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Plenary Session “Setting the Tone for International Science Collaborations”

The world is changing, and more and more we are thinking globally: about our economies, natural resources, and health and environmental problems. Science and technology are at the heart of most of these global issues. And I would like to speak briefly about how we can better promote international scientific collaborations: to build global networks of scientists cooperating for the advancement of science and the benefit of humanity.

There are of course many valuable approaches to promoting international science that we will discuss in our session. And I would like to set the tone for this discussion by speaking from my own personal experience as Secretary General of the Human Frontier Science Program (HFSP). HFSP is a unique organization, initiated by Prime Minister Nakasone some 20 years ago, which I believe is a model program that can be very instructive to policy-makers and others interested in promoting global science.

The first thing to emphasize about HFSP is that it is a bottom-up program: the initiatives we support are proposed by the international teams of scientists who are working at the frontiers of the life sciences, and who see new opportunities to make important discoveries and to create new research tools.

HFSP is funded by governments, but it is the scientists and postdoctoral students themselves who decide what they want to work on. Their proposals are peer-reviewed by international, high-caliber scientific review boards. Japan generously provides us with about half our \$56 million budget, and we have 12 other member countries from North America, Europe, and Asia, most recently including India, the Republic of Korea, Australia, and New Zealand.

The program has two basic elements. First, we fund grants to international, interdisciplinary teams of young and senior investigators. Our grants programs are very competitive and highly regarded in the scientific community, with some 700 applicants, only about 5% of which are funded. 13 HFSP awardees have subsequently received Nobel Prizes.

Second, we nurture the development of young scientists with what many regard as the most prestigious international fellowship program in the life sciences. We support post-doctoral fellows from around the world who wish to train outside their home country in the world’s best laboratories. And we provide a small number of 3-year Career Development Awards to especially talented fellows who return to their home countries to establish their own research groups.

In addition, students and scientists meet once a year at an Annual Meeting, held in one of our member countries, to discuss and share their passion for science, to present the work HFSP has been supporting, and to form new contacts and collaborations.

HFSP supports basic research into the complex mechanisms of life, from molecular interactions in cells to the neural networks underlying human vision and language. We have a special emphasis on novel, interdisciplinary approaches to these complex biological problems, and almost all of our research teams now include scientists from outside biology, such as physicists, chemists, mathematicians, engineers and computer scientists. This interdisciplinary emphasis has led us to

create a new cross-disciplinary fellowship program for talented young Ph.D's in physics, chemistry and so on, who wish to receive training in biology.

HFSP is a Frontier program supported by member countries with well-established science and university training programs. But I feel there is a crying need to do more to extend global scientific cooperation to countries with less-developed science, and to supplement individual bilateral arrangements between countries by establishing a multinational science-funding organization devoted to the developing world. Perhaps this organization could be structured along the lines of HFSP, and support international training and collaborations between scientists, or an International Science Foundation that would award grants to individual scientists and laboratories.

I do believe that such a program for the developing world should be a peer-reviewed, bottom-up program driven by the needs and creativity of individual scientists, in order to best develop first-rate scientific research laboratories and to identify and train the most promising students. **I should also say that HFSP, together with the Third World Academy of Sciences, EMBO and the Wellcome Trust, held a meeting in Trieste in 2003 devoted to the issue of Promoting Life Science Research and Training in Developing Countries.** A report on our meeting and proposals can be found on the HFSP web-site.

Finally, I would like to mention that I have also been involved in a small program involving Israeli and Palestinian scientists called IPSO, which again is a bottom-up program that supports scientific collaborations and exchanges. The theme of our meeting here in Kyoto is "Lights and Shadows of Science and Technology," and of course when most of us think about the Middle East, the shadows of war and terrorism, of religious and ethnic hatred come quickly to our minds. **International scientific programs like IPSO, HFSP and others with similar aims, help spread the "Light of science" around the world. They also I think can serve as models for how people from different cultures can join together to solve problems in the spirit of rationality, tolerance, cooperation and pragmatism that are so central to the scientific enterprise.**

Thank you, and I very much look forward to hearing other experiences and perspectives on these issues during our session.