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Five HHMI Scientists Offered \$57 Million to Improve Health in Developing Nations

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 totaling \$57 million as part of the Grand Challenges in Global Health initiative - an international effort to use science and technology to create effective health tools that are inexpensive to produce, easy to distribute, and simple to use in developing countries.

The Grand Challenges initiative, launched in 2003 by the Bill & Melinda Gates Foundation, in partnership with the National Institutes of Health, focuses on 14 main challenges, identified by scientists from around the world, that are expected to have profound impact on improving health in the world's poorest countries. The challenges range from developing vaccines that do not require refrigeration to discovering drugs and delivery systems that minimize the likelihood of drug resistant microorganisms.

The Grand Challenges initiative will fund 43 groundbreaking research projects, which were selected from more than 1,500 requests for funding. The projects led by HHMI investigators and international research scholars that will be funded by the initiative aim to improve strategies for vaccine design; develop medicines that do not lead to drug resistance; devise new ways to test the safety of potential vaccines; better understand how the body naturally fights infection; and incapacitate disease-carrying insects.

The five Grand Challenge projects that will be led by HHMI scientists are described below:

Richard Axel, an HHMI investigator at Columbia University, and colleagues have been offered \$5 million to study insects' sense of smell, and how the signaling molecules involved in the process can be blocked to interfere with the insect's ability to identify its host. The aim of this research is to guide the development of safe, effective, and low-cost mosquito repellants that will reduce malaria transmission in endemic areas.

A research team led by B. Brett Finlay, an HHMI international research scholar at the University of British Columbia in Canada, has been offered \$8.7 million to explore ways to boost the body's general defenses against infectious agents. Because medicines that act in this way would act on the human body and not the pathogens themselves, the researchers expect that they will be less likely to promote the development of drug-resistant strains.

Richard A. Flavell, an HHMI investigator at Yale University, 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. This type of animal model will enable scientists to test the safety of promising new vaccines made from weakened live viruses, before moving those vaccines into human trials.

A project led by Adrian Vivian Hill, an HHMI international research scholar at the University of Oxford in the United Kingdom, has been offered \$10 million to explore ways to improve technologies used in the design of potential vaccines against HIV, tuberculosis, and malaria. Using recently discovered molecular signals, the project will work to increase the potency of vaccines' immune stimulus and overcome regulatory mechanisms in the body that can limit protective immunity.

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. By better understanding the initial strengths and ultimate weaknesses of the immune system as it responds to the HIV, this project aims to guide the development of an HIV vaccine.

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