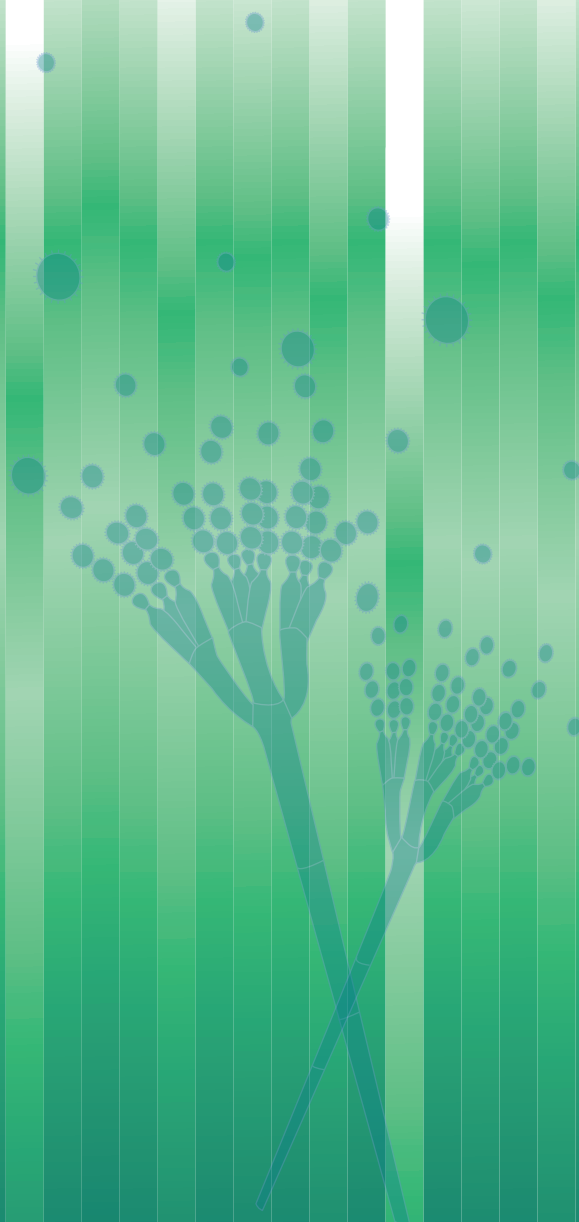




The University of Osaka

# International Center for Biotechnology





## Connecting the World through Biotechnology

The International Center for Biotechnology (ICBiotech) at the University of Osaka has been serving as a hub for international collaborative research in biotechnology in Asia for nearly 50 years since its establishment in 1978. To promote the sustainable utilization of unexplored biological resources in Southeast Asia, the Cooperative Research Station (CRS) was established in the Faculty of Science at Mahidol University in Thailand. CRS functions as a local base for education and research in biotechnology, fostering academic exchange with Thailand and neighboring countries such as Laos, Cambodia, and Vietnam.

In education, ICBiotech collaborates with Department of Biotechnology, Graduate School of Engineering in the University of Osaka to foster young researchers equipped with excellent academic knowledge and high affinity toward international environments. In research, the center focuses on industrial biotechnology, applying the functions of microorganisms and plants to address various global issues. Recent achievements include the development of sustainable manufacturing systems through bio-based production and advancements in the production of therapeutic proteins, earning widespread recognition domestically and internationally.

These extensive activities of ICBiotech have been supported by ministries and funding agencies including the Ministry of Education, Culture, Sports, Science, and Technology (MEXT), the Japan Science and Technology Agency (JST), the Japan Society for the Promotion of Science (JSPS), the Japan Student Services Organization (JASSO), and UNESCO, as well as the cooperation of researchers from prestigious universities nationwide and abroad.





History	
1978	The establishment of the International Center of Cooperative Research and Development in Microbial Engineering, Japan (ICME) at the Faculty of Engineering, the University of Osaka.
1985	The renaming of the center to International Center of Cooperative Research in Biotechnology (ICBiotech) in the recognition of the wide acceptance and success of ICME's activities and achievement.
1995	The foundation of the International Center for Biotechnology (ICBiotech) as an independent institute in the University of Osaka with a mission to pursue academic advancement and collaborative research in biotechnology.
2002	The establishment of the Cooperative Research Station (CRS) in Southeast Asia, ICBiotech, the University of Osaka, and Mahidol University - the University of Osaka Collaborative Research Center (MU-UOsaka CRC) in Mahidol University, Thailand.
2013	The completion of new building, the International Research Complex for Biotechnology ( $\alpha+\beta$ complex, 4,100 m <sup>2</sup> ), and moving-in from the 1978-established old building (1,000 m <sup>2</sup> ).

## Cooperative Research Station (CRS) at the International Center for Biotechnology, the University of Osaka

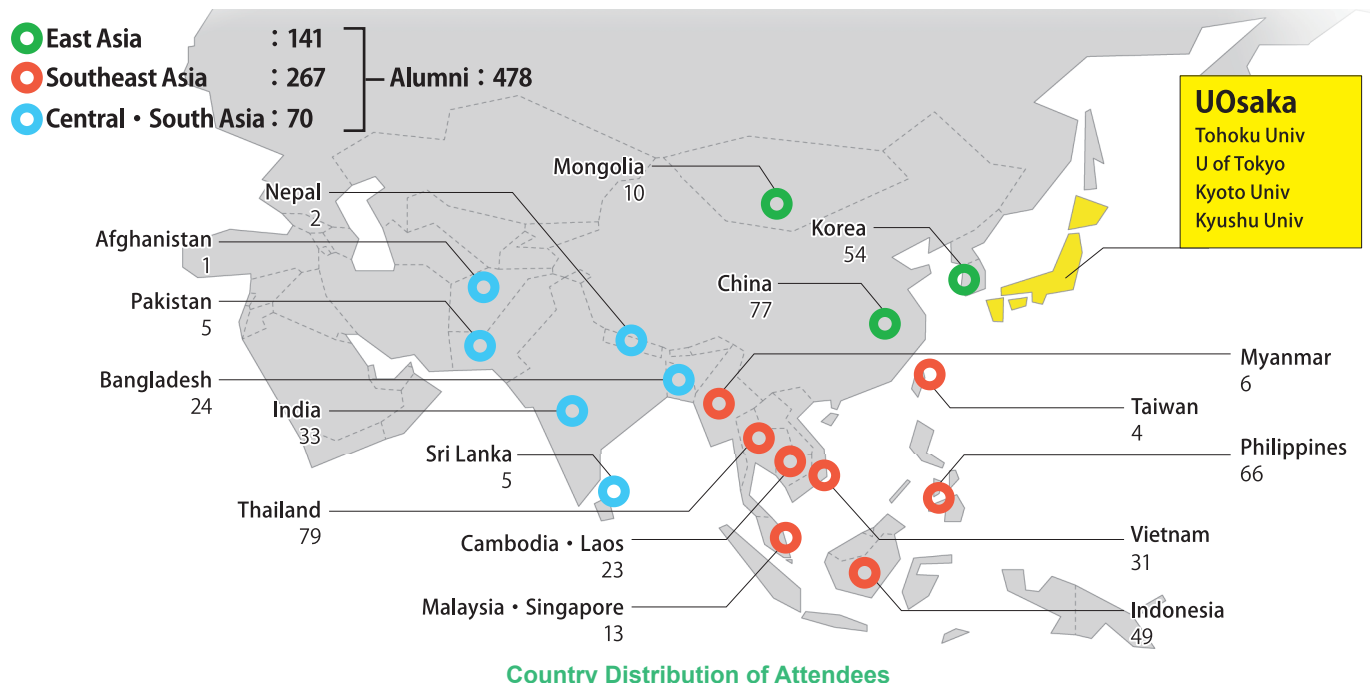
In 2002, the Cooperative Research Station (CRS) was established within the Faculty of Science at Mahidol University, Thailand, with the support of research facilities provided by Mahidol University. CRS promotes collaborative research with Southeast Asian researchers focusing on the sustainable utilization of natural resources and the exploration of biological genetic resources. These efforts were supported by various programs such as 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). In addition to collaborative research, CRS has also functioned as an education and research station of the UNESCO International Post-graduate Inter-University Program, double degree programs, and other student exchange programs.

CRS also functions as a joint research center for biosciences and biotechnology established between Mahidol University and the University of Osaka, serving as a platform for collaborative research in the biotechnology field between the two universities.



# UNESCO Program for Development of Human Resources and Research Network (1973-2017)

From 1973 to 2003, the UNESCO International Post-graduate Inter-University Program in Microbiology was carried out to provide specialized training to many young scientists from Asia. This initiative was continued to the UNESCO Biotechnology School in Asia (2012-2017), a program supported by MEXT and UNESCO.



## Development of Research and Education Hubs through International Collaborative Programs in Southeast Asia (1978-2013)

In 1978, a bilateral exchange program with Thailand on “Microbiology in Agro-Industry” began, in collaboration with the Department of Fermentation Technology (now the Department of Biotechnology) of the University of Osaka. This program expanded to include multi-lateral collaborative research on biotechnology with researchers from Japan, Thailand, the Philippines, Indonesia, and Malaysia. Over 25 years, the program yielded significant academic outcomes, trained young researchers through joint projects, and established networks between researchers in Japan and Southeast Asia.

From 2006 to 2008, with support from JST, a joint research project titled “Establishment of bioproduction research center for Southeast Asian bioresources” was conducted with Thailand. The project aimed to create core research bases for bio-industry by using Thailand’s biological resources as a model. From 2009 to 2013, the JSPS Asian CORE Program utilized CRS as a platform for practical education of young researchers, establishing a world-class exchange hub in the field of bioproduction. These initiatives not only produced significant academic results but also contributed greatly to the training of young researchers and the development of international research networks.

### Partner Institutes in the Programs

**Japan:** The University of Osaka, Hokkaido University, The University of Tokyo, Toyama Prefectural University, Mie University, Kyushu University, etc

**Thailand:** Mahidol University, Chulalongkorn University, Kasetsart University, King Mongkut’s University of Technology Thonburi, National Center for Genetic Engineering and Biotechnology (BIOTEC), etc

## Short Stay Short Visit (SSSV) Program

Supported by JASSO's Study Abroad Support Program, ICBiotech organizes short-term study abroad opportunities for graduate students in the Department of Biotechnology at the University of Osaka (the SSSV Program). Participants are assigned to laboratories at Thai universities such as Mahidol University, Chulalongkorn University, Kasetsart University, and King Mongkut's University of Technology Thonburi. Over approximately 40 days, students engage in research, lectures, presentations, and visit local Japanese companies and embassies in Thailand to learn about Japan's global presence.

Similarly, graduate students from these Thai universities participate in a short-term research program at ICBiotech. This bilateral exchange fosters mutual cultural understanding and provides a platform to discuss the industrial application of biotechnology research in both countries, nurturing global leaders.



## Sakura Science Exchange Program

Since 2014, ICBiotech has been granted for JST's Sakura Science Exchange Program, inviting approximately eight students from Asia to experience Japan's bio-based manufacturing industry and advanced biotechnology. Activities include hands-on experiments, lectures, group work, visits to top-tier companies, and cultural exchange with students studying at the University of Osaka.

Some participants have gone on to enroll at the University of Osaka, demonstrating the program's success in fostering relationships. ICBiotech aims to build a foundation for enhanced collaboration in biotechnology between Japan and Asian countries, contributing to the region's sustainable development.

## Osaka University International Certificate Program (OUICP)

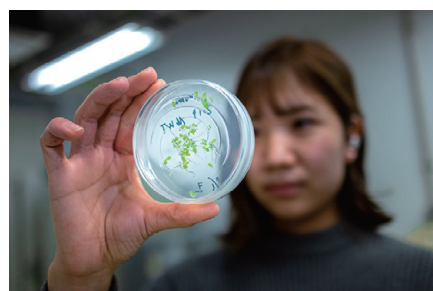
The OUICP is a hybrid education program combining online lectures and overseas training courses at the University of Osaka or its ASEAN campuses. Participants complete short-term study abroad at partner universities during the program's one-year duration and earn a certificate from the President of the University of Osaka upon fulfilling course requirements (6-8 credits). The program is open to students in the University of Osaka and its ASEAN campuses, working professionals in Japan, and professionals in ASEAN countries. OUICP emphasizes interdisciplinary and socially integrated education under the "Double-Wing Academic Architecture" initiative of the University of Osaka.





## Applied Microbiology Laboratory (Fujiyama Laboratory)

In our laboratory (Professor FUJIYAMA Kazuhito), we engineer plants, animals, and microorganisms as “factories for producing useful substances” and are engaged in research that harnesses various types of information and data to take advantage of their potential. One of our research interests is glycosylation, particularly post-translational modification. We challenge to create functional proteins that can be used in various fields including medicine by identifying and elucidating the functional factors that support glycan modifications and manipulating them using the power of genetic engineering. Additionally, we are actively involved in research on the recycling of waste oils, which contributes to technological innovations to address global challenges. Through these researches, we aim to develop technologies that provide sustainable and practical solutions to social issues such as healthcare and environmental problems by leveraging the power of biology.



## Molecular Microbiology Laboratory (Honda Laboratory)

Rapidly advancing molecular biological techniques have enabled us to modify the genes and genomes inside of living cells. These techniques have also contributed to our deeper understanding of molecular apparatus in the cells. By combining these techniques and knowledge, we are now able to engineer the function of living cells and utilize them in various industrial sectors, including food, chemical, pharmaceutical, and environment. Among a wide variety of living organisms on the earth, our group is focusing on microorganisms owing to their diversity and unique physiology. We are working on (i) the identification and characterization of biomolecules underlying the unique physiology of microorganisms, and (ii) their application to the development of industrially useful technologies (e.g., those for chemical/pharmaceutical manufacturing, waste treatment, and energy production). Currently, we are particularly interested in biomolecules derived from extremophiles, such as thermophiles and organic-solvent-tolerant microorganisms, and secondary-metabolite-producing microorganisms.



## STEERING COMMITTEE

### Chairman

Director of ICBiotech	Prof. Honda Kohsuke
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### Members

ICBiotech	Prof. Fujiyama Kazuhito
Grad. School Eng.	Prof. Omasa Takeshi
Grad. School Eng.	Prof. Watanabe Hajime
Grad. School Eng.	Prof. Tobisu Mamoru

Grad. School Phar. Sci.	Prof. Arai Masayoshi
Grad. School. Eng. Sci.	Prof. Umakoshi Hiroshi
Res. Inst. Microbial Diseases	Prof. Iida Tetsuya
Inst. for Protein Research	Prof. Kurisu Genji



## STAFF

Director/Professor	Dr. Honda Kohsuke
Professor	Dr. Fujiyama Kazuhito
Specially Appointed Prof.	Dr. Miyazaki Kentaro
Associate Prof.	Dr. Misaki Ryo
Associate Prof.	Dr. Tomita Hiroya
Assistant Prof.	Dr. Kajiura Hiroyuki

Adjunct Prof.	Dr. Ike Michihiko (Grad. School Eng.)
Adjunct Prof.	Dr. Sumimura Yoshinori (Institute for International Initiatives)
Collaborative Prof.	Dr. Irfan Dwidya Prijambada (U Gadjah Mada, Indonesia) Dr. Choowong Auesukaree (Mahidol U, Thailand) Dr. Jochen Büchs (RWTH Aachen U, Germany)

## SUCCESSIVE DIRECTORS



Prof. Taguchi Hisaharu  
1978-1986



Prof. Okada Hirosuke  
1987-1989



Prof. Oshima Yasuji  
1990-1994



Prof. Yoshida Toshiomi  
1995-1998



Prof. Murooka Yoshikatsu  
1999-2002



Prof. Seki Tatsuji  
2003-2006



Prof. Harashima Satoshi  
2007-2010



Prof. Nihira Takuya  
2011-2016



Prof. Fujiyama Kazuhito  
2017-2024



Prof. Honda Kohsuke  
2025-Present

### Publication

- Annual Report of ICBiotech (in CD format since vol.22, 1999)
- Proposal on Efficient Utilization of Thai Bioresources (2006-2008).
- Proceedings of JSPS Seminar on Biotechnology in Southeast Asia: Microbial Utilization of Renewable Resources, vol.1-9; Sustainable Utilization of Biological Resources in the Tropics, vol.10-17).
- MEXT(JST)/NRCT/BIOTEC Joint Workshop 2006—Establishment of Bioproduction Research Center for Southeast Asia Bioresources.
- Reports of UNESCO Postgraduate Inter-University Course in Biotechnology 1-3.





The University of Osaka

## The University of Osaka International Center for Biotechnology

2-1 Yamadaoka, Suita, Osaka 565-0871, Japan

TEL : +81-6-6879-7455 FAX : +81-6-6879-7454

E-mail : info\_icbio@icb.osaka-u.ac.jp

<https://www.icb.osaka-u.ac.jp>

