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>
> ROKHSANNA SADEGHI

who brought food and medical care to homeless people. Accompanying them, sometimes to burned-out buildings on bitterly cold evenings, she helped medical students take patient histories and arrange for medical referrals among the people that her laboratory research might ultimately benefit. This combination of research and community service invigorated and inspired her, Sadeghi says. "It renewed my faith that these are things I want to do and can do."

Another student opted for an assignment north of the border in Canada, just 400 miles from his home base at Michigan's Kalamazoo College. Michael Glista, a senior, immersed himself in Alzheimer's disease research by spending his summer at Peter St George-Hyslop's University of Toronto lab. Throughout the summer, postdoc Hiroshi Hasegawa mentored Glista as they worked with recombinant proteins in an effort to reconstruct the molecular puzzle pieces that interact as cells produce the disease's telltale ß-amyloid plaques in the brain. His experience, Glista says, resulted in a published paper and a direction to pursue in his intended career as a researcher and clinician.

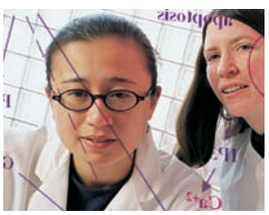
Although he didn't journey far for his research project, Glista says the international mix of colleagues in the St George-Hyslop lab—from Japan, China, Poland, and Canada—and their passionate commitment to their work left a strong impression.

Her summer in Ranulfo Romo's lab at Mexico City's National Autonomous University of Mexico allowed Egle Cekanaviciute, a junior at Harvard University, to explore neuroscience research with animals. She trained a rhesus monkey to respond differently when two distinct vibration frequencies were applied to its hands; then she watched her colleagues implant electrodes to understand how the monkey's brain distinguished between those stimuli. Sifting through detailed statistical analyses of the resulting data, she helped dispel the widely assumed notion that monkeys' brains sort and compare tactile information based on repeating patterns of stimulation.

Cekanaviciute also learned to appreciate working with these higher animals, especially compared with her previous efforts—with cell cultures. "Cells are not cute, they're not fluffy, and they're not smart," she says. "You don't get attached to them; you don't name them." Working with animals requires patience and emotional stamina, she says. "You are dependent on this whole set of circumstances: how smart the monkey is, how much it wants to be trained, and whether it stays healthy."

Overwhelmingly, her summer experience has deepened her love of Latin-American culture. In her free time, Cekanaviciute's growing fluency in Spanish allowed her to explore. She hiked through jungles and climbed pyramids in the Yucatan peninsula. She learned about the struggles of guerillas in the state of Chiapas and the poverty of young children selling flowers on the streets.

After she graduates next year, Cekanaviciute plans to spend a year south of the border, perhaps in Mexico or Peru, before pursuing graduate work. "It's very important to travel," she advises future participants. "It's a must to go and see everything you can." ■ —SARAH WEBB



Kay Chernush

Making It Relevant to Human Health

A NEW HHMI PROGRAM AIMS TO INCREASE THE NUMBER OF BASIC RESEARCHERS WHO ARE CLINICALLY LITERATE.

IT ALL COMES DOWN TO A FRAME of mind. The best physician-scientists have it. Their laboratory research is aimed directly at benefiting human health.

A new HHMI program aims to instill that sensibility in Ph.D. students to expand the pool of investigators steeped in rigorous scientific techniques but also familiar with clinical practice. HHMI's Med into Grad Initiative recently awarded $10 million over the next 4 years to 13 innovative graduate-training programs that combine medical knowledge with basic science.

"The goal is to integrate clinical science and medical information so the students are trained to think about the relevance of what they do to health or disease, and to emphasize an understanding of how things work in the human body," says Martha K. Cathcart, a cell biologist and director of one of the new training programs at the Cleveland Clinic Lerner College of Medicine of Case Western Reserve University. *(continued on next page)*

Awards Bring Science to the Community

***A new HHMI grant** initiative will harness the resources of biomedical research institutions to increase public understanding of science and broaden access to science for people of all ages. These outreach efforts will be aimed at improving science education for elementary, middle school, and high school students. "**Research institutions** have unique resources for sparking an interest in science and transforming science education," says Jill Conley, director of HHMI's Precollege Science Education Program. "For example, they have modern research facilities, cutting-edge scientific knowledge, and the ability to offer authentic research experiences to students." **HHMI has committed** $22.5 million to fund about 30 grants for 5-year projects. Almost 300 nonprofit U.S. institutions have been invited to apply. They include medical schools, academic health centers, independent research institutions, and schools of veterinary medicine, dentistry, and public health. To deliver their programs, the research institutions may collaborate with community-based organizations, including school systems and science centers. Two previous competitions have awarded 96 grants totaling $33 million. **The outreach programs** will be directed at teachers, students, families, and others in the community. Research institutions can design activities in a variety of areas, such as building students' scientific skills; supporting professional development for teachers; improving scientific literacy among parents, caregivers, and others; involving undergraduate and graduate students and postdoctoral fellows in K–12 education; and developing science education resources. "**We want to nurture** students' fascination with the natural world when they're young and curious," Conley says. "This may happen in school, but we've also seen a positive correlation between students' science proficiency and the importance placed on science outside school." **HHMI will announce** the awards for biomedical research institutions in June 2007.*

Mike Sands, Case Western Reserve University

This new medical school was established in partnership between Case Western and the Cleveland Clinic Foundation to train physician-scientists. HHMI will support a Ph.D. program in its Department of Molecular Medicine, where an intensive "core curriculum"—classes in the fundamentals of basic and clinical research—will be taught during the students' first 15 months. Advanced coursework can be taken there as well and on Case Western's nearby campus. Students will be assigned a clinical mentor and a research mentor.

If a student wished to do her thesis research on the molecular and cellular biology of cardiac ion channels and how they relate to human diseases, Cathcart explains, she would be mentored by a clinical researcher in the Cleveland Clinic's Department of Cardiovascular Medicine. The student would attend biweekly conferences sponsored by the clinic's atrial-fibrillation group—cardiologists, cardiac surgeons, radiologists, electrophysiologists, geneticists, cell biologists, nurses, and social workers who share a common interest in cardiac dysrhythmias—to discuss challenging cases and the latest advances in clinical and basic research.

At the end of the semester, the student would make a presentation to the group focused on a relevant translational-research problem—such as development of new targeted therapies directed against specific cardiac ion channels or the use of genomic tools to identify novel genetic changes associated with heightened risk of atrial fibrillation. And throughout the semester, her mentor would bring her to specific clinical sites to observe clinicians and clinical researchers engaged in activities related to a disease of current interest.

Houston's Rice University is working with neighbor University of Texas's M.D. Anderson Cancer Center to train future biomedical engineers in drug design for cancer therapeutics, tissue engineering for reconstructive procedures following surgery, and imaging tools for early cancer detection. Students take five courses and then do clinical rotations in specialties such as diagnostic imaging, radiotherapy, and bone marrow transplantation. "Our goal is to get students to understand the challenges physicians face in their practice and how bioengineering can be clinically useful," says Rebecca Richards-Kortum, a bioengineer and HHMI professor at Rice University who codirects the program.

At Stanford University, first-year graduate students take basic biomedical science classes alongside medical-school students. They also attend seminars in translational medicine and do an intensive 1- to 2-month clinical rotation. In their second year, students pick labs and mentors for their thesis research. "With only an extra year-and-a-half of training," says neurologist Ben Barres, the program's director, "we can generate a group of basic researchers who understand what goes on in the clinical wards."

Among the key elements emphasized at the program of the University of Alabama at Birmingham (UAB) are techniques of modern drug discovery. By working alongside scientists at Birmingham's Southern Research Institute, "Students can learn firsthand what it takes to get a drug to the marketplace," says Thomas Clemens, a pathology professor at UAB and the program director.

These programs, as well as the others supported by the Med into Grad Initiative, aim to provide graduate students in basic sciences with the skills to take their own research findings and apply them to clinical situations. In that way, translating basic scientific discoveries into new medical treatments will be not only better but faster. ■ —LINDA MARSA

"The goal is to integrate clinical science and medical information so the students are trained to think about the relevance of what they do to health or disease."

MARTHA CATHCART