One Asia Foundation International Lectures, Fall 2019 Semester
"Humanities General Education: The Asian Community:
The Construction and Transformation of East Asiaology" Lecture Series (14)

Title: Taiwan and Biotechnology Development in East Asia

For the 14th lecture, we invite Professor Shu-Ying Wang from the Graduate Institute of Biotechnology at Chinese Culture University as guest speaker. Professor Wang received his Ph.D. Degree in animal science from Cornell University in the United States and she specializes in animal physiology and biotechnology. Professor Wang now served as Director in the Graduate Institute of Biotechnology and Vice President at our university. She said that it is her honor to introduce her discipline to students other than the Department of Animal Science. This lecture focused on two points: (1) the development of biotechnology in Taiwan and East Asia; (2) what is biotechnology? Professor Wang hope to lead students to understand the interesting substance of biotechnology. The summary of lecture is as following:

Professor Wang first stated that technology evolved with times and brought dramatic changes to human lives. For example, the prevalence of personal computer in 1980s and the appearance of Internet in 1990s. Meanwhile, biotechnology is a rising star in millennials. The technology in East Asia developed rapidly in the recent decades and the progress in biotechnology has contributed enormously to human's medical treatment. She analyzed that the United States, United Kingdom, and Germany are still leading the trend of global biotechnology development. The biotechnology in Taiwan has developed since 1982 and it has achieved many contributions under our government's efforts. However, comparing to other East Asian countries like Japan and South Korea, our development in East Asia remain slow.

Professor Wang stated that the decisive elements in the development of biotechnology include the distance between biotechnology companies and technology center, the location of universities which playing important role as research units, national policies, the level of mastering Internet information, etc. The statistics, whether from the percentage of the amounts of global biotechnology companies or from the amounts of the newly-added biotechnology companies in 60 years, demonstrate that the development of biotechnology in East Asia still falls behind European countries and the United States. If we compare the development of biotechnology in East Asian countries (Japan, South Korea, Taiwan, Hong Kong), in terms of the amount of biotechnology companied, South Korea has 441, Japan has 212, Taiwan has 27, and Hong Kong has 13 biotechnology companies. From these numbers, we can see Taiwan still has a long way to go.

Professor Wang continued to explain what is biotechnology? The definition of biotechnology is "any technological application that uses biological function, biological

systems, characteristic, ingredient, metabolites thereof, to make or modify products' quality to improve humankind's lives. Biotechnology has various types: (1) those use bioprocess, like the characteristic, ingredient, metabolites in the cells of microbes, plant, and animals, to produce products; (2) those apply molecule level technology to improve traditional producing process; and (3) those technology promotes quality of human lives. Many nouns like cell, nuclei, chromosome, gene, DNA, RNA, protein, and clone, are vocabularies from biotechnology. In other words, biotechnology is to use organism to produce useful products or solve problems for humankind. For example, we can produce beer, wine, and cheese by using microbial fermentation or produce insulin from cloning for diabetics. These are substantial contributions of biotechnology.

Moreover, professor Wang explained that in fact, humankind has used biotechnology since ancient times. Ancient people's crop planting and selection was part of biotechnology. Nowadays, technology, whether in medicine, industry, agriculture, is depending on the research results of biotechnology. Health care in particular, will increase the usage of biotechnology widely in disease diagnosis, gene therapy, drug manufacturing, organ transplant. Stan Davis and Christopher Meyer predicted in 2000 that human society will welcome a new era of bio-economy in the late 21st century and almost all the companies will be related to biotechnology. At last, professor Wang reminded everyone that while developing biotechnology, we need to strictly adhere to basic ethics and morality so that we can use biotechnology to devote to humankind.

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