

The IVI Newsletter

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President Kim Dae-jung welcomes Prof. Barry Bloom, Chairman of the IVI Board of Trustees, to a special meeting of the Board held at Cheong Wa Dae, the official residence of the President of Korea.

President Kim Dae-jung Receives Board of Trustees

The Institute's Board of Trustees met in Seoul, March 13-15, the fifth such meeting in the Institute's history. The Board had the honor to meet with several of the highest-ranking officials of the Republic of Korea, including the President, the Prime Minister, the Minister of Education and Human Resources Development, and the President of Seoul National University.

The President of the Republic and Nobel Peace Prize winner Kim Dae-jung received the Board of Trustees at Cheong Wa Dae, his official residence, on March 13.

The President discussed the future of the IVI with the Board for nearly an hour and reiterated strongly the commitment of the Republic of Korea to the IVI. First Lady, Ms. Hee-ho Lee, joined the President in this landmark meeting. Ms. Lee also serves as the Honorary President of the Korea Support Committee for the IVI. President Kim noted in particular the importance of the IVI in the international effort to relieve the burden of the unnecessary and tragic diseases that affect so many poor people. Prof. Barry Bloom, Dean of the Harvard School of Public Health and Chairman of the IVI Board, expressed the Board's gratitude for the generous support of the Republic of Korea and reaffirmed the Board's commitment to ensuring the achievement of the IVI's goals. (continued on page 2)

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IVI Welcomes New Deputy Director

Prof. Aldo Tagliabue has been appointed Deputy Director for Laboratory Sciences at IVI, effective May 1. In this role, he will lead the development of the Institute's laboratory research program at the new IVI headquarters.



Prof. Tagliabue obtained his doctoral degree in Biology in 1974 from the University of Milan, Italy and his PhD in 1976 at the Mario Negri Institute in Milan. He did postdoctoral work at the U.S. National Cancer Institute and at McMaster University. (continued on page 2)



Participants in the dinner hosted by the Prime Minister Han-Dong Lee.

Front: Prof. Wan Kyoo Cho, Prof. Philip Russell, Ms. Anne-Isabelle Degryse Blateau, Dr. John Clemens, Mr. Han-Dong Lee, Prof. Barry Bloom, Sir Gustav Nossal, Dr. Margaret Liu, Dr. Thamrin Poeloengan. **Second Row:** Prof. Sang Dai Park, Prof. Jan Holmgren, Prof. Ian Gust, Dr. Uton Muchtar Rafei, Dr. Shigeru Omi, Dr. Daniel Tarantola, Prof. Paul-Henri Lambert, Prof. Dang Duc Trach, Dr. Cyrus Simanjuntak, Dr. Geoffrey Schild. **Third Row:** Dr. Rich Mahoney, Mr. Chan-ho Ha, Prof. Aldo Tagliabue, Prof. Wang Ke-An, Dr. Varaprasad Reddy, Dr. Bernard Ivanoff, Mr. Michael Goon, Dr. Jean-Marie Col. **Back Row:** Prof. Hyun Koo Lee, Dr. Luis Jodar

Board of Trustees (from page 1)

Board Shares Dinner with Prime Minister Han-Dong Lee

Also on March 13, the Board and several guests visited the official residence of the Prime Minister for dinner. Prime Minister Lee made some brief and very encouraging remarks. In part he said, "It is a matter of regret that as many as 10 million children are deprived of their precious lives every year, and that most of them are those in underdeveloped countries. In this regard, efforts made for the development of vaccines are the most valuable thing of all. Our government is glad that it is doing its part for such a humanistic project and I would promise that we will provide all possible assistance for the Institute's research activities."

In addition to these visits to the two most senior leaders of the government, the Minister of Education and Human Resources Development and the President of Seoul National University hosted lunches in honor of the Board.

Resource Mobilization

The Board devoted more time to resource mobilization than any other topic. There is a need to obtain greater support in order to respond to the opportunities and challenges faced by the Institute. New programs on Japanese encephalitis and dengue are two examples where the Institute has identified opportunities for rapid progress but for which funding is inadequate. Further, the Institute's headquarters, including laboratories and pilot plant, will become available at the beginning of 2003, but the Institute will require additional resources to take full advantage of these superb gifts of the Republic of Korea. The Board developed a multifaceted plan of resource mobilization that will be implemented in the coming months.

Retirement of Sir Gustav Nossal

In a moment filled with both sadness and fondness, Sir Gustav (Gus) Nossal's last meeting was acknowledged. Prof. Bloom spoke on behalf of the other Board members in thanking Gus for his tremendously valuable service to the Institute both as a Board member and as a persuasive and eloquent spokesman.

IVI Welcomes New Deputy Director (from page 1)

In 1979 he moved to Siena, Italy to build the new Immunology Department at the Sclavo Research Center. While there, he developed independent research projects in the field of mucosal immunology, applying his basic findings to investigate immune responses in volunteers treated with enteric vaccines.

In 1990 he became Director of Research for Domp-E, taking responsibility for planning and building research facilities.

During his scientific career, he has authored over 100 original scientific papers and edited several books in the fields of mucosal immunology and cytokines. He has also obtained 10 international patents. In 1998, Prof. Tagliabue founded ALTA - Biotechnological Research and Development - Srl in Monteriggioni, Italy.

In parallel with his scientific and business activities, Prof. Tagliabue has been involved in teaching from the beginning of his career. Since 1996 he has been Professor of Immunology at the Biotechnology Faculty of the University of Bologna.

Tackling the Diseases of the Poorest

The second year of the Diseases of the Most Impoverished (DOMI) Program, funded by the Bill and Melinda Gates Foundation and coordinated by the IVI, saw great steps forward in a wide-ranging program of research and technical assistance designed to accelerate the rational introduction of new vaccines against cholera, shigellosis, and typhoid fever for the poor in developing countries of Asia.

Research initiated by the DOMI Program is downstream in nature and designed to generate evidence needed by policymakers for rational introduction of vaccines against these three diseases. Concomitantly, the Program is working with both international and local producers of licensed new-generation vaccines against cholera and typhoid fever (no licensed vaccines are available for shigellosis at present) to make vaccines available at affordable prices, and is supporting the clinical evaluation of promising experimental vaccine candidates against all three diseases. Part of the work entails assistance with transfer of technology for production of new vaccines to qualified local producers.

Capacity building is integral to the DOMI agenda. To help ensure that locally produced vaccines against the DOMI diseases will be of high quality, the Program is providing technical assistance to vaccine producers and national regulatory authorities in China, India, Indonesia, and Vietnam. The Program is also providing training to collaborating investigators in the seven DOMI partner countries (Bangladesh, China, India, Indonesia, Pakistan, Thailand and Vietnam) on methods and standards for clinical evaluations of vaccines, and on methods for economic and behavioral studies to generate needed information for vaccine policymakers.



DOMI collaborator Prof. Zulfikar Ahmed Bhutta (fourth from left) of the Aga Khan University, Pakistan, and colleagues.

In total, the DOMI Program has now launched more than 30 research projects in coordination with the World Health Organization and with Ministries of Health and partner institutions in the seven partner countries. To be most effective in generating the broad constellation of

IVI Director and Advisors Meet Hee-ho Lee, the First Lady of Republic of Korea

On January 18, 2002, Dr. John Clemens (second from left), the Director of the IVI, together with Prof. Wan Kyoo Cho (far right) and Prof. Sang Dai Park, special advisors to the Director and members of the Korea Support Committee for the IVI, visited Mrs. Hee-ho Lee, the First Lady of Republic of Korea and the Honorary President of the Korean IVI Support Committee. They discussed IVI's operations and research activities and the future projects of the Korean IVI Support Committee. The First Lady emphasized the importance of vaccine research and development in promoting human welfare, and congratulated the IVI and the work it is doing. In addition, the First Lady promised active participation in the projects involved in the development of the IVI and the Korean Support Committee.



evidence needed for policies to introduce vaccines targeted by the Program in a rational fashion, the Program's research is wide-ranging, including epidemiologic studies of disease burden, demonstration projects of the use of licensed vaccines in public health programs, clinical evaluations of experimental vaccines in target populations in developing countries, economic studies of cost-effectiveness of using vaccines, and behavioral studies of community, provider, and policymaker perceptions about the importance of cholera, shigellosis, and typhoid fever and the need for vaccines against them.

Consensus building on the need to introduce vaccines is a key element of the DOMI Program. An important part of building consensus is involving policymakers in the design of the Program from its inception. To this end, in 2001 the DOMI Program completed in all seven partner-countries a comprehensive policy assessment - the first of its kind ever conducted on the three diseases and vaccines for them in Asia. This assessment investigated the views of policymakers and other key leaders related to

the potential use of DOMI disease vaccines. Issues included in the survey were the policymakers' perceptions of the scope of the DOMI diseases, their level of interest in vaccines, the reasons that already-licensed, new-generation vaccines were not yet in use, and what is needed to improve the situation.

The survey, conducted by DOMI policy scientists Denise de Roeck and Andrew Nyamete, proved highly informative. It indicated that policymakers viewed all three DOMI diseases to be of importance, but that vaccines against typhoid and shigellosis were most urgently needed. In contrast, new vaccines against cholera were judged to be important, but for more circumscribed populations at particularly high risk. Uniformly, policymakers urged DOMI to provide more evidence on the magnitude of the burden of the three diseases in their countries; to conduct demonstration projects to show the programmatic feasibility of introducing the vaccines; and to supply evidence on the economic consequences and acceptability of introducing new vaccines. The policymakers also urged that DOMI to assist in transfer of technology for production of vaccines to qualified local producers, particularly since vaccines against cholera, shigellosis, and typhoid are not of great commercial interest to international pharmaceutical companies.

The results of this assessment have helped DOMI to respond to the needs of policymakers, and have also confirmed that the basic activities of the Program, with a focus on downstream research, technical assistance, and technology transfer, are on the right track. Policymakers will be reconvened during the course of the Program for policy briefings.

Consensus-building activities have also been undertaken at regional and international meetings. Both the Asian Society for Control of Diarrheal Diseases in Delhi, September 2001, and the International Forum on Typhoid Fever in Karachi, February 2002, attended by public health officials and policymakers from all of the DOMI partner countries, included special forums devoted to specifically to the DOMI program, its goals, and its results. In addition the Orphan Vaccines Conference held in Cairns, Australia, in August 2001, and the Bio Farma Symposium on Recent Developments in Vaccination, held in Jakarta, Indonesia, in August 2001 included presentations on the DOMI Program.

Although the DOMI Program is only two years old, it has already generated critical research findings that will have a major impact in accelerating rational introduction of new-generation vaccines against cholera, shigellosis, and typhoid fever into public health programs for the poor.

DOMI Research Highlights: Cholera

A clinical trial cofunded by DOMI, together with the Swedish SIDA/SAREC and the U.S. National Institutes of Health demonstrated that a locally developed and produced killed whole-cell oral cholera vaccine in Vietnam,

which is produced at only about \$0.30 per dose, elicited serum vibriocidal antibody responses equivalent to the internationally licensed, recombinant B subunit-killed whole-cell oral cholera vaccine produced in Sweden. These findings, published in the *Bulletin of the World Health Organization* (80: 2-8, 2002), indicate that both internationally and locally produced killed whole-cell oral cholera vaccines should be considered for the public health armamentarium against cholera.

Another study of the Vietnamese killed whole-cell oral cholera vaccine, also co-funded by Swedish SIDA/SAREC, the U.S. National Institutes of Health, and DOMI, was reported on by Dr. Moshaddeque Hossain, a senior scientist at IVI, at the Asian Society for Control of Diarrheal Diseases in Delhi, September 2001. This study, done in collaboration with the National Institute of Hygiene and Epidemiology in Vietnam, and in collaboration with investigators from the University of Gothenburg and the U.S. National Institutes of Health, evaluated the costs of purchasing and delivering the Vietnamese killed oral cholera vaccine in a large demonstration project in Hue, Vietnam. The total costs for completely vaccinating a recipient with the two-dose regimen of this vaccine were only \$0.89, suggesting that use of this vaccine is an affordable public health option.

DOMI Research Highlights: Typhoid Fever

A DOMI project led by Dr. H.H. Yang of the Guangxi Provincial Health Service evaluated the protective impact of Vi polysaccharide vaccine in helping to terminate an epidemic of typhoid fever that occurred in a middle school in Guangxi. As reported in *The Journal of Infectious Diseases* (183: 1775-80, 2001), these investigators found that Vi vaccine given in routine public health practice to students before the epidemic was about 70% protective, a level of protection nearly identical to that observed in pre-licensure Phase 3 trials of Vi vaccine. Interestingly, Vi given during the epidemic was also about 70% protective. These results are important since this is the first time that Vi vaccine, the new generation typhoid vaccine targeted by the DOMI program for introduction for the poor in developing countries, has been evaluated in a public health program in a developing country, and also the first time that the effectiveness of a Vi vaccine administered during an outbreak has been evaluated.

A project in New Delhi, India, co-funded by the U.S.-India Vaccine Action Program and by DOMI and led by Professor M.K. Bhan of the All India Institute of Medical Sciences, found that persons who had been earlier infected by the ubiquitous gastric pathogen, *Helicobacter pylori*, were at more than a two-fold higher risk of developing typhoid fever. This presumably occurs because *H. pylori* impairs the ability of the stomach to produce acid, which is an important human defense against enteric pathogens such as *Salmonella typhi*, the cause of typhoid fever. In practical terms,

these data imply that the heightened susceptibility to typhoid due to *H. pylori* infections may account for up to 30% of the typhoid infections that occur in poor populations in some developing countries such as India. This is important, since it means that current efforts to develop an effective vaccine against *H. pylori*, in which the IVI is currently participating, may translate into the added benefit of preventing a substantial fraction of the disease burden of typhoid fever.

DOMI Research Highlights: Shigellosis

Dr. Lorenz von Seidlein, an IVI scientist, reported to the Asian Society for Control of Diarrheal Diseases in Delhi, September 2001 on DOMI studies of the disease burden of shigellosis in impoverished populations in Bangladesh, China, Indonesia, Pakistan, Thailand, and Vietnam. These studies have confirmed that shigellosis imposes a major burden of disease, especially in children, in these settings. They have also shown that the distribution of *Shigella* species and serotypes causing disease in these study populations differs substantially from country to country, in some instances at considerable variance with widely cited data about these distributions globally. Since immune protection against *Shigella* is species- and serotype-specific, these findings indicate that future *Shigella* vaccines for the poor will have to be broad-based to provide protection against the wide diversity of *Shigella* species and serotypes that cause disease in different populations.

Researchers at the International Centre for Diarrhoeal Disease Research, Bangladesh have completed a clinical trial of SC602, the most promising genetically engineered, live oral *Shigella* vaccine developed to date. The investigators evaluated this vaccine in young children in Bangladesh in a study co-funded by the DOMI Program. Although this vaccine had been both safe and immunogenic in older age groups in earlier studies in Bangladesh, it failed to induce immune responses in young children, the group at highest risk for shigellosis. These findings indicate that the live oral vaccine approach for *Shigella* vaccines for young children in endemic countries has important obstacles, many still not well understood.

Finally, a DOMI study of shigellosis outbreaks in refugee camps in Malawi, Congo, Rwanda, and Tanzania, conducted by scientists at Epicentre in Paris, documented that preemptive vaccination, given at the inception of the formation of a refugee camp, could have a major impact in preventing outbreaks of shigellosis, which are common in these settings. The study also found that if a future *Shigella* vaccine could be obtained at a cost lower than that for a course of ciprofloxacin (an expensive antibiotic commonly used for treatment of shigellosis), vaccination would be cost-saving. These results are extremely important in that they provide a rationale for development of future *Shigella* vaccines for refugees, who experience a large toll of morbidity and mortality from shigellosis.

Technology Transfer Projects of the DOMI Program

Assurance of an adequate and cost-competitive supply of the DOMI vaccines will require that these vaccines be produced not only by international vaccine producers, but also by local producers in certain developing countries afflicted by the DOMI diseases. As noted earlier, policy-makers and opinion-leaders surveyed in the seven DOMI partner countries stressed the importance of technology transfer for production of DOMI vaccines to assist their introduction into public health programs for the poor. DOMI is focusing on two licensed vaccines for cholera and typhoid (killed oral whole cell-based vaccines for cholera; Vi vaccine for typhoid) and has already successfully coordinated or facilitated transfer of production technology for each of these vaccines to qualified producers in Asia. Importantly, these transfers have entailed both South-South and North-South collaborations between producers.

Technology for the inexpensive (produced at \$0.30 per dose in Vietnam) killed oral whole-cell cholera vaccine is in the public domain. Under DOMI, the technology has been transferred from Vietnam to Bio Farma in Indonesia, which in turn has committed the resources to building a suite for production (called the "DOMI Suite" by Bio Farma). DOMI is currently participating in additional transfer of technology for production of this vaccine from Vietnam to qualified producers in India and China.

Technology transfer activities have also focused on Vi polysaccharide typhoid vaccine. This inexpensive vaccine (produced at under \$1 per dose), which also is in the public domain, is being transferred under the DOMI Program from Lanzhou Institute, China to Shantha Biotechnics in India. Under DOMI, the Lanzhou Institute has also transferred improved technology for higher yield production of Vi vaccine to Vietnam, which had earlier received the technology from U.S. NIH.

IVI to Issue 5-Year Strategic Plan

With the coming completion of its headquarters facility and pilot plant, and the arrival of capabilities in laboratory research, the IVI Board of Trustees has approved the Institute's Strategic Plan for the next five years (2003-2007).

The Strategic Plan, to be made available for wide distribution in mid-2002, takes four key factors into account in the growth and development of the Institute over the next five years:

- * Future growth should build on existing programs and expertise,
- * The Institute's activities should expand its geographic range beyond Asia,
- * The future program should ensure that the IVI's activities are focused, and
- * Future work should ensure that the IVI's skills create synergy with other organizations involved

in the development, evaluation, and use of vaccines.

The future activities of the IVI will take place in four areas:

1. *Translational research*

The discovery, development, and licensure of a vaccine are only the first steps towards its introduction into the public health programs of developing countries. The scarcity of resources in these settings demands that vaccine introduction be supported by evidence of

- * A high burden of disease
- * Suitable vaccine safety and efficacy
- * Practical effectiveness of deployment of the vaccine in existing programs
- * Affordability and cost-effectiveness of the vaccine
- * Acceptability of the vaccine to the community, to providers, and to policymakers.

During the past three years the Institute has focused on research to provide this evidence, which is currently sparse and incomplete for many diseases and vaccines of public health importance. During the next five years, the IVI will expand its work on this crucial but relatively neglected area by continuing its current focus on vaccines against enteric and respiratory pathogens and against flaviviruses (Japanese encephalitis and dengue fever), and will expand into one or more of three areas of major global interest: HIV/AIDS, tuberculosis, and malaria.

2. *Laboratory Research*

Laboratory research programs will be launched in molecular biology (molecular epidemiology and applied microbial genetics), immunology (improved understanding of protective immune responses and development of better tests for use in the field), and chemistry (carbohydrate-protein conjugate vaccines). The development of these programs is being presaged by IVI's current training of postdoctoral fellows in several laboratories in Europe and the United States (related story on page 9).

3. *Product Development*

Because of the complexity of vaccine development, the IVI will focus its energies on development of vaccines against just two pathogens, *Shigella* and Japanese encephalitis, both of which are relatively neglected areas of research due to the limited commercial attractiveness of vaccines against these diseases.

4. *Technical Assistance and Training*

IVI's in-house expertise and access to a wide range of experts in many organizations provides it with a strong basis to assist in training programs to strengthen scientific, vaccine regulation, and vaccine production skills in developing country institutions. IVI is a member of the WHO Global Training Network for vaccine production and regulation. IVI will also continue its program of

training in the clinical evaluation of vaccines. It will sustain its program of supporting postdoctoral training at select centers in developed countries. It will also have an active program of seminars and publications.

Finally, the IVI will undertake activities to continue the building of a strong institution. These activities will include the further development of its own multi-disciplinary staff, currently coming from 12 countries, the mobilization of additional resources, and maintaining strong systems of governance and management.

The full Strategic Plan will be posted on the IVI Web site at www.ivi.int.

Other IVI Research Projects

Japanese Encephalitis (JE)

With funding from the Children's Vaccine Program at PATH, supported by the Bill and Melinda Gates Foundation, and under the leadership of Dr. Zhi-yi Xu, IVI senior scientist, IVI is undertaking a multicountry, multidisciplinary program to provide critical information necessary for the rational introduction of JE vaccines into existing immunization programs in countries endemic for JE in Asia. The key components of the project are to measure the disease burden due to JE, to assess the views of policymakers about factors that facilitate and constrain introduction of JE vaccines into their countries, and to evaluate the cost-effectiveness of JE immunization programs.

During the last year, the JE Program has produced three findings of key relevance to the introduction of JE vaccines into Asia. First, a cost-effectiveness assessment of two vaccines used in China, the live attenuated SA-14-14-2 vaccine and the inactivated P3 vaccine, has found both vaccines not only to be cost-effective, but actually cost-saving to the health care system of China. These findings suggest that there may be a strong economic rationale for the use of JE vaccines in public health programs of other developing countries of Asia. Second, an innovative cohort study following up JE survivors in Shanghai, in which persons who had JE as children have been assessed 6-27 years later, has demonstrated that approximately 30% of survivors have a debilitating neurologic deficit or major reductions of IQ resulting from their episodes of JE. These findings indicate the disease burden of JE, and the rationale for vaccinating against JE, cannot rely merely on statistics about disease incidence and acute case-fatality, but must consider the frequent, severe, and long-lasting neurological deficits among JE survivors. In a third study, IVI and Indonesian investigators have evaluated the incidence of JE in all children 12 years of age and younger residing on the island of Bali. This study was undertaken to evaluate the contention, largely based on anecdotal evidence, that JE is not a major problem in Southeast Asian countries. Strikingly, this study has produced evidence indicating that the incidence of JE is of the same order of magni-

tude as incidence rates seen in hyperendemic populations elsewhere in Asia.

Invasive Bacterial Diseases of Asian Children

Doubts about the magnitude of the disease burden of *Haemophilus influenzae* type B (Hib) have impeded the introduction of modern polysaccharide-protein conjugate vaccines against Hib into the routine immunization schedules for infants in East Asia. To address these uncertainties about Hib, and to determine the incidence of invasive syndromes due to other important pathogens, IVI has been conducting a multi-country study of the incidence of meningitis in children under five years of age in three field sites: Guangxi Province, China; Hanoi Province, Vietnam; and North Chungcheong Province, South Korea. This ambitious project is being supported by the Children's Vaccine Program at PATH, as well as by three large producers of new-generation vaccines against Hib: Glaxo SmithKline, Merck, and Wyeth-Lederle. Principal scientific collaborators on this project include the Guangxi Provincial Anti-Epidemic Center in China, Chonbuk University School of Medicine in Korea, the National Institute of Hygiene and Epidemiology in Vietnam, and the UCLA School of Medicine.

In each of these sites, geographically defined populations of approximately 100,000 children have been placed under two years of comprehensive surveillance for meningitis in all children's hospitals serving the targeted catchment populations. A unique feature of this program of studies is that each site shares a common protocol for patient eligibility and clinical evaluation, as well as for laboratory methods to evaluate blood and cerebrospinal fluid (CSF) specimens for bacterial causes of meningitis. Use of a common protocol will be indispensable for comparing the results for disease burden between the three sites.

Two-year periods of field surveillance have now been completed for the sites in Korea and Vietnam; the China site has completed the first year. Initial results of the study were recently presented at the International Congress of Infectious Diseases in Singapore. Thus far, annual incidence rates of Hib meningitis, proven by microbiological culture, have been low in each site: below 10 cases per 100,000 children under the age of 5. To put this incidence rate into context, annual rates of Hib meningitis in comparably aged U.S. children before the U.S. decided to use Hib vaccines in its public health programs were over 40 cases per 100,000 children.

However, one important factor distinguishes the three sites in the IVI study from the U.S. prior to Hib vaccine introduction: widespread administration of antibiotics before diagnostic evaluations. In each of the three sites in the IVI study, substantial numbers of children had received antibiotics before presenting for care, in part because of the ready availability of antibiotics without prescriptions and the common practice of parents giving antibiotics to their children for illnesses - including the

premonitory symptoms of meningitis - prior to seeing a physician. Such widespread antibiotic use can cause cultures to become negative without aborting the meningitis illness. To assess the extent to which apparent culture-negative meningitis is actually due to Hib in each of the three sites, collaborators at the UCLA School of Medicine are further evaluating CSF specimens with more sensitive diagnostic techniques, including polymerase chain reaction and latex agglutination. Initial test results using these sensitive techniques have revealed additional cases of Hib that were not culture-positive for Hib from each site. These findings suggest that use of standard culturing techniques for blood and cerebrospinal fluid may fail to detect the true disease burden of Hib meningitis in settings in which antibiotics are widely used before patients present for diagnostic evaluations.

Rotavirus

In 2001, IVI initiated collaborative hospital-based surveillance in six cities of China. The six hospitals are Beijing Friendship Hospital, Changchun Children's Hospital (Jilin Province), Kunming Children's Hospital (Yunnan Province), Lulong County Hospital (near Beijing), MaAnShan Hospital (near Nanjing, capital of Jiangsu Province) and Suzhou Children's Hospital.

Two scientists, Dr. Wang Ning (in Nanjing) and Dr. Fang Zhao Yin (in Beijing) serve as the Chinese co-investigators for this project. This project will determine the rotavirus disease burden in terms of inpatient hospitalizations, emergency department visits and intravenous rehydration center visits for treatment of rotavirus.

In addition, the investigators will be able to assess the clinical severity of rotavirus, epidemiologic risk factors for rotavirus infection, costs related to rotavirus illness and the pattern of rotavirus strains circulating in the populations served by each of the six hospitals. The six field sites cover a wide range of geographic areas from northern Jilin Province to southern Yunnan Province. The project also covers a range of populations and socioeconomic levels from Beijing to Lulong county in nearby Hebei Province.

The project, which is being supported by the Children's Vaccine Program at PATH, uses standardized data surveillance forms designed in conjunction with local investigators, clinicians and laboratory scientists. All surveillance data are entered into a standardized database management system that allows data entry for all epidemiologic and laboratory data. Data collection will be conducted over a 2-year period in order to analyze data from two consecutive seasons of rotavirus transmission.

ETEC

Enterotoxigenic *Escherichia coli* (ETEC) are the most common bacterial cause of childhood diarrhea in developing countries and are thought to cause about 400,000 deaths annually. The IVI is currently collaborating with

SBL Vaccin (now Powderject), Sweden; the U.S. Naval Medical Research Unit-3 in Cairo; the U.S. National Institutes of Health; the University of Gothenburg, Sweden; and the WHO on an efficacy trial of a killed oral ETEC vaccine in 6-18-month-old infants and children in Egypt.

The vaccine under evaluation consists of cholera toxin B subunit together with formalinized ETEC whole cells expressing epidemiologically prevalent colonization factor antigens of ETEC. It was developed by Professor Ann-Mari Svennerholm and colleagues of the University of Gothenburg, in partnership with SBL. Thus far, the trial in Egypt has enrolled two sequential cohorts of infants, 195 in 1999 and 161 in 2000, who were then randomized to receive three-dose regimens of either the killed, oral ETEC vaccine or a placebo. The two cohorts have been placed under twice-weekly household surveillance for diarrhea, and each diarrheal episode is evaluated microbiologically to detect fecal excretion of ETEC and other enteric pathogens. This is the first trial to evaluate the protective efficacy of a new-generation ETEC vaccine in developing country infants and children, the age group accounting for the vast majority of deaths due to ETEC in these settings. It is anticipated that the code for the trial will be broken for analysis of vaccine efficacy in mid-2002. If promising results are obtained from this trial, the next step will be to assess the efficacy of the vaccine against ETEC diarrhea when the vaccine is given in the routine EPI schedule administered in the first half of infancy.

Dengue

Dengue infection is a mosquito-borne disease that in recent years has become a major public health problem. It can occur as a mild febrile illness called dengue fever (DF) or as more severe forms, dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS). Since the discovery of DHF/DSS in the mid-1950s, over 5 million children have been hospitalized and 70,000 have died of DHF/DSS. Untreated, the case fatality rate for DSS may be as high as 40%. The burden of disease is greatest in tropical Asia, where DHF/DSS is a leading cause of pediatric hospitalization and death.

To launch a program to accelerate the development and introduction of a dengue vaccine for poor children, a meeting was held in Ho Chi Minh City, Vietnam. More than 150 pediatricians, vector control specialists, immunologists, virologists, vaccine scientists, economists, international health development specialists and representatives of funding agencies from 30 industrialized and developing countries met December 5-8, 2001. The Conference was convened by the Rockefeller Foundation (New York) and the IVI, and co-hosted by Children's Hospital No. 1 and the Pasteur Institute of Ho Chi Minh City. The World Health Organization's Initiative for Vaccine Research, the UNDP/World Bank/WHO Special Programme for Research and Training in Tropical Diseases, Aventis Pasteur (Lyon, France) and GlaxoSmithKline (Rixensart,

Belgium) gave significant support.

The meeting provided an opportunity for participants to get a first-hand view of the burden of dengue in the community, for researchers to present current clinical and immunologic findings, for vaccine scientists to discuss the current status of dengue vaccines under development, and for an exchange of ideas. A steering committee was formed to continue advocacy, initiate fund-raising, draft a proposal to collect more comprehensive disease burden data and develop potential vaccine field sites, as well as foster a scientific blueprint for pediatric dengue vaccine development.

As a result of this meeting, under the sponsorship of the Rockefeller Foundation, a global Pediatric Dengue Vaccine Initiative has recently been launched, with a secretariat located at the IVI.

IVI Technical Assistance Programs

Among countries in the developed world, national regulatory authorities are responsible for reviewing developmental plans for candidate vaccines and setting guidelines for carrying out various phases of clinical trials and their marketing approval processes. But most developing countries either have no such regulatory authority or have agencies that are in early stages of being created. Therefore, vaccine manufacturers have in these settings traditionally been responsible for the necessary "regulatory approval process" through in-house quality assurance units in many of these settings. Most of these manufacturers, however, have evolved from traditional research and development facilities, which may lack minimum manufacturing regulatory compliance.

The major impetus of the Technical Assistance and Cooperation Program of the IVI focuses on Good Manufacturing Practice (GMP) training and assistance to upgrade all personnel involved in the manufacture of vaccines and in the regulatory approval pathway. The overall goal is to assist these countries and their vaccine manufacturers to achieve adequate delivery of safe and efficacious vaccines.

In March 2001, an introductory GMP training course was conducted at the Wuhan Institute of Biological Products (WIBP), Wuhan, China. Staff members from WIBP who attended came from varying functions such as production, quality control, quality assurance and other manufacturing support activities. Several attendees came from the Chinese National Regulatory Authority. After the four-day GMP training was completed, the IVI team stayed on to review WIBP's manufacturing facilities and operations for the production of a Japanese Encephalitis (JE) vaccine.

In May 2001, an introductory GMP/Good Laboratory

Practice (GLP) course was presented to key personnel at the National Center for the Control of Medico-Biological Products (CENCOBI), Hanoi, Vietnam. A few members from the manufacturing arm of the National Institute of Hygiene and Epidemiology (NIHE) were also in attendance. After the delivery of the training course, an assessment of CENCOBI's overall operation was conducted by IVI staff, who were also assisted by representatives from the Australian Therapeutic Goods Administration. The entire assessment exercise was jointly organized with the World Health Organization. The DOMI Program accords high priority to providing the assistance because Vietnam has made local production of vaccines against cholera and typhoid a national policy.

Technical assistance in production of vaccines against shigellosis and typhoid fever was provided in June 2001 to Lanzhou Institute of Biological Products in Lanzhou, China. The assistance involved assessment of GMP-related issues for the production of shigellosis and typhoid fever vaccines. The DOMI Program is also working with the Lanzhou Institute to transfer production technology for Vi polysaccharide vaccine against typhoid to Shantha Biotechnics in India. Additional technical assistance and training were provided to ensure Lanzhou's typhoid vaccine production meets appropriate quality standards.

In July 2001, IVI staff provided an introductory GMP/GLP training course to the National Institute for the Control of Pharmaceutical and Biological Products (NICPBP) in Beijing, China. NICPBP serves as the country's national control laboratory for vaccines. After the course, an assessment was carried out to evaluate the Institute's quality control functions for vaccines.

An introductory GMP training course was provided in October 2001 to the National Institute of Hygiene and Epidemiology (NIHE) in Hanoi and the Institute of Vaccines and Biological Substances (IVAC) in Nha Trang, Vietnam. Both institutes are producers of vaccines of interest to the DOMI Program. NIHE is engaged in the production of killed, oral whole cell cholera vaccine, while IVAC is involved with the production of Vi polysaccharide vaccine against typhoid. Following the course, IVI staff conducted an assessment of production facilities at each site. Both facilities were built originally as research laboratories that were subsequently renovated to take on small-scale production. Now both Institutes are making plans to build new facilities in order to comply with currently accepted regulatory requirements. Consequently, IVI is also providing assistance in new facility planning. In addition to this on-site training, the IVI has organized and arranged for key staff from the NIHE to receive hands-on training at an accredited producer facility. This activity took place at Bio Farma, Indonesia. The trainers received hands-on training in production, quality control testing and quality assurance system for a six-week duration, which was completed at the end of 2001.

Affiliated Laboratory Programs

The IVI Affiliated Laboratories Program was created to establish a network of Korean academic laboratories doing work related to IVI's mission in order to initiate IVI's laboratory research program and to identify highly productive laboratories that might complement the Institute's research in future collaborations. Four grants of \$25,000 per year for a two-year period were allocated at the beginning year 2001. The funding for the second year will be contingent on performance during the first year, as judged by the Steering Committee of the Program. Scientists involved in the Program from the Affiliated Laboratories have been given adjunct appointments at IVI coterminous with the duration of the grants. A special advisory steering committee for the selection of laboratories comprises experts on immunology and vaccinology, including Dr. Seong Hae Park (Seoul National University), Dr. Byung Sae Kwon (Ulsan University), Dr. Yeung Joo Bang (Seoul National University), Dr. Hae Whual Cho (Korea National Institute of Health), Dr. Bak Lym Seong (Yonsei University), Dr. Roe Hyun Seong (Seoul National University), and Dr. Soo Il Chung. The committee was chaired by Prof. Sang Dae Park (Seoul National University).

Among several candidate laboratories, four laboratories were selected and their proposals were presented at the Institute's second Scientific Advisory Group meeting in April 2001 at IVI. Laboratory chiefs of the selected laboratories are Dr. D.S. Lee (Immunology, Seoul National University), Dr. S.Y. Kim (Microbial Genetics, Seoul National University), Dr. S.R. Cho (Microbial Genetics, Yonsei University), and Dr. H.S. Rho (Immunology, Seoul National University).

IVI Postdoctoral Program

IVI has initiated a Postdoctoral Training Fellowship Program at designated internationally recognized laboratories commencing 2002. The overall goal of this research training initiative is to increase the number of laboratory-trained vaccine scientists who can join the staff of the IVI and undertake research as part of multidisciplinary teams. In addition, trainees will establish close and long-term relationships with the host institutions. In so doing, the program will enhance vaccine research and development at Korean academic research centers as well. These fellowships are intended to support up to two years of advanced training to qualify the fellows to pursue a career in vaccine research, especially in the area of enteric infections. Five fellowships for two years each have commenced this year. Five world-renowned vaccine research laboratories have graciously opened their laboratories for IVI trainees.

The recipients of IVI Postdoctoral fellowships for 2002 are:

Dr. Gieun Rhie, Ph.D., 1995 (Biology). After finishing her Master's degree in Microbiology at Seoul National University, she finished her Ph.D. at Brown University. Since returning to Korea, she has lectured at various universities and participated in research on microbial enzymes and photoaging of skin, with 20 papers published in peer reviewed journals. She started her fellowship duty in January at Prof. John Mekalanos' laboratory, Harvard University, Boston, MA.

Dr. Man Ki Song, Ph.D., 2001 (Virology). Dr. Song completed both Master's and Ph.D. degrees at Pohang University of Science Technology. He continued postdoctoral training at Pohang with a focus on the development of DNA vaccines against HIV/AIDS. He is assigned to Prof. Myron Levine University of Maryland, Baltimore, MD and started his fellowship this spring.

International Meetings

Annual Course on Clinical Evaluation of Vaccines

IVI's second international training course was run in collaboration with the London School of Hygiene and Tropical Medicine, University of London. The course took place in Ho Chi Minh City, Vietnam, December 1-5, 2001. The venue was the Pasteur Institute, Ho Chi Minh City, Vietnam. The course was sponsored by Rockefeller Foundation, Glaxo SmithKline and Sartorius, Germany. The specific objective of the course was to strengthen local capacity to evaluate vaccines in developing countries.

Dr. John D. Clemens and Prof. Laura Rodrigues led the faculty team. This year, the course was also enhanced by Prof. Scott Halstead's contributions. Dr. Linda Kaljee (University of Maryland), Mr. Rodney Carbis (Sartorius) and IVI scientific staff reinforced the faculty team. Twenty-four trainees and eight observers from developing countries attended the course. Participants came from seven different countries in Asia and one in North Africa. Course trainees are currently working for the following organizations: ICDDR, B Dhaka, Bangladesh; Fudan University, Shanghai, China;

From the left side: Dr. Soo Il Chung, Mr. Michael Goon, Prof. Sang Dai Park, Dr. John Clemens, Dr. Cheol-Heui Yun, Dr. Gieun Rhie, Dr. Man Ki Song, and Dr. Seung Hyun Han. Not pictured is Dr. Dong Wook Kim.

Dr. Cheol-Heui Yun, Ph.D., 1997 (Immunology). Dr. Yun completed his Master's degree in animal science from Seoul National University, then received his Ph.D. in animal science at Saskatchewan University. He has completed postdoctoral training in mucosal immunology and HIV/AIDS vaccine development at the USDA agricultural research station and at the U.S. National Cancer Institute. Since his return to Korea, he has served as a research professor at Seoul National University. Dr. Yun is assigned to Prof. Jan Holmgren's laboratory, University of Gothenburg, Gothenburg, Sweden and started his fellowship this spring.

Dr. Dong Wook Kim, Ph.D., 1997 (Virology). Dr. Kim obtained Master's and Ph.D. degrees from the Korea Advanced Institute of Science and Technology. He then completed postdoctoral fellowships at the State University of New York, Stony Brook, and at Samsung Biomedical Research Institute. He is assigned to Prof. Philip Sansonetti, Pasteur Institute, Paris, France and started his fellowship this spring.

Dr. Seung Hyun Han, Ph.D., 1999 (Toxicology). Dr. Han completed both Master's and Ph.D. degrees at Korea Advanced Institute of Science and Technology. Currently, he is carrying out postdoctoral training at Korea Research Institute of Bioscience and Biotechnology. He is assigned to Prof. Moon Nahm, University of Alabama, Birmingham, Alabama and started his fellowship this spring.



Dr. Zhi-yi Xu lecturing at the second international training course on vaccine evaluation in developing countries, hosted by IVI.

Lanzhou Institute of Biological Products, Lanzhou, China; Guangxi Center for Disease Control and Prevention, Nanning, China; Guangxi Medicine University First Teaching Hospital, Nanning, China; National Institute of Cholera and Enteric Disease, Kolkata, India; National Institute of Health Research and

Development, Ministry of Health, Jakarta, Indonesia; Bio Farma, Indonesia; Thammasat University, Thailand; Institute Pasteur, Nha Trang, Vietnam; National Institute of Hygiene and Epidemiology, Hanoi, Vietnam; CEN-COBI, Hanoi, Vietnam; Center of Preventive Health, Hue, Vietnam; Institute Pasteur, Ho Chi Minh City, Vietnam; the International Vaccine Institute, Seoul, Korea; and VACSERA, Cairo, Egypt.

WHO Expert Committee on Cholera Vaccines

On October 16-17, 2001, the IVI hosted a meeting of a WHO expert committee convened to draft guidelines for the production and regulation of inactivated, oral cholera vaccines. The guidelines under development will be WHO's first such guidelines for these important vaccines. IVI has several ongoing activities in the area of cholera vaccines and, through the DOMI Program, is attempting to expand the number of producers of these vaccines in cholera-endemic countries. The meeting was chaired by Professor M. Haase of the Paul Erlich Institute, Lange, Germany. Other committee members included cholera vaccine experts from China, England, France, Indonesia, Korea, Norway, Sweden, and Vietnam.

WHO Workshop on Future HIV Vaccines

The IVI hosted a WHO workshop on "Access to Future HIV Vaccines" at IVI Headquarters, June 4-5, 2001. The workshop, organized by the WHO-UNAIDS Program in collaboration with the International AIDS Vaccine Initiative, was convened to consider the challenges and opportunities in identifying target populations and channels of vaccine distribution in Asia, should an acceptably safe and efficacious HIV/AIDS vaccine become available. The workshop was chaired by Dr. Jose Esparza, Coordinator of the WHO-UNAIDS HIV Vaccine Initiative in Geneva, and included public health experts from Australia, Cambodia, China, Korea, the Philippines, and Thailand.

Korean Support Committee

Financial Support for the IVI

On August 24, 2001, Mr. Jae Soon Kim, the President of the Support Committee, gave 30 million won on behalf of the Committee to Dr. John Clemens, the Director to the IVI, in the presidential room of the Support Committee. It was the first financial aid given by the Committee for the operation and management of the IVI. Present were Prof. Wan Kyoo Cho, the Chairman of the Committee; Prof. Sang Dai Park, the Executive Director of the Committee; and Mr. Michael Goon, the Deputy Director for Finance and Administration of the IVI.

This contribution was made possible by generous donations from Mr. Se Woong Lee, the President of Shin Il Corporation and member of the Support Committee; Prof. Woo Suk Hwang of the College of Veterinary

Medicine at Seoul National University; and Mr. Joon Hyun Kang, the President of Sam Jin Corporation.

Second Meeting in 2001

The second meeting of the governing board of Support Committee was held in the Marriott hotel on August 20, 2001. The meeting, which was hosted by Prof. Wan Kyoo Cho, the Chairman of the Support Committee, presented a progress report. In addition, the Executive Director, Prof. Sang Dai Park, presented detailed plans on a fund-raising drive for the IVI. Then, the meeting approved the membership of Prof. Seung Ju Han of Korea University, who had devoted himself to inviting IVI to Korea during his term as the Minister of Foreign Affairs, and Prof. Woo Suk Hwang of the College of Veterinary Medicine, Seoul National University.

Progress on Construction of IVI Headquarters



Construction on the new home for IVI continued at a solid pace in 2001. As of the end of the year, 73% of the overall building construction has been completed.

For the year 2002, the construction schedule aims to complete landscaping and external paving work, as well as the interior of the building. The overall planning is for the building construction to be completed at the conclusion of 2002 and for occupancy to begin in early 2003.

Board of Trustees News

Prof. Paul-Henri Lambert and Prof. Philip Russell Join the Board of Trustees



Prof. Paul-Henri Lambert

Prof. Paul-Henri Lambert brings important scientific skills and experience to the Board. A Belgian citizen, Prof. Lambert is with the Center of Vaccinology of the University of Geneva. Before joining the University, Prof. Lambert had a long and distinguished career with the World Health Organization in Geneva where he headed various programs concerned with vaccine research and development. Since 2000, he has been Director, International Advanced Course of Vaccinology, Veyrier-du-Lac, Switzerland. In recent years, his research has focused on early life responses to viral and bacterial vaccine antigens and on respiratory syncytial virus.



Prof. Philip Russell

Prof. Philip Russell brings broad expertise in vaccine research and development to the Board. In the U.S. Army, he was Commanding General of the Medical Research and Development Command where he was involved in numerous vaccine research and development efforts. He has published important work on Japanese encephalitis and dengue. In recent years, he was a professor at the Johns Hopkins School of Public Health and served on various boards in both the public and private sectors. Currently, Prof. Russell is associated with the U.S. Department of Health and Human Services where he is working with Prof. D.A. Henderson on bioterrorism.

Dr. Lars Pallesen and Dr. Adolfo Martinez-Palomo Complete Terms on Board of Trustees

Two founding members of the IVI Board, Dr. Lars Pallesen and Dr. Adolfo Martinez-Palomo, completed their terms in 2001. When elected to the Board, Dr. Pallesen was head of the State Serum Institute in Copenhagen. Dr. Pallesen's expertise in financial management and scientific facility design and management were exceptionally important assets to the Board during the IVI's early years, and Dr. Pallesen will be sorely missed.

Dr. Martinez-Palomo is one of Mexico's most influential scientists. He has been Director of the Center for Advanced Study and Research in Mexico City. His membership on the Board added to the scientific stature of the IVI in its early years and helped to extend awareness of the IVI in Latin America. Dr. Martinez-Palomo's value for the Board will be difficult to replace.

Founding Board Member Prof. V. Ramalingaswami

Prof. V. Ramalingaswami, one of the greatest figures in international public health over the last several decades, passed away in May 2001. Prof. Ramalingaswami was internationally known for his research in nutrition and for his leadership in global health. He was Director General of the Indian Council for Medical Research in the 1970s. He also played senior roles at UNICEF and with several international commissions. Prof. Ramalingaswami was a member of the Advisory Board to the UNDP for the IVI and subsequently was a founding member of the IVI Board. His membership on the Board was important to the stature of the IVI, and his wisdom and kindness were of immense value in launching the IVI.

December 2001 Executive Committee Meeting

The Executive Committee of the Board met in Bethesda, Maryland on December 16-17, 2001. The Sunday session was held at a local hotel and the Monday session was held at the Fogarty International Center of the U.S. National Institutes of Health. The Director of the FIC, Dr. Gerald Keusch, hosted the Committee. A major portion of the Committee meeting was led by Dr. Clemens on the development of the scientific and technical program.

Recent Awards

IVI senior scientist Prof. Zhi-yi Xu (third from the right) received the "2001 National Award on Science and Technology" from the People's Republic of China for his Hepatitis A Vaccine Study. In his research, he determined the optimal vaccine dose, estimated the protective efficacy of the first live attenuated vaccine at 95%, and concluded that those vaccinated responded to the sub-clinical HAV infection as a natural booster.

Mr. Jiang Zemin, the President of the People's Republic of China, Mr. Zhu Rongji, the Premier, and four other major leaders met on February 1, 2002, with the principal investigators of 223 projects that were selected for the 2001 award. The 223 projects were in areas such as medicine, biology, agriculture, engineering, computer technology, military science and basic research.



Visitors' List 2002

Embret Aasen, First Secretary, Royal Norwegian Embassy, Korea
Remon Abu-Elyazeed, US NAMRU3, Egypt
Jim Ackland, Vice President, West Coast Operations, Biologics Consulting Group, U.S.
Sang Jeom Ahn, Head/Associate Director, Quality Assurance Section, GreenCross Vaccine Corp., Korea
Anan Ariyachaipanich, Deputy Director-General, Department of Disease Control, Ministry of Health, Thailand
Budiarnan Bahar, Minister Counsellor (Economic), Embassy of the Republic of Indonesia
Avivit Bar-ilan, Deputy Chief of Mission, Embassy of Israel, Korea
Barry R. Bloom, Dean Harvard School of Public Health, U.S.
Hans Bock, Glaxo SmithKline, Singapore
Jae-Yun Chang, Director, Development Study Team, KOICA, Korea
Anupong Chitwarakorn, Senior Expert in Preventive Medicine, Department of Communicable Disease Control, Ministry of Health, Thailand
Kachit Choopanya, Principal Investigator, Bangkok Vaccine Evaluation Group, Thailand
Byung-ha Chung, Deputy Director, United Nations Division, Ministry of Foreign Affairs and Trade, Korea
Jeanne-Marie Col, Interregional Adviser, Public Administration, Department for Economic and Social Affairs, United Nations, U.S.
Anne-Isabelle Degryse-Blateau, Representative, UNDP, Korea
Aldo de Luca, Counsellor, Embassy of Switzerland, Korea
Jean-Jacques Faure, Attaché (Science), Embassy of France, Korea
Robert Frenck, US NAMRU3, Egypt
Kurt Gerlach, Director of Marketing and Sales, B. Braun Biotech International GmbH, Germany
Thomas Tong Ming Go, Hong Kong, China
Michael F. Good, Director, Queensland Institute of Medical Research, Australia
Elwyn Griffiths, Coordinator, Quality Assurance and Safety of Biologicals, World Health Organization, Switzerland
Ian David Gust, Professor Emeritus, The University of Melbourne, Australia
Chan-ho Ha, Deputy Director General, International Organizations, United Nations Division, Ministry of Foreign Affairs and Trade, Korea
Amany Mohamed Hassan, Inprocess Control Manager, Op-QC VACSERA, Egypt
Jan Holmgren, Professor, Department of Medical

Microbiology and Immunology, Gothenburg University, Sweden
Bernard Ivanoff, Consultant to IVI Director, Switzerland
Zbyszek Janowicz, Head, Research Institute of Rhein Biotech, The Netherlands
Luis Jodar, Vaccine Research and Development, World Health Organization, Switzerland
Bertram Jooss, Third Secretary (Economic), Embassy of the Federal Republic of Germany, Korea
Iftikharul Karim, Ambassador, Embassy of the People's Republic of Bangladesh, Korea
Stefan Kaufmann, Director, Max-Planck-Institute for Infection Biology, Germany
Duck Sang Kim, Korea Country Manager, Sartorius AG, Korea
Jin-Oh Kim, Director, Development Study Team, KOICA, Korea
Kwanbok Kim, Director, Research and Academic Affairs Division, University Affairs Bureau, Ministry of Education & Human Resources Development, Korea
Paul-Henri Lambert, Professor of Pathology, University of Geneva, Switzerland
Salwa Seddik Abdel Latif, General Manager, Anti-Sera Plant, VACSERA, Egypt
Hyun Koo Lee, Vice President, Seoul National University, Korea
Gustavo Lembcke, Charge d'Affaires, Embassy of the Republic of Peru, Korea
Margaret A. Liu, Consultant in Vaccinology, Bill and Melinda Gates Foundation, U.S.
K.C. Logeswaran, Ambassador, Embassy of Democratic Socialist Republic of Sri Lanka, Korea
Bo Lundberg, Ambassador, Embassy of Sweden, Korea
Fernando Ramos Machado, Ambassador, Embassy of the Portuguese Republic, Korea
André Baker Méio, Third Secretary, Embassy of the Federative Republic of Brazil, Korea
Kim Nadezhda, First Secretary, Embassy of the Republic of Kazakhstan, Korea
Moon H. Nahm, Professor, Department of Pediatrics, University of Alabama at Birmingham, U.S.
Isabelle Nakhla, US NAMRU3, Egypt
Sir Gustav Nossal, Professor Emeritus, The University of Melbourne, Australia
Shigeru Omi, Regional Director, WHO Western Pacific Regional Office (WPRO), Philippines
Sang-Dai Park, Professor, Department of Molecular Biology, Seoul National University, Korea
Urjinhundev Perenlei, Ambassador, Embassy of Mongolia, Korea
Thamrin Poeloengan, Thamrin Poeloengan & Kel., Indonesia
Hazem H. Ramadan, Counsellor, Embassy of Egypt, Korea
Varaprasad Reddy, Managing Director, Shantha Biotechnics PVT.LTD, India
Philip K. Russell, Professor Emeritus, Johns Hopkins University, U.S.
Mario Scalet, Science Attaché, Embassy of Italy, Korea
Goeffrey Schild, Emeritus Professor, Imperial College of

Science, Technology and Medicine, U.K.

Namsoo Seo, Director General, University Affairs Bureau, Ministry of Education & Human Resources Development, Korea

Cyrus H. Simanjuntak, Senior Researcher, National Institute of Health Research & Development, Ministry of Health, Indonesia

George J. Slama, Country Liaison Officer, World Health Organization, Korea

Dipika Sur, Senior Research Officer, National Institute of Cholera & Enteric Disease, India

Aldo Tagliabue, Chief Executive Officer, ALTA S.r.l., Italy

Daniel Tarantola, Senior Policy Adviser to the Director-General; Director, Vaccines and Biologicals; WHO, Switzerland

James Thomson, First Secretary, (Science, Technology & Environment), Embassy of the United Kingdom of Great Britain and Northern Ireland, Korea

Dang Duc Trach, Professor, National Institute of Hygiene & Epidemiology, Vietnam

Nguyen Manh Tuan, Second Secretary, Embassy of the Socialist Republic of Vietnam, Korea

Saul Tzipori, Professor, New England Medical Center Hospital, Tufts University, U.S.

Uton Muchtar Rafei, Regional Director, WHO, Regional Office for South-East Asia (SEARO), India

Mrs. Uton Muchtar Rafei, India

Ke-An Wang, Director, ThinkTank Research Center for Health Development, China

Jolyon White, Business Development Manager, PowderJect plc., U.K.

Serhan A. Yigit, First Secretary, Embassy of the Republic of Turkey, Korea

Recent Publications by IVI Scientists

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Science Features IVI

Science magazine recognized the IVI's integral work in the developing world with a full-page feature in the January 25 issue. Calling the Institute's approach "novel," the magazine highlighted the IVI's role in discovering just how damaging are diseases like shigellosis, cholera and typhoid fever in the DOMI-member nations and their effects on people throughout the region.

The article focused on how even though the DOMI program is only two years old, it is already having tangible effects in partner countries. It also examined how the DOMI program is combining the resources of the seven countries to introduce new vaccines to help fight these widespread diseases.

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The IVI Newsletter

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