

India to develop its own AIDS vaccine

After losing an 11-year battle to control AIDS with slogans, condoms and a \$100 million World Bank loan (*Nature Med.* 2; 951, 1996) the Indian government has launched a program to develop a vaccine against the disease despite skepticism in the West that this is still a distant dream.

"There is no alternative," says Vulimiri Ramalingaswami, former head of the Indian Council of Medical Research and now a member of the international AIDS Vaccine Initiative (IAVI) at the Rockefeller Foundation, New York. "Educational campaigns have not made a dent and AIDS drugs are not affordable even for rich Indians." He added that even if India does not succeed in developing a vaccine "it is time we put our foot in the door rather than wait until someone comes out with a vaccine and asks us to buy it."

An agreement signed by the US secretary for Health and Human Services Donna E. Shalala on a visit to India last month, may help vaccine development in the country. The agreement is a five year extension of an existing Indo-US program started in 1987 to develop vaccines against a range of infectious diseases. AIDS, which was not in the original list of diseases, has now been added. Under the 1987 program, India agreed to become a testing ground for vaccines against diarrhea, cholera, typhoid and hepatitis B, but authorities have made it clear to the National Institutes of Health (NIH) that the Indian population is not available for efficacy trials of western-made AIDS vaccines.

The revised agreement includes collaboration with US vaccine research groups and possible US funding, but details of these terms have not been disclosed. Indian teams working on the project include the government Department of Biotechnology (DBT) and four other institutions: the All India Institute of Medical Sciences (AIIMS), the National Institute of Communicable Diseases (New Delhi), Christian Medical College (Vellore), and National AIDS Research Institute (Pune).

Even without a US contribution, funding is manageable according to the DBT, which is expected to contribute \$1 million to the project. "We are not starting from scratch as participating units already have infrastructure and expertise in handling the virus or in making DNA vaccines and will need only incremental funds," says

N.K. Vinayak, senior adviser at the DBT which launched the AIDS vaccine initiative in November. Support may also come from the various arms of the US Agency for International Development and from IAVI according to Ramalingaswami.

The quest for an indigenous vaccine stems from a fear that those being developed in the West may not work in India due to differences in subtypes of HIV. While subtype B is prevalent in western countries, C is dominant in India along with B and E. "We need to develop a vaccine that takes care of local HIV-1 and HIV-2 strains and the diverse subtypes," Vinayak told *Nature Medicine*. According to UNAIDS more than three million Indians are infected with HIV and some 200,000 are suffering from AIDS.

Believing it to be the cheapest and simplest approach, Indian scientists plan to develop a DNA vaccine cocktail containing the desired gene sequences of prevalent subtypes. P.N. Rangarajan of the Indian Institute of Science, who is

developing DNA vaccines against the cattle diseases rinderpest and Japanese encephalitis, says that the recent success in immunizing chimpanzees against HIV supports the potential superiority of DNA vaccination over other approaches (*Nature Med.* 3; 526, 1997). However, on a recent trip to Delhi, Jean-Louis Excler, medical director of Pasteur Merieux Connaught, voiced his skepticism of the plan. "DNA vaccines work in animals but there is no evidence they work in humans," he warned. Excler says India could avoid the huge cost of vaccine development if it agreed to test the canary pox virus based HIV vaccine already developed jointly by his company and the NIH. Problems posed by divergent subtypes in India "can be worked out" with suitable modification, he says.

Pradeep Seth of AIIMS, whose group has tested a DNA vaccine in mice, told *Nature Medicine* that a prototype vaccine could become available for clinical trials in less than four years if everything goes well."

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Sabin Institute joins Georgetown University

The story goes that Albert Sabin, developer of the live oral polio vaccine, once told his good friend, pharmaceutical company executive H. R. Shepherd, there would "never" be an HIV vaccine. After Sabin's death in 1993, Shepherd

honored his friend's memory by establishing the Albert B. Sabin Research Foundation (now Institute) with the mission "to prevent diseases through the development of new vaccines and delivery technologies, and through increased immunization rates."

On December 8, the Institute celebrated its merger with Georgetown University by hosting a vaccine research symposium entitled "Filling the Gaps in Vaccinology." It was perhaps fitting that included in the meeting was a presentation by National Institute of Allergy and Infectious Diseases (NIAID) director Anthony Fauci on HIV-vaccine research.

Fauci stated what for many basic HIV vaccine researchers is the unthinkable: at some time during HIV-vaccine development, "we will have to bite the bullet and make an empirical decision." Fauci also said, "every single vaccine that has

ever been developed in history has gone ahead with empirical decisions without all of the scientific answers." This contrasts with recent statements made by David Baltimore, chair of the National Institutes of Health's AIDS Vaccine Research Committee, that "everybody says empirical research is what gives you a vaccine. Well, it doesn't give you anything else in science, so why should it give you an AIDS vaccine?" Shepherd commended Fauci on "burying the hatchet between the empiricists and the basic scientists."

The conference marked the official move of the Institute from Connecticut to Georgetown's Washington, D.C., campus—a move Shepherd describes as "an extraordinary opportunity" to affiliate with the university where Sabin served on the faculty until his death. Shepherd told *Nature Medicine* that Georgetown beat Yale in the competition for the merger because of its strength in the vaccine development field.

"Georgetown is right where the action is. It's where the policy people are, where the NIH is, and also where Congress is," says Shepherd. With all these factors combined, Shepherd intends to prove Sabin wrong about the development of an HIV vaccine.

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