



Editorial

Biocatalytic activity in Korea

It is a great pleasure for us to have the opportunity to expose the recent activity regarding biocatalysis. Personally, I am very happy to act as a Guest Editor and write a short history of our progress. This Special Issue is also dedicated to Professor Joon-Shick Rhee, on the occasion of his retirement from KAIST, who has made a significant contribution to enzyme technology as the pioneer in our country.

It was not until the early 1970s that R&D for enzyme technology at the academic and industrial sectors actively started. Most of the activity was focused on basic enzymology comprising isolation and characterization of enzymes and process development. Even though many kinds of enzymes were subject to research, those relevant to food-processing, antibiotics, and cellulose hydrolysis drew the most attention. For example, fructose isomerase, cellulase, penicillin amidase, amylase, etc. were the most interesting enzymes. Commercialization of enzyme process for Rifampicin, in particular, which is a tuberculosis drug, is a typical example of successful stories.

In the 1980s, gene manipulation techniques became available for researchers, which brought about a new trend in biocatalysis research. A number of groups tried to overproduce and commercialize the industrially important enzymes, and several biotech companies got into the business. At that time, most of the industrial enzymes were imported from a few major foreign companies, and the need for domestic production of enzymes was very high. But, we soon realized the reality in commercial production of industrial enzymes. Apart from conventional use, new applications were found for enzymes in the organic synthesis of fine chemicals, affecting greatly the trend in both

academic institutions and industries. Titles like “Enzymes in organic solvents” or “Enzymes in organic synthesis” were most popular among researchers in Korea, and the same time, also around the rest of the world. Since the early 1990s, this trend had become stronger. As environmental problems became very serious, enzyme-based green technology has been regarded as a promising solution to environmental pollution. Many chemical companies have been interested in biocatalysis, and in this sense, a large number of researchers at universities concentrated their activities on enzyme technology. Namely, biocatalysis entered the first boom period. With this, people who were working on enzyme-related research in the Korean Society of Microbiology and Biotechnology, which is the largest biotechnology society, out-numbered those in other research areas, and this situation still continues.

In the late 1990s, we faced a financial crisis, and research activities in all sectors slowed down, and got even more depressed. Upon entering the 21st century, nonetheless, this became a turning point, and when the economic crisis had successfully recovered everything returned to normal. The most exciting event was that a large number of start-up companies with competence in enzyme technology were founded, and we experienced the second Renaissance. During that period, molecular evolution of enzymes and synthesis of chiral compounds were the hottest research topics throughout the world, and many groups have been actively working on these areas so far.

Over the past few years, our government has been pouring large amounts of money into biotechnology, including enzyme technology, which is highly

encouraging researchers. In addition, the Enzyme Engineering Conference will be held in Korea in 2005, and we believe that this will also give us a good opportunity to boost the research in biocatalytic activity.

Finally, I would like to thank again all the people who have helped us publish this Special Issue as well as the contributors. Especially, Professor Asano is greatly appreciated for his efforts regarding review process. I hope this will provide a great platform to make ourselves known.

Hak-Sung Kim
Department of Biological Sciences
Korea Advanced Institute of Science and Technology
393-1 Kusung-Dong, Yuseong-Gu
Taejon 305-701, South Korea
Tel.: +82-42-569-2602
fax: +82-42-869-2610
E-mail address: hskim76@webmail.kaist.ac.kr
(H.-S. Kim)

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