

# A Global Approach to Global Problems

Forty-two biomedical scientists worldwide named HHMI international research scholars.

**FROM AVIAN FLU TO SARS, TODAY'S** headlines regularly highlight new outbreaks of disease around the world. Add the persistent presence of malaria, cholera, tuberculosis, and countless other infectious and parasitic diseases, and the challenges to world health seem truly staggering.

To support researchers abroad who address such challenges, HHMI recently awarded \$17.5 million to 42 outstanding scientists in 20 countries. Their research, which in diverse ways tackles the mysteries of the molecular and genetic mechanisms underlying infectious and parasitic disease, could have a great impact on public health around the world. It may lead, for example, to the identification of potential drug targets and the development of vaccines.

Among this distinguished group of HHMI international research scholars is Grant McFadden, a virologist at Canada's University of Western Ontario. His award will support the ongoing study of molecular mechanisms by which viruses disarm host immune systems and cross species barriers—such

as when avian flu migrates from birds to infect humans.

Another grantee is Rajesh S. Gokhale, a dedicated young scientist who, despite attractive job offers in the United States, chose to return to his native India. Gokhale studies the “enzymatic crosstalk” by which *Mycobacterium tuberculosis*, which causes tuberculosis, modulates the proteins and lipids of its cell walls in response to varying environmental circumstances. The results of his work could help explain the subtle ways by which the pathogen generates different, and sometimes not-so-subtle, individual reactions.

A Swiss researcher, Gisou van der Goot, wants to better understand the mechanisms by which anthrax toxin manages to delay the onset of normal immune responses. Using a variety of biological, morphological, and biochemical techniques, including an RNAi screen, she analyzes the molecular systems that govern the delivery and presentation of the toxin and its enzymes in the cell.

Nearly 500 scientists in 62 countries applied for the 5-year awards, from

which HHMI selected its 42 winners. They hail from Argentina, Australia, Brazil, Canada, China, Denmark, France, Germany, Hungary, India, Israel, Mali, Mexico, Portugal, Russia, South Africa, Spain, Switzerland, Thailand, and Uruguay. Each researcher will receive \$350,000 to \$500,000 over 5 years.

Half of these awards are for first-time HHMI grant recipients, and the other 21 are current HHMI international research scholars. Since 1991, HHMI has awarded more than \$100 million to support scientists in 32 countries.

These awards underscore the “international scope of science,” says Peter J. Bruns, HHMI vice president for grants and special programs. Moreover, “the Institute’s support of these scientific leaders in their home countries encourages those nations’ most creative researchers, strengthens their research environments, and provides vital educational opportunities for aspiring scientists.”

## HHMI SCIENTISTS: \$57 MILLION TO IMPROVE WORLD HEALTH

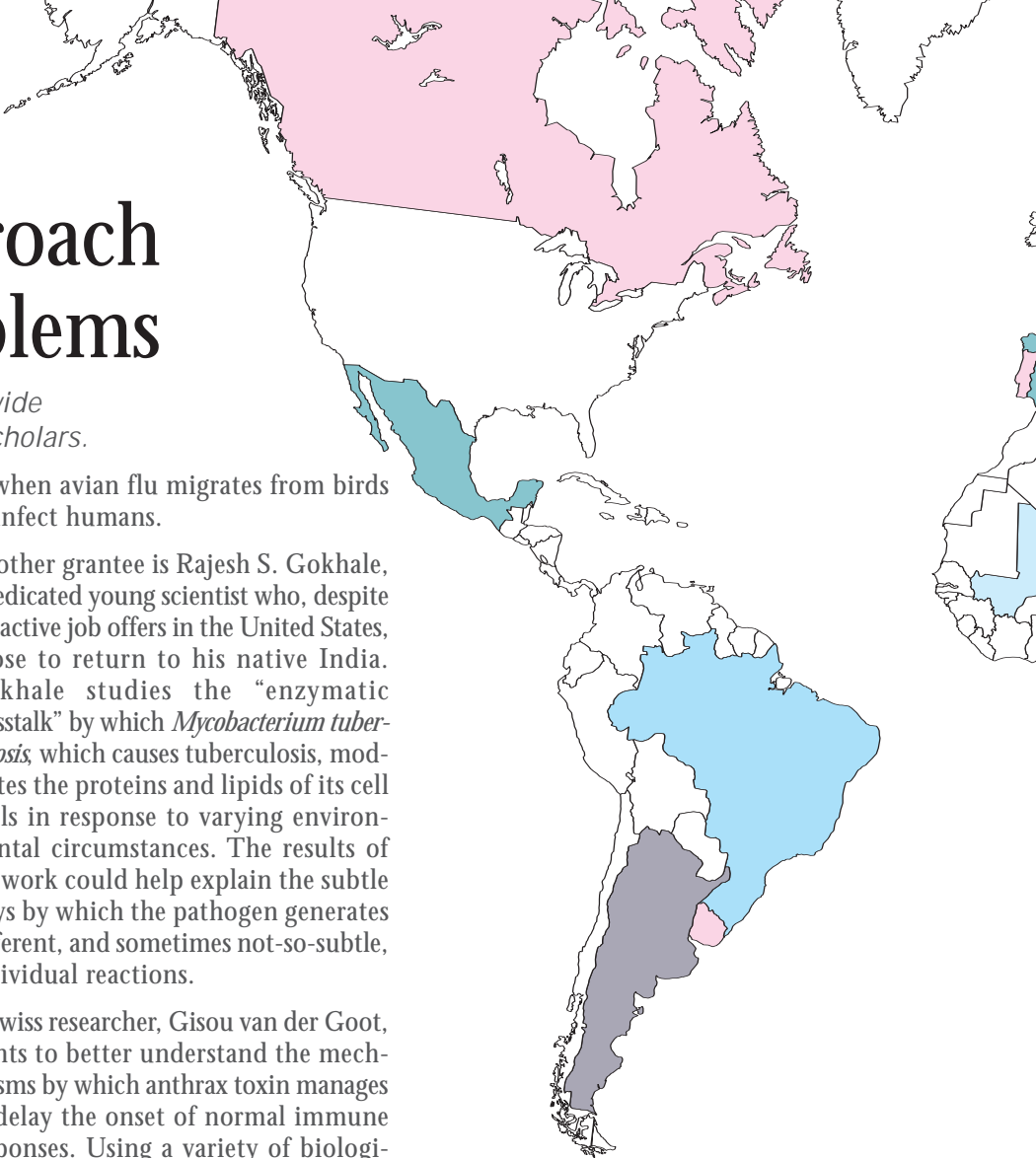
Three HHMI investigators and two HHMI international research scholars at universities in the United States, Canada, and the United Kingdom will lead projects that have been offered grants—aimed at creating effective health tools in developing countries—totaling \$57 million.

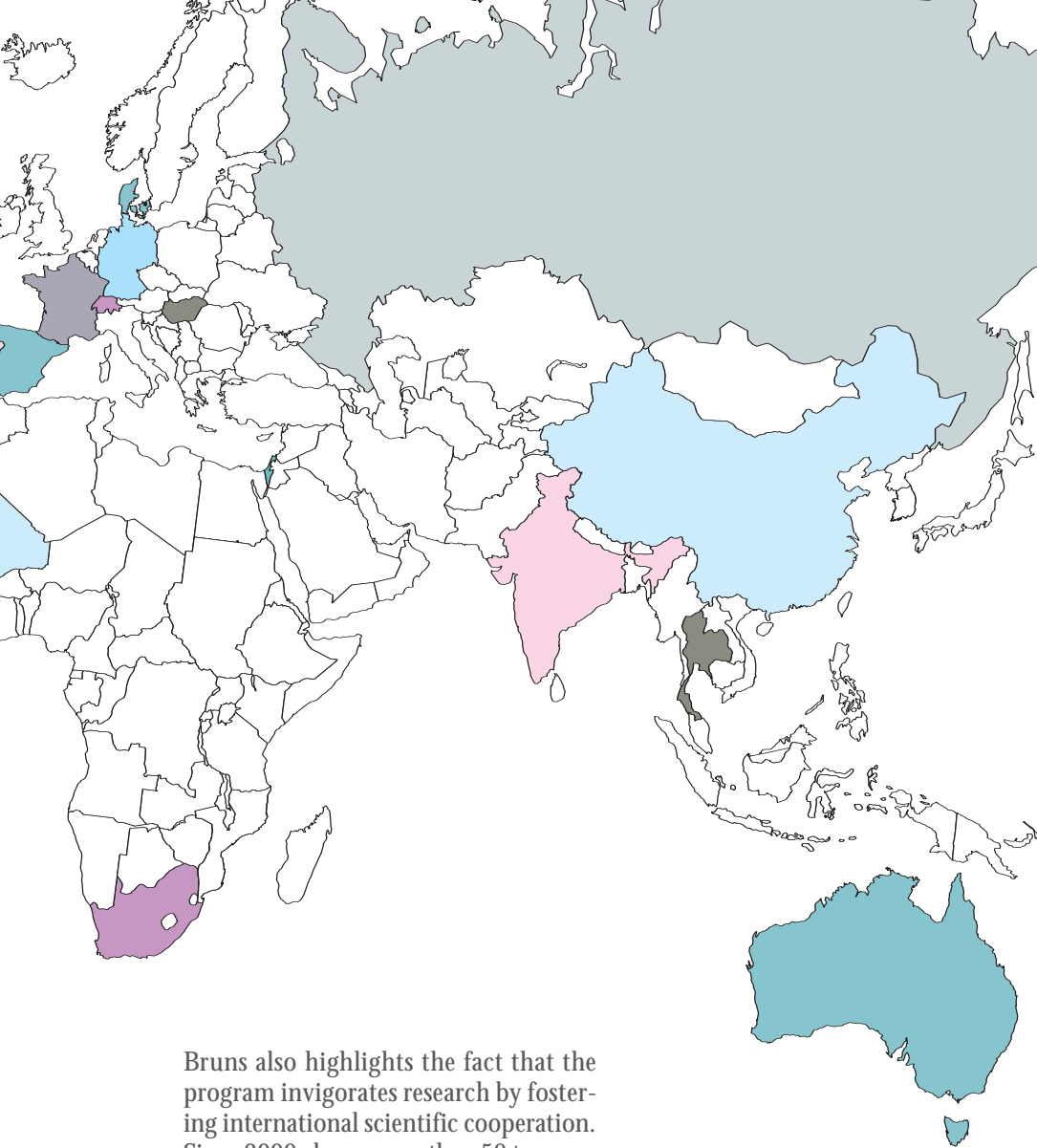
The grants are part of an international effort launched in 2003 by the Bill & Melinda Gates Foundation in partnership with the National Institutes of Health. This initiative focuses on 14 main scientific and technological challenges that, if met, could have a profound impact on improving health in the world's poorest countries. Key goals are to devise new ways to test the safety of potential vaccines, better understand how the body naturally fights infection, and incapacitate disease-carrying insects.

Among the HHMI awardees is Richard A. Flavell, an HHMI investigator at Yale University. He and colleagues have been offered \$17 million to develop laboratory mice whose immune systems are similar enough to humans to allow testing of human vaccines. George M. Shaw, an HHMI investigator at the University of Alabama at Birmingham School of Medicine, will lead a team offered \$16.3 million to study how the immune systems of patients with HIV change as they are infected by and respond to the virus, as well as corresponding changes in the virus itself. HHMI investigator Richard Axel and two HHMI international research scholars, B. Brett Finlay and Adrian Vivian Hill, also received support.

### FOR MORE INFORMATION

Including brief descriptions of the HHMI scientists' projects, visit [www.hhmi.org/news/062805.html](http://www.hhmi.org/news/062805.html).





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Bruns also highlights the fact that the program invigorates research by fostering international scientific cooperation. Since 2000 alone, more than 50 transnational collaborations have sprung from HHMI meetings of international research scholars and HHMI investigators.

Two HHMI-supported scientists, for example, one from the United States and the other from Argentina, joined forces to identify two unique protein-forming features of *Trypanosoma cruzi*, the parasite that causes Chagas disease. Parasitologist Mariano Levin, who recently completed a term as HHMI international research scholar, works at the Institute for Research on Genetic Engineering and Molecular Biology in Buenos Aires. Joachim Frank is an HHMI investigator at Health Research Inc., at the Wadsworth Center in Albany, New York.

Levin told Frank of his work on Chagas and his need to know more about the structure of the parasite's ribosome (the site of protein synthesis in the cell). Frank, it turns out, was a pioneer in the analysis of ribosome structures. The partnership formed that day resulted in the solving of *T. cruzi*'s unusual ribosome structure. This

research was published July 19, 2005, in the *Proceedings of the National Academy of Sciences*.

In a separate initiative sponsored by HHMI's international program, the Institute plans to announce later this year a new round of grants for biomedical research scientists working in the Baltics, Central and Eastern Europe, Russia, and Ukraine. The Institute is also conducting a competition at present that will award 5-year grants to promising Canadian and Latin American scientists who are doing basic biomedical research. ■

**FOR MORE INFORMATION**  
[www.hhmi.org/grants/office/international/](http://www.hhmi.org/grants/office/international/)

\* Indicates renewed support for a previous HHMI international research scholar