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OF
INTERNATIONAL CENTER FOR BIOTECHNOLOGY
OSAKA UNIVERSITY**

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The Annual Report is published to record the activity of the International Center for Biotechnology (ICBiotech) and issued once in each fiscal year. It contains scientific articles, progress reports, letters, and announcement from the Center. This volume includes publications by the former participants in UNESCO courses. The editor welcomes the submission of appropriate articles from all persons who are concerned with the activity of the Center. All the contributions, however, will be reviewed by editors before their acceptance. The scientific paper herein should be treated as personal communications and not treated as original publications. The Annual Report is distributed upon request to the International Center for Biotechnology, Osaka University, 2-1 Yamadaoka, Suita, Osaka 565-0871, Japan (e-mail: info_icbio@icb.osaka-u.ac.jp).

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ACTIVITIES OF ICBiotech

ACTIVITIES OF INTERNATIONAL CENTER FOR BIOTECHNOLOGY FOR FY2016

The International Center for Biotechnology (ICBiotech) was founded in April 1995 as an independent institute in Osaka University with a mission to pursue academic advancement and collaborative research in biotechnology. ICBiotech has its origin from the “International Center of Cooperative Research Center in Microbial Engineering Japan (ICME)” which was established in the Faculty of Engineering, Osaka University in April 1978, through renaming to “International Center of Cooperative Research in Biotechnology (ICBiotech)” in April 1985 with the recognition of the wide acceptance and success of ICME’s activities and achievements.

ICBiotech is dedicated to promote international cooperation among Asian countries in the aspects of research and educational advancement in the field of Biotechnology by propelling academic interactions in Asian countries, and is committed to industrial biotechnology studies by means of microbial engineering and related sciences, focusing on the sustainable utilization of abundant natural resources in Southeast Asian countries.

ICBiotech serves as the seat of education and research in Asia, with the support of the Ministry of Education, Culture, Sports, Science and Technology (Monbu-kagaku-sho, MEXT), the Japan Society for the Promotion of Science (JSPS), the Japan Science and Technology Agency (JST), the Japan Student Service Organization (JASSO), and the auspices of the United Nations Educational, Scientific and Cultural Organization (UNESCO), with the cooperation of Department of Biotechnology, Graduate School of Engineering, Osaka University, and researchers from prestigious universities nationwide and abroad.

In 2002 Mahidol University-Osaka University Collaborative Research Center for Bioscience and Biotechnology: MU-OU:CRC was set up at Faculty of Science, Mahidol University as a collaborative research center to accomplish multidisciplinary research in the field of Bioscience and Biotechnology.

The activities of the ICBiotech include:

1. Research and Education

The main area of research is industrial biotechnology rooted in microbial engineering, whilst centering on the sustainable use of agricultural and forest resources in bioresource-rich countries such as those in Southeast Asia. Research is underway in the field of cell engineering with the objectives of analyzing the cellular functions of bacteria, fungi and plants, and developing and using functions of these cells for management and rational use of biological resources that exist on our planet. ICBiotech covers three areas of Biotechnology:

- 1) Discovery of new functions from biological resources.
- 2) Bio-conversion and process engineering of biological resources.
- 3) Conservation of biological resources.

For under graduate and post graduate courses, ICBiotech is involved in the education activities of Department of Biotechnology, Graduate School of Engineering as collaborating laboratories and currently covers several fields of biotechnology in education and research: Molecular Microbiology laboratory chaired by Prof. Takuya Nihira and Applied Microbiology laboratory chaired by Prof. Kazuhito Fujiyama.

2. Participating in FrontierLab@OsakaU 'Scientific Empowerment Program for International Students' which was created for international students to conduct thematic studies and achieve results under the guidance of supervisors while acquiring skills necessary for continuing research in one of Osaka University's internationally renowned science and technology laboratories for a period of up to 12 months.
3. Acting as collaborating laboratories with Department of Biotechnology, Graduate School of Engineering, Osaka University for 'Biotechnology Global Human Resource Development program', a five-year program for master's and doctor's degrees. The aim of this program is to expose graduate students (privately financed as well as the Japanese Government Scholarship students) to state-of-the-art research skills and in-depth knowledge of advanced biology, chemistry and physics to harness the potential of biotechnology.
4. Having been administrating and implementing the "UNESCO Biotechnology School in Asia" (2012-2017) at Department of Biotechnology, Graduate School of Engineering, Osaka University, taking over the long-termed "International Post-Graduate University Course in Microbiology" (1972-2003) and Postgraduate Inter-University Course in Biotechnology (2004-2007) with total of 459 alumni spreading all over Asia.
5. Serving as the secretariat for the UNESCO Regional Network for Microbiology and Biotechnology in Southeast Asia in accordance with a proposed memorandum resulting from a Consortium Meeting of the Project "Tropical Bio-Resources and Green Chemistry Strategy" (Osaka 2003).
6. Working as a member of the global network "Microbiological Resource Centers" (MIRCENs) operated by UNEP, UNESCO and ICRO; and as an original member of the "Regional Network for Microbiology in Southeast Asia" operated under the auspices of UNESCO through the Fund-In-Trust of the Japanese Government (J-FIT).
7. Promoting international cooperative researches in biotechnology with the Southeast Asian countries related to Biotechnology, under the support of Monbu-kagaku-sho Grant-in-Aids for International Scientific Research. In addition, ICBiotech cooperates in developing international organization and conducting academic seminars related to biotechnology.
8. Publishing Annual Reports of ICBiotech periodically.

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I. COOPERATIVE RESEARCH STATION (CRS) IN SOUTHEAST ASIA

The ICBiotech, Osaka University launched out the Cooperative Research Station (CRS) in Southeast Asia at Chalermprakiat Building, Faculty of Science, Mahidol University in 2002 through the generous support by Mahidol University. The CRS's space and equipments are made available for Southeast Asian and Japanese researchers to undertake cooperative onsite researches on the development of the abundant natural biological and genetic resources and their sustainable utilization in Southeast Asian countries through JSPS core university program (ended in 2005), JST Special Coordination Funds for Promoting Science and Technology (2006-2009) and JSPS Asian CORE Program (2009-2014). The CRS also functioned as a lecturing and research station of the UNESCO International Post-graduate Inter-University program, which Osaka University operated in coordination with Thai universities. The CRS is considering support to the alumni of Osaka University and provision of university information for recruitment of students for study in Osaka University.

Mahidol University (MU) and Osaka University (OU) together established the Mahidol University-Osaka University Collaborative Research Center (MU-OU:CRS) for Bioscience and Biotechnology at Faculty of Science, Mahidol University in 2002, to strengthen the research cooperation in these fields which are amongst the most active fields of study and research in both universities.

Currently, MU-OU:CRS has coordinated a research projects under the jointly support of National Research Council of Thailand (NRCT), National Center for Genetic Engineering and Biotechnology (BIOTEC) and The Japan Society for the Promotion of Science (JSPS). Researchers from Mahidol University, Chulalongkorn University, Kasetsart University, King Mongkut's University of Technology Thonburi and BIOTEC participate in this project.

CRS is conducting researches on

1. Strain improvement of *Bacillus thuringiensis*.
2. Screening of actinomycetes for bioactive compound.
3. The soil metagenome for screening of potential polysaccharide-degrading enzymes.
4. Cell culture system for screening of bioactive compounds from Streptomyces and environmental fungi.
5. Quorum sensing interference: Novel biocontrol strategies for pathogenic bacteria.

II. UNESCO COURSE

”UNESCO International Post-Graduate University Course in Microbiology” (1973-2003) plus the “UNESCO Postgraduate Inter-University Course in Biotechnology” (2004-2007) was one of the two long-term training courses held in Japan launched in response to the recommendations concluded at a UNESCO General Conference Meeting. After the operation of 33 batches for developing human resources in Asia, total 459 young researchers from all over Asian countries are now playing active and leading roles in current biotechnology research and education in the region to contribute to the development of their own country, and consequently to Asian countries, and the establishment of the closer and stronger network in the region.

UNESCO Biotechnology School in Asia (JFIT Project)

The “UNESCO Biotechnology School in Asia” was launched in October 2012. This program is an activity of the “UNESCO Extra-budgetary Program for Human Resources and Research Network in Sciences and Technology” supported by the Japanese Fund-In-Trust (JFIT). The course is a program of the scientific training for young Asian university-graduates in the field of Biotechnology and related areas resulting in achieving master degree, and the participants are expected to make significant contributions to an educational or scientific institution in the coming years in their home countries. It aims also to strengthen the network activities among the biotechnology scientists in the region.

[3rd: 2014 cohort students] (Aug 2014 – July 2016)

Schedule

April 21, 2016	Interim report meeting of UNESCO Biotechnology School in Asia
July 11, 2016	Final Presentation by the UNESCO Biotechnology School in Asia “Cohort 2014” (at ICBiotech, Osaka University)
July 15, 2016	Awarding diploma and Closing ceremony

III. WORKSHOP

The 5th Workshop on Collaboration between Osaka University and Japanese companies for global human resource development in the field of biotechnology

May 18, 2016

International Center for Biotechnology, Osaka University

Sponsorship; International Center for Biotechnology, Osaka University

Co-sponsored; International Research Initiative for Frontier of Industrial Biotechnology, Osaka University

The Fifth Workshop on Collaboration between Osaka University and Japanese companies was held. Representatives of industries engaged in the biotechnology industry were introduced to the international students enrolled at Osaka University for the purpose of attaining international human resource development. A total of six enthusiastic companies attended the meeting. Companies, faculty members and students introduced themselves and their activities to one another. Students were able to know about the Japanese companies and how to apply their scholarly works in the industrial biotechnology setting. Adding to the great success of this meeting are the lively discussions and exchange meetings which have resulted in a deepened understanding of each other.

Schedule

- 15:00- Introduction
Prof. Nihira (Director of ICBiotech)
- 15:10-16:00 Keynote lecture
Mr. Koji Abe (Sysmex Corporation)
- 16:15-17:15 Informal conference of companies
- 1) Ajinomoto General Foods, Inc.
 - 2) Kaneka Corporation
 - 3) Shionogi & Co.
 - 4) Sysmex Corporation
 - 5) House Foods Group Inc.
 - 6) Rohto Pharmaceutical Co.
- 17:30-19:00 Mixer

**The 6th Workshop on Collaboration
between Osaka University and Japanese companies**

Sponsorship; International Center for Biotechnology, Osaka University

Co-sponsored; International Research Initiative for Frontier of Industrial Biotechnology, Osaka University

January 27, 2017

4th and 5th floor, International Center for Biotechnology, Osaka University

Schedule

1. Brief introduction about the project (15:00 -15:10)
Prof. Nihira, Director of ICBiotech
2. Key note Lecture (15:10-16:00)
Mr. Naoto Kato (Ajinomoto Co., Inc.)
Osaka U Graduate School, Division of Engineering Completed in 1987.
“Ajinomoto –its business and global production management”
3. Informal conference of companies (16:10-17:50)
 - 1) Ajinomoto General Foods, Inc. (AGF)
 - 2) Sunstar Inc.
 - 3) TORAY Industries, Inc.
 - 4) Kaneka Corporation
 - 5) House Foods Group Inc.
 - 6) Lion Corporation
 - 7) Sysmex Corporation
 - 8) Ajinomoto Co. Inc.
4. Mixer (18:00-19:30)

IV. JASSO STUDENT EXCHANGE SUPPORT PROGRAM (SSSV) (Scholarship for Short-Term Stay/ Short-Term Visit Program)

This is a field study program jointly operated with GLOCOL (Global Collaboration Center), Osaka University and several universities in Thailand. In 2016, 35 first year master's degree students of Osaka University visited 4 universities and an institute in Thailand between August 1 and September 5, and 23 postgraduate students from Thailand visited Osaka University between September and December, which enhanced mutual interactions.

V. JST JAPAN-ASIA YOUTH EXCHANGE PROGRAM IN SCIENCE (SAKURA Exchange Program in Science)

Purpose of the Program: Promoting science and technology is a key engine to materialize a bright future of Asia and it is vitally important to enhance the exchange of youths in Asian countries and Japan who will play a crucial role in the field of science and technology. Based on this concept, "Japan-Asia Youth Exchange Program in Science" (SAKURA Exchange Program in Science) is the program for enhancing exchanges between Asia and Japan of the youths who will play a crucial role in the future field of science and technology through the close collaboration of industry-academia-government by facilitating short-term visits of competent Asian youths to Japan. This program aims at raising the interest of Asian youths toward the leading Japanese science and technologies at Japanese universities, research institutions and private companies.

Schedule

Oct. 23, 2016	Orientation
Oct. 24	Lecture: Structural and functional studies of enzymes from extremophiles and their application (Dr. Yuichi Koga)
Oct. 25	Lecture: Yeast bioscience and biotechnology (Dr. Minetaka Sugiyama) Lecture: Industrial application of enzymes (Dr. Kenji Okano)
Oct. 26	Lab tour at Osaka U
Oct. 27	Visiting companies: Riken, Super Computer "Kei", Sysmex, Kobe.
Oct. 28	Visiting company: Shimadzu, Kyoto.
Oct. 29	Visiting Expo '70 Commemorative Park and National Museum of Ethnology, Suita.
Oct. 31	Presentation of task, certificate award

VI. SCIENTIST EXCHANGES

Record of Scientist Exchange (FY2016)

From Japan to counterpart countries

Between counterpart countries

(Please refer to the Office.)

VII. GUESTS/VISITORS

(Please refer to the Office.)

VIII. COMMITTEE MEETING 2016

Steering Committee Meetings of ICBiotech were convened as follows:

- June 6, 2016: Discussion on inviting a Visiting Research Scholar:
 - Ms. Ngan Minh Le (July 1, 2016 – July 31, 2016)
 - Ms. Nguyen Thi Minh Ngoc (July 1, 2016 – July 31, 2016)
 - Mr. Phan Thanh Phat (August 17, 2016 – September 16, 2016)
 - Ms. Thanh Thao Nguyen (August 17, 2016 – September 16, 2016)

- July 4, 2016: Discussion on inviting a Visiting Research Scholar:
 - Dr. Sriwan Wongwisansri (September 1, 2016 – October 1, 2016)

- September 27, 2016: Discussion on inviting a Visiting Research Scholar:
 - Ms Nabilah Sari Mustafa, Laos (October 1, 2016 – September 30, 2017)
 - Ms. Dian Angraini Suroto (October 1, 2016 – September 30, 2017)

- October 26, 2016: Discussion on inviting a Part-time Lecturer:
 - Dr. Chanita Boonmak (January 10, 2017 – February 28, 2017)

- December 16, 2016
 - Report on:
 - JST Sakura Exchange Program in Science
 - Workshop on on Collaboration between Osaka University and Japanese Companies
 - JASSO Short-stay and Short-visit program 2016
 - Two Visiting Research Scholars staying at ICBiotech during the FY2017
 - Adjunct Professor for the FY2016
 - Discussion on:
 - Selection of a new director for the FY2016-2017
 - Selection of members of the steering committee
 - Conferring the title on visiting professors from abroad for FY2016
 - Conferring the title on visiting professors assigned from Japanese universities for FY2016
 - Inviting a visiting research scholar

- March 23, 2017:
 - Discussion on inviting Part-time Lecturers:
 - Prof. Masashi Tsuda (April 1, 2017 – March 31, 2018)
 - Dr. Masaru Kobayashi (April 1, 2017 – March 31, 2018)
 - Dr. Hitomi Yumioka (April 1, 2017 – March 31, 2018)

 - Approval of Prof. Nihira's holding the concurrent post of Director of ASEAN Center from April 1, 2017 to March 31, 2018.

 - Approval of assignment to an ex officio member of the Steering Committee of Oversea Department of Global Initiative Center from April 1, 2017 to March 31, 2018.