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## Inside this issue

Vaccines can forego refrigeration with a new silk stabilizer...p. 2

FOGARTY INTERNATIONAL CENTER • NATIONAL INSTITUTES OF HEALTH • DEPARTMENT OF HEALTH AND HUMAN SERVICES

## Latest science advances discussed at AIDS 2012

More than 20,000 HIV/AIDS experts and advocates are convening in Washington to discuss progress and challenges at the AIDS 2012 international conference. The NIH, the world's leading funder of HIV/AIDS research, is the local scientific partner for the meeting, convened by the International AIDS Society.

NIH scientists and grantees are presenting their latest discoveries at the weeklong event. The topics include various advances in prevention, research to improve treatment outcomes—including management of co-infections—and possible approaches toward a cure.

"We are gathering at a defining moment in the AIDS epidemic where the science tells us we can turn the tide on HIV," according to a welcome message from the event's co-chairs. "Scientific advances are also propelling forward the efforts to find a cure and vaccine for HIV. AIDS 2012 will unite science, community and leadership from around the globe to develop strategies and mobilize support for translating new evidence into meaningful action that



reflects HIV's complex web of social, human rights and political issues."

The conference theme, Turning the Tide Together, captures the current sense of hope and renewed optimism that a change of course in the HIV epidemic is possible, the organizers note. It also serves as an urgent call to action.

## USAID, NIH launch program to improve child health

To help end preventable child deaths in developing countries, the USAID and the NIH have jointly announced a new grant program called Partnerships for Enhanced Engagement in Research (PEER) Health. Each award will provide up to \$450,000 over three years to support collaborations that address research-to-practice barriers, while building professional capacity and more closely linking USAID missions with local health and research institutions. The number of awards is subject to the availability of funds.

In addition to accelerating the reduction of under-five child mortality rates, the USAID Indonesia mission is seeking to support awards to Indonesian scientists to engage in implementation research in neonatal survival, tuberculosis and emerging infectious diseases.

The announcement follows on the heels of the Child Survival: Call to Action held in June 2012, and extends the PEER Science program, launched last year.

The National Institute of Child Health and Human Development (NICHD) at the NIH will support the review of proposals. Fogarty and NICHD staff consulted with USAID to formulate the program.

Pre-proposals are due August 31, 2012 for all countries except Indonesia.

### RESOURCES

Application details: [www.nationalacademies.org/peerhealth](http://www.nationalacademies.org/peerhealth)

Call to Action website: <http://5thbday.usaid.gov>

## FOCUS



### AIDS International Training and Research Program (AITRP)

- Building research capacity in the developing world for 25 years
- Fostering international research collaborations
- Contributing to key HIV/AIDS science advances

Read more on pages 6 - 13

# NIBIB marks decade of innovation

A decade of innovation was celebrated as the National Institute of Biomedical Imaging and Bioengineering (NIBIB) marked its tenth anniversary with a symposium and technology showcase on the NIH campus.

The NIBIB was established to carry out and support research that would improve the detection, treatment and prevention of disease. By assembling diverse teams of scientists and engineers, NIBIB has fostered cutting-edge medical therapies and technologies.

One of the Institute's priorities highlighted during the symposium was the development of low-cost technologies that can improve health in low-resource settings. One product demonstrated was a battery-powered, portable, fiber-optic microscope that is bringing quick and accurate cervical cancer screening to women in China and Botswana. Women with HIV are particularly at risk but are often not diagnosed until the cancer is advanced. "Right at the point of care, you can have a diagnosis that is an accurate diagnosis and enables immediate outpatient therapy," according to Dr. Rebecca Richards-Kortum of Rice University, who developed the technology with NIBIB funding. Meanwhile, a palm-sized ultrasound imaging system—produced by General Electric with support from NIBIB—is helping identify medical problems in Tanzania and rural India.

Courtesy of Rice University



To mark its 10th anniversary, the NIH's National Institute of Biomedical Imaging and Bioengineering celebrated innovative projects it has supported, such as this portable, battery-powered fiber-optic microscope that provides accurate cervical cancer diagnoses in remote settings.

In recognition of the NIBIB's many accomplishments, the U.S. Senate unanimously passed a resolution marking the anniversary. "The NIH is an engine in America's innovation economy," said Senator Barbara Mikulski, who represents Maryland. "And it is a hope for those with loved ones suffering from a disease or condition that has no cure. I'm proud to support research and innovation at the NIBIB creating new treatments and cures to save lives and keep families healthy."

## RESOURCES

Website: [www.nibib.nih.gov](http://www.nibib.nih.gov)

Video of portable fiber optic microscope: <http://bit.ly/MaK5er>

Video of portable ultrasound scanner: <http://bit.ly/OLQWK6>

# Silk product may eliminate need for vaccine cold chain

A new silk-based stabilizer may eliminate the need to refrigerate vaccines and antibiotics, according to NIH-funded researchers. The new product could pave way for enhanced delivery and storage in low-resource countries, eliminating the need to provide a cold chain during transport to the clinic.



Medicines often need to be refrigerated to prevent alteration of their chemical structures, which can render them ineffective. By immobilizing their bioactive molecules using silk protein matrices, researchers were able to protect and stabilize both live vaccines and antibiotics when stored at

at temperatures of 140 degrees Fahrenheit for extended periods of time.

The research was conducted in the lab of Dr. David Kaplan

at the Tufts University School of Engineering and supported by the NIH's National Institute of Biomedical Imaging and Bioengineering.

Keeping medications cold from production until they are used in treatment is a costly process, accounting for as much as 80 percent of the price of vaccinations. Failures in the cold chain result in the loss of nearly half of all global vaccines, according to researchers.

"New studies are already under way," Kaplan reported. "We have already begun trying to broaden the impact of what we're doing to apply to all vaccines. Based on what we've seen with other proteins, peptides and enzymes, there's no reason to believe that this wouldn't be universal. This could potentially eliminate the need for a cold-chain system, greatly decreasing costs and enabling more widespread availability of these lifesaving drugs."

## RESOURCES

News release: <http://1.usa.gov/MkpP6q>

Courtesy of Tufts University



# Vaccines must reach more children

Photo by P. Virel/WHO



Many children in developing countries do not yet have access to life-saving vaccines. The GAVI Alliance, a private-public partnership, raises funds to supply vaccines and since 2000 has reached more than 326 million children.

Photo by Ernie Bronson, NIH



Dr. Seth Berkley

The power of vaccines to prevent deaths is immense, especially in children, and access must be extended globally, particularly in sub-Saharan Africa and Southeast Asia, said Dr. Seth Berkley, CEO of the GAVI Alliance that works to improve vaccine access in low- and middle-income countries.

“Vaccines have helped bring a huge decrease in child deaths,” he said, noting that annual deaths fell to 7.6 million in 2010 from 12 million in 1990. “But 7.6 is 7.6 too many. Twenty-one thousand children die every day.”

Berkley recently spoke at the NIH’s John Ring LaMontagne Memorial Lecture. Immunizing children and preventing illness has numerous benefits, aside from directly protecting the child, he said. These include:

- Healthy children do better at school
- Families have fewer out-of-pocket expenses
- Parents lose less work time and income caring for sick children
- Couples conceive fewer children if they expect them to survive to adulthood

The two largest killers of children in the world’s 73 poorest countries are pneumonia and diarrheal diseases, at 24 percent and 18 percent of all deaths, respectively. Yet vaccines exist to protect against both, Berkley said, noting that GAVI has made supplying these vaccines—pneumococcal and rotavirus—its top priority. For instance, the group plans to have provided the rotavirus vaccine to 50 million children by 2015.

In its program to date, GAVI has orchestrated the vaccination of more than 325 million children. To extend this number, the group continues to arrange special pricing plans with manufacturers and to enlist the help of officials in the affected countries. Vaccination programs, when established, can be “a wedge into the health system and strengthen outreach” for other health programs, he said.

However, GAVI’s vaccine program faces many challenges, not least in vaccine costs. Other threats include disinformation circulating on the Internet that scares people away from vaccines and a potential ban on mercury by the United Nations, which would affect mercury-derived thimerosal currently used as a low-cost preservative in some vaccines.

Overcoming the obstacles to universal access to immunization will require the political will to make vaccine access a right for every child, to spur innovations in vaccine delivery and to ensure support from finance ministries to prioritize vaccines in national budgets, Berkley said.

The John Ring LaMontagne Memorial Lecture honors contributions to the NIH and public health made by LaMontagne during his 30-year career with the National Institute of Allergy and Infectious Diseases.

## GAVI vaccines reach more children

The GAVI Alliance continues to increase the number of children who have access to vaccines that can save their lives. By the end of 2011, it reported the following:

- 296 million children were immunized against hepatitis B
- 124 million children were protected against Haemophilus influenza type b (Hib), the virus that causes deadly forms of meningitis and pneumonia
- 54 million children have received yellow fever vaccine
- 50 million children will receive rotavirus vaccines in 40 countries by 2015

## RESOURCES

Videocast: <http://bit.ly/NkenFw>

Website: [www.gavialliance.org](http://www.gavialliance.org)

# NIH marks 125th anniversary with tribute to founder

As NIH marks its 125th anniversary in August, the agency is remembering its founder and humble beginnings as a one-person, one-room “Hygienic Laboratory” on New York’s Staten Island.

Dr. Joseph J. Kinyoun, an early pioneer of international research collaborations and a key figure in the annals of medicine, is not widely known today. As a physician in the Marine-Hospital Service (MHS)—the precursor of today’s U.S. Public Health Service—Kinyoun founded the Hygienic Laboratory in 1887 to diagnose cholera, plague, smallpox and other infectious diseases prevalent among immigrants seeking to enter the U.S.



Dr. Joseph James Kinyoun around the time of his 1886 entry on active duty in the Marine-Hospital Service.

In this modest facility, Kinyoun laid the foundation for what today are 27 institutes and centers of the National Institutes of Health. However, few people recognize Kinyoun’s legendary contributions or the hardships he endured as a result of his work. In a review published recently in the journal *mBio*, two NIH researchers aim to change that.

“Dr. Joseph Kinyoun was a central character in shaping the medical research enterprise of today,” said Dr. Anthony S. Fauci, co-author and director of the NIH’s National Institute of Allergy and Infectious Diseases. “Before disciplines such as microbiology and epidemiology emerged, Kinyoun used his ingenuity to discover creative ways to save lives and improve health.”

Co-author Dr. David M. Morens, an epidemiologist and senior adviser to Fauci, led the effort to dig into the historical record to uncover previously untold stories that enrich Kinyoun’s legacy.

During the 12 years he directed the MHS lab, Kinyoun followed closely the rapid breakthroughs in microbiology, traveling to Berlin to collaborate on tuberculosis studies and visiting Louis Pasteur’s lab in Paris to learn how to

Photo courtesy of the National Cancer Institute/NIH



In 1887, Dr. Joseph Kinyoun set up his one-room Hygienic Laboratory on Staten Island, New York, to research cholera and other infectious diseases. This was the early beginnings of what is now the NIH.

produce the rabies vaccine, among other things. Kinyoun brought new reagents, techniques, protocols and ideas back to the Hygienic Laboratory, which by then had been moved to Washington, D.C. His international research partnerships included studies of the recently identified plague bacillus, the diphtheria antitoxin and other novel biological agents.

In 1899, Kinyoun was abruptly reassigned to San Francisco to prepare for the anticipated—and much feared—emergence of plague in the U.S. Instead, he became a scapegoat, the article’s authors recount. From the start, Kinyoun met resistance from business leaders and politicians, who were concerned that federal interference would hurt the economy and stir up public fear. For two years, Kinyoun headed efforts to improve sanitation, prepare quarantines and minimize the potential for the spread of plague. When he confirmed the first case in California in March 1900, the governor alleged that Kinyoun fabricated the information, legislators called for his hanging and local residents fought against quarantines. Two months later, with 11 plague cases confirmed and many more suspected, Kinyoun, with the support of President William McKinley, declared an epidemic. Opponents placed a bounty on Kinyoun’s life, forcing him to carry a loaded pistol for self-protection.

Kinyoun had many opportunities to fight his detractors and clear his name, but instead he remained patient, continued his work—sometimes under an alias—and eventually was exonerated. By 1904, 121 people in San Francisco had been diagnosed with plague and nearly all of them had died.

“We should never forget the perspective that Kinyoun brought to the role of scientist: a sense of wonder and the pursuit of substantive answers,” said Morens.

## RESOURCES

News release: <http://1.usa.gov/MOYFXX>

Full article: <http://bit.ly/M9d6BV>

Website: <http://1.usa.gov/LCSolT>



## DR. KEN BRIDBORD



*Twenty-five years ago, as he witnessed the devastation of HIV/AIDS on the developing world, Dr. Ken Bridbord came up with a new concept to create in-country expertise in the regions where the need was greatest. Bridbord—Fogarty’s Director of the Division of International Training and Research—conceived an innovative program consisting of mentored research projects, in addition to formal coursework. The AIDS International Training and Research Program has since trained more than 2,000 scientists and clinicians in more than 100 developing countries.*

### How did Fogarty’s AIDS International Training Program (AITRP) come about?

My inspiration for AITRP began with conversations I had during the international AIDS meeting in Washington, D.C. in June 1987. While we knew much less then about infection rates and spread than we do today, it was clear to all of us that to really tackle the problem we would need to enter into a partnership with colleagues in those countries hardest hit. The release of the Institute of Medicine report, *Confronting AIDS*, also had a profound impact on my thinking about what our responsibilities as a wealthy nation should be in response to a growing global epidemic largely impacting poorer populations.

### What is unique about the program?

AITRP aims to teach research by engaging its trainees in actual research projects designed to address the issues that are most pressing to that country’s health problems. The program takes a systematic approach to training and research capacity strengthening, combining both short- and long-term training with support for research conducted in the participants’ home countries. AITRP is designed to build enduring scientific partnerships between both the participating institutions and the individuals. It also provides critical support so research can be continued at home once training is completed, which helps prevent brain drain. The long-term nature of the capacity building process was recognized from the beginning of AITRP, but is even better appreciated today. It’s clear that building sustainable international research and public health capacity requires an investment measured in decades, not years.

### What has it accomplished?

AITRP’s success is built primarily upon the energy, talent and commitment of the numerous foreign trainees and their U.S. teachers. Through AITRP, these two groups of people became scientific colleagues. Trainees who have returned home have ample opportunity to continue the mentorship process with former teachers becoming, over time, true and equal collaborators with their former professors. Trainees also have opportunities to return to the U.S. for shorter-

term training and continuing education in modern research techniques or to obtain specialized skills. Eventually, trainees who have returned home and established their research and public health careers become mentors for new trainees, and so the process continues. Many of the scientific advances—preventing mother-to-child transmission, therapy as prevention, and the benefits of microbicides and male circumcision—have been discovered by research teams led by or including former trainees.

### What is the significance of in-country expertise?

AITRP would not have succeeded if it did not provide skills and support for research that is responsive to the needs and priorities of the collaborating countries. The program has emphasized the support of research to include prevention and development of interventions that are realistic, practical and affordable for the collaborating countries. Perhaps no single word captures the essence of AITRP more than empowerment. AITRP trainees are empowered with the knowledge, experience and increased confidence to return home and become scientific and public health leaders in the struggle against HIV/AIDS. This empowerment enables former trainees to be on a par with scientists from the developed world and—armed with this knowledge—returning trainees help their countries to craft and implement locally relevant strategies tackle HIV/AIDS.

### How does AITRP benefit other U.S. activities?

Fogarty’s AITRP and other research capacity building programs complement and expand on the major research investments of the other NIH components. At the start, AITRP awardees were immediate beneficiaries of the NIH’s considerable grantmaking investments in AIDS research. Over time, NIH research programs have become the beneficiaries, as former AITRP trainees became the major foreign collaborators on numerous NIH-supported research projects. In addition, they have gone on to lead projects supported by the Bill & Melinda Gates Foundation, the Elizabeth Glaser Pediatric AIDS Foundation, the World AIDS Foundation and others. There is still much to be done but I’m confident the talented AITRP alumni are well-equipped for the challenge.

## Celebrating 25 years of research training to combat HIV/AIDS

**T**urn back the clock 25 years and research laboratory equipment in some developing countries amounted to no more than a mirror and a light microscope sitting on a desk. As a result, it was not uncommon for so-called “parachute scientists” from the U.S. or Europe to drop in for a quick visit to collect data and samples and take them home for analysis. Today, the scene looks much different, with well-trained local researchers using cutting-edge equipment and working as equal partners in collaboration with their counterparts around the world.

Driving this dramatic change has been a devastating catalyst: the HIV/AIDS epidemic. To date, more than 30 million people have succumbed and more than 34 million are infected, according to the WHO. Sub-Saharan Africa has borne the heaviest burden, virtually losing a generation and now harboring two-thirds of all people in the world living with the disease.

From the start, scientists recognized that research into this mysterious new disease was badly needed, not only in the developed world, but also in countries with different experiences in transmission, testing and patient care. But there was an enormous barrier: the lack of research capacity in areas most severely hit by the epidemic.

### An idea for a novel program takes shape

Moved by the scale of the epidemic, Fogarty’s Dr. Ken Bridbord took action. He sketched out a novel research

*Reacting to the alarming spread of AIDS around the world, Fogarty created a unique grants program to build sustainable research capacity around the globe.*



Photo by David Snyder for Fogarty/NIH



*More than 2,000 physicians and scientists in 100 developing countries have received training through Fogarty’s novel AIDS International Training and Research Program (AITRP).*

training program that would arm promising developing country scientists with skills in epidemiology, lab techniques, ethical research practices and data analysis—in addition to subject matter expertise in HIV/AIDS and related diseases. The trainees would remain engaged in research studies of importance to their own communities and receive support to continue their projects when they returned home, a feature designed to prevent brain drain and ensure their expertise was deployed where it was needed most.

**“AITRP trainees are empowered with the knowledge, experience and increased confidence to return home and become scientific and public health leaders in the struggle against HIV/AIDS.”**

– DR. KEN BRIDBORD, Fogarty International Center

The AIDS International Training and Research Program, known as AITRP, began in 1988 and has since provided significant research training to more than 2,000 individuals from more than 100 countries. (See related article on page 5.) It is now managed by program officer Dr. Jeanne McDermott.

One U.S. investigator recalls the void in which AITRP germinated. “We got a lot of samples from different places in Africa and Asia and brought them to Boston for testing, because there was no way to test them there—they didn’t have the equipment or personnel, didn’t have the tests,” said Dr. Max Essex of the Harvard School of Public Health. Essex received one of the first AITRP grants, as did other investigators cited in this article.

Photo by Trevor Samson/World Bank

The stories in this section were written by Cathy Kristiansen



Fogarty's approach was groundbreaking and helped to build the level of expertise necessary for sustained research efforts to study the HIV/AIDS epidemic on the ground in the locations where suffering was greatest. AITRP alumni returned home not only to conduct research projects critical to their home countries but also to train others, adding to the impact.

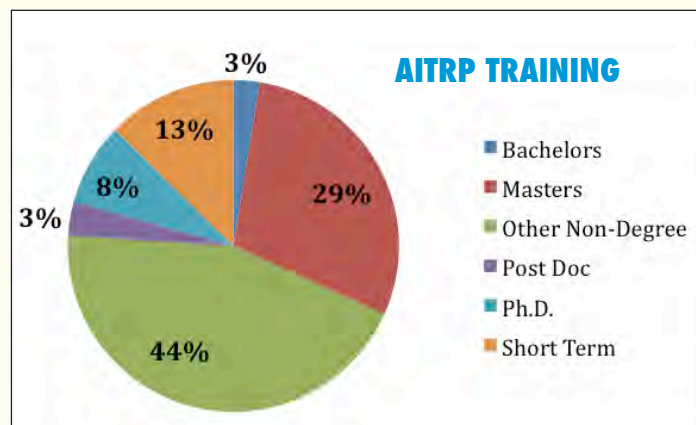
"It was clear we needed to enter into a partnership with colleagues in countries hardest hit," said Bridbord, now director of the Division of International Training and Research at Fogarty. "Perhaps no single word captures the essence of AITRP more than empowerment. AITRP trainees are empowered with the knowledge, experience and increased confidence to return home and become scientific and public health leaders in the struggle against HIV/AIDS."

Fogarty's new approach was not universally embraced. "There was a lot of skepticism about the logic of this kind of support, would it work in a country like, say, Haiti," said Dr. Warren Johnson, a longtime AITRP grantee at Weill Cornell Medical College. "It was visionary."

Johnson's partner in Haiti, Dr. Jean "Bill" Pape, founder and director of GHESKIO, said AITRP has been essential to his country's response to the HIV epidemic. "At our site, we rest on three legs: research, training and services. They are all interrelated and one makes the other one stronger. So it is through research that we find results, it is through training that we expand the results, and the services get the benefit of both the research and the training. And Fogarty has been instrumental in all three aspects."

### A cadre of developing country scientists is trained

Under the program, developing country trainees were selected to come to the U.S. grantee institutions to learn



Source: Fogarty's CareerTrac system. Data are incomplete, but give a snapshot of the more than 2,000 people trained under the AIDS International Research and Training Program.

from experts and work in well-equipped laboratories. Training courses were short- or long-term and covered many different levels and topics, including master's and doctoral degrees, laboratory skills, proposal and paper writing, epidemiology, biostatistics, ethics and HIV/AIDS-related biology.

"The training provided people with a skill set that they didn't have before, how to approach and analyze a problem, design a study, choose the right study, conducting perhaps more quantitative epidemiologic types of research," said Dr. Art Reingold, who manages an AITRP grant at the University of California, Berkeley School of Public Health. "We also stressed the ethical aspects of research and encouraged a more questioning, intellectually stimulating approach in general."

Another unique aspect of AITRP was how it encouraged trainees to exercise their new skills back at home. After their education in the West, many scientists face the

*Fogarty's AITRP grants built a cadre of qualified researchers who have helped make scientific discoveries that have changed HIV infection from a death sentence to a chronic disease that can be managed by drugs.*

### NIH PARTNERS

A number of NIH Institutes and Centers have provided co-funding and other support for AITRP over the past 25 years:

Eunice Kennedy Shriver National Institute of Child Health and Human Development, National Cancer Institute, National Health Lung and Blood Institute, National Institute of Allergy and Infectious Diseases, National Institute of Dental and Craniofacial Research, National Institute on Drug Abuse, National Institute of Mental Health, National Institute on Minority Health and Health Disparities, National Institute of Neurological Disorders and Stroke, National Institute of Nursing Research, Office of AIDS Research, Office of Behavioral and Social Sciences Research and Office of Research on Women's Health.

Photo by Sebastian Seyd/World Bank



temptation to remain abroad in relatively well-paid jobs, leaving their home country no better off. So the AITRP grantees incorporated both a carrot and a stick. The carrot was re-entry funding for mentored research projects at home, where support might otherwise be hard to obtain. Many trainees have chosen to continue to extend their degree projects or launch new studies on HIV-related topics of particular interest in their country, such as how to treat HIV-positive children who are also malnourished.

The stick was an explicit expectation that the trainees should return home and put their new knowledge and skills to work, as a way to repay their AITRP support. These conditions encouraged the flow of bright, qualified and empowered scientists back to developing countries, making the overall AITRP re-entry success rate in excess of 80 percent.

“We trained more than 65 graduate level trainees through AITRP over the years and 95 percent of them are back in Uganda today, working in various aspects of academics or in the Ministry of Health or working in the private sector on HIV-related issues,” said Dr. Christopher C. Whalen, of Case Western Reserve University.



Photo by David Snyder for Fogarty/NIH

Research by Fogarty trainees has uncovered how HIV and co-infections interface, leading to earlier screening and treatment for infections such as tuberculosis, cervical cancer and malaria.

As skilled scientists became established in developing countries, they made attractive partners for global research collaborations and began to successfully compete for NIH research grants, in addition to funding from international foundations and other sources.

## Shifting Pakistan's approach to HIV/AIDS

Courtesy of Dr. Shah



Dr. Sharaf Ali Shah

As a physician in Pakistan specializing in dermatology and venereology, Dr. Sharaf Ali Shah began encountering HIV/AIDS in the clinic, but realized no one had any idea how extensively the disease was hitting the country, because no reliable surveillance system was in place. His country's health policies, steered by physicians and restrained by low resources, focused

on treating the sick rather than devising preventive interventions.

In order to help, Shah decided he needed new skills. He applied for training under the University of Alabama's Fogarty AIDS International Training and Research Program (AITRP) grant to earn his master's degree in public health. The experience was transformative. “AITRP training changed me from clinician and manager to a researcher,” he said.

Today, he uses the skills he learned to conduct research, including surveillance, to train and mentor young

scientists and to urge the government to institute HIV/AIDS prevention programs. “The number of people who are interested in public health is growing. Now we have the research, the data,” Shah said.

As part of his AITRP training, he received instruction in grant writing, which helped him, with other former AITRP trainees, to secure several multimillion dollar grants from leading global health funders. Since the mid-1990s, Shah estimates about 50 Pakistanis have benefited directly from AITRP. Former trainees now hold important positions in academia, public health, international organizations and non-profit agencies.

Now that Pakistan has data clarifying the state of its epidemic, it is in a better position to formulate intervention strategies, Shah said. Initially, nearly all the country's AIDS cases were in men who had been migrant workers abroad but were sent home after falling ill. Nowadays, the bulk of new infections are occurring among people who inject drugs. “They are homeless, live on the street and are very mobile, therefore the HIV epidemic also moves. This is a highly dynamic mode of transmission,” Shah noted.

Prevention is increasingly regarded as cost-effective and the government has established 10 preventive programs for various infectious diseases. Workers going overseas now receive education about HIV/AIDS.



AITRP incorporates an unusual degree of flexibility, allowing the grantees to adapt to changing conditions. “As the epidemics evolve, the position of Fogarty has always been that if it was logical to change directions, follow new opportunities, fine, go ahead and do it,” Johnson said.

## Changing the research landscape

Around the globe, the ability to conduct research in HIV/AIDS has expanded exponentially over the past two-and-a-half decades and AITRP is hailed widely for its role. AITRP has also provided the model for other Fogarty training programs.

UC Berkeley, for one, has had AITRP funding continuously since 1988. “We’ve seen a whole series of individuals go through the program who are back in their home countries now and doing pretty phenomenal work; whether it’s in Uganda, Zimbabwe, or some other institutions or countries, it’s the collective effort that is really impressive in terms of what has come out of all of this,” Reingold said.

One shining example of AITRP’s impact is in Malawi. “When we started the program, Malawi did not have a medical school. It had a very limited professional base. Malawians who had medical training were trained either in the UK or other African countries. There was really very

Photo by Richard Lead for Fogarty/NIH



Studies in developing countries brought valuable findings on how to significantly reduce the transmission of HIV between an infectious mother and her baby, including through breastfeeding.

## Scientific findings that include contributions from former AITRP trainees

### Treatment as prevention

A study showed that if patients take antiretroviral drugs as soon as possible after diagnosis, they are 96 percent less likely to infect their HIV-negative heterosexual partner than if they wait until the virus climbs to a specific concentration in their blood. The study involved clinical trials in five sub-Saharan African countries, Brazil, India, Thailand and the U.S. The finding was named Breakthrough of the Year by *Science* magazine in 2012. As a result, the WHO updated its guidelines to recommend that patients begin antiretroviral therapy immediately after diagnosis.

### Circumcision

Mounting observations in HIV patients suggested that circumcised males might be less susceptible to catching the HIV virus than uncircumcised males. Former AITRP trainees in Uganda’s Rakai district conducted studies that confirmed male circumcision reduces HIV incidence. This discovery prompted the WHO to recommend circumcision as a way to help curb HIV infection in high-risk populations.

### Cervical Cancer

HIV-infected women are more susceptible to infection with the HPV virus that causes cervical cancer, but many cases are diagnosed too late. To see if HIV-positive women in Kenya could undergo low-cost HPV screening during clinic visits, researchers including a former AITRP trainee and an NIH-sponsored researcher investigated the situation. They found 87 percent of women agreed to HPV screening and about 7 percent needed

treatment. Other low-resource countries, such as Cambodia, are adopting similar HPV screening recommendations for women with HIV and other high-risk factors.

### Tuberculosis co-infection

To determine how often HIV and tuberculosis coexist and how severe the problem of multidrug resistance is in rural Kenya, researchers—including former AITRP trainees—developed a house-to-house survey that uses cough monitors. The technique has since been replicated in other countries.

### Discordant couples

A large survey in Uganda revealed that HIV prevalence had leveled off, so researchers there investigated the predominant way HIV was being transmitted. They found it was no longer via casual relationships but rather occurred in established relationships. They published their findings in seminal journal articles, which led to changes in prevention strategies in Uganda and other countries.

### Antiretroviral adherence

When antiretroviral drugs arrived, some potential donors questioned whether patients in low-resource, low-education settings could follow the regimen of multiple drugs to be taken at precise times each day. AITRP trainees in Port-au-Prince, Haiti, helped conduct a study that showed patients there adhered to the drug regimen as effectively as patients in New York City.

little in the way of advanced technical capacity to respond to the epidemic and to do research,” said Dr. Christopher Beyrer, of Johns Hopkins Bloomberg School of Public Health.

Into this vacuum came investments from AITRP and others, which have continued for the past couple of decades. Beyrer recently visited Malawi to discuss interests and objectives for the next round of funding with grantees and at their urging visited policymakers. “I met with the Minister of Health, the head of the National AIDS program and the head of the immunization program—and all of them had had training through our AITRP. You realize that you have really helped build in-country expertise. That was very powerful for me,” he said.

Longtime AITRP collaborator in Uganda, Dr. David Serwadda, of Makerere University, said the program’s concept is unique. “Fogarty’s model of integrating training and research has been more successful than the model in which scholarships are given, Ugandans go to train, and they come back and say ‘Now, what?—What am I going to do?’ Those programs tend to have a much higher brain drain compared to Fogarty’s.”

### AITRP trainees contribute to scientific discoveries

Former AITRP trainees around the world have made enormous contributions to virtually every area of HIV/AIDS science. (See box on pg. 9.) “The trainees contribute to critical research projects,” said Dr. Myron (Mike) Cohen, of the University of North Carolina. “This is not a hobby. This is deadly serious science.”

Grantees are happy to give name after name of trainees who are living proof that AITRP was a success in the multiple ways they are extending their country’s ability to research, manage and improve global health. (See related trainee profiles on pages 8-13.)

Because some developing countries have much larger numbers of HIV-positive patients, they are better positioned to carry out high-quality clinical trials in, for example, pediatric AIDS and mother-to-child transmission. “There were many aspects of AIDS you couldn’t learn about as efficiently, if at all, by looking at just western populations,” said Dr. Roger Detels, AITRP grantee at the University of California Los Angeles School of Public Health.

Columbia University’s AITRP has supported an important collaboration with the Centre for the AIDS Programme of Research in South Africa (CAPRISA), led by Drs. Salim Abdool Karim and Quarraisha Abdool Karim, for much of the project’s 20-year history. CAPRISA has produced groundbreaking studies on microbicides, among other issues.

Photo by Richard Lord for Fogarty/NIH



AITRP trainees exposed to the U.S. academic culture not only learned about science topics but also became familiar with a more questioning, interactive approach to education and research.

Many studies conducted in developing countries had broader implications. “Just like overseas, it’s sometimes hard to get people tested in the U.S., prevention is often elusive and it’s hard to access certain subpopulations at highest risk, whether they’re sex workers or gay men in the U.S. or Zambia,” said Dr. Sten H. Vermund, of Vanderbilt University, formerly of the University of Alabama at Birmingham. “So there is a lot more resonance in these research themes than people might realize.”

### Multiplying AITRP’s impact

Fostering long-term research collaborations is a key factor in AITRP’s success. By providing a forum for sharing information and lessons learned, the program’s impact is multiplied. One grantee cited how the head of China’s AIDS program, after observing HIV was spreading in sex workers, reached out to former AITRP alumni in Thailand who had already implemented an effective condom promotion program to reduce transmission. “When you go through graduate training together, it’s like being in the trenches, you sort of become buddies,” Detels said. “That kind of interaction and mutual support between people from different countries really wasn’t going on in the ‘80s, but is now.”

AITRP alumni Dr. Peter Cherutich was greatly influenced by exposure to the U.S. academic research environment, recalls University of Washington AITRP grantee Dr. Carey

Studies conducted by Fogarty trainees in Haiti proved adherence is possible in low-income settings.

Photo by Huguere-Roberi Marson for Fogarty/NIH





Farquhar. “When he came over, he saw role models doing what he wanted to do, and that was life-changing for him.” Cherutich subsequently helped lead his country’s successful circumcision program and now directs the sexually-transmitted disease control program at Kenya’s Ministry of Health.

Success begets success. When well-qualified people remain at home, rise through the ranks and keep connected, they become the go-to people for HIV/AIDS in their country and attract funding from international agencies. “Leveraging is widespread and inevitable. I don’t know anybody with an AITRP where it wasn’t leveraged into something way bigger than the AITRP,” Cohen said.

As former AITRP trainees have added to their country’s pool of expert scientists and health leaders, they have helped lay the groundwork for other U.S. efforts, such as the President’s Emergency Plan for AIDS Relief (PEPFAR). These projects then feed research further, allowing experts on the ground to craft new research projects involving PEPFAR patients, AITRP grantees noted.

**Fostering long-term research collaborations is a key factor in AITRP’s success. By providing a forum for sharing information and lessons learned, the program’s impact is multiplied.**

In Zambia, AITRP helped spark tremendous research expansion. “Our initial success in grants in Zambia were two small Elizabeth Glaser Pediatric AIDS Foundation grants, along with our AITRP,” Vermund said. “In 2001, we had a program funded in the \$300,000 range. By 2011, it was \$34 million a year. So there’s no question that the people that were trained under AITRP and some of the projects that they did for their master’s and doctoral degrees were highly relevant in building our credibility to be able to apply for the larger programs.”

At Uganda’s Makerere University, many of the school of public health staff were trained through AITRP, Whalen recalled. “And that school is on par with any school of public health here in the U.S. The pressures are a little different on the faculty, but the knowledge and expertise and publication record of the faculty is just extraordinary and most of that as a result of AITRP.”

Although AITRP intends for trainees to return home and build in-country capacity, sometimes careers draw them in other directions. This can work out for the best, though, remembered Vermund. “Dr. Isaac Zulu was a terrible loss when he left the University of Zambia, because he was one of their most talented researchers, trained in our AITRP. But he went to the CDC/Zambia and spearheaded a capacity building initiative through PEPFAR that brought

## Preventing HIV in Uganda

Courtesy of Fred Nalugoda



Fred Nalugoda

On his first visit to the Rakai district in western Uganda, Fred Nalugoda was horrified by the numerous worn-out people he saw wandering listlessly around, open sores evident, and being shunned by all. “I got chills and thought I could not go back,” he said.

Nonetheless, Nalugoda decided to return and make a difference in these sick people’s lives. He joined Rakai’s Health Sciences Program, which conducts extensive community epidemiologic and behavioral studies in HIV/AIDS and related topics. In 1999, he received his master’s degree under Johns Hopkins University’s Fogarty AIDS International Training and Research Program (AITRP).

He says skills in demography and biostatistics have enabled him to collect, manage, analyze and interpret data and get his studies published. His mentorship experience has given him the blueprint he uses to mentor others. He is now program director responsible for all field studies and is highly regarded for his deep knowledge of the Rakai communities.

He has been involved in many key Rakai trials, including the landmark study that found male circumcision was a highly effective barrier to HIV transmission. Although Uganda has been relatively slow at promoting the procedure, not least due to limited resources, the proportion of circumcised men in Rakai is about 55 percent, he said, double the previous level.

Courtesy of Johns Hopkins University



There are also notable changes in other areas of HIV prevention, Nalugoda noted, a remarkable change from two decades ago. “Regarding this disease, it is close to 100 percent

awareness, even in young children,” he said. “They know about strategies for prevention and stigma has been reduced very much. Now HIV treatment and prevention is widely available and denial is not a big issue now, especially in Rakai.”

### RESOURCES

Paper: [www.ncbi.nlm.nih.gov/pubmed/17321311](http://www.ncbi.nlm.nih.gov/pubmed/17321311)

substantial resources to the university. So sometimes you think you've lost something but you end up gaining."

## AITRP changes the academic culture

Visiting the U.S. for training has been a valuable experience on many levels for AITRP trainees, some of whom have not traveled outside their country before. The U.S. academic teaching styles often differ substantially from what they are used to, for instance in the interaction with mentors, style of networking and examples of role models.

Many trainees come from former British or French colonies, where the education system remains based on top-down, didactic teaching. "Education there basically amounts to professors talking to you, you writing it all down, being tested on how well you wrote it down and remembered it. It's not an interactive process where you argue, disagree, discuss, and that is central to the way we educate people in our graduate school," Reingold observed. "I think many of them do go home with a refreshingly more candid, open, argumentative (in a good way) approach to things, questioning their elders or the system or how things are done and that's a good thing."

Many developing countries did not have a tradition of research as part of academia and AITRP provided the roadmap for success. "It really helped lay down the template showing that a large part of achieving academic success is through international-level research, collaboration, publication and presentations," Beyrer said.

## Bringing benefits for US institutions

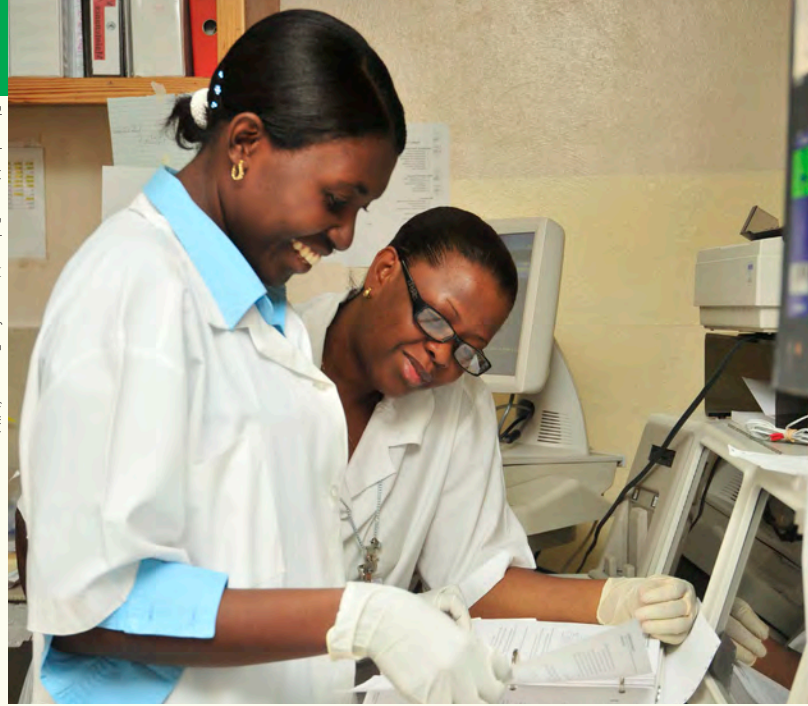
AITRP has increased capacity at U.S. institutions as well, as the recipient universities have established or

*AITRP trainees have conducted studies on HIV prevention strategies suited for low-resource settings.*



Photo by David Snyder for Fogarty/NIH

Photo by Hugues Robert Marsan for Fogarty/NIH



*Low-income countries have critical shortages of expertise in informatics and data analysis, which Fogarty's research training programs address.*

expanded their global health departments and attracted larger numbers of U.S. as well as visiting students. The visiting trainees bring an added dimension to classroom discussions with their first-hand knowledge of conditions and needs. The connections formed often lead to long-term research collaborations and lasting friendships. We have some Americans who were minimally involved in international health, an AITRP trainee came into their lives and the next thing you know they were deeply involved," Vermund said. "Having those talented international students enhances the richness of the student pool here."

Faculty members and both U.S. and visiting trainees gain from their experience of working together. "We develop these relationships which shape our lives. We don't look at the world the same way, because we're working with people from other countries," Cohen said. "I can see generations of people from other countries, as well as from our faculty, whose not just careers but personal lives, personalities, view of the world are all really shaped by AITRP."

## Preparing to meet new challenges

Twenty-five years after AITRP's birth, HIV/AIDS is still a scourge that needs extensive study. However, research is shifting from its earlier focus of identifying HIV infection, clinical manifestations and transmission modes toward treating HIV as a chronic disease, dealing with co-infections and studying the effects of treatment over time. For instance, scientists do not understand why long-term antiretroviral treatment, while extending life, also accelerates aging and the development of related conditions such as cardiovascular disease and certain cancers.

## RESOURCES

Website: <http://bit.ly/PQI4pj>



To meet these new challenges, Fogarty has consolidated AITRP with another implementation research training effort, into the new Fogarty HIV Research Training Program. While the areas for training permitted under the new program will be broad—to include various aspects of HIV-related research—each project will focus on building or strengthening capacity in a particular scientific or critical research infrastructure area of importance to a developing country institution. The new initiative will measure outcome indicators focused on increased research capacity for more meaningful monitoring and evaluation.

As AITRP transitions to this new program after a quarter century, those who participated take stock of its accomplishments. “I remember when AITRP was just an idea in '85. To see it evolve in the magnificent way it has is really hard to believe. The breadth of the effect of AITRP has been remarkable,” said Dr. Charles Carpenter of Brown University.

Summing up the widely held position among AITRP grantees, Beyer concluded: “There’s no question that the training and the empowerment of the developing country scientists and their institutions to do AIDS research has just been enormous. Without it, we would not be anywhere near where we are today in the global response. It is a powerful legacy.”

Photo by Douglas Leveque/University at Buffalo



AITRP trainees, such as Zimbabweans visiting the University at Buffalo, learn new skills in areas ranging from epidemiology to microbiology to bioethics, which they then develop in others back home, building capacity.

## Combating AIDS in Malawi

Courtesy of Dr. Phiri



Dr. Sam Phiri

Dr. Sam Phiri thought a lot about helping people when he was young, but he came from a humble background and access to education was difficult in Malawi. Nonetheless, he worked diligently at school and college, qualified as a clinical officer and began treating patients. Before long, the devastation of AIDS filled his days.

“I can tell you, it was quite depressing,” Phiri recalled. “In the late ‘90s, you could see patients coming in with advanced AIDS. We were only able to provide some drugs for opportunistic infections and pain relief. Some of the patients were people I knew, some of them were members of staff.”

He felt he needed to do more, so obtained a master’s degree in sexually transmitted infections and HIV and a Ph.D. in clinical epidemiology, both at the London School of Hygiene and Tropical Medicine, supported by Fogarty’s AIDS International Training and Research Program (AITRP) grant to the University of North Carolina.

With the skills he learned through AITRP support, he now trains and mentors others, obtains funding and manages clinical trials—all while running his country’s largest HIV care organization, Lighthouse Trust, which handles more than 18,000 HIV and AIDS patients.

Under Phiri’s leadership, Lighthouse, now a recognized WHO Center of Excellence, has been involved in numerous trials in key areas of HIV and AIDS management, including treating sexually transmitted infections to limit HIV risk, giving HIV-positive pregnant and lactating mothers antiretroviral treatment to prevent infection of their babies, and investigating how HIV and tuberculosis interact.

Just as he benefited from being trained by experts in another country, Phiri now trains not only Malawian students but also those who visit from abroad to learn more about HIV and AIDS in a setting where conditions and concerns are often different. As a UNC adjunct assistant professor, he teaches and mentors students from the U.S., U.K. and Germany.

### RESOURCES

Website: [www.mwlighthouse.org](http://www.mwlighthouse.org)

# OPINION

By Dr. Roger I. Glass, Director, Fogarty International Center

## Answering the call to action with science



Twenty-five years ago, we were horrified to see the toll HIV/AIDS was taking in the developing world. Not only did it wipe out nearly a generation of adults in sub-Saharan Africa, it also killed countless children and left many more orphans. After several decades of improving indicators of health, life expectancy in sub-Saharan Africa began a sharp decline linked directly to the consequences of HIV on the entire population.

Today, the situation has changed dramatically—we are now able to manage the disease through drugs and we've learned how to prevent HIV-positive mothers from passing the virus to their babies. We've also discovered ways to reduce transmission through male circumcision, discordant couple's counseling and treatment as prevention. All of these advances required the efforts of talented, well-trained researchers.

At Fogarty, we're proud of the role we've played in developing scientific expertise in the parts of the world most affected by the HIV epidemic. Through our AIDS International Research and Training Program, we've helped produce a cadre of well-qualified HIV/AIDS researchers and clinicians in 100 developing countries. They have become equal research partners, working in collaboration with American scientists and others around the globe, studying the most promising interventions and how best to implement them effectively in low-resource settings. In fact, many of the major advances in HIV research in these settings have been the product of research conducted by Fogarty trainees.

And yet, we must do more. As the world's HIV/AIDS scientists, advocates, policy makers and others gather in Washington for the AIDS 2012 meeting, we must consider what we can do to speed progress. U.S. Secretary of State Hillary Rodham Clinton has set an ambitious goal for us—creating an AIDS-free generation. By continuing to push for new ways to prevent and treat the disease—and by more efficiently incorporating these discoveries into practice, we can achieve this lofty goal.

At the NIH, we are also committed to Secretary Clinton's Call to Action to eliminate preventable child deaths. Although perhaps an aspirational goal for some countries, we can certainly accelerate progress everywhere by more closely linking research discoveries with development practice and by reinforcing the research agenda to improve compliance, lower costs and better understand the medical issues among people now living long-term with HIV.

But for children under 5, pneumonia, diarrhea, malaria and neonatal conditions claim the most lives. By prioritizing research in these areas, we can identify and implement new lifesaving, cost-effective measures that will help bend the curve and drive down the number of child deaths.

Fogarty has been a leader in training for research in global health. Our programs to support HIV have been the longest standing and have helped build the workforce for research and training throughout the developing world. We are committed to studying the research gaps that remain, to provide a credible evidence base that will drive decision making and increase efficiencies so we can achieve our goal of ending preventable child deaths everywhere.

At the NIH, we are excited to partner with the USAID in a new research funding program that will move us forward. The PEER Health awards provide a tremendous opportunity for collaborations that address research-to-practice barriers, while building scientific capacity and more closely linking USAID missions with health and research institutions in developing countries.

In addition, we are beginning to see the benefits of our collaboration to transform medical education in sub-Saharan Africa. With support from the President's Emergency Plan for AIDS Relief and our NIH partners, we are enhancing health science curricula and making quality online training more widely available to address the tremendous shortfall of health care workers and scientists across the region.

We must be ambitious and relentless to do our part in building the research workforce needed to achieve our goal. The world's most vulnerable citizens are depending on us.





### Fogarty's Katz designated as deputy division director

Dr. Flora Katz is the new deputy director of the Division of International Training and Research. Katz also continues her role as a program officer, overseeing the Center's Framework Innovations and Informatics programs and co-managing the Biodiversity grants program. Katz received her Ph.D. from the Massachusetts Institute of Technology in cell and molecular biology. As a faculty member at University of Texas Southeastern Medical Center at Dallas and Texas A&M University, she directed a research laboratory in developmental genetics. She joined Fogarty in 2001.



### Smith wins Tyler Environmental Prize

Fogarty grantee Dr. Kirk R. Smith was awarded the 2012 Tyler Environmental Prize by the University of Southern California for his work on household air pollution and related early deaths. A professor at the University of California at Berkeley, Smith founded and directs the university's masters program in Global Health and Environment. Previously, he founded the Energy Program of the East-West Center in Honolulu.



### Cohen receives award for innovation

Long-time Fogarty grantee Dr. Myron Cohen has received the 2012 Herbert Pardes Clinical Research Excellence Award for his scientific innovation stemming from U.S. clinical research investment. Cohen, a professor of medicine, microbiology and epidemiology at the University of North Carolina at Chapel Hill, who led a landmark study on HIV prevention, received the award from the U.S. Clinical Research Forum.



### Ngure receives University of Washington Award

Former Fogarty trainee Dr. Kenneth Ngure received the University of Washington's Outstanding Community Partner Award in recognition of his work on HIV/AIDS, not least in coordinating key HIV-prevention trials in Kenya. He recently received his doctoral degree from the Jomo Kenyatta University of Agriculture and Technology in Nairobi, and lectures at the Institute of Tropical Medicine and Infectious Diseases.

### Global cancer burden expected to shift, grow

Researchers estimate that 16 percent, or around 2 million, of the world's 12.7 million cancer cases diagnosed in 2008 were caused by viruses, bacteria, parasites and other infectious agents, according to a recent paper. A second study suggested that reductions in infection-related cancers will be offset by new cases associated with reproductive, dietary and hormonal factors. Using a variety of data, the researchers calculated that in 2030 there will be 22.2 million new cases of cancer, up 75 percent from 2008. Both articles were published in *Lancet Oncology*.

Abstracts: <http://1.usa.gov/KDNGeG>  
<http://1.usa.gov/OtL2xZ>

### WHO issues mental health tool kit

WHO has released a QualityRights Tool Kit to help countries assess and improve the quality and human rights of their mental health and social care facilities.

Website: <http://bit.ly/MEFJpJ>

### TDR announces new strategy

The Special Program for Research and Training in Tropical Diseases (TDR) has unveiled its new strategic plan with an increased focus on intervention and implementation research, research capacity strengthening and knowledge management.

Established in 1975, TDR is based at and executed by the WHO and sponsored by the United Nations Children's Fund, the United Nations Development Program, the World Bank and WHO.

Website: <http://bit.ly/KDM5pg>

### Global health case studies posted

A new collection of case studies that illustrate how individuals, non- and for-profit organizations and governments work together to solve global health challenges is now available.

Website: [www.casestudiesforglobalhealth.org](http://www.casestudiesforglobalhealth.org)

### mHealth review published

mHealth is a tool with promise for fostering behavior change, including in the developing world, but more evaluations of current interventions are needed, according to a recent study published in the *Journal of Health Communication*. The researchers conducted a systematic review of the literature to determine how much evidence exists to support mHealth behavior change communication interventions.

Full report: <http://bit.ly/NCeGMH>

### NIH promotes research impact

The NIH has developed a web resource to highlight how NIH-supported biomedical research benefits the U.S. health, economy, communities and knowledge base. The site includes fact sheets, reports and slides designed for use by researchers or research advocates.

Website: [www.nih.gov/about/impact/index.htm](http://www.nih.gov/about/impact/index.htm)

### NIH microbiome project publishes findings

A consortium of researchers organized by the NIH has completed mapping the normal microbial makeup of healthy humans, producing the first such reference data. The Human Microbiome Project Consortium members recently published their findings in a series of reports with contributions from some 200 members at nearly 80 universities and scientific institutions.

News release: <http://1.usa.gov/NCpWsm>

## Funding Opportunities

Funding Opportunity Announcement	Details	Deadline
Fulbright-Fogarty Fellowships in Public Health (Info on Fulbright Site)	<a href="http://bit.ly/NYuMnm">http://bit.ly/NYuMnm</a>	October 17, 2012
Limited Competition: Framework Programs for Global Health Innovation (D43)	<a href="http://1.usa.gov/JYqonE">http://1.usa.gov/JYqonE</a>	December 14, 2012
Limited Competition: Brain Disorders in the Developing World: Research Across the Lifespan (R01) - Non-AIDS	<a href="http://1.usa.gov/L6UUfk">http://1.usa.gov/L6UUfk</a>	February 14, 2013
Brain Disorders in the Developing World: Research Across the Lifespan (R21) - Non-AIDS	<a href="http://1.usa.gov/JjpxKs">http://1.usa.gov/JjpxKs</a>	February 14, 2013
Limited Competition: Brain Disorders in the Developing World: Research Across the Lifespan (R01) - AIDS	<a href="http://1.usa.gov/L6UUfk">http://1.usa.gov/L6UUfk</a>	April 11, 2013
Brain Disorders in the Developing World: Research Across the Lifespan (R21) - AIDS	<a href="http://1.usa.gov/JjpxKs">http://1.usa.gov/JjpxKs</a>	April 11, 2013
Chronic, Non-Communicable Diseases and Disorders Across the Lifespan: Fogarty International Research Training Award (NCD-LIFESPAN) (D43)	<a href="http://1.usa.gov/Hj3YfL">http://1.usa.gov/Hj3YfL</a>	April 17, 2013
Planning Grant for Chronic, Non-Communicable Diseases and Disorders Across the Lifespan: Fogarty International Research Training Planning Award (NCD-LIFESPAN) (D71)	<a href="http://1.usa.gov/GW4LyT">http://1.usa.gov/GW4LyT</a>	April 17, 2013

For more information, visit [www.fic.nih.gov/funding](http://www.fic.nih.gov/funding)

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