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Gates Foundation invests in 104 novel ideas for global health

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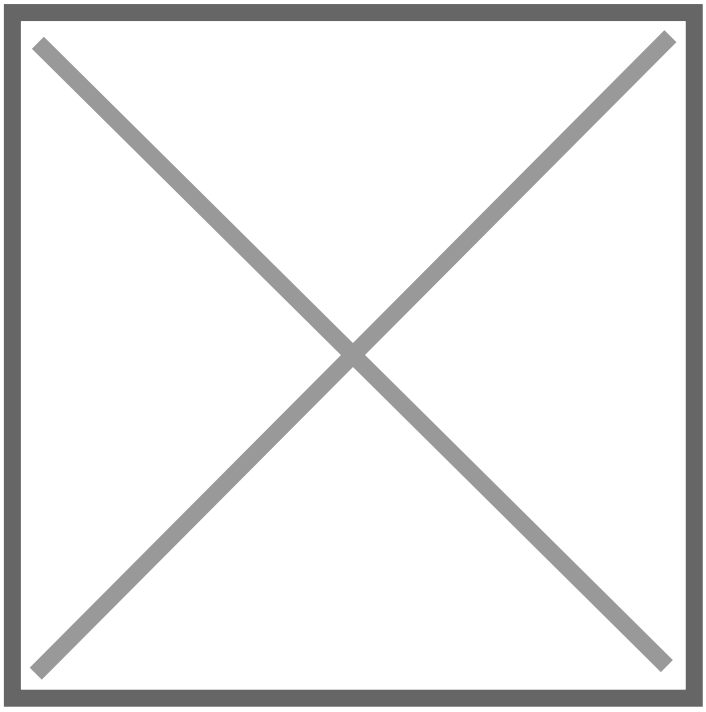

Gates Foundation invests in 104 novel ideas for global health

Unconventional ideas include a hypothesis on mosquitoes to act as "flying syringes to deliver vaccines" when they bite.

The Bill & Melinda Gates Foundation recently announced 104 grants to explore bold and largely unproven ways to improve global health. The grants worth $100,000 each will be made to scientists from 22 countries and five continents. They mark the first round of funding from Grand Challenges Explorations, an initiative to help lower the barriers for testing innovative ideas in global health.

In all, 104 grants were selected from nearly 4,000 proposals, with the geographic distribution of applicants largely matching the geographic distribution of awards. The winner of Grand Challenges from India is Karthikeyan Kandavelou, project leader, Pondicherry Biotech Pvt Ltd. His project on a novel approach to prevent or cure HIV Infection will explore genetic approaches to fighting HIV/AIDS, by attempting to mimic the natural resistance to HIV found in some people.

The initial set of grants will inject fresh perspective into research for preventing or curing infectious diseases such as HIV/AIDS and TB, and limiting the emergence of drug resistance. Successful applicants showed how their project falls outside current scientific paradigms and could lead to significant advances if successful--in just two pages. The applicant details were not provided to reviewers, helping them to focus on the innovation of the idea instead of a scientist's credentials, geographic location, or organization's reputation.

"We were hoping this program would level the playing field so anyone with a transformational idea could more quickly assess its potential for the benefit of global health," said Dr Tachi Yamada, president of global health at the Gates Foundation, who announced the grants at the fourth annual meeting of the Grand Challenges in Global Health initiative in Bangkok. "The quality of the applications exceeded all of our expectations. It was so hard for reviewers to champion just one great idea that we selected almost twice as many projects for funding as we had initially planned," he added.

All levels of scientists are represented, including young investigators who have never before received a research grant, and those who were applying experience from other fields like bioengineering. Grants were made to universities and other nonprofit organizations, government agencies, and six private companies. Projects cover a wide range of innovation, including a "mosquito flashlight" to prevent malaria transmission by disrupting wavelengths, self-destructing TB cells, and studying anti-infective properties of the eye to help prevent HIV/AIDS and other infectious disease.

Applications for the second round of Grand Challenges Explorations are being accepted through November 2, 2008, and topics for the third round will be announced in early 2009. Grant application instructions, including the list of topic areas in which proposals are currently being accepted, are available at www.gcgh.org/explorations.

Some Novel Projects

Mimicking effective natural processes to limit infectious disease

- Pattamaporn Kittayapong at Mahidol University in Thailand will explore new approaches for controlling dengue fever by studying bacteria with natural abilities to limit the disease.

- Suzanne Fleiszig at the University of California, Berkeley, in the US will focus on the natural defenses of the human eye to discover new classes of broad-spectrum anti-microbial agents.

- Elizabeth Sockett at the University of Nottingham in the UK will study whether the best medicine against some disease-causing bacteria may be a "living antibiotic" made up of microorganisms that naturally prey on harmful ones.

Engineering ways to enhance the natural human immune system

- Leonard Damelin at the National Health Laboratory Service in South Africa will attempt to improve bacteria that naturally line the walls of the vagina and cervix in order to enhance their ability to fight infections.

- Yen Wah Tong at the National University of Singapore will attempt to create nanoparticles to "soak up" viruses circulating in the body; the particles will be imprinted with the viruses in order to mimic the three-dimensional structure of cells that the virus normally tries to infect.

- Jord Stam at Utrecht University in the Netherlands will attempt to create "two-sided" antibodies to fight HIV; one side would attach to HIV, and the other side would safely deposit the virus in cells in which it cannot replicate.

- Sanah Jowhari at TheraCarb, a biotechnology company in Canada, will apply technology to capture and remove the cholera toxin from the body of a host, and validate an approach to developing an effective drug candidate for cholera.

Probing unexpected results for global health

- Elijah Songok at the Kenya Medical Research Institute will explore whether natural resistance to HIV may be linked to genetic markers for type 2 diabetes.

- Huan Nguyen at the International Vaccine Institute in Korea will follow up on the unexpected finding that a fluorescent green protein originally intended as a research control could be the basis of a highly effective influenza vaccine.

Exploring hypotheses that challenge conventional wisdom

- Mike McCune at the University of California, San Francisco, in the U.S. suggests that the best immune response to HIV may be no response at all, because the immune cells that are marshaled to fight the virus are the same cells that HIV infects.

- Hiroyuki Matsuoka at Jichi Medical University in Japan thinks it may be possible to turn mosquitoes that normally transmit disease into "flying syringes," so that when they bite humans they deliver vaccines.

A complete list of the funded projects is available at www.gcgh.org/ explorations.

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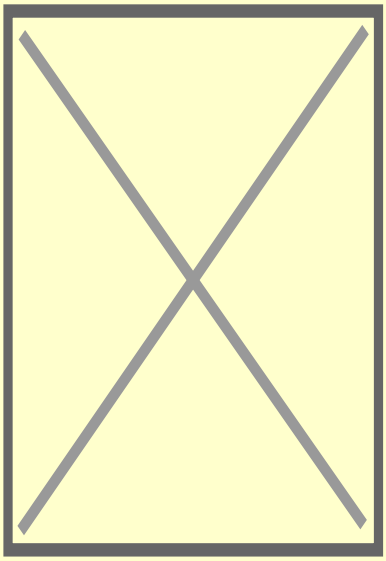
Andrew Serazin, program officer, Gates Foundation



Grand Challenges Explorations is a five-year $100 million initiative to promote innovation in global health. It is part of the Grand Challenges in Global Health initiative, which is supported by the Gates Foundation to achieve major breakthroughs in global health. We find out more in interview with Andrew Serazin, Program Officer, Gates Foundation.

What is the objective of the Grand Challenges Explorations?

The objective is to increase the number of bold and unconventional ideas that are being investigated for global health. We gamble on a small number of ideas and the greatest problems facing humanity today and the program is a way to increase the diversity and innovation present in the ideas. The program is founded on the belief that bright ideas need to be championed. During a review, a reviewer can chose one idea that we can empower to be funded. It is more like a VC system wherein each new idea needs a champion behind it.

What are the criteria for selection of the grant?

The idea presented has to fall within the purview of our research. The applicant has to offer unconventional and bold ideas and make sure his/her idea is innovative. Unlike most programs of this nature, we have tried to streamline the application which is two pages in length and requires no preliminary data.

What are the priority areas for the grants?

The total number of grants last year was approximately $2 billion, half of which were in global health. We define Global Health in three different areas--infectious diseases, nutrition, and child and maternal health. The fundamental principle that the foundation operates upon is that all life has equal value, and so it aims to reduce inequalities that exists in the world in global health. Grants priorities are vaccines, new drugs and diagnostic tests for malaria and TB. We believe that basic scientific ideas and fundamental discoveries can lead to many different kinds of products.

What is your view on the scientific talent in India?

This year there were nine grants to scientists in Asia, including one from India. We are excited about the potential of scientists in India and Asia. There is an emerging recognition of Indian scientists in public and private sector. We think excellence is there in India, some of the problems that we are addressing are there in India, so we hope that scientists here can find out better ways and means to deal with them.