DEPARTMENT OF HEALTH AND HUMAN SERVICES
Food and Drug Administration

The Food and Drug Administration (FDA) does not engage much in the exchange of technical information with other countries, except in regulatory matters. Foreign manufacturers of drugs and medical devices wishing to sell or distribute their products in the U.S. must obtain FDA approval, just as domestic manufacturers do. They submit applications that include substantial amounts of technical information on efficacy and safety of the drug or device, clinical data, etc. When FDA receives technical information from private companies abroad, it treats this information as confidential, in accordance with regulations created under the Freedom of Information Act of 1974, and therefore will not release commercial technical information, either domestic or foreign, to persons outside the Federal Government.

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DEPARTMENT OF HEALTH AND HUMAN SERVICES
National Institutes of Health

The National Institutes of Health (NIH) engage in the exchange of technical information throughout the world through formal agreements executed with other countries, the dispatch of scientists to foreign laboratories and conferences, and the reception of foreign scientists in NIH laboratories. The organizations with the largest or most active international programs are the National Cancer Institute, the National Institute of Allergy and Infectious Diseases, the National Heart, Lung, and Blood Institute, the National Eye Institute, the National Neurological Institute, and the National Institute of Drug Abuse.

Following are the principal contact points and program descriptions for international matters in the individual institutes (though not all transfers of technical information from foreign sources flow through these offices).

National Cancer Institute (NCI)

The NCI supports international health research through agreements, grants, and contracts. It also maintains an International Cancer Information Center (ICIC). During FY 1994, NCI obligated about $25 million for its programs related to international cooperation.

Individual scientists initiate most of the cooperation in cancer research, but NCI does take the initiative when a particular scientific opportunity is ready for exploitation. Either the Office of International Affairs (OIA) or one of the research divisions of NCI may act in this capacity.

One vehicle used by NCI for exchanging information with other countries is international workshops. Twelve of these were held with Japanese counterparts in 1994 (under the U.S.-Japan Cooperative Cancer Research Program), one with Chile, two with Russia and a multilateral workshop was held in Poland.

During 1994, OIA supported 198 exchange scientists from 36 countries. In addition, 564 foreign scientists visited NCI laboratories under other NIH programs. The NCI also contributed to the funding of over 100 short-term technology transfer fellowships administered by the International Union Against Cancer. As well, a new program was begun to aid young cancer researchers in the states of the former USSR, and another was set up to provide retraining in medical physics for doctoral-level scientists formerly engaged in defense work in the former USSR.

The NCI supported 57 foreign grants and 25 foreign contracts in 1994 in addition to many grants and contracts awarded to U.S. institutions with a foreign component. Also, clinical trials of anticancer agents are sponsored in other countries in cooperation with U.S. industry.

The NCI now has 14 direct, formal bilateral agreements for cooperation with other countries, an additional 40 informal agreements, and 21 more agreements arranged through the Fogarty International Center. In addition, OIA maintains liaison with the following international organizations: European Organization for Research and Treatment of Cancer; International Agency for Research on Cancer; Organization of European Cancer Institutes; Pan American Health Organization; and the International Union Against Cancer.

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National Eye Institute (NEI)

The National Eye Institute (NEI) currently supports international research on seven blinding diseases of worldwide concern: cataract, corneal epitheliopathy, diabetic retinopathy, glaucoma, ocular toxoplasmosis, onchocerciasis, and vitamin A deficiency. Collaborative research is carried out with partners in Belgium, Brazil, Canada, India, Israel, Italy, Japan, Mexico, Sweden, and the United Kingdom.

In FY 1995, NEI awarded 16 grants to foreign institutions in 9 countries. It received 32 visiting fellows, 16 visiting associates, 17 visiting scientists, 23 special volunteers, and 1 guest researcher from more than 20 countries for the purpose of conducting research at NEI's Bethesda laboratories.

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National Heart, Lung and Blood Institute (NHLBI)

In FY 1994, NHLBI spent $3,536,059 in direct costs for 16 cooperative agreements (fellowships, contracts, and grants) with Germany, Sweden, Canada, Switzerland, and the United Kingdom. Its other major expenditures were a contribution of $108,315 to USAID for a project in Egypt; $76,000 to the Center for Disease Control for a contract involving China, Poland, and Russia; $563,000 for a contract with the University of North Carolina involving China, Poland, Russia, and Pakistan; and $398,318 for expenditures in the U.S. involving 17 bilateral agreements with other countries.

Major cooperative research activities, both within and outside bilateral agreements, were carried out in FY 1994 with Canada, China, the Czech Republic, Egypt, Georgia, Germany, Hungary, India, Italy, Japan, Korea, Kyrgyzstan, Nigeria, Pakistan, Poland, Russia, Sweden, Thailand, Uganda, and Vietnam. The NHLBI maintains extensive collaboration with the World Health Organization. It also has developed relationships with Juvenile Diabetes International, the Montreal Heart Institute, the University of Manitoba, the European Molecular Biology Organization, and the Karolinska Institute (Stockholm).

During FY 1994, 30 visiting associates, 20 visiting scientists, 24 volunteers, 68 visiting fellows, one guest researcher, and one expert have carried out joint research in the NHLBI laboratories. Countries represented included Argentina, Belgium, Australia, Brazil, Canada, Chile, China, France, Germany, Greece, India, Iran, Ireland, Israel, Italy, Japan, Korea, Morocco, Pakistan, Poland, Russia, Spain, Thailand, the United Kingdom and several countries from Africa.

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National Institute of Allergy and Infectious Diseases (NIAID)

The NIAID currently participates in bilateral agreements with Brazil, China, Croatia, Finland, France, Germany, India, Israel, Italy, Japan, Mongolia, Poland, Russia, Slovenia, and Taiwan. It also manages international projects on behalf of USAID, the Department of State, and the Environmental Protection Agency. The NIAID participates extensively in World Health Organization programs and also maintains close working relations with the Pan American Health Organization and the Organization of American States.

In addition to these countries with which NIAID has bilateral agreements, research contacts and involvement occur through normal scientific channels with a number of countries, including Argentina, Australia, Austria, Bangladesh, Belgium, Canada, Chile, Colombia, Czech Republic, Denmark, Gambia, Ghana, Greece, Haiti,

Malawi, Mali, Mexico, Netherlands, Papua New Guinea, Philippines, Rwanda, Senegal, South Africa, Spain, Sudan, Sweden, Switzerland, Thailand, Uganda, United Arab Emirates, Venezuela, Vietnam, and Zaire.

The NIAID currently supports five special international programs. Three are in Tropical Medicine. The other two are in HIV/AIDS and tuberculosis. Tropical Disease Research Unit (TDRU) awards support multi-disciplinary centers of research excellence in the U.S.A. The International Collaboration in Infectious Disease Research (ICIDR) Program provides funding to U.S. institutions to link up with foreign institutions in developing countries. Tropical Medicine Research Center (TMRC) awards are direct funding to outstanding institutions located in the tropics. In 1987, NIAID launched the International Collaboration in AIDS Research (ICAR) Program modeled after the ICIDR Program. The ICARs were succeeded by the more focused Preparing for AIDS/HIV Vaccine Evaluation (PAVE) linkage awards which supported U.S. institutions for an intensive two year effort to work with developing country counterparts overseas in training, technology transfer, and institutional strengthening. The NIAID also supports an International AIDS Vaccine Master Contract which makes awards to U.S. institutions to carry out specific HIV/AIDS intervention or prevention projects in developing countries. At present there are eight international and seven domestic HIVNET sites.

To coordinate and monitor tropical medicine research activities more closely, NIAID established the International Centers for Tropical Disease Research (ICTDR) Network in 1992. The ICTDR Network consists of: (1) the NIAID Assistant Director for International Research (OTMIR/NIAID); (2) LPD/NIAID, LMR/NIAID, and other intramural laboratories; (3) TDRU, ICIDR, and TMRC participants; and (4) other U.S. institutions receiving substantial NIAID tropical medicine research support. The ICTDR Network convenes each Spring in an open scientific meeting in Bethesda for coordination, exchange, and identification of research needs and opportunities.

In the current period of increasingly limited resources in the U.S. Government, it has become common for agencies to combine resources to carry out joint programs. This strategy has particularly characterized USAID which frequently utilizes the resources within the U.S. Government to carry out its international activities. Examples of these agreements include LIR/NIAID and DAIDS/NIAID participation in an agreement with CD.C. for Project SIDA in Zaire and NIAID participation in the Biodiversity Program managed by FIC/NIH. In addition, NIAID and NASA are engaged in an ongoing dialog to identify projects of mutual interest. The OTMIR/NIAID frequently manages externally funded international agreements which draw on the resources of multiple NIAID components or awardees. During FY 1994, NIAID managed four USAID, three DoS, and one Environmental Protection Agency (EPA) agreements.

The NIAID is also a member of the consortium of UN agencies (e.g., WHO, UNICEF) and other organizations convened with the Childhood Vaccine Initiative (CVI). The DMID/NIAID role is to invest in basic and applied research leading to the development and evaluation of new or improved pediatric vaccines.

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National Institute of Dental Research (NIDR)

International cooperation by NIDR involves bilateral exchanges and communication through the NIDR's partnership with the World Health Organization, the Federation Dentaire Internationale, the International Standards Organization, and the International Association for Dental Research. The NIDR and these agencies also participate in an initiative of the G-7 economic summit nations, the International Collaboration for Oral Health Research. Bilateral activities are carried out with Chile, India, and Israel. In specific instances, support by the Department of State is involved.

During FY 1993, NIDR provided support for 5 foreign grants, 1 foreign contract, and foreign components of 13 domestic grants. Another two foreign grants and the foreign components of four domestic grants continued to be active through NIDR grants made in previous years. Investigators from Australia, Belgium, Brazil, Canada, China, Czech Republic, Denmark, Egypt, Germany, Israel, Mexico, Norway, South Africa, Sweden, Switzerland, Taiwan, and the United Kingdom are involved. More than 100 foreign scientists and researchers representing 26 countries worked in the 8 intramural NIDR laboratories. Some of these were supported by foreign institutions.

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National Institute on Alcohol Abuse and Alcoholism (NIAAA)

NIAAA maintains international cooperative activities through a program of joint research, technical assistance, the exchange of information and the exchange and training of scientists. The Institute currently supports activities in the following countries: Australia, Bulgaria, Canada, China, Czech Republic, Estonia, France, Great Britain, Hungary, Italy, India, Japan, Latvia, Lithuania, Mauritius, Mexico, New Zealand, Poland, Romania, Russia, Slovak Republic, Slovenia, South Africa and Sri Lanka. NIAA is a World Health Organization Collaborating Center for Research and Training on Alcohol.

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National Institute on Drug Abuse (NIDA)

The National Institute on Drug Abuse (NIDA) is one of the newest NIH institutes, becoming part of NIH in 1992. It maintains bilateral research linkages with Brazil, Canada, Poland, China, Colombia, Czech Republic, India, Israel, Japan, The Netherlands, Russia, Turkey and the United Kingdom. The NIDA has extensive collaborative arrangements with the World Health Organization, and works directly with the following regional organizations: Organization of American States, Pan American Health Organization, U.S.-Mexico Border Health Association, Council of Europe Pompidou Group, Commission of the European Communities, and the Colombo Plan Bureau.

In FY 1994, NIDA supported 14 foreign grants or domestic grants with foreign components. It sponsors a broad fellowship plan to bring foreign scientists to the U.S. Countries involved include Brazil, Bulgaria, India, Israel, Korea, Morocco and Russia. Intramural research conducted at NIDA's Addiction Research Center in Baltimore, MD hosted visiting fellows, visiting scientists, and guest workers from Argentina, Belgium, Colombia, China, France, Germany, Japan, and the United Kingdom.

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Other NIH Organizations

The NIH is composed of a management organization, 17 national institutes, two research centers, the Fogarty International Center, the Clinical Center, the National Library of Medicine, a computer division, and a research grants division. All have some kind of involvement in international matters. Therefore, the descriptions given above represent only a sample of the total international activity.

NIH HomePage: http://www.nih.gov/

NATIONAL INSTITUTES OF HEALTH
John E. Fogarty International Center for Advanced Study in the Health Sciences

The John E. Fogarty International Center (FIC) for Advanced Study in the Health Sciences has its own program of exchanges and fellowships and provides leadership in confronting the most compelling international health threats and scientific challenges. FIC works in concert with scientists throughout the country to develop long-range plans focused on key global health threats of national importance.

The FIC serves as the NIH link with the Department of State, U.S. Agency for International Development (USAID), the international component of the White House Office of Science and Technology Policy, and international organizations and foreign ministries. It seeks to coordinate its programs with NIH research institutes and other government agencies.

Protecting citizens from the health threats that emerge from worldwide ecological, social and demographic change, such as emerging infectious diseases, and illness resulting from pollutants is an FIC priority. With the increasingly rapid mobility of individuals and populations, new infectious diseases can spread more quickly across borders and continents. As the international arm of the National Institutes of Health, the FIC carries forward an historic mandate--to combat diseases of international origin.

In response to the 1988 Congressional mandate to implement an international research and training program on the epidemiology of AIDS, the FIC has established research linkages between 13 U.S. and 40 foreign medical centers in South America, Africa and Asia. Because of geographic differences in the biological and epidemiological characteristics of HIV/AIDS, international approaches are essential to develop vaccines and other preventive measures.

In collaboration with U.S. trained foreign scientists, American scientists have conducted international studies on the factors that enhance the risk of acquiring HIV. Based on its international AIDS program, the FIC is forging scientific linkages between U.S. research institutions and the regions of the world in which new infections are likely to arise because of changing population patterns and encroachments on wilderness.

Serious health risks are also presented by rising concentrations of industrial and chemical pollutants, particularly in countries undergoing rapid industrialization. These hazards are transnational and underscore the importance of international cooperation to identify and prevent environmentally induced diseases.

Through the FIC International Training and Research Program on Environmental and Occupational Health, the U.S. works cooperatively with regions of the world with relatively high contamination levels. The objective is to study the effects of environmental agents on human health and to develop new interventions. The program is a joint effort of the Fogarty Center, the National Institute of Environmental Health Sciences, and the National Institute for Occupational Safety and Health of the Centers for Disease Control and Prevention. Environmental degradation, including the destruction of tropical rain forests, will also diminish the discovery and development of new medicines. In the U.S., one-quarter of all pharmaceuticals are substances extracted from plants. Another 13 percent are derived from microorganisms. However, only a fraction of the world's biological resources has been examined for therapeutic potential.

In partnership with other NIH research institutes, the National Science Foundation (NSF), and the USAID, the Fogarty Center supports and administers the International Cooperative Biodiversity Groups Program (ICBG). Its purpose is to discover new drugs from the earth's biological diversity while advancing ways to preserve important ecosystems and promoting economic growth through sustainable development. Research and training conducted by consortia of U.S. and foreign scientists and development practitioners from universities, foundations and pharmaceutical firms that share expertise and resources.

The emergence of new infectious diseases, increased human exposure to pollutants, and the destruction of natural ecosystems are all related to demographic changes. In cooperation with the National Institute of Child Health and Human Development, the FIC has launched an International Training and Research Program on Population and Health. The purpose of this program is to enable American universities to cooperate with scientists and health professionals in developing nations, to improve reproductive health and to better understand the social and behavioral determinants of population change. In addition to programs that address global health threats, the FIC supports investigator-initiated grants and fellowship programs to enable the U.S. to benefit from innovation, expertise and special resources throughout the world.

The FIC Scholars-in-Residence Program brings some of the world's leading scientists to the NIH campus to conduct advanced study in concert with NIH intramural scientists. Over the past year, one Scholar has examined the genetic changes in the influenza virus that enable it to elude vaccine immunity. This new technology will lead to more rapid development of flu vaccines when the threat of a new epidemic appears.

Through the program of Fogarty International Research Collaboration Awards (FIRCA), American scientists cooperate with counterparts in regions of the world that present new opportunities because of democratic change. Examples include American and Hungarian scientists who have done research on the metastasis of tumors and discovered the biochemical steps that result in the migration of tumor cells to other regions of the body. One enzyme, known as 12 lox, appears to activate key events in cancer metastasis. This enzyme is now a potential target for new anti-cancer drugs. A cooperative study with scientists in the Slovak Republic has resulted in the isolation of a gene that determines the cellular receptor, or "docking place" of bovine leukemia virus, one of a family of "retroviruses" that includes HIV. This finding may have implications for the development of a retroviral vaccine or other strategies to assist the immune system to fight infection. The Fogarty International Center also works to prepare the current and future generation of American scientists to work effectively within a global environment. With the support of NIH's Office for Research on Minority Health, the FIC has launched a program to enable African American, Hispanic American and Native American students to pursue research and training at academic institutions on four continents. A goal is to encourage students from groups under-represented in the biomedical research professions to pursue research careers through the stimulus of international programs.

Recognizing the growing importance of biomedical research in Japan and the need for U.S. scientists to learn firsthand about scientific advances in that country, the FIC supports American graduate students to conduct research in Japan. The Summer Institute in Japan Program, funded jointly by the Japanese government, the Fogarty Center and the National Science Foundation, transfers basic innovations and research technologies from Japanese laboratories to the United States.

In support of the Middle East peace process, the FIC worked with the Department of State to launch a cooperative program among Arab, Israeli and American scientists to assess the environmental risks of pesticides in the region. Through a bilateral agreement known as the U.S.-Japan Common Agenda, FIC contributed to a major shift in Japanese foreign aid toward support for development of childhood vaccines,

combating AIDS, and the eradication of polio in Asia. The FIC also conceived and helped develop a proposal for the creation of a Council on Science and Technology for the Americas (COSTA), which was adopted at the Summit of the Americas in Miami. The COSTA will increase collaboration among the scientific communities of the Americas.

The NIH remains a world leader in research but has many allies and much to learn from them. Today, new discoveries and techniques may be pioneered in foreign laboratories as well as those of the U.S. American scientists must know and interact with their colleagues in the "global laboratory."

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NATIONAL INSTITUTES OF HEALTH
Fogarty International Center
International Cooperative Biodiversity Group (ICBG)

The International Cooperative Biodiversity Groups (ICBG) Program is an integrated conservation and development program that addresses the interdependent issues of biodiversity conservation, sustained economic growth, and human health in terms of drug discovery for diseases of concern to both developing and developed countries. The funding for this program is provided by the National Institutes of Health, National Science Foundation, and U.S. Agency for International Development.

Because biological resources that benefit local communities are among those most likely to be preserved, chemical prospecting or, more specifically, development of pharmaceuticals from natural products can be used to promote biological conservation by providing an economic return from sustainable use of the resources. A critical component of the supported activities is to ensure that equitable economic benefits from these discoveries accrue to the country of origin, community, group, or organization which facilitated the discovery of the natural product. This is being achieved through the use of novel contractual mechanisms among the members of each group. Observations drawn from implementation and the first year of the program include the importance of realistic assessments of returns, infrastructure strengthening in partner countries, private-public linkages, individual project design, and collaborative benefits-sharing agreements.

Conservation of Biological Diversity

Program goals encompass creating incentives at all levels for the preservation of intact habitat; increasing the knowledge base upon which conservation activities are based; and developing long-term ecological and economic strategies to ensure more sustainable harvesting of targeted organisms and conservation of habitat. Programs undertake implementation of strategies to support the selection and acquisition of natural resources and novel agents, including the use of ethno-biological studies and approaches to working with traditional cultures and their knowledge of traditional medicine. Programs incorporate systematists, ecologists, and anthropologists in integrative surveys of a developing country's biological diversity. Programs develop collection practices compatible with conserving biodiversity. Production and documentation of all collected material in the form of published works, and/or databases, reporting specific locality and all features of biology relevant to standard botanical and zoological collections is an important aspect of the inventory work. Programs assure accessibility of inventory data to all individuals, including those not associated with the ICBG, by housing catalogues and databases in public institutions (such as universities and national museums) and, when databases are kept on computer systems in private institutions, by including specific references to these databases in publications.

Program Goals

The ICBG program has three interrelated goals reflecting the tri-agency support for the program: biodiversity conservation; sustainable economic activity; and drug discovery. The ICBG Program accomplishes this by linking developing country organizations and indigenous peoples with U.S. academic and industry partners for the purpose of developing and implementing innovative strategies for the conservation and sustainable management of biological diversity through economic returns from the screening of medicinal and other organisms for compounds active against both developing and developed country diseases, agricultural and

veterinary purposes, and in some instances parallel development of medicinal or other products for host country markets.

Projects include the selection and acquisition of natural products derived from biological diversity as potential therapeutic agents for diseases of concern to both developed and developing countries, such as AIDS, cancer, parasitic diseases, and heart disease. Other important components include the examination of traditional medicine practices, development of long-term strategies to ensure sustainable harvesting, biodiversity inventories and surveys, training and infrastructure support for host country institutions, and long-term funding for biodiversity conservation in the host countries. Included also are the preparation of crude materials for testing against diseases; isolation, and preclinical evaluation of agents from natural sources to treat or prevent cancer, infectious diseases including AIDS, malaria, and parasitic infections, cardiovascular diseases, mental disorders, and other diseases. Medical conditions of primary concern to developing countries are important components of every ICBG. Studies required for the later stages of drug development (e.g., formulation development, classical toxicology, etc.) and the conduct of clinical trials are beyond the scope of this program.

Program Participants

Five groups, consisting of diverse private and public institutions including pharmaceutical companies and environmental organizations in seven countries, are collaborating on projects that address biodiversity conservation and the promotion of sustained economic activity through drug discovery from natural products. Support for this innovative program totals approximately $2.3 million per year over its five year duration, shared among the NIH, NSF, and USAID. The Fogarty International Center, the international arm of the NIH, both administers the program on behalf of the sponsoring agencies and contributes to it along with the National Cancer Institute, the National Institute of Allergy and Infectious Diseases, the National Institute of Mental Health, and the National Heart, Lung, and Blood Institute.

These investments in part represent the U.S. Govemment's commitment to uncover new knowledge that leads to better health for everyone, to promote and advance scientific progress and to achieve sustainable development that focuses on the environment, health and population, democracy, and sustained economic activity.

Program Awards

A Request for Applications (RFA) was completed in June of 1992 and invited applications for the establishment of International Cooperative Biodiversity Groups to address the interdependent issues of biodiversity conservation sustained economic activity, and human health in terms of drug discovery for diseases of primary concern to developed and developing countries. Sixty-three letters of intent to submit an application were received in September followed by 34 applications in November 1992. Applications included primary investigators and collaborators from 25 countries, 13 in Latin America and the Caribbean (LAC), 7 from Asia, 4 from Africa, and 1 from the Middle East. About half the applications included a collaborator from LAC, a third from Asia, and about an eighth from Africa.

The peer review of these applications in March of 1993 included reviewers from universities, museums, pharmaceutical companies, the World Bank, and environmental non-profits with backgrounds in natural products chemistry, intellectual property rights law, systematics, ecology, ethnobiology, and international development. In addition, the Advisory Board of the Fogarty International Center, the administrators of the

program, and a Technical Advisory Group made up of representatives of the three funding agencies also reviewed the proposals and participated in the selection process.

Review was based on both the scientific merit and the responsiveness of each application to the goals and priorities outlined in the detailed and lengthy RFA which included the desire for a balanced portfolio in terms of geography, industrial partners, target study organisms, diseases, etc. The composition of the final portfolio reflects this together with the desire to fund those applications which were most responsive to the goals and priorities outlined in the RFA.

The awarding of five Cooperative Agreements was announced in December of 1993. Each award is five years in duration and has an annual budget of approximately $400,475. Each ICBG constitutes a cooperative agreement with the U.S. Government. Cooperative agreements differ from grants and contracts in that sponsoring government agencies have substantial programmatic involvement in achieving the goals and objectives of the project. In the ICBGs this is accomplished through the designation of a Government Scientific Coordinator for each project who has scientific oversight responsibility and is assisted by an advisory committee consisting of staff in relevant technical fields from the participating agencies. The Government Scientific Advisory Committee for each group serves as a resource and acts in an advisory capacity.

Although collaboration with an industrial partner was encouraged by the RFA as a mechanism for the later stages of product development and commercialization, there was no requirement that applicants include an industrial partner.

Listed below are the programs and participants that were awarded grants.

- Virginia Polytechnic Institute and State University in Blacksburg, VA, is collaborating with the forest people of Suriname, Conservation International, the National Herbarium of Suriname, the Missouri Botanical Garden, Bedrijf Geneesmiddelen Voorziening Suriname, and Bristol-Myers Squibb Pharmaceutical Research Institute to study rainforest plants in Suriname.
- Washington University in St. Louis is collaborating with the Natural History Museum in Peru, the Cayetano Peruvian University, and Searle Pharmaceuticals to examine plants that have been used medicinally for generations in Andean tropical rainforests of Peru.
- Cornell University in Ithaca, NY leads a team for the study of insects and related species from the dry tropical forests of the Guanacaste Conservation Area in Costa Rica, in conjunction with the National Biodiversity Institute of Costa Rica, the University of Costa Rica, and Bristol-Myers Squibb Pharmaceutical Research Institute.
- A group based at Walter Reed Army Institute of Research is focusing on cures for parasitic diseases from rainforest plants of Cameroon and Nigeria. Their collaborators are the Smithsonian Institution, the Bioresources Conservation and Development Programme, The University of Yaounde in Cameroon, the Biodiversity Support Program, and Shaman Pharmaceuticals.
- The University of Arizona at Tucson and colleagues are collaborating with the Institute of Biological Resources of Buenos Aires and the National University of Patagonia in Argentina, the Catholic University of Chile, the National University of Mexico, Purdue University, Louisiana State University, and the Medical and Agricultural Divisions of American Cyanamid Company to study arid land plants in Argentina, Chile, and Mexico.

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