

Development of White Biotechnology

Mitsuyoshi Ueda

Graduate School of Agriculture, Kyoto University

Kitashirakawa, Sakyo-ku, Kyoto 606-8502, Japan

Tel/Fax: +81-75-753-6110/6112, E-mail: miueda@kais.kyoto-u.ac.jp

It is often said that Japan is a country with few natural resources. But, when you find a lot of chemical products by the industrial application of microbial reactions and enzymes, Japan is one of the most resource rich countries as well as Asian countries in the world. It is estimated that a single gram of soil contains between 10 million and 100 million microorganisms. Japan is extremely varied geographically, hence an extremely wide variety of microorganisms can be found. Furthermore, these microorganisms undergo variations throughout the year as the seasons change. It is considered highly likely that just by looking for them we will be able to discover microorganisms with superior capabilities or previously unknown abilities.

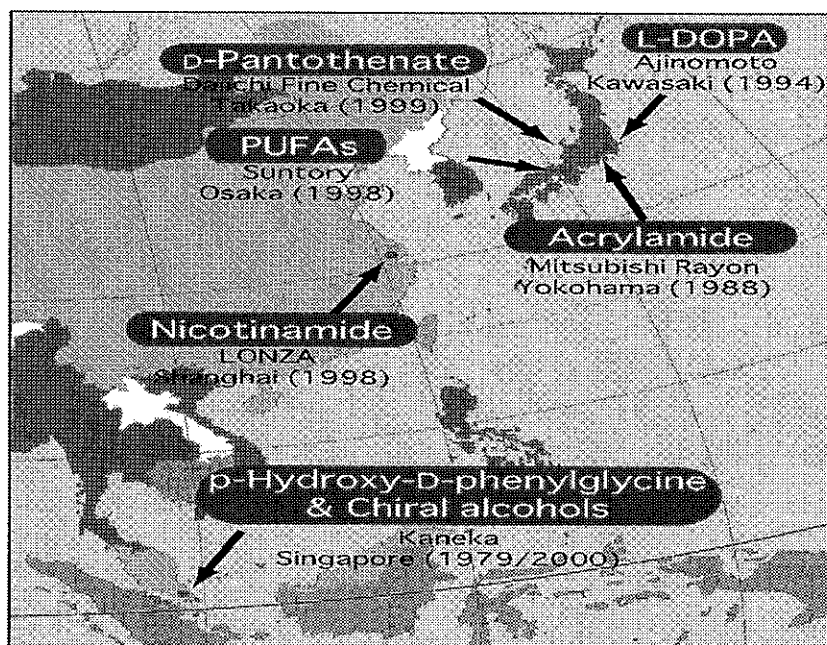
In the post-genome researches, conventional screening methods and advanced screening methods, including molecular breedings such as cell surface engineering etc., have operated to find out novel enzymes or to create novel functions of known/unknown enzymes in biocatalysis researches. 'Microbial factories', so-called, have been developed through collaborations with university laboratories and industries. These novel relationships between universities and industries are good examples of "White Biotechnology".

From these aspects, our COE based on this 'White Biotechnology' is a very unique one in Japan and the world. Mutual and respectable relationship between academia and industries brings very fruitful results (Table). In over all, "Learning Natures and Going after Nature" may be one of the characteristic Japanese ways of applied microbiology research.

Our system will strongly contribute to the sustainable environment of our earth and to CDMs among Asian countries according to the 'Kyoto Protocol 2005'.

Industrial Application of Microbial Reactions (Academia / Industries)

Product	Year	Organization
★Acylamide	1985	Kyoto Univ. / Mitsubishi Rayon Co., Ltd.
Stabilized Vitamin C	1990	Okayama Univ. / Hayashibara Co., Ltd.
★D- <i>p</i> -Hydroxyphenylglycine	1990	Kyoto Univ. / Kaneka Corporation
Hypoallergenic rice	1991	Tokyo Univ. / Shiseido Co. Ltd.
★DOPA	1994	Kyoto Univ. / Ajinomoto Co. Inc.
★Nicotinamide	1998	Kyoto Univ. / Lonza Group, Ltd.
★Polyunsaturated fatty acids	1998	Kyoto Univ. / Suntory Ltd.
★Pantothenate intermediate	1999	Kyoto Univ. / Daiichi Fine Chemical Co., Ltd.
★Chiral alcohols	2000	Kyoto Univ. / Kaneka Corporation
5' -IMP, 5' -GMP"	2003	Toyama Pref. Univ. / Ajinomoto Co., Inc.



CV

UEDA, Mitsuyoshi

(e-mail: miueda@kais.kyoto-u.ac.jp)

Title: Professor, Kyoto University

Address: Division of Applied Life Sciences,

Graduate School of Agriculture, Kyoto University,

Kitashirakawa-oiwake-cho, Sakyo-ku,

Kyoto 606-8502, JAPAN

TEL:+81-75-753-6110 FAX:+81-75-753-6112

1984 PhD (Kyoto University, Engineering)

Professional Career:

1984- JSPS Research Fellow

1985- Assistant Professor (Kyoto University)

1991- Associate Professor (Kyoto University)

2003- Professor (Kyoto University)

1999- Leader, Association of Combinatorial Bioengineering

2000- Governmental Project Leader, NEDO Nano-Bio Project

2001- Technical Manager, Bio-Energy Co. (Bio-venture Co.)

2002- Guest Researcher, Mitsubishi Life Science Institute

2004- Governmental Project Leader, NEDO Post-genome Project

2004- Governmental Project Leader, JST Photon Craft Lazer Project

2006- Governmental Project Leader, NEDO Omics Analysis Project