VACCINE DEVELOPMENT

Korean Institute Ponders Role In Global Eradication Efforts

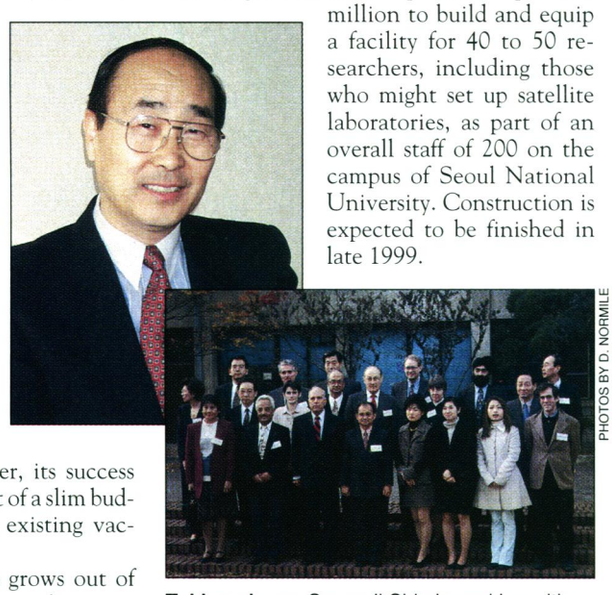
SEOUL—The eradication of smallpox in 1977 proved that industrialized nations can mount a successful global immunization program with an arsenal that includes research, training, public education, and distribution of the right vaccine. Polio and measles are next on a list of possible targets. In most cases, these vaccines had initially been developed for diseases that affected the industrialized world. Yet health officials and scientists say that progress against infectious diseases that primarily affect developing nations, such as malaria and tuberculosis, will require greater attention than is now being given to them by the industrialized world.

It is hoped that a new International Vaccine Institute (IVI) taking shape here will redress this lack of attention by marshaling the talent and resources of the developing countries themselves. However, its success depends upon making the most of a slim budget and avoiding duplicating existing vaccine development efforts.

The idea for the institute grows out of the Children's Vaccine Initiative, begun in 1991 by a host of international organizations to provide affordable vaccines for children. On 28 October, the IVI passed a major milestone with a ceremony at the United Nations that established it as an autonomous, not-for-profit institute. Last month, to celebrate the occasion, the institute sponsored a symposium on Vaccines for the 21st Century as part of the 5th Pacific Rim Biotechnology conference in Seoul. Meetings of an IVI network coordinating group and the IVI advisory board turned the week into a brainstorming session on how IVI can make its greatest contribution.

IVI's major goal is to expand the roster of existing vaccines to meet the public health needs of the developing world. "Some very important diseases against which vaccines need to be developed are not being developed because [they] do not have obvious commercial potential," says Seung-il Shin, a Korean-born biochemist and former U.S. academic researcher and entrepreneur who is project leader for the institute as it searches for a director. Richard Mahoney, a public health expert and IVI's director of institutional development, says that possible targets include malaria, tuberculosis, Japanese encephalitis, and *Haemophilus influenzae* B.

In 1992, Shin joined the United Nations Development Program (UNDP) to work on a series of studies that led to IVI and the selection of Seoul as its home. The South Korean government has promised up to $50 million to build and equip a facility for 40 to 50 researchers, including those who might set up satellite laboratories, as part of an overall staff of 200 on the campus of Seoul National University. Construction is expected to be finished in late 1999.



PHOTOS BY D. NORMILE

Taking shape. Seung-il Shin is working with an international coordinating committee *(inset)* to help launch a new vaccine institute in Seoul.

The government has also agreed to pay 30% of an estimated $15 million a year in operating costs. Shin hopes the rest will come from international donor agencies and other East Asian countries, supplemented by contract research and fees from educational and training programs in vaccine production and delivery. "Obviously, [funding is] a major challenge," he says.

The institute's constitution describes an ambitious agenda that includes research and development, education and training programs, technical cooperation to boost the research and production capabilities of developing nations, and disseminating information through publications and conferences. Adolfo Martinez-Palomo, director-general of Mexico's Center for Research and Advanced Studies and a member of the IVI board, believes that developing countries need "to establish and strengthen an adequate health research base." He points to the recent discovery that what had long been considered two forms of amebiasis, a parasitic disease, are actually two different infections, one relatively harmless and the other a major killer in developing countries.

Some public health administrators feel IVI is in danger of stretching its resources too thinly. "My major problem in selling IVI within WHO [World Health Organization] and to other countries is its all-inclusive constitution," says Jong-Wook Lee, a Korean-born physician who heads WHO's Global Program on Vaccines and Immunization and is also executive secretary of the Children's Vaccine Initiative. Support from countries that are already contributing to vaccine-related work at WHO and UNICEF is not likely, he says, unless IVI can make clear its unique role: "In my view, IVI should focus on vaccine R&D."

But even in R&D, IVI will have to focus its efforts. Trying to do everything on its own "would be not only foolish but impossible," Shin agrees. He says IVI doesn't want to duplicate basic work done elsewhere, nor is there any point in competing with pharmaceutical companies.

John La Montagne, a U.S. National Institute of Allergy and Infectious Diseases official who served on the IVI site-selection committee, says a recent study by his institute found that there were 250 basic research candidates that could possibly be turned into vaccines. But only a handful of these are likely to go further along the development pipeline. "The major challenge facing all of us is the problem of translating these discoveries of basic science into reality," he says.

IVI's Mahoney says the experience of the International Task Force on Hepatitis B Immunization, which he chairs, could provide a model of how IVI could relieve some of the bottlenecks in the vaccine development process. With a budget of only $7 million over 9 years, the task force worked jointly with the industry to conduct marketing studies, sponsor model effectiveness trials, and help companies clear regulatory hurdles in particular countries. As a result, he says, what in 1986 was a very expensive vaccine given only to high-risk groups is now plentiful, relatively cheap, and given routinely to 10% of the world's newborn infants. That success story is well known to Shin, who before joining UNDP was a partner in a New Jersey biotechnology firm working on one version of the vaccine.

Philip Russell, a public health expert from Johns Hopkins University and a member of IVI's networking group, says that in the developed world, public health authorities often cooperate with the private sector to bring to market vaccines or drugs not commercially attractive enough for private companies to tackle on their own. "There is nobody playing that [public sector] role in Asia," he says. IVI's challenge, he adds, is to fill this gap.

–Dennis Normile