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

NCD panel highlights need for comprehensive solutions

By Steve Goldstein

It is not only possible, but essential, to deploy comprehensive strategies to address non-communicable diseases (NCDs) in low-and middle-income countries, and these should offer cost-effective treatment alongside prevention in a mutually reinforcing way.

That was the message delivered by Harvard School of Public Health Dean Dr. Julio Frenk, the keynote speaker at a session devoted to the epidemic of NCDs at the Global Health Council's annual conference in Washington, D.C. Frenk headlined an impressive cast of speakers appearing on two panels, one devoted to the major risk factors for NCDs and the other addressing innovative multisectoral approaches to controlling these diseases.

Introducing Frenk, Fogarty Director Dr. Roger I. Glass described the purpose of the meeting as highlighting "the instrumental role that research will play in thinking about the chronic and non-communicable disease agenda."



Photo by Curt Cernamark/World Bank

Diabetes, heart disease and other NCDs account for nearly two-thirds of all deaths worldwide.

The research symposium, organized by NIH, served as part of the run-up to the U.N. General Assembly's High-Level

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Arab Spring spurs scientific renaissance in Egypt

By Ann Puderbaugh

Egypt is poised for a scientific renaissance with a plan to more than double its research investment over the next four years, according to the country's science minister, who visited NIH recently to meet with senior leaders.

"Egypt is moving toward a new era," said Dr. Amr Salama, Egypt's Minister of Higher Education, Scientific Research and Technology. "We have a strategic geographic location, a well-educated population and robust research facilities. We are prepared to become one of the world's leading research centers."

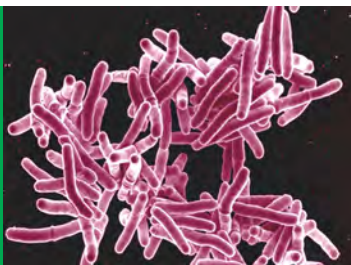
He asked for help in achieving that goal, calling for America

to open its doors to scientists from Egypt's universities and research centers so they can enhance their capabilities and form collaborations that will benefit both partners.

"We have much to learn from each other and look forward to increasing interactions with Egyptian scientists," agreed Dr. Lawrence Tabak, NIH principal deputy director. Salama assured NIH officials the recent change in government has not disrupted his country's biomedical research enterprise. "Everything is running normally at Egypt's universities and research centers," he said.

"Everyone is excited and optimistic . . . *continued on p. 4*

FOCUS



The National Institute of Allergy and Infectious Diseases

- HIV/AIDS: 30 years of advances, but more to achieve
- NTDs and the skewed burden of disease
- Efforts continue to defeat TB, malaria

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New research details spread of swine flu virus

The spread of the influenza A/H1 virus follows large-scale movements of swine from the South to the Midwest, according to a new paper by Fogarty investigators published in *PLoS Pathogens*. Thus, farmers should not only conduct their own localized surveillance, but information must be amassed and shared at national and regional levels to inform vaccine design and targeted surveillance strategies.

Photo courtesy of Susan Demmer



The spread of the A/H1 virus follows movements of swine from the South to the Midwest.

This study suggests that even though the Midwest traditionally has the largest swine populations in the U.S., influenza surveillance efforts should be concentrated in the South, where new influenza viruses originate. Based on these findings, what should swine farmers do differently? “I believe the salient point here for farmers is that influenza viruses are continuously emerging in swine and disseminating along key U.S. ‘swine-ways’ from the Southern to the Midwest region,” said Dr. Martha I. Nelson, a Fogarty postdoctoral fellow who led the study. “Hence, viruses that emerge in states such as North Carolina or Oklahoma quickly disseminate to Iowa, Minnesota, and other major pig-producing states.”

Nelson added that this study is important for human health as there are frequent introductions of swine influenza viruses into human populations, and vice versa, as illustrated by the 2009 pandemic virus.

Since 1998, genetically and antigenically diverse influenza A viruses have circulated in North American swine due to continuous cross-species transmission and reassortment

with avian and human influenza viruses, presenting a pandemic threat to humans. Millions of swine are transported year-round from the southern U.S. into the corn-rich Midwest, but the importance of these movements in the spatial dissemination and evolution of the influenza virus in swine is unknown. Using a large data set of influenza virus sequences collected in North American swine during 2003-2010, researchers investigated the spatial dynamics of two influenza viruses of the H1 subtype that were introduced into swine from humans around 2003.

Employing recently developed Bayesian phylogeography methods—a way of mapping the geographic distribution of viruses—they found that the spread of this influenza virus follows the large-scale transport of swine from the South to the Midwest. Based on this pattern of viral migration, they suggest that the genetic diversity of swine influenza viruses in the Midwest is continually augmented by the importation of viruses from source populations located in the South.

Understanding the importance of long-distance pig movements in the evolution and spatial dissemination of influenza virus in swine may inform future strategies for the surveillance and control of influenza, and perhaps other swine pathogens.

Fogarty senior scientist Dr. Cecile Viboud, one of the co-authors of the paper, entitled “Spatial Dynamics of Human-Origin H1 Influenza A Virus in North American Swine,” said that their findings should encourage “intensified surveillance” in the Southern states to curtail the spread of the influenza virus.

In addition to the Fogarty researchers, other collaborators included evolutionary biologists at Pennsylvania State University, the University of California at Los Angeles, Edinburgh University and veterinarians at the University of Minnesota.

The study’s importance was enhanced by a recent WHO report that a novel variant of swine flu has emerged in Asia with a genetic variant showing some resistance to the two mainstay drugs used to counter the disease.

More than 10 percent of the H1N1 infections in Singapore and 30 percent of those in northern Australia tested in early 2011 had reduced sensitivity to the two drugs. The H1N1 pandemic caused about 18,450 deaths worldwide from March 2009 through August 2010, according to WHO.

PLoS link: <http://bit.ly/ltpocN>

WHO link: <http://bit.ly/m5hgKv>

The call of the tame: how genes outfox nature

By Steve Goldstein

What is tame? How does wild become domesticated? Would a fox wagging its tail as you approach it convince you that breeding can change biology? These are some of the questions that Russian scientist Dr. Lyudmila Trut hoped to answer, as well as a larger one: what could research with the fabled “sly” member of the *Canidae* family mean for humans?

Trut works in Novosibirsk in southern Siberia with the world’s only population of domesticated foxes. Several years ago, she received a Fogarty International Research Collaboration Award (FIRCA) grant to work on the genetic architecture of the silver fox, building on previous studies demonstrating that domestication of foxes involves the acquisition of the ability to interpret human intent from facial expressions and body language of humans.

“The silver fox, as a recently domesticated mammal, offers a rich resource for studying complex patterns of interactive behavior,” said Trut. “Tame and aggressive strains of fox we’ve developed have retained consistent but distinct behavioral phenotypes for several decades and multiple generations. The tame strain exhibits friendly, playful behavior like that of canine puppies.”

Trut and her collaborators have published seven papers in the past two years, including the recent “On the origin of a domesticated species: identifying the parent population of Russian silver foxes” in the *Biological Journal of the Linnean Society*. Her work was prominently featured in the March issue of *National Geographic*.

The relevance to public health is the belief that this characteristic would help shed light on behavioral problems in humans such as autism. The inability to recognize human intent is one of the major components of autism. Trut’s research investigates the fox model for deciphering the genetic basis for recognition of human intent. Preliminary evidence identified four locations of genes on a DNA sequence that regulates behavior.

The research traces its history back more than 50 years to the Institute of Cytology and Genetics in Novosibirsk. As a young graduate student in 1958, Trut traveled to fur farms to locate the calmest foxes she could find. At the fox farm, they bred those most amenable to human contacts. Through generations, foxes began to show the “domestication phenotype.”

But the collapse of the Soviet Union caused scientific funds to dwindle, just as the research was focusing on the ability



Photo by Nadezhda P. Glebova

Dr. Lyudmila Trut has been working with foxes for 50 years.

to trace the domestication connection to foxes’ DNA. At risk was this rare population of domesticated silver foxes.

After Trut received her FIRCA grant, she was joined by Dr. Anna Kukekova, a Russian-born postdoc in molecular genetics at Cornell who’d read about Trut’s struggles and got a grant from the National Institute of Mental Health to go to Siberia. “Although these fox strains have been carefully studied for several decades, only recently has it become possible to consider a systematic approach to identify the loci and molecular mechanisms controlling complex interactive behaviors,” said Kukekova.

Kukekova is working to link tame behavior to genes, but as she notes the task of locating the genes related to social behavior is monumental given that over 14,000 genes are expressed in the brain.

“Behavior is inherently complex, reflecting the response of an individual to its environment as mediated by multiple interacting, genetic, endocrine and neurologic mechanisms,” Trut explained. “Despite this complexity, distinctive behavioral phenotypes are consistently observed in humans and other mammals, including many human behavioral disorders and the impaired social reciprocity characteristic of autism.”

Publications: <http://bit.ly/kqOkdH>

NCD panel highlights need for comprehensive solutions

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Meeting on NCDs scheduled for September. Frenk noted the urgency of the epidemic: 80 percent of the deaths attributed to NCDs occur in low- and middle-income countries. U.N. estimates say that cancer, heart and lung disease, diabetes and other NCDs account for nearly two-thirds of all deaths worldwide.

Frenk dismissed what he called the “false dichotomies,” such as the idea that no NCDs have genetic or infectious causes, and urged the global health agenda to embrace integration of different levels of care. “I have always seen global health as a crossroads where multiple dimensions intersect: biology and society, individual and population, evidence and ethics, analysis and action,” Frenk declared.

Panelists Dr. David G. Marrero of Indiana University, Dr. Nancy A. Rigotti of Harvard Medical School and Dr. Douglas R. Lowy, deputy director of the National Cancer Institute addressed diabetes, tobacco and cervical cancer, respectively. Marrero advocated community-based partnerships to facilitate successful interventions in obesity-caused diabetes. Rigotti, noting that tobacco usage is responsible for one in 10 deaths worldwide, said the toll is expected to worsen in the 21st century.

“We have effective treatments, but we need better ones,” Rigotti said. She noted that only 25 percent of American smokers who try to quit seek help. “If this is true in deve-

NIH collaborations with Egypt

. . . continued from p. 1

about the future.” To drive Egypt’s economic recovery, the new government intends to increase its budget for education, scientific research and health from .7 percent of the Gross Domestic Product to 2 percent by 2015. “This is a clear indication that research is a priority,” he said.

Egypt’s most urgent health concern is combating the hepatitis C virus, which infects more than 10 percent of the population, Salama said. Other priorities include addressing its high rate of colorectal and childhood cancers and schistosomiasis, a parasitic infection endemic in Egypt. To spur investigations in these and other areas, Salama plans to upgrade research facilities; improve IT infrastructure and data mining capabilities; increase salaries for faculty so they can dedicate more time to research, and bolster science and math education. In addition, he would like to encourage more short- and long-term scientific exchanges—including increasing the number of visiting Egyptian scientists at NIH from the current nine. He’d also like to expand the ongoing NIH collaborations with his country, which include bioethics and trauma research training; studies of youth drug abuse, and investigations of bladder, breast and liver cancer.

loped countries, what about the rest of the world?” she asked.

Lowy spoke of the importance of the identification of human papillomavirus as the cause of the cervical cancer. Until an affordable vaccine is widely available, screening remains an essential means to curtail mortality.

Sir Peter Gluckman, a biology professor at the University of Auckland and chief science adviser to the Prime Minister of New Zealand, said that a poor start to life is a strong determinant for obesity, diabetes and heart disease, among other afflictions. Early intervention in maternal health is vital, Gluckman explained, because it has been found that the first 1,000 days of life determine such characteristics as tastes, satiety and energy expenditure.

Also on the second panel were Deputy Assistant Secretary of State Nerissa J. Cook and Dr. Scott C. Ratzan, a government affairs executive with Johnson & Johnson. Cook emphasized the significance of the upcoming UN high-level meeting as crucial to multilateral “health diplomacy” to increase the involvement of international partners. Ratzan advocated the use of a risk-based “scorecard” to measure up to seven indicators that will account for 70 percent of chronic diseases.

UN meeting link: [http: bit.ly/kqqPNq](http://bit.ly/kqqPNq)

Expansion of Egypt’s biomedical research enterprise will benefit the entire region, Salama noted. Egypt helped establish the African Network for Drug and Diagnostic and Innovation, a consortium of 52 African nations intended to promote and sustain African-led product innovation through the discovery, development and delivery of affordable new tools. Egypt, as one of the top three research producers in the continent, plays a leading role.

The Arab Spring has re-energized Egypt’s research community, Salama said, and created new opportunities for international exchange and innovation.

“We have the vision to apply scientific solutions to our society’s health needs and to support a knowledge-based country,” he explained. “With our enhanced investment—together with the wisdom and guidance from our U.S. partners—we will see a new Egypt.”

Note: in a cabinet reshuffle in mid-July, Dr. Salama was replaced by Dr. Moataz Khorshid, currently chairman of the Egyptian Software Engineers Association. The plan for R&D investment is not expected to change significantly.

Q & A: Dr. Anthony S. Fauci

National Institute of Allergy and Infectious Diseases Director Dr. Anthony S. Fauci has been closely identified with the fight against HIV/AIDS since it began. He admitted his first AIDS patient to the NIH Clinical Center in January 1982. The identification of the human immunodeficiency virus as the cause of AIDS made possible the subsequent development of tests and medications that have improved and lengthened the lives of millions worldwide. Here he reflects on 30 years of the disease.

Photo courtesy of NIAID



NIAID Director Dr. Anthony S. Fauci has been working on HIV/AIDS for three decades.

How did you begin at NIH?

I went to Cornell Medical College in New York City. I had a burning desire to study the interface between infectious diseases and the human immune system, which was not well studied at the time. I came to the NIAID as a clinical associate. My mentor, Dr. Sheldon Wolff, put me on an unusual project that led me to study the possibility of suppressing the immune system to effectively treat diseases like Wegener's granulomatosis.

How did you become involved with HIV?

On June 5, 1981, I was in my office at the Clinical Center when the CDC's *Morbidity and Mortality Weekly Report* landed on my desk and it reported five gay men, from Los Angeles, otherwise healthy, presenting with this strange pneumonia, *Pneumocystis pneumonia*, which we used to see in clinical patients with cancer. I was familiar with this and that it was seen only in persons with dramatically suppressed immune systems. I remember putting the issue to the side of my desk, thinking, 'Wow, what a bizarre curiosity.' One month later, in July, a second MMWR came to my desk, and this time, an additional 26 men had it, again all

gay, all seemingly healthy, and not only in LA, but now also in San Francisco and New York City. I remember reading it very clearly. It was the first time in my medical career I actually got goose pimples. I knew something was very wrong. It changed the direction of my career.

How would you describe those early days of the epidemic?

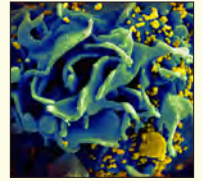
It was an extraordinary time. I call it the dark years of my medical career. Seeing all my patients die was a very sobering experience. I became director of NIAID in 1984 because I wanted to have more of an impact on HIV and infectious diseases. I interacted with Presidents. I interacted with gay activists. Author and activist Larry Kramer is a dear friend who was a long-time nemesis. I remember he wanted to get my attention by writing an open letter to "that incompetent idiot" Dr. Tony Fauci. He needed to stir the pot.

What does the future hold for HIV research?

The Holy Grail is a vaccine. I don't think that there will be a singular prevention modality. If we are going to put an end to HIV/AIDS, the dynamic will be a combination of prevention modalities. It could be topical microbicides, pre-exposure prophylaxis, male circumcision and even a vaccine. The most daunting challenge of all is trying to find a cure for HIV. I have an idea we might be able to cure at least a fraction of people. It's probably too much to ask that we will have a universal cure for HIV. But in some cases, we will likely be able to discontinue therapy with a certain fraction of new drugs, working by different mechanisms than the current drugs, by starting people early on therapy so the reservoir of the virus becomes much lower. As I said on World AIDS Day, Dec. 1, 2010, I hope that in the not too distant future, World AIDS Day will be a commemoration of something that happened in the past as opposed to a challenge that we still face today.

Dr. Fauci's lecture: <http://videocast.nih.gov/Summary.asp?File=16681>

HIV/AIDS: 30 years of hard-won victories



HIV/AIDS

While extraordinary scientific, medical and public health accomplishments have been made in the battle against HIV/AIDS, major challenges remain, especially in the delivery of therapies and prevention tools to the resource-poor countries that need them the most. NIAID played an important role in the design and early implementation of the President's Emergency Plan for AIDS Relief and continues to serve as a scientific partner for that program. NIAID has led much of the research that supports the program, engaging scientists from throughout the world and many U.S. biomedical and public health research institutions.

NIAID's investment in HIV/AIDS research has generated many significant findings in preventing, treating and advancing scientific understanding of the disease. Most recently, an NIAID-funded clinical trial demonstrated that early initiation of antiretroviral therapy by the infected partner in heterosexual couples where one partner was HIV-infected and the other was not reduced the risk of HIV transmission to the uninfected partner by 96 percent. In 2010, a study cosponsored by NIAID and the Bill & Melinda Gates Foundation and conducted at 11 global sites found that a daily dose of an oral antiretroviral drug approved to treat HIV infection reduced the risk of HIV acquisition among men who have sex with men by 44 percent. The study, known as iPrEx, found even higher rates of effectiveness, up to 73 percent, among study participants who adhered most closely to the daily drug regimen.

These landmark findings followed closely on the heels of another breakthrough international study, CAPRISA 004,



Significant advances have been made in addressing mother-to-child-transmission of the HIV/AIDS virus.

About NIAID

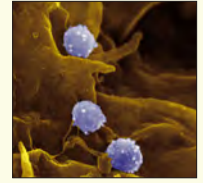
THE NATIONAL INSTITUTE OF ALLERGY AND INFECTIOUS DISEASES (NIAID)

is *one of the 27 institutes and centers that constitute the NIH*. The NIAID operating budget in fiscal year 2010 was approximately \$4.8 billion. More than 11 percent of the NIAID budget supports international research and training, and NIAID is one of the few NIH institutes to have an Associate Director for International Research Affairs to facilitate international activities. As with other large NIH institutes, most of the NIAID budget supports biomedical research at external academic and other research institutions. The remaining budget funds research within NIAID's own laboratories and also supports administrative functions.

which found that heterosexual women who used a vaginal microbicide gel containing a one percent concentration of the antiretroviral drug tenofovir had 39 percent fewer HIV infections than those study participants who used a placebo gel. NIAID was among the organizations that provided substantial support and resources to establish the infrastructure and training for the Centre for the AIDS Programme of Research in South Africa, which conducted the study. Ongoing and future clinical trials will build on these study results with the goal of developing a safe and effective microbicide.

Conducting HIV/AIDS research in international settings allows NIAID-supported scientists to study the disease under a variety of environmental and social conditions. For example, the NIAID-funded HIV Prevention Trials Network (HPTN) comprises more than 60 clinical sites in the United States, Africa, Asia, and South America. HPTN evaluates the effectiveness of various HIV prevention strategies in different populations to better understand and ultimately control the spread of HIV on a global scale.

NTDs and the skewed burden of disease



CHLAMYDIA

Though of low prevalence in most of the United States, tropical diseases such as dengue fever, lymphatic filariasis, leishmaniasis and schistosomiasis take a tremendous toll on global health. According to recent estimates, more than one billion people—about one-sixth of the world's population—suffer from at least one neglected tropical disease (NTD). These diseases tend to thrive among impoverished populations in developing regions of the world, where water quality, sanitation and access to health care are substandard.



Photo courtesy of NIAID

NIAID researchers study cells infected with the dengue virus.

NIAID supports a robust program of research devoted to better understanding, preventing and treating NTDs. Studies conducted and supported by NIAID have led to important new discoveries about the microbes that cause these diseases, the identification of targets for potential new drugs and vaccines, and the development of strategies for controlling the vectors that transmit NTD-causing agents to humans. For example, NIAID-supported investigators have

sequenced the genomes of *Trypanosoma brucei*, *Trypanosoma cruzi*, and *Leishmania major*, the parasites that cause the diseases African sleeping sickness, Chagas' disease, and leishmaniasis, respectively.

Researchers also have sequenced the genome of *Aedes aegypti*, the mosquito species that transmits dengue and yellow fever. Currently, NIAID investigators are working on sequencing the genomes of two other important NTD vectors: the tsetse fly, which transmits *T. brucei* to humans, and the freshwater snail *Biomphalaria glabrata*, which transmits a parasite that causes schistosomiasis. This new genetic information promises to help researchers design better ways to diagnose, treat and prevent NTDs.

Through its Partnerships with Public-Private Partnerships program and Tropical Disease Research Units, NIAID is actively supporting the discovery and development of treatments for parasitic tropical diseases. For example, researchers in these programs are developing a low-cost treatment for visceral leishmaniasis, the most severe form of the disease, and identifying new drugs for African sleeping sickness and Chagas' disease.

Recently, scientists supported in part by NIAID identified cellular components in mosquitoes and in humans that dengue viruses use to multiply inside both hosts. Their findings could lead to the development of drugs that would inhibit one or more of these components, thus limiting infection and the development of dengue fever. The search for anti-dengue therapies is vital, as no specific drugs or vaccines are available to fight dengue infection, which afflicts up to 50 million people worldwide each year.

ICER program fosters research collaborations

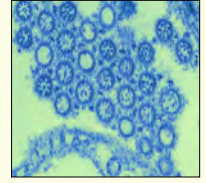
The NIAID International Centers for Excellence in Research (ICER) program was launched in 2002 to develop and sustain research programs in resource-poor countries through partnerships with local scientists. NIAID has developed core programs at the ICER sites—currently located in Mali, Uganda and India—and, over time, has facilitated the expansion of research capacity by training young scientists, improving laboratory and clinical infrastructure, and enhancing information technology capabilities.

The ICER program builds on experience gained from NIAID's long-standing malaria research collaboration

with scientists in Mali. Initially, the collaboration focused on the genetics of malaria mosquitoes, but it has expanded significantly over the years.

Today, Malian researchers collaborate with NIAID scientists on multiple projects, including studies on mosquito vectors, malaria drug resistance, and candidate malaria vaccines; research on neglected tropical diseases such as filariasis and leishmaniasis; and immunologic and microbiologic studies of patients co-infected with HIV and tuberculosis. NIAID and Malian colleagues have recently initiated research programs on relapsing fever and Lassa fever.

Research targets new diagnostics, drugs and vaccines for TB



H1N1 INFLUENZA

NIAID's tuberculosis research program includes domestic and international efforts to develop new tools and strategies to help control TB. In 2009, an estimated 9.4 million new cases of TB were reported worldwide and an estimated 1.7 million people died of the disease. NIAID is leading and sponsoring research activities to create a foundation of knowledge for the discovery of new diagnostics, drugs and vaccines for drug-resistant and drug-sensitive TB. Many of these programs are providing critical information to advance the scientific understanding of TB.

Caused by the bacterium *Mycobacterium tuberculosis* (*Mtb*), TB remains one of the major causes of disability and death worldwide. The BCG vaccine, the only TB vaccine approved for human use, provides limited protection against immediate TB illness but does not prevent reactivation of latent infection, in which *Mtb* persists in human cells for years and may later develop into active disease.

In 2010, a test designed to easily diagnose TB and detect a drug-resistant form of the bacterium was shown to provide much more specific, sensitive and rapid results than currently available TB diagnostics. Known as the Xpert MTB/RIF test, when evaluated in a large clinical trial, it successfully identified 98 percent of all confirmed

TB cases and 98 percent of patients with rifampin-resistant bacteria in less than two hours.

A recent study supported by NIAID and Fogarty has added compelling evidence that new, simpler and shorter treatment regimens using antibiotic drugs could dramatically help prevent tens of millions of people worldwide already infected with *Mtb*, and especially those co-infected with HIV, from developing full-blown TB.

The study, published in the *New England Journal of Medicine* by an international team of scientists, found the most streamlined combination— a high-dose pairing of 900 milligrams each of the newer antibiotic rifapentine and traditional isoniazid once weekly for three months— worked just as well or even better than 300 milligrams of isoniazid taken daily for six months or longer and widely considered the gold standard of care.

In another study, a team of European and U.S. researchers has found that a new vaccine strategy tested in mice provides better protection from TB infection than the BCG vaccine. Their findings were published recently in the journal *Nature Medicine*.

NIAID Tuberculosis web portal: <http://niaid.nih.gov/topics/tuberculosis>

Centers expand global reach of influenza research

In 2007, NIAID established the Centers of Excellence for Influenza Research and Surveillance (CEIRS) to expand its worldwide influenza surveillance program and bolster influenza research in key areas, including understanding how the virus causes disease and how the immune system responds to infection with the virus. The goal of the CEIRS program is to provide essential information for the development of public health strategies crucial to both lessening the impact of seasonal influenza and responding to a pandemic.

Following the 2009 H1N1 influenza outbreak, the CEIRS sites quickly began work with the virus. Within four months, they had characterized the virus and provided other essential information. Their research helped explain how the new influenza virus emerged; its pathogenicity, transmissibility and susceptibility to antiviral agents; and what to expect during recurrences of pandemic influenza virus circulation.



Heightened surveillance will aid in developing new strategies for blunting the impact of influenza outbreaks.

The CEIRS program currently seeks to expand the NIAID influenza virus surveillance program, both internationally and domestically, and to conduct research on: 1) the prevalence of avian influenza; 2) how influenza viruses evolve, adapt, and are transmitted; and 3) the immunological factors that influence the course of influenza infection. Some of the five sites will continually monitor international and domestic cases of animal and human influenza to rapidly detect and characterize viruses that may have pandemic potential and to develop pandemic influenza vaccine candidates. These activities help lay the groundwork for new and improved control measures for emerging and re-emerging influenza viruses.

CEIRS locations and contacts: <http://1.usa.gov/m2mwAE>

NIAID-funded centers seek to enhance malaria control



MALARIA

Photo courtesy of NIAID



A new program tries to meet the need for sustainable, multidisciplinary strategies to control malaria.

Malaria has been eliminated from many parts of the globe, yet approximately half of the world's population remains at

risk of contracting the disease. In July 2010, NIAID awarded funds to establish the International Centers of Excellence for Malaria Research (ICEMR), which form a network of independent research institutions in malaria-endemic regions of Africa, Asia, the Pacific Islands and Latin America. These regions include some of the focus countries of the President's Malaria Initiative, an effort that since 2005 has worked to fight malaria in the regions most affected by the disease.

The ICEMR program is based on the need for sustainable, multidisciplinary strategies to control malaria. The centers will integrate clinical and field approaches with laboratory-based immunologic, molecular and genomic methods. They will adapt their research to changes in malaria epidemiology and emerging research needs as well as to scientific opportunities within the specific regions. Findings are expected to help inform how new interventions and control strategies are designed and evaluated in the future.

The ICEMR program will support malaria research in more than 20 countries and will provide the knowledge, tools and evidence-based strategies to support researchers working in a variety of settings, especially within governments and healthcare institutions. The program is expected to bring critical infrastructure to malaria-endemic regions and help build the needed training and research capacity to combat malaria around the world.

Basis for key parasite function in malaria found

Inside a human red blood cell, the malaria parasite both hides from the immune system and fuels its own growth by digesting hemoglobin, the cell's main protein. The parasite, however, must obtain additional nutrients from the bloodstream via tiny pores in the cell membrane. NIAID investigators— who previously discovered the main feeding pore on parasite-infected red blood cells— recently found the genes that malaria parasites use to create these feeding pores.

The discovery of parasite genes required for feeding pore activity opens up several new research directions. For example, development of antimalarial drugs that target

these channels could be accelerated. The NIAID team has already found channel inhibitors that kill malaria parasites. They also are exploring how the feeding channel protein is transported from the parasite to the red blood cell membrane, as preventing this transport may be another way to kill malaria parasites.

In addition to funding from NIAID's Division of Intramural Research, this study was supported by Medicines for Malaria Venture, a not-for-profit public-private partnership headquartered in Switzerland.

<http://1.usa.gov/ppksJT>

'Giant' steps in the battle against HIV/AIDS

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



During my trip to South Africa this spring in support of the Medical Education Partnership Initiative, I was able to witness some of the great work being done to prevent and treat HIV/AIDS. As we commemorate the 30th anniversary of the fight against this scourge, we acknowledge the advances against this and other infectious diseases by the National Institute of Allergy and Infectious Diseases (NIAID)

and its director, Dr. Anthony S. Fauci, and by the many scientists around the world supported by NIAID and other institutes and centers of the NIH.

But if the great advances have been made standing on the shoulders of giants, in Isaac Newton's phrase, I think Fogarty has a hand—or a shoulder, perhaps—in a number of the research breakthroughs. Trainees supported through Fogarty-funded grants have helped contribute to the work that led to this progress. We're pleased to see our 20-year investment in some of these developing country sites paying off with trainees who are well qualified to move forward the research funded by NIAID and others.

A singular breakthrough in the news is the study known as HPTN 052, which revealed that men and women infected with HIV reduced the risk of transmitting the virus to their sexual partners through early initiation of oral antiretroviral therapy (ART). Fogarty grantee Dr. Myron "Mike" Cohen, who runs the global health institute at the University of North Carolina, is the principal investigator of the study, funded mainly by NIAID with additional funding from other institutes.

This is the first randomized trial to definitively indicate that an HIV-infected individual can reduce sexual transmission of HIV to an uninfected partner by beginning ART sooner. This adds very strong scientific evidence that you can use treatment of HIV as an effective prevention modality by decreasing the possibility that a person who is infected would transmit HIV to their sexual partner. More than 30

Fogarty-supported trainees in Malawi, India, Botswana and Thailand worked on the study.

Very recently, the conclusions of this discordant couples trial were buttressed by results from a pre-exposure prophylaxis, or PrEP, trial that showed that heterosexual participants who took a daily Truvada pill had a significantly lower chance of being infected.

Another landmark is the CAPRISA-004 trial, which demonstrated the effectiveness of an antiretroviral microbicide (tenofovir gel) in preventing sexually transmitted HIV infection in women. USAID funded the study, but Fogarty trainees authored many of the research papers and NIAID has long supported the site. The training was supported by a grant under Fogarty's AIDS International Training and Research Program (AITRP). Dr. Quarraisha Abdol Karim of Columbia University, who directed the CAPRIA study is the director of the AITRP grant and has mentored many trainees continuing this work.

Moreover, a site co-located with the Durban municipal TB clinic—and used in the CAPRISA study based at University of KwaZulu-Natal—is also one of eight sites for the ongoing NIAID-funded multi-country "VOICE" trial, which may help to confirm the outcomes of the CAPRISA-004 study. Fogarty trainee Dr. Kogie Naidoo said that a randomized clinical trial conducted at Durban demonstrated that antiretroviral treatment should begin at the same time as TB treatment. This result has caused the WHO to change its guidelines for TB treatment.

Finally, Dr. Sten Vermund of Vanderbilt University has directed a multi-country study, funded partly by NIAID with some Fogarty trainees participating, demonstrating the effectiveness of ART therapies in stopping mother-to-child transmission of the HIV virus. Sten's program has trained 64 individuals in degree programs, nearly all of whom have returned to their home countries.

There remains much to be done in the effort to achieve "a world without AIDS," in Dr. Fauci's phrase. As we mark the 30th anniversary of that effort, Fogarty is pleased to have played a significant role in training many of the researchers who are positioned to lead the battle.

PEOPLE

Global
HEALTH Briefs**Leadership changes at Fogarty**

Fogarty's Deputy Director, Dr. Michael P. Johnson (top left) is beginning a detail to the Office of the Global AIDS Coordinator, where he will serve as Global Fund Attaché based in Geneva. During his absence, Dr. Joshua Rosenthal (bottom left) will serve as the Center's Acting Deputy Director. Rosenthal is currently Deputy Director of Fogarty's Division of International Training and Research. In addition, Fogarty staffer Nalini Anand will assume the position of Acting Director of the Center's Division of Science Policy, Planning and Evaluation. Anand also is Acting Director, Center for Global Health Studies.

**New director for cookstoves alliance**

Radha Muthiah has been tapped as the new executive director of the Global Alliance for Clean Cookstoves. Muthiah was previously vice president for strategic partnerships and alliances at CARE International, USA.

**Kingston named to alternative medicine council**

Virginia Tech chemistry professor Dr. David G. I. Kingston has been named to the advisory council for the National Center of Complementary and Alternative Medicine. He is principal investigator of the Madagascar International Cooperative Biodiversity Group program, which is administered by Fogarty.

**Hotez joins NTD center at Baylor**

Dr. Peter Hotez, an expert on neglected tropical diseases, is establishing a school of tropical medicine at Baylor College of Medicine and Texas Children's Hospital. Hotez serves on Fogarty's Advisory Board.

**Greenberg again acting director of NIGMS**

Dr. Judith H. Greenberg became acting director of NIH's National Institute of General Medical Sciences (NIGMS) in early July. Greenberg has served as acting director of NIGMS in the past, acting from May 2002 to November 2003.

**Fogarty grantee Birbeck wins Kellogg award**

Fogarty grantee Dr. Gretchen Birbeck, director of Michigan State University's International Neurologic and Psychiatric Epidemiology Program, won the 2011 Outreach Scholarship/W.K. Kellogg Foundation Engagement Award for her work with epilepsy in Zambia.

Report on DOD medical research issued

The U.S. military's global medical research efforts should receive more funding, be better integrated and work to increase awareness of their activities, according to a report published by the Center for Strategic and International Studies. Titled "The Defense Department's Enduring Contributions to Global Health," the report offers recommendations following a year-long independent study that analyzed the defense labs' contributions to military readiness and global infectious disease research. Full report: <http://bit.ly/lpu0cX>

Eliminating mother-to-child HIV

UNAIDS and PEPFAR unveiled a plan to virtually eliminate mother-to-child transmission of HIV by 2015 at the recent U.N. High Level Meeting on AIDS. UNAIDS estimates it will cost about \$2.5 billion in additional funds to achieve the goal. PEPFAR announced it will provide \$75 million on top of the \$300 million it currently devotes to the effort. Full report: <http://bbc.in/iKBJzL>

Disability key to achieving MDGs

A joint WHO/World Bank report reveals that 20 percent of the world's poorest people have a physical or mental disability, and the Millennium Development Goals will not be reached unless governments address the needs of the disabled. Full report: <http://bit.ly/I0Nx0f>

Health Affairs on vaccine strategies

The June issue of *Health Affairs* examines global vaccine strategies including the estimated benefits of vaccines, partnerships that have spurred research and deployment, and how distribution could be improved. Full issue: <http://bit.ly/kX4M05>

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Funding Opportunities

Program	Contact	Receipt Date	Eligibility
International Tobacco and Health Research and Capacity Building Program (R01)	Xingzhu Liu, M.D., Ph.D. Xingzhu.Liu@nih.gov	Sept. 15, 2011	Principal investigators from the U.S. or other high-income countries are required to collaborate with investigator(s) from one or more low- and middle- income countries, and vice-versa.
Chronic, Non-Communicable Disease and Disorders Across the Lifespan: Fogarty International Research Training Award(NCD-LIFESPAN) Training Grant (D43) Planning Grant (D71) PAR-10-257	Kathleen Michels, Ph.D. Kathleen.Michels@nih.gov	Sept. 21, 2011	Applications from U.S. institutions must demonstrate collaborations with institutions in low- and middle-income countries. Foreign applications will only be accepted from LMIC institutions.
Global Infectious Disease Research Training Program (GID) Full awards (D43) Planning grants (D71) PAR-10-260 PAR-10-262	Barbara Sina, Ph.D. Barbara.Sina@nih.gov	Sept. 21, 2011	D43-U.S. institutions with a demonstrated collaboration with a researcher in low- and middle-income country and foreign institutions in LMICs may apply. Applicant institution must have active, ongoing research (18 months of funding remaining at the time of applicant submission). D71- Applicants may only be submitted by foreign institutions in LMICs and foreign applicants should apply in collaboration with U.S. institutions.
Ecology of Infectious Diseases (EID) Announcement on National Science Foundation website (NSF 10-616)	Joshua Rosenthal, Ph.D. Joshua.Rosenthal@nih.gov	Dec. 14, 2011	Proposals for research on disease systems of public health concern to developing countries are strongly encouraged, as are disease systems of agricultural concern.

For more information, visit www.fic.nih.gov/funding

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First Lady visits Fogarty grantee in Botswana



Photo courtesy of the White House

During a June visit to Africa, First Lady Michelle Obama wielded a brush to help paint a mural at the Botswana-Baylor Children's Clinical Center of Excellence in the capital city of Gaborone, the site of a Fogarty AIDS International Training and Research Program (AITRP) grant. The clinic serves 4,000 children and their families who have been affected by HIV/AIDS.

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