Rice University, in collaboration with the Texas Medical Center (TMC), has launched a multidisciplinary, biomedical training initiative to educate and train students to understand, address, and solve global health disparities.

The program, Beyond Traditional Borders, engages students and enhances learning by a guided process that culminates in an opportunity to design meaningful solutions that help people in underdeveloped countries.

In July 2006, the Beyond Traditional Borders initiative launched the outreach portion of its program, which is designed to prepare middle school and high school teachers and university educators in Houston and Monterrey, Mexico, to teach the course Bioengineering and World Health at their respective institutions.

“Beyond Traditional Borders promotes global health by giving educators innovative curriculum based on real issues that involve global health perspectives from psychology, sociology, philosophy, public policy, and religious studies, as well as science and engineering,” says Rebecca Richards-Kortum, the Stanley C. Moore Professor of Bioengineering and chair of the Department of Bioengineering. She also is a professor at Howard Hughes Medical Institute (HHMI).

Richards-Kortum adds: “The course has received approval from the Texas State Board of Education as a new course for state elective credit, and program leaders are working with the Houston Independent School District to teach Bioengineering and World Health at schools throughout Houston.”

Christiana Ichara, Pin Oak Middle School, demonstrates Pizza Pan Immunology for a class activity in the 2006 Professional Development Workshop.

Continued on page 2

Computer Science Camp (CS-CAMP) is a summer enrichment program at Rice University designed to interest high school girls in computer science and other related fields.

The 3-year-old program began in 2002 with a National Science Foundation (NSF) grant and now is managed under the auspices of Richard Tapia’s Center for Excellence and Equity in Education (CEE).

Tapia, University Professor and Maxfield-Oshman Professor of Computational and Applied Mathematics; Keith Cooper, chair of the computer science department; and Cynthia Lanius, who designed the camp, saw the need for a program to help reverse the declining enrollment of women in university-level computer science. The idea was to attack the problem at the high school level with interesting, challenging activities presented during a technological summer camp.

Computer science teachers from nine Houston Independent School District (HISD) high schools were recruited to participate in the summer 2003 program. Each teacher, working with counselors from their school, selected up to six female sophomore
Richards-Kortum pioneered the concept for the Beyond Traditional Borders program in 2001 with Michele Follen, director of the University of Texas Center for Biomedical Engineering, through teaching the course.

As part of the outreach program, educators participate in a four-week professional development workshop. The course provides an overview of contemporary technological advances to improve human health and opens with an introduction to the epidemiology and physiology of the major global health problems.

The inaugural class of teachers that attended the workshop this summer provided important feedback to adapt the curriculum to meet the diverse needs of middle and high schools and universities in the United States and abroad. Although space is limited for the workshop, Beyond Traditional Borders curriculum and program details will be available without cost at www.beyondtraditionalborders.org.

“Students want to experience science and learn by using hands-on materials. I couldn’t have been happier with the results.”

“I was expecting to learn something I could impart to my students, because they are always excited to learn new things, especially in an elective class,” says Christiana Ichara, a teacher at Pin Oak Middle School. “Students want to experience science and learn by using hands-on materials. I couldn’t have been happier with the results.”

Supported by a $2.3 million grant from HHMI, Beyond Traditional Borders is distinct in the way it unites expertise from Rice with clinicians and professors in the TMC.

In addition to Richards-Kortum, other members of the leadership team include Rice faculty members George Bennett, professor and chair of the Department of Biochemistry and Cell Biology; Jennifer West, the Isabel C. Cameron Professor of Bioengineering and director of the Institute of Biosciences and Bioengineering; and Kyriacos Zygourakis, the A.J. Hartsook Professor in Chemical Engineering and chair of the Department of Chemical and Biomolecular Engineering. A supporting team of 18 professors and clinicians from Rice and the TMC also contribute to the educational component.

—Shawn Hutchins
Writer/Web Coordinator
Department of Bioengineering
students to take part in the program. The teachers also attended the camp and acted as mentors for their students. This approach gave the girls skills to help them compete in computer science classes and also allowed them to build relationships with the teachers they would have at their home schools in the fall.

A goal of the program is for the participants to encourage other girls at their schools to take computer science, creating a more female-friendly environment. The hope is that enrollment in computer science classes at participating schools will become at least 50 percent female. Although this level of participation hasn’t been achieved, progress was made at some schools, thus continued activity is necessary.

Over the course of four summers, the camp has successfully served more than 100 high school girls and more than a dozen high school computer science teachers. Because a portion of the girls participated in several camps, the number of students at some of the sessions swelled to more than 40.

The structure of the camp has been modified slightly from year to year to accommodate the needs of the students, but the basic idea remains the same: to provide fun, challenging activities for everyone. Activities include computer program design, digital camera scavenger hunts, visits to Rice labs, building and operating robots, discussions with female professionals from the computer industry, talks from Rice professors and graduate students, disassembling and repairing computers, and a variety of team-building activities. The program often combines talks and discussions with lunch, creating a familial atmosphere for the camp.

Although the NSF-funding cycle is complete, the program is seeking further funding to continue at Rice. Plans include talks with other institutions, such as the San Diego Supercomputer Center, to scale the program elsewhere.

For more information, visit http://ceee.rice.edu/cs-camp/.

—Michael Sirois
Program Manager
CEE  

IMMERGING RICE STUDENTS INTO HOUSTON’S CULTURAL DIVERSITY

Rice’s Community Involvement Center conducted its first Urban Immersion program in 1995 to expose undergraduates to parts of Houston that they might otherwise never see during their four years at Rice.

Eleven years later, Urban Immersion is still committed to engaging students in meaningful service and introducing them to Houston’s cultural diversity.

This year, 21 incoming students elected to participate in the preorientation program. They took a week out of their summer to travel to Houston from across the country. The students spent six days volunteering at nonprofit agencies in and around the city, including an AIDS hospice (Omega House), the Houston Food Bank, the Houston Area Women’s Center, and the Galveston Bay Foundation.

In addition, Rice sociology professor Stephen Klineberg gave participants a broader context in which to understand their experiences. His lunchtime presentation outlined social change in the city and his work with the Houston Area Survey. Students also learned about the state of children’s healthcare in Houston from Anat Kelman of the Children’s Defense Fund.

During the evenings, students relaxed while enjoying the city’s rich cultural diversity. They watched a modern dance performance, attended a Shaolin Kung Fu presentation, and learned a few steps of international folk dancing. Participants also ate dinner at ethnic restaurants, sampling Ethiopian, Lebanese, and El Salvadoran cuisines.

Each night, the participants gathered in small groups to share their personal reflections on the day’s work. They also discussed their individual service in light of larger social issues such as homelessness, hunger, healthcare, and the environment.

The students came away from the week with a heightened awareness of social inequality in Houston. At the end of the program, each student made a commitment to help the community in some way during his or her time at Rice.

For more information about the Community Involvement Center, visit www.rice.edu/service.

—Christine Faulstich
Community Involvement Center

A Rice graduate student demonstrates a haptics experiment in Marcia O’Malley’s robotics lab for students participating in the summer program for high school girls.
TEACHERS LEARN ABOUT SCIENCE WHILE LOOKING FOR UNMARKED GRAVES

The Department of Earth Science hosted a summer program in which local teachers were taught to use geophysical data to look for unmarked graves in a derelict Fifth Ward cemetery.

Seventeen teachers from area schools participated in the program, representing grade levels from kindergarten through high school. The group spent five days in the field and five days in the classroom. The teachers used ground-penetrating radar (GPR) data, global positioning system (GPS) data, and ArcGIS software to create an interactive map of the cemetery.

“The purpose of the program was to allow teachers to experience the process of science first-hand,” says Alison Henning, director of the program and lecturer of earth science. “The teachers visited the cemetery, devised their own questions, and designed GPR experiments to answer those questions.”

Evergreen Negro Cemetery is located at the intersection of Market Street and Lockwood Drive in the Fifth Ward, just east of downtown Houston and about a 10-minute drive from the Rice campus. The cemetery dates back to the late 1800s and has been abandoned for many years. There are no records of current ownership or the burials that took place there, and large areas without headstones suggest there may be numerous unmarked graves.

The group collected GPR data to look for subsurface anomalies that could represent unmarked graves. GPR sends radar waves into the ground and records their reflections at the surface, so the data is collected without disturbing the ground. The GPR record showed many anomalies that probably indicate unmarked graves at the cemetery.

In addition, the GPR data was used to locate old Market Street, which ran through the middle of the cemetery in the early 1900s.

The final product of the summer program was an interactive map containing locations of the existing 300 headstones and 15 GPR lines, along with a written report. This information will be given to a local nonprofit group to aid its cemetery restoration efforts. And most importantly, the teachers experienced the process of science firsthand.

“Whenever you can do something as opposed to just reading about it, you learn more and it’s more enjoyable,” says Lucy Condon, a Houston Independent School District teacher. “It was great that we were also able to make a contribution to the community.”

—Alison Henning

Lecturer of Earth Science

Department of Earth Science

RICE SCIENCE LAB EXTENDED TO SANCHEZ ELEMENTARY SCHOOL

For more than 15 years, Rice University’s Center for Education has partnered with the Houston Independent School District (HISD) to provide professional development to teachers in science content, pedagogy, and teacher leadership. This fall, the middle and high school Rice Model Science Lab programs were extended to the elementary level.

Wallace Dominey, K–12 science outreach director of the Center for Education, and Cheryl Stephens, HISD director, lead this new project, which is housed at Sanchez Elementary School. The Rice/HISD Elementary Model Science Lab (REMSL) aims to ensure that all HISD elementary students receive an exemplary science education. To help support this endeavor, approximately 100 elementary teachers, referred to as interns, receive professional development in science content knowledge, research-based teaching strategies, and teacher leadership.

Interns attend the REMSL one day each week for the entire academic year. Lab activities, led by C. J. Thompson, REMSL associate director, focus on enriching life, physical, and earth/space science content and provide a working knowledge of effective K–12 science instructional strategies as identified by the Texas Science Initiative of the Texas Education Agency. The other four days of the week, interns work their regular teaching assignments. Reid Whitaker, REMSL associate director, and Sandy McClemore, HISD campus support specialist, provide campus support to translate REMSL derived knowledge into effective classroom practices.

The mission of REMSL, like the other two Rice/HISD science teacher training labs, is to help teachers provide the type of science instruction to develop the young minds of today into the science and technology leaders of tomorrow. REMSL is funded by Rice’s Center for Education, HISD, the Teacher Quality Grants program of the Texas Higher Education Coordinating Board, and the Texas Regional Collaboratives for Excellence in Science Teaching.

—Wallace Dominey

K–12 Science Outreach Director

Center for Education
SELECTING THE RIGHT MATCH

The Nominators Circle was initiated in 1998 to help Rice University reach out to underrepresented students. The circle includes a select national network of K–12 teachers, counselors, administrators, and community leaders, who help identify students who are excellent matches for Rice. Administered by the Office of the Associate Provost in partnership with the Office of Admission, the program is part of Rice’s commitment to educational diversity and provides a vehicle for outreach and recruitment.

Each fall, a new group of 16 to 18 educators is selected to join the circle. The process involves a two and one-half-day visit to Rice for an orientation workshop that includes interacting with deans, faculty, and senior administrative officials and meeting with students and touring the campus. They also attend classes and tour select areas in Houston. Participants learn about the Rice admission and financial aid process, as well as international study abroad programs.

The Rice Nominators Circle added 17 educators in November, bringing the total to 150 members located in 40 cities across the United States, including many in the Greater Houston area.

For the Class of 2010, “nominated” students were admitted at a 57 percent rate, which is more than twice the regular admit rate of 24 percent. “Our challenge moving forward is to double our efforts to encourage more of those admitted to choose Rice,” says Roland B. Smith, associate provost.

For more information concerning the program, contact Sharon Bush, educational outreach administrator in the Office of the Associate Provost, at 713-348-4351 or send email to bush@rice.edu.

—Roland B. Smith
Associate Provost
Education Outreach

—Sharon Bush
Administrator
Educational Outreach

HIGH SCHOOL STUDENTS LEARN ABOUT SCIENCE AND COLLEGE LIFE

The Institute of Biosciences and Bioengineering (IBB) sponsors summer internship programs for high schools students to introduce them to the newest fields in science and engineering and expose them to the college experience.

For the past 15 years, Rice University and the South Texas Independent School District have been working together to provide opportunities for the Science Academy of South Texas, a science and technology magnet high school in Mercedes, Texas.

The Science Academy is a public high school geared to math, science, and technology studies. The students who come to Rice from the academy are between their junior and senior year and are primarily interested in pursuing math, science, medicine, or engineering in college.

Students from Houston’s Milby High School and the YES College Preparatory School also have participated in this summer internship program for the past 14 years. The two-week program had been sponsored by federal and private corporation grants, but IBB took over sponsorship in 2004.

Summer internship programs are designed to expose students to the college experience and to show them what current science fields have to offer. While at Rice, students attend lectures and lab tours conducted by faculty, postdoctoral fellows, research staff, and graduate and undergraduate students. They also visit industry facilities at NASA, Shell, and Texas Instruments, as well as the Houston Museum of Natural Science and Baylor College of Medicine.

The program features interactions with mentors, who are graduate students in the biosciences and bioengineering at Rice. The students attend several communications workshops directed by Mary Tobin, a lecturer in English, which teach the writing and public speaking skills necessary for the college application process.

Participating students value the internship for reaffirming their desire to study science and engineering and for preparing them for college.

This year, with help from Anne Papa- konstantinou, director of the Rice University School Mathematics Project, the IBB added six hours of hands-on mathematics enrichment projects for Milby High School and YES College Prep School. Josef Sifuentes and Chantal Edwards, graduate students in the computer and applied mathematics department, prepared three two-hour sessions for the students. The sessions included an experimental exercise combing blocks of different lengths; a traditional lesson involving probability and statistics; and another lesson on probability, using the popular TV game show Deal or No Deal.

Participating students value the internship for reaffirming their desire to study science and engineering and for preparing them for college.

One of the most popular features of the program is the physics demonstration conducted by Barry Dunning, the Sam and Helen Worden Professor of Physics, and his colleagues. This year, biochemistry and cell biology lecturer Alma Novotny’s “Balloon Project,” which develops and tests hypotheses, also was added to the program to the thorough enjoyment of the students.

—Diana Welch
Associate Director
IBB

—Sharon Bush
Administrator
Educational Outreach
MATHEMATICS TEACHERS EXPAND THEIR KNOWLEDGE

For the third year, the Rice University Mathematics Leadership Institute (MLI) is providing high-quality professional development for high school mathematics teachers in the Greater Houston area.

Funded by a $3.8 million grant from the National Science Foundation, MLI is a five-year project that collaborates with the Rice University School Mathematics Project (RUSMP) and Rice’s Departments of Computational and Applied Mathematics, Mathematics, and Statistics. The Houston and Aldine Independent School Districts also collaborated in the project. MLI builds on RUSMP’s 20 years of experience in offering mathematics professional development.

In MLI’s first two years, a cohort of 36 high school lead mathematics teachers participated in an intensive month-long Summer Leadership Institute, where they deepened their mathematics knowledge, teaching methods, and understanding of current research in mathematics education. They also developed leadership and adult-education skills.

During the second summer, graduate students from the three Rice mathematics departments taught the mathematics strand, which provided an opportunity for the graduate students to hone their own teaching practices. Lead teachers were challenged to do mathematics as university mathematicians do. In addition, Rice faculty made presentations on mathematics topics and diversity.

When they return to school, lead teachers are given time to work with mathematics teachers, particularly with novice and struggling instructors. Through a “model classroom,” lead teachers show how to implement effective mathematics instruction techniques.

For more information, visit http://nsfmlri.rice.edu/.

—Richard Parr
Director of Educational Technology and Secondary Education
RUSMP

—Jackie Sack
Compliance Visiting Scholar
RUSMP

NANOKIDS COLLABORATES WITH TEJANO CENTER

Rice University’s NanoKids development team is collaborating with the Tejano Center for Community Concerns to develop a program that will teach minority students of all ages the benefits of nanoscale science and engineering.

In the next three years, the Tejano Center, led by Richard Farias, president and CEO, is planning to build a high school for Hispanic students interested in nanotechnology and engineering. The partnership between the Tejano Center and NanoKids is the first step in creating the school.

The purpose of NanoKids Hispanic Outreach is to inform Hispanic communities about nanoscale science and technology. The NanoKids Hispanic Outreach project was launched in early 2006 by establishing hubs in San Angelo, Houston, and Brownsville. Supporters of the project include State Representative Ana Hernandez, Harris County Commissioner Sylvia Garcia, Houston City Council Member Adrian Garcia, and Felix Fraga of the Neighborhood Centers, Inc.

There are nine adult workshops scheduled for the next nine months. Also, Galena Park Independent School District (GPISD), with an 80 percent Hispanic enrollment, is sponsoring four adult and student workshops this fall as well as implementing the NanoKids instructional materials into all seventh and eighth grade classes. Thirty-two Galena Park middle school teachers attended a six-hour workshop in the use of the instructional materials, and approximately 3,100 Galena Park middle school students will enjoy the NanoKids experience in the classroom.

For the second consecutive year, about 3,500 eighth grade students at Spring Independent School District (SISD) will be using the NanoKids instructional materials. Teresa Green, director of science at SISD, has joined the NanoKids’ curriculum development team along with David Fillman from GPISD; Christine Nassar, secondary science director of Mobile County Public Schools in Mobile, Alabama; and Scott Barber of the Berea City School District in Berea, Ohio.

Also joining the NanoKids advisory board are Kelly Hurt of the Chickasaw Nation, as well as Sharon Smith, director of Advanced Technology for Lockheed Martin Corporation; and Sara Selber, president of Prepared 4 Life.

For more information, visit www.nanokids.rice.edu/.

—Suzanne Lamminen
Project Development Producer
NanoKids
IMMIGRATION SHAPING THE FUTURE OF HOUSTON

Houston's burgeoning ethnic diversity is a source of great strength for the city, says Rice sociology professor Stephen Klineberg.

In his lecture, titled "Houston's Hispanic Communities: Tracking the Demographic and Attitudinal Changes Through 25 Years of Houston Surveys," Klineberg reported on the effects immigrants have had on the city and on Houstonians' view of the new immigration.

Klineberg spoke to members and guests of the Houston Association of Hispanic Media Professionals (HAHMP), which included news anchors, reporters, news directors, and the general managers of nearly all the local television stations and newspapers, July 14 at Rice University. The Office of Minority Community Affairs hosted the event, which is held once a year for HAHMP and general managers to discuss issues that are important to Houstonians. The topic of immigration is enormously important in shaping a prosperous future for the city.

Klineberg has received nine major teaching awards at Rice. He and his students initiated the Houston Area Survey in 1982, and it has received generous funding from numerous donors, including support for two postdoctoral fellows. The research also is one of the very few in any city to include systematic interviews with all of the Asian communities.

"If this region is to flourish," Klineberg says, "it will need to grow into a much more inclusive multiethnic society, where all of its communities are invited to participate as full partners in shaping Houston's future."

—Lilia Fabry
Staff Assistant
Minority Community Affairs

SIX HOUSTON HIGH SCHOOL STUDENTS GET A TASTE OF COLLEGE LIFE AT RICE UNIVERSITY

Rice University accepted six Houston-area high school students to the second annual Rice for High School Students: College Credit in the Summer Program, administered by the Susanne M. Glasscock School of Continuing Studies. Of the six, two achieved the highest grade in their Rice course.

The program permits rising high school juniors and seniors to take one course in Rice’s regular summer school alongside college students from Rice and other institutions. With more than 20 courses offered in a variety of subjects, including math, science, and English, participants have the opportunity to register for a course of their choice.

Students admitted to the program represented five area high schools: Barbara Jordan High School for Careers, Klein Forest High School, Strake Jesuit College Preparatory, Stratford Senior High School, and Elkins High School.

Two students received scholarships to cover the cost of the course. One of the scholarship recipients, Fernando Chavez of Barbara Jordan High School for Careers, says he now has a better understanding of what college academic life is like. "I also came out feeling more confident going into the AP courses offered at my high school," he says. "I recommend this program to anyone who is serious about going to college."

“I HOPE THIS PROGRAM CONTINUES FOR MANY YEARS TO COME AND CONTINUES TO OFFER STUDENTS LIKE ME THE BOOST THEY NEED TO MAKE A BETTER DECISION AT THIS CRUCIAL POINT IN LIFE.”

“I hope this program continues for many years to come and continues to offer students like me the boost they need to make a better decision at this crucial point in life,” Chavez says.

Information on this program can be found at www.scs.rice.edu/rhs or by calling 713-348-4803.

—Kristal Scheffler
Marketing Specialist
Susanne M. Glasscock School of Continuing Studies

The high school students who participated in the Rice summer program earned college credits. Of the six, five are pictured above L–R (back) Nicholas Young and Bich Hong Do; L–R (front) Jonathan Hernandez, Erin Sparck, and Fernando Chavez.
JUMPING TO TEACH CLASSICAL MUSIC

Rice University’s Shepherd School of Music is JUMPing with excitement for in-reach opportunities.

The mission of the Just for U Music Program! (JUMP!) is to introduce classical music to school students through fun, interactive concerts. The program uses the in-reach concept, which is an outreach program conducted in house. JUMP! offers six concerts a year at Rice for school groups and senior citizens.

This fall, JUMP! will perform a concert called Captured in Sound, featuring collaborative compositions of children’s and Shepherd School students’ works. Young artists will submit poems, stories, and paintings to Shepherd School composition students, who will in turn write a piece to exemplify the artwork in sound.

Other program events include Music of the Night, a concert about the nighttime for a younger audience; and Show Me Your Style, a compare and contrast event with two dueling piano trios, one from the 20th century jazz tradition and another from the time of Mozart and Beethoven.

Shepherd School students founded JUMP! in 1998 and have since participated in many concerts. Concerts range from a student-led Renaissance instrument demonstration to a “jam session” with faculty members.

Faculty and guest artists such as musician Frank Proto; Marie Speziale, Rice professor of trumpet and chair of brass; and Karim Al-Zand, Lynette S. Autrey Assistant Professor of Composition and Theory at Rice, have contributed to the concerts with their compositions and performances. For example, Al-Zand’s Animal Sounds, is an interactive experience that encourages students to move their hands in crawling and bouncing motions when they hear sounds representing ants and grasshoppers. Frank Proto’s The Creatures in Room 642 is a presentation about a closed-off room no one has ever seen, located on the top floor of a school.

The students conducting JUMP! concerts have continued with professional outreach programs in other parts of the country, including with Tales and Seals, a storytelling chamber music group, and through educational programs with the Pittsburgh Symphony.

For more information, visit the program’s website at www.rice.edu/jump. If you are interested in attending concerts or supporting the not-for-profit program, contact JUMP! at jump@rice.edu.

—Abigail Jones
Graduate Student in Bassoon Performance
Shepherd School of Music