

Dr. George Sheldon, chairman of the department of surgery at the University of North Carolina-Chapel Hill, pointed out that “the emotional reaction you have to an institution is important as well.”

Dr. Joseph Pagano, Lineberger Professor of Cancer Research at the University of North Carolina-Chapel Hill, suggested that young researchers “consider places that you don’t normally consider. Look at the trajectory of the department. See if it is an exciting intellectual environment, and if you can make your own identity there.”

The evening plenary speaker, Jack Griffith, Ph.D., professor of microbiology and immunology at the University of North Carolina-Chapel Hill, delivered a talk, titled “Development of a Career in Molecular Biology: Together with, and in Spite of, the NIH.”

“The science you do should be something that matches your personality,” he emphasized.

Griffith suggested that the grant-writing process should begin with writing down the

specific aims of the research. He encouraged grant writers to initiate communication with the appropriate section within the National Institutes of Health in which the grant will be evaluated. Griffith mentioned that it is best to have the grant in a readable form about a month and a half before it is due, so peers can review it. Also, the principle investigator is responsible for the final proofreading, he reminded. It is helpful to send the grant in with a cover letter to ensure that the grant is directed to the right committee, he added.

In general, Dr. Griffith suggested that young researchers consider a field where they can develop an area of expertise.

“We do science because we enjoy it,” Dr. Griffith said. “There is nothing more pleasurable than to think our lab is the expert on this scientific area.”

He also noted, “A grant is a grant and not a contract, you can do what you want with it. Now if you want to get it renewed, you should do what you said you would do.”

On Tuesday, the meeting continued with a panel session titled, “Key Strategies for Managing Your Laboratory.”

Konstatin Severinov, Ph.D., assistant professor of genetics at Rutgers University, spoke first on issues such as hiring and managing foreign postdoctoral students, who comprise a large percentage of the American scientific community. He noted that principle investigators should be aware of visa requirements, as well as tax issues.

Dr. Severinov also mentioned that every principle investigator may face the situation of firing an employee.

“Sometimes it has to be done, and it is best if you tell the employee right away,” he stated.

Klaus Nuesslein, Ph.D., assistant professor of microbial ecology at the University of Massachusetts, spoke on creating lab solidarity and a team environment.

“Being a junior faculty member is a very isolating position. You have to be a leader and an example,” Dr. Nuesslein said. “To create a productive lab you have to make people want to come to work, you do this by designating responsibility, everything is assigned.”

He also mentioned that in his lab the members regularly celebrate grants, birthdays, and good data together. Dr. Nuesslein creates a team atmosphere in his lab by having lab outings, such as a barbeque in his backyard.

Pointing out that being a principle investigator includes responsibilities other than those of a good scientist, Dr. Daley of the Whitehead Institute and Harvard Medical School explained, “One of the most effective scientists I know previously ran a roofing company. It is important to remember you are becoming not just a scientific manager but also an employer and a boss. In doing this you assume stewardship of other peoples lives.”

Dr. Daley suggested that acquiring and renewing grants is directly tied to

Meeting (Continued on page 7)

Program Deadlines for 2003

Basic Biomedical Sciences

Career Awards in the Biomedical Sciences October 1, 2002

Infectious Disease

Investigators in Pathogenesis of Infectious Disease November 1, 2002

Interfaces in Science

Check our web site www.bwfund.org for more info May 1, 2002

Science Education

Student Science Enrichment Program April 10, 2002

Translational Research

Clinical Scientist Awards in Translational Research September 1, 2002

Slingerland (Continued from page 1)

it to stop progressing through the cell cycle. Thus, p27 helps keep cell growth and division in check. Cancerous cells lose these molecular breaks. In some cancers, uncontrolled cell growth has been linked to low levels of p27. Dr Slingerland's group and others have linked loss of p27 in tumor cells with poor outcomes for patients with breast and other cancers.

"We've shown that loss of p27 within the tumor tissue is prognostic for poor outcome for breast cancer patients," she says.

The reason for this link, Dr. Slingerland explains, is that the hormone estrogen promotes the growth of breast cancers that express the estrogen receptor. The anti-estrogen drug tamoxifen is a very useful tool for treating these breast cancers. However, Dr. Slingerland's group has found that the presence of p27 and a second protein, p21, are necessary for tamoxifen to have a beneficial effect. Unfortunately many cancers develop resistance to treatment with tamoxifen.

"For patients with metastatic breast cancer, tamoxifen initially causes the cancer to shrink and the outlook improves, but eventually within months to years, the disease progresses despite this drug treatment," explains Dr. Slingerland.

Her group and others have learned that this resistance stems, in part, from the activation of a cellular pathway called the mitogen activated protein kinase (MAPK) pathway. Once the switch has been turned on for this cellular pathway, p27 no longer does its job, which allows the cells to continue to grow and divide abnormally.

In the near future, this prognostic knowledge may directly affect the clinical treatment of women with breast cancer.

"We are completing a large study of almost 1,200 breast cancer patients to confirm our original findings," explains Dr. Slingerland. "If the study confirms the prognostic value of p27, we will then move this test into the clinical management of patients. The next step is to test if p27 has predictive value to show which patients do or don't respond to current chemotherapies."

In the coming years, Dr. Slingerland says she will explore new therapies that may be able to stop the activation of the MAPK pathway, restore proper levels and function of the growth inhibitor p27, and permit women to continue treatment with drugs like tamoxifen without developing resistance.

With one foot in the laboratory and one in the clinic, Dr. Slingerland approaches research as "an exciting avenue to pursue the answers to real human problems. There are molecular answers to all the problems we have in clinical work. The

information is almost at our fingertips; what is missing is the ability to apply it."

Rather than become frustrated by the slow progress with which new findings from the lab eventually influence clinical medicine, Dr. Slingerland takes it as a challenge to continually use her knowledge of the body and the cell to improve the lives of cancer patients.

"I think it is very important that we as researchers realize that the work that we are doing goes beyond our own ego and has potential application to real human problems," she explains.



www.bwFund.org

VISIT BWF'S WEB SITE:

- Directory of current awardees
- 2002 Career Awards at the Scientific Interface brochure
- BWF 24/7, our monthly feature profiling BWF awardee accomplishments
- Interactive on-line application forms
- More FAQs for our programs
- Special reports, newsletters, grant announcements, and much more!

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hiring good people. He suggested that prospective employees spend a full day in the lab to allow the other lab members to assess their potential intellectual contribution.

Dr. Doering explained, "Your goal is to do good science and produce well-trained people at the same time."

For Dr. Doering, the underlying foundation of a good lab is communication within the lab, between the lab and the principle investigator, and the lab's relationship to the administration and the support staff. She also suggested, "Shift responsibility laterally rather than top to bottom. Have a reward system for good work."

Crispin Taylor, Ph.D., the Managing Editor of *Science's Next Wave*, a weekly online publication that covers career

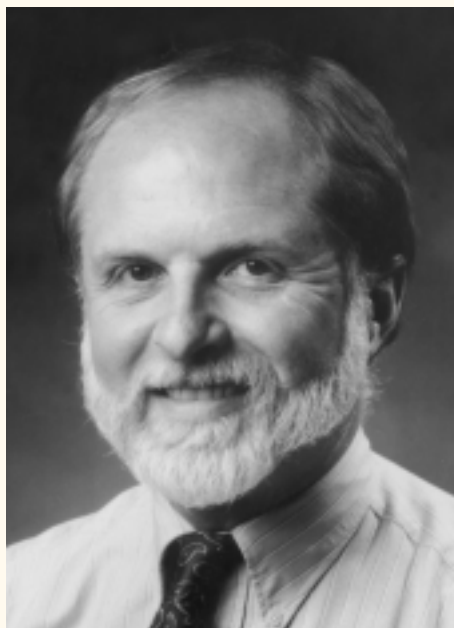
development, scientific training, and the science job market, then spoke about the online Career Development Center (CDC) at www.nextwave.sciencemag.org and how it can be helpful in guiding principle investigators.

Dr. Taylor suggested, "You can use this site and the Career Development Center throughout your career as a PI. It can be used to help students in science interested in a career away from the bench. The web site also deals with professional issues, grants, and grant writing." Next Wave's CDC is sponsored by the Burroughs Wellcome Fund and Howard Hughes Medical Institute, and access to this portion of this site is free.

Career awardees seemed to find the meeting helpful and enjoyable. As described by one attendee, it was, "a little science, a little career development, a little networking."

Changes to BWF Board

The Burroughs Wellcome Fund welcomes **Albert James Hudspeth, M.D., Ph.D.**, to its board of directors beginning October 2001. Dr. Hudspeth received his Ph.D. from Harvard Graduate School in 1973 and his M.D. from Harvard Medical School in 1974. Following a year's postdoctoral training at the Karolinska Hospital in Stockholm, Sweden, he joined the faculty of California Institute of Technology in 1975. Dr. Hudspeth has held faculty positions at the University of California-San Francisco, where he directed the cell biology program, and the University of Texas Southwestern Medical Center-Dallas, where he chaired the department of cell biology and neuroscience and founded the neuroscience program. In 1995, Dr. Hudspeth became F. M. Kirby Professor and head of the Laboratory of Sensory Neuroscience at Rockefeller University. He has won numerous awards, both for his teaching and for his research on the mechanoelectrical properties of hair cells, the sensory cells of the inner ear. Dr. Hudspeth is a Howard Hughes Medical Institute investigator and a member of the National Academy of Sciences. He has served on BWF's Interfaces in Science advisory committee since 1995 and has chaired the committee since 1999.



Albert James Hudspeth, M.D., Ph.D.

The Fund also wishes to thank the following board members, who have finished their second four-year term, for many years of dedicated service to the Fund: **Mary Ellen Avery, M.D.**, Thomas Morgan Rotch Distinguished Professor of Pediatrics, emeritus, Harvard Medical School; **Joseph Pagano, M.D.**, Lineberger Professor of Cancer Research, director emeritus, Lineberger Comprehensive Cancer Center, University of North Carolina-Chapel Hill School of Medicine; and **Jerry Whitten, Ph.D.**, professor of chemistry, North Carolina State University.

Terwilliger (Continued from page 2)

I need," Dr. Terwilliger explains. "I have used the money from this fellowship to help pay for the numerous reference materials I have used for the background research for this project, mostly in Korean—which I studied in grad school. I have also arranged the initial meetings with our potential collaborative partners in Kazakhstan, Russia, China, Korea, and Sweden."

Dr. Terwilliger says that the independent funding offered by BWF has made it possible to apply theoretical models in practice.

"It would have been very difficult to fund otherwise, given the multidisciplinary nature of this project, which involves cultural and physical anthropologists, historians, geneticists, epidemiologists, clinicians, sociologists, nutritionists, and others, and requires working with people in multiple languages and multiple cultures," he says. "It is fascinating, but a bit outside the realm of conventional scientific thought. The freedom of the Hitchings-Elion Fellowship has made this possible."

FOCUS

This newsletter is published quarterly by the Burroughs Wellcome Fund, an independent private foundation dedicated to advancing the medical sciences by supporting research and other scientific and educational activities.

Send comments to:

FOCUS editor
Burroughs Wellcome Fund
Post Office Box 13901
Research Triangle Park, NC 27709-3901
Telephone (919) 991-5119
Fax (919) 991-5160
E-mail: khede@bwfund.org

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