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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 FY2018

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" (2012-2016) 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.

STEERING COMMITTEE

Chairman	Prof. Kazuhito Fujiyama (Director of ICBiotech)
Committee Members	Prof. Eiichiro Fukusaki (Graduate School of Engineering) Prof. Tsuyoshi Inoue (Graduate School of Engineering) Prof. Hajime Watanabe (Graduate School of Engineering) Prof. Kazumasa Hirata (Graduate School of Pharmaceutical Sciences) Prof. Masahito Taya (Graduate School of Engineering Science) Prof. Toshihiro Horii (Research Institute for Microbial Diseases)

STAFF

Director/Professor	Dr. Kazuhito Fujiyama
Adjunct Professor	Dr. Michihiko Ike (Graduate School of Engineering, Osaka University)
Collaborative Professor	Dr. Watanalai Panbangred (Mahidol University, Thailand) Dr. Irfan Dwidya Prijambada (Universitas Gadjah Mada, Indonesia) Dr. Raymond L. Rodriguez (University of California-Davis, USA)
Guest Professor	Dr. Toshiomi Yoshida (Prof. Emer., Osaka University) Dr. Tatsuji Seki (Prof. Emer., Osaka University) Mr. Junji Tayama (Osaka University) Dr. Yasuhiro Igarashi (Toyama Prefectural University)
Adjunct Associate Professor	Dr. Yoshinori Sumimura (Center for Global Initiatives, Osaka University)
Guest Associate Professor	Dr. Saori Kosono (The University of Tokyo)
Visiting Academic Staff	Dr. Vu Thu Trang (Hanoi University of Science and Technology, Vietnam) (Specially Appointed Associate Professor under the Cross-appointment Agreement) Dr. Nantana Srisuk (Kasetsart University, Thailand) (Specially Appointed Associate Professor) Dr. Marian Pulido De Leon (University of the Philippines Los Banos, Philippines) (Specially Appointed Associate Professor under the Cross-appointment Agreement) Dr. Jigjiddorj Enkh-Amgalan (Institute of General and Experimental Biology, Mongolian Academy of Sciences, Mongolia) (Specially Appointed Associate Professor under the Cross-appointment Agreement)
Associate Professor	Dr. Shigeru Kitani
Assistant Professor	Dr. Ryo Misaki Dr. Hiroshi Kinoshita Dr. Takao Ohashi
Administrative Official	Ms. Reiko Matsumoto
Administrative Assistant	Ms. Fumiko Tomomatsu Ms. Megumi Okamoto Ms. Chiyoko Katayama
Technical Assistant	Ms. Shizuka Kawakami Ms. Kyoko Sugimoto Ms. Terumi Kikuchi

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 Streptomycetes and environmental fungi.
5. Quorum sensing interference: Novel biocontrol strategies for pathogenic bacteria.

II. WORKSHOP

The 8th Workshop on Collaboration between Osaka University and Japanese companies for global human resource development in the field of biotechnology

February 1, 2019

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 eighth 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 ten 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.

13:45: Opening remark by Prof. Kazuhito Fujiyama

13:50-14:30: Special lecture “The Way for Science Graduates to Survive in a Company”
by Katsuyuki Kawatsura (Asahi Holdings, Inc.)

14:30-15:00: Coffee Break

15:00-15:20: Keynote Address by Prof. Kazuhito Fujiyama

15:20-17:30: Group talking with individual company
(45 min each, three rounds at α building and β building in ICBiotech)

15:30-16:05: 1st Round

16:10-16:45: 2nd Round

16:50-17:25: 3rd Round

Attending companies are:

Earth Environmental Service Co. (α -508)

Asahi Group Holdings, Ltd. (α -506)

Ajinomoto General Foods, Inc. (α -502)

Kao (α -401)

Glico Nutrition Co. (α -510)

Saraya Co. (α -509)

Shionogi Administration Service Co. (α -511)

Sysmex Corp. (α -504)

Shimadzu Corp. (β -303)

Lion Corp. (α -504)

17:45-19:30: Simple party with light meal at International saloon (β -102).

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

This is a field study program jointly operated with several universities in Thailand. In 2018, 27 first year students of the master's course of Osaka University visited 4 universities in Thailand between August 5 and September 10, and 16 postgraduate students from Thailand and the Philippines visited Osaka University between November 2018 and March 2019, which enhanced mutual interactions.

IV. 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

January 20	Arriving
January 21	Orientation, Seminar on advanced biotechnology I Welcome Party
January 22	Seminar on advanced biotechnology II, Cutting-edge biotechnology experiment I Lab Visit in OU Shimadzu Analytical Innovation Research Laboratory
January 23	Cutting-edge biotechnology experiment II Lab Visit in Department of Biotechnology and Analytical Instrumentation Facility, OU and Hitz Exchange party with OU students
January 24	Seminar on advanced biotechnology III Visit to Hakutsuru Sake Brewery Museum and Daikin Solution Plaza fuha
January 25	Seminar on advanced biotechnology IV Visit to Shimadzu Company in Kyoto and Kinkakuji-Temple
January 26	Presentation of task, Certificate award Closing Ceremony
January 27	Back home

V. SCIENTIST EXCHANGES

Record of Scientist Exchange (FY2018)

From Japan to counterpart countries / Between counterpart countries

*Please contact us for more information.

VI. GUESTS/VISITORS

*Please contact us for more information.

VII. STEERING COMMITTEE MEETING 2018

Steering Committee Meetings of ICBiotech were convened as follows:

- October 16, 2018: Discussion on ICBiotech Director's supplementary assignment to Director of ASEAN Center:
Dr. Kazuhito Fujiyama (October 16, 2018 – March 31, 2019)
- November 19, 2018: Discussion on the conclusion of the academic exchange agreement between College of Biological Sciences and College of Engineering, University of California, Davis and International Center for Biotechnology, Osaka University
- November 22, 2018: Discussion on the conclusion of the cross appointment agreement:
Dr. Enkh-Amgalan Jigjiddorj (March 1 – 29, 2019)
- December 6, 2018
Report on:
 1. JST Sakura Exchange Program in Science
 2. JASSO Short-stay and Short-visit program 2018
(Aug. 5, 2018 – Sept. 11, 2018 sending Japanese students to Thailand, Nov. 5, 2018 to Feb. 10, 2019 accepting Thai students)
 3. Four Visiting Academic Staff
Dr. Vu Thu Trang from Vietnam, April 16 – May 15, 2018
Dr. Srisuk Nantana from Thailand, May 15 – June 13, 2018
Dr. Marian Pulido De Leon from Philippine, June 1 – 29, 2018
Dr. Enkh-Amgalan Jigjiddorj from Mongol, March 1 – 29, 2019
 4. Adjunct Professors for the FY2019
 5. Other topics: Organization of ICBiotech

Discussion on:

1. Selection of Director of ICBiotech:
Dr. Kazuhito Fujiyama (April 1, 2019 – March 31, 2021)
2. Selection of members of Steering Committee:
Dr. Mamoru Tobisu (April 1, 2019 – March 31, 2021)
Dr. Hiroshi Umakoshi (April 1, 2019 – March 31, 2021)
Dr. Genji Kurisu (April 1, 2019 – March 31, 2021)

- February 1, 2019:
 - Discussion on:
 1. Selection of a member of Steering Committee:
Dr. Tetsuya Iida (April 1, 2019 – March 31, 2021)
 2. Inviting a Visiting Research Scholar:
Mr. Tuan Hoang Viet (April 1 – 30, 2019)
- March 1, 2019:
 - Discussion on:
 - *Retirement and open recruitment of an Assistant Professor
 - *Selection of a member of Evaluation Committee:
Dr. Hiroshi Umakoshi (April 1, 2019 – March 31, 2020)
- March 12, 2019: Discussion on accepting a Visiting Researcher:
Dr. Takao Ohashi (April 1, 2019 – March 31, 2020)
- March 19, 2019: Discussion on concluding the cross appointment agreement:
Dr. Napathorn, Suchada Chanprateep (January 6 – January 31, 2020)