Biomedical research and biotech R & D picked up momentum since about 1995, when the Executive Yuan, the executive branch of the government, issued a fairly detailed biotech industrial development plan and erected an oversight committee to coordinate responsibilities among various governmental departments (including the Ministry of Economic Affairs, National Science Council, the Department of Health, Academia Sinica, etc.). The increased activities coincided with the return of Dr. Yuan Tse Lee, a Nobel laureate in Chemistry, to his homeland to head the Academia Sinica and to spearhead reforms in education and academic research. Under the Science and Technology Advisory Group (STAG) of the Executive Yuan, the biotech industry’s Strategic Review Board (SRB) meetings have been held annually since 1997. These meetings invite leaders from academic institutes, research organizations, industry, government, and investment communities to participate and to form consensus, discussing urgent issues and bottlenecks, and devising strategies and solutions.

Over the past few years, the conditions and environment for developing biotech businesses have been substantially improved. Academic institutes are making strides towards innovative research and are paying much more interest in the applicative value of research results. Increasing numbers of universities have established graduate programs in applied biology, biomedicine, and biotechnology. Taiwan is now ranked among the top countries in the number of SCI papers published per capita. This is an important step forward, although we recognize that we must pay attention to the impact, not merely the numbers, of papers published.

The improvement of the infrastructure cover broad fronts. Guidelines for carrying out initial human clinical studies of new drugs and the Center for Drug Evaluation, have been established. The standards for patentability of biotech inventions have been established. The laws, which entitle research institutions the ownerships of patents and their development rights resulting from research carried out with government funds, have been passed. The laws for relaxing the requirements for enlisting biotech companies in the stock markets have been modified. Semi-governmental, nonprofit R & D organizations, such as Development Center for Biotechnology and Industrial Technology Research Institute, have helped to build
facilities, such as pilot plants for producing proteins and antibodies by mammalian cells and experimental animal laboratories, as well as research teams in preclinical research and manufacturing process development, etc., in efforts to assist companies to develop their products.

While substantial improvements in the conditions for developing biotech enterprises in Taiwan have been made, the biotech industry development in Taiwan is at a very early stage. We have a great deal of “road-paving” work ahead. Our ability to do innovative biomedical and biotech research lags that of many other countries in North America and Europe. Our experience in developing biotech products through the regulatory processes is very limited. The government and industry have hard times adjusting from the mold of manufacturing economy to one based on innovation and research. Nevertheless, there is a growing realization that developing the biotech industry must adopt a different kind of approach and model.

Perhaps the most encouraging aspect of the biotech industrial development in Taiwan is that people are very enthusiastic about gaining biotech knowledge and about investing in biotech businesses. Over the past three years, more than 120 firms have been formed to develop businesses in biotech. The zeal for biotech is partly reflected by the existence of nearly 600 companies with the word “biotech” in their names.

However, an estimated 150 to 200 companies are doing businesses relating to new biotechnology. Some of the new startups, such as Taigen and VitaGenomics, have secured generous capital infusions, comparable to those obtained by the most funded biotech startups in the United States. Based on the unabated trend, the biotech industry will be dominated by small and mid-sized new biotech companies. Traditional pharmaceutical manufacturing houses will probably not be the dominant players in biotech.

It is probably not unique among many industrialized and industrializing Asian countries that the severest shortcoming in the biotech industry development facing Taiwan is the shortage of top-level managers and scientists who have experience developing biotech products.

On the capital side, while Taiwan is noted for the diversity, capacity, and rich international experience of its venture capital companies, these companies have largely not found biotech investment luring. Large forms of capital from the information technology, electronic, chemical industries have not set foot in biotech. There is reason to hope that the investment communities and other established industries would discover biotech as attractive targets to invest for the long term.

A prominent feature of the biotech industry development in Taiwan is that the importance of international collaboration and partnership is appreciated. The Development Center for Biotechnology has set up a BioFronts Program with the mission to facilitate the biotech industry to integrate with the international research community.

This program has helped many companies to adopt a serious international outlook in developing biotech businesses. The view that biotech industry will be huge but will take many years, perhaps twenty to thirty years or even longer, to grow has gradually been adopted by most people. We believe that we must emphasize education and research, nurturing creativity and leadership qualities in our children and youngsters. We also believe that a general improvement in the quality of living in our lands will be important in attracting and retaining top talents working in our communities.

The introductory reports presented by various members of our biotech and biomedical community in Taiwan will probably give an image that our biotech development is in a trial and very young phase. They will probably also transpire an impression that the biotech activities in Taiwan are brisk and dynamic.

We realize that various members in the community must work in a coordinated fashion and identify and fulfill our unique roles to make progress in setting a foothold in biotech development. We also recognize that we cannot build our biotech industry by ourselves. Our shared vision is to play an effective role in developing and commercializing biotechnology in the international biotech community. Hopefully, we will find mutually beneficial reasons to interact and collaborate with many of our Asian neighbors in advancing biotech development in our countries.