

CBI

OSAKA UNIVERSITY
CROSS-BOUNDARY
INNOVATION
PROGRAM



The Cross-Boundary Innovation (CBI) Program is a place where doctoral students selected from the graduate schools of Osaka University come together and grow as leaders who will promote the integration of society and knowledge.

Integration of Society and Knowledge

Today, society is in the midst of change. The expectation is that the coming fourth industrial revolution where cyberspace and physical space merge in a highly sophisticated manner and the advances in artificial intelligence will significantly change social systems and the required types of human resources and jobs. Moreover, in an effort to resolve the issues of poverty and hunger, welfare and education, living and urban environments, sustainability of the global environment, and peace and fairness in a comprehensive manner, the United Nations set forth the Sustainable Development Goals (SDGs) as an agenda common to all humankind.

In the meantime, the division of labor, which developed rapidly in society after the Industrial Revolution, has further complicated the aforementioned issues, and specialization at universities has made it more difficult to address these issues. What is required now is the integration of society and knowledge where the complicated issues of modern society are addressed from comprehensive view across disciplines and specialized fields, where issues are identified by venturing into unknown fields and where new value is created through crosscutting intellectual activities.

New Human Resources That Generate Innovation

In response to social demands and in an effort to help students develop into creative global leaders with comprehensive view who can actively participate in the industrial, government, academic, and private sectors, Osaka University has offered the CBI Program, an interdisciplinary doctoral degree program, since 2012.

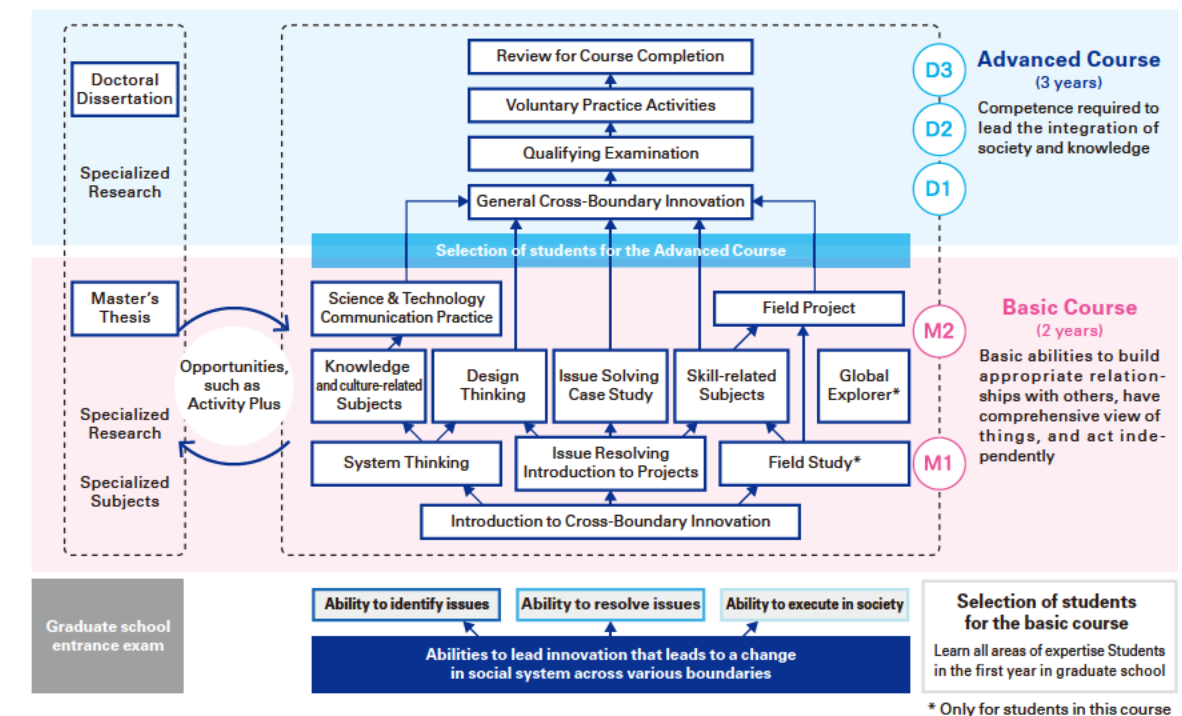
The purpose of conventional doctoral programs was to develop specialists, that is, human resources with high expertise in specific fields. However, in order to achieve the integration of society and knowledge, society needs new types of PhD holders with high expertise in specific fields who at the same time can leverage their knowledge and skills in other fields.

The CBI Program aims to develop PhD holders with high expertise and versatility for a new era who can integrate different specialized fields and overcome challenges and issues via imagination, comprehensive view, and creativity that transcend the existing boundaries (specialized fields, national borders, stereotypes, and conventional wisdom).

System of Coursework for the Integration of Society and Knowledge

(This is for students in the five-year doctoral program. The main subjects are excerpted from the curriculum.)

◆ Program's Own Coursework



Features of the Coursework

Humanities and Sciences Combined Education and Participatory Education

Workshops of various scales and project-based learning are offered according to the progress of studies so that students from different backgrounds, including the humanities and sciences, have opportunities for constructive discussions with people from different specialized fields and different years in the graduate school.

Getting to Know the Center and the Peripheral World

The program offers opportunities to gain overseas experience through visits to developed and developing countries as part of the coursework.

From Issue Identification to Issue Resolution

Project-based learning is offered at each stage of the course, where students acquire the skills to identify and resolve social issues in collaboration with off-campus issue providers, such as companies and government agencies.

Examples of Classes Offered in the Basic Course

Introduction to Cross-Boundary Innovation

This class introduces students to the program as a whole. Toward the realization of cross-boundary innovation, the following themes are addressed comprehensively:

- ✓ Modern society and its future vision, where innovation that transcends boundaries must overcome complicated, difficult, and unknown challenges
- ✓ As a specific point of discussion, relationships between universities as the bases of knowledge and society where knowledge is deployed



Design Thinking

Students acquire the skills to solve problems by collaborating with people from different fields and generating better ideas through teamwork.

- ✓ Students learn process control to achieve pre-determined objectives through collaboration with team members.
- ✓ Students learn from the theories that rapidly repeating the process of empathy and understanding, problem definition, creation of ideas, and prototyping is indispensable for problem solving.



System Thinking

Students acquire the basic methods to grasp the structure of complicated problems and achieve overall optimization in both theory and practice.

- ✓ Students acquire an approach called the "system," where one understands complicated issues by sorting the elements and connections and their mutual relationships.
- ✓ Students study the methodology to capture the big picture of the target from comprehensive view, identify root causes as the key to solving problems, and discover effective approaches to resolving issues by leveraging a loop diagram.



Issue Resolving Case Study

Students deepen their understanding of the actual process from the identification of issues to the creation of concepts and the implementation of solutions through discussions of actual cases in society.

- ✓ Students become aware of the roles that system thinking, design thinking, and process control played in resolving actual issues.
- ✓ Through a workshop-type seminar for each case, students develop an accurate understanding of key points and deepen their understanding of a variety of different approaches.
- ✓ By providing classes on different cases, students learn of diverse social issues and solutions.

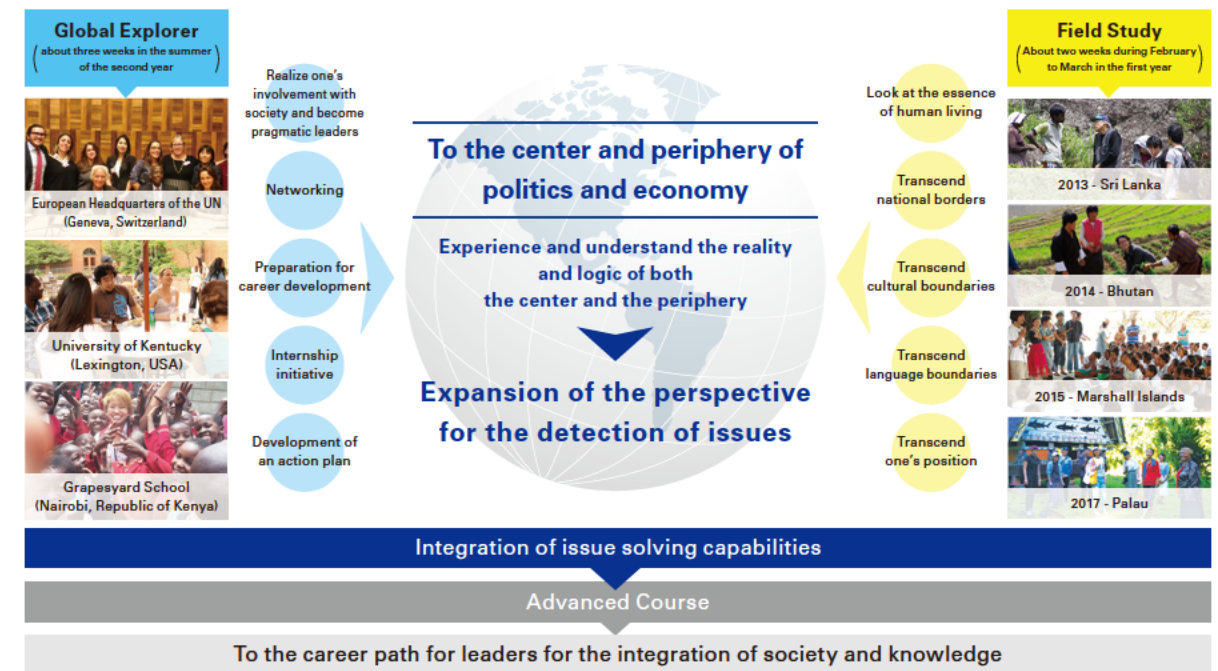


Field Project

This project-type seminar deepens students' understanding of the factors underlying social issues, the spread of the significance of social issues, and countermeasures by working to resolve social issues within society.

- ✓ Through familiar issues provided by companies, municipalities, and other organizations, students learn how to handle the boundaries that exist in society.
- ✓ Students' understanding deepens through the process of integrating and applying the approaches and methods that they studied in class to actual social problems in a short-term (several week) project.

◆ Aims and Positioning of Cross-Boundary Innovation Activities



Global Explorer

Each student visits a domestic or overseas company, university, NPO, NGO, or international organization according to personal interests or needs. Then, based on the information and networks acquired through such visits, the student develops an action plan for future activities or career development and thereby creates and gives shape to a personal image of career formation.



Field Study

After preliminary study, students receive several weeks of overseas training. Students visit regions and interact with people of different cultural, political, social, and economic backgrounds and address local social issues with local residents. Through such experiences, students relativize their own values and understand the concept of global diversity.

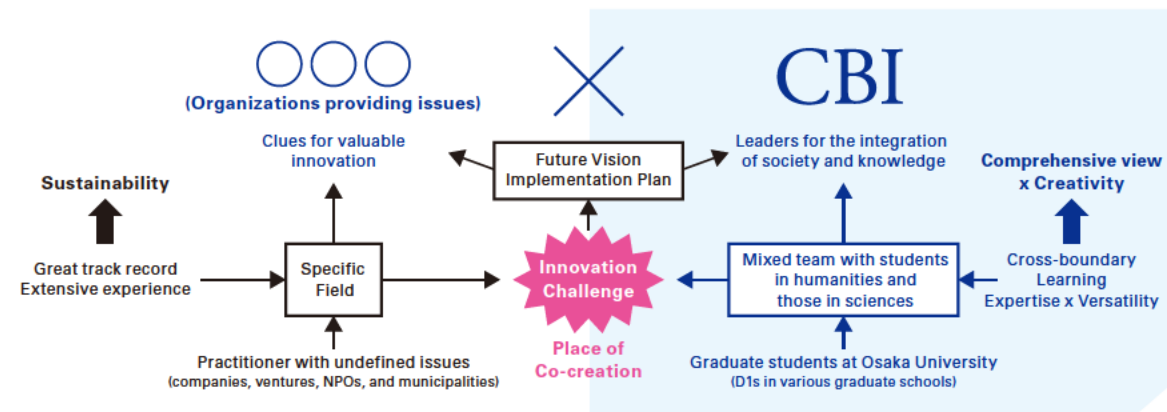


*Field Study and Global Explorer are offered only to those students (students in the program) who plan to advance from the Basic Course to the Advanced Course.

Core Subject in the Advanced Course (3rd year & beyond) : General Cross-Boundary Innovation

This is a long-term (six to nine months) project-based seminar where students address actual social problems, understand the situation, define the problems, and develop countermeasures. Using on-site observations, fieldwork, surveys, prototyping, and verification, students develop proposals for the creation of new value that is not simply an extension of existing value. This project-based seminar provides comprehensive learning that enables students to combine and apply the knowledge and experience acquired from the curriculum and specialized research to more complicated situations.

Companies, municipalities, and NPOs cooperate with the program as providers of issues in specific areas or fields. Students from the various graduate schools work on issues by employing unconventional ideas that only an interdisciplinary team of graduate students can develop. Using several consecutive on-site observations, fieldwork, surveys, prototyping, and verification, students develop proposals for the creation of new value that is not simply an extension of existing value.



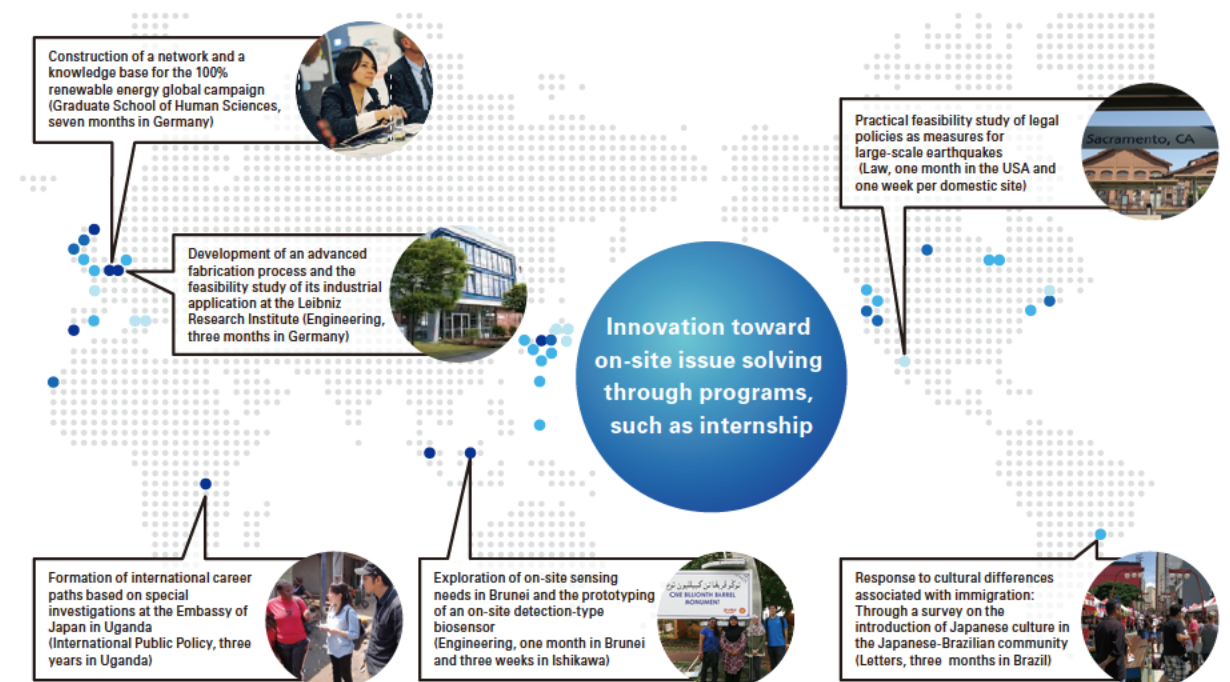
Projects in General Cross-Boundary Innovation

- ✓ Earnestly wanted or desired display
- ✓ Redesign of shopping experience at large shopping malls
- ✓ Comfortable space that will be realized in five years
- ✓ Sanitation, environmental, and health business in Uganda
- ✓ Total system for the Namba Station Plaza
- ✓ Water education program with a focus on urban ecosystems
- ✓ Waste disposal training program for emerging countries
- ✓ Next-generation environmental education connecting urban cities with satoyama
- ✓ Construction of houses as a happy, rich living space for 100 years
- ✓ Shopping mall popular with the community
- ✓ Next generation mobility for people in depopulated mountainous areas
- ✓ Measures for vacant houses to help revitalize depopulated areas
- ✓ Solution to damage by wild animals in urban neighborhoods
- ✓ Sustainable social system for depopulated areas
- ✓ Reuse of vacant elementary schools as new bases for local communities

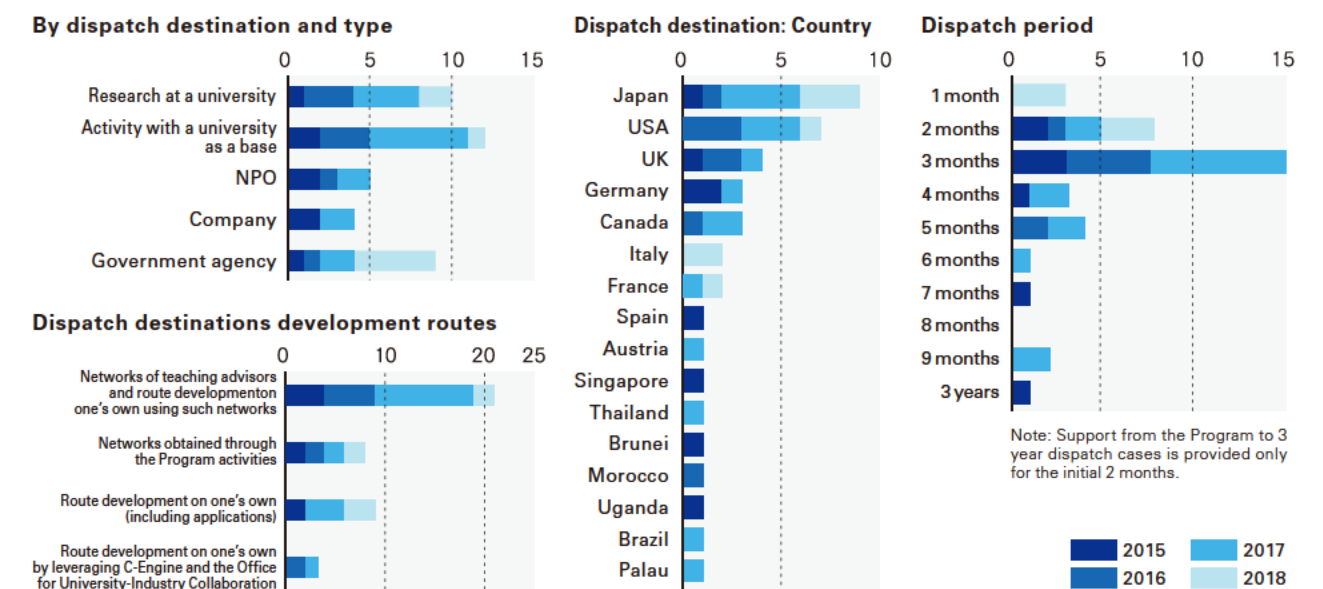
Activity in the Advanced Course (3rd year & beyond) : Voluntary Practice Activity

The voluntary practice activity offers an opportunity for students to plan and implement a volunteer project in an actual social situation to acquire the comprehensive capability of leveraging the knowledge and skills acquired through the coursework of the CBI Program. The activities include internships, joint research projects, and other practical tasks that fulfill their interest or area of expertise. Performance for the period from 2015 to 2018 (38 students)

(Three other students implemented similar activities without support from the CBI Program.)



Dispatch Data (including achievements by students working in more than two countries)



Flow from Enrollment to Completion

Completion of the Basic Course

For completion of the Basic Course, students must acquire a predetermined number of credits. If students fulfill this requirement, the CBI Program will award certificates of completion.

Requirements for Advancement from the Basic Course to the Advanced Course

Students who have completed the Basic Course must pass a qualifying examination to progress to the Advanced Course. Through this examination, students are evaluated on research skills and English proficiency from the perspective of the integration of society and knowledge.

Qualifying Examination (QE)

At the end of the first year in the Advanced Course, students who have earned the predetermined number of credits are comprehensively evaluated on the improvement in expertise in light of their research proposals for the doctoral dissertation and the integration of society and knowledge to determine whether they can continue in the CBI Program.

Requirements for the Completion of the Advanced Course

In order to complete the Advanced Course, students who have earned the predetermined number of credits must take the final examination. Course completion certificates will be awarded to those students who have passed the final examination, and the completion of the CBI Program will be stated on the graduation certificate upon conferment of the PhD by their respective graduate schools.

Student Support

Support System for Voluntary Activities Initiated by Students

For excellent practice activities related to social issues and initiated by a group of students, part of the activity costs, such as travel expenses, is provided after examining the purpose and detailed plan of the activity.

Tutoring System

The CBI Program offers consulting services where tutors provide advice on the program, answer questions related to the coursework, and explain how to set learning objectives on an ongoing basis.

Financial Assistance

- ✓ The program provides the participation fees, such as travel expenses, required for practice activities in the coursework.
- ✓ The University selects outstanding students enrolled in the program and provides support through a scholarship system.

Career Paths for Students Who Completed the Program

Students who completed the course during the period from 2016 to 2018 found employment in a rich variety of occupations and include many jobs in industries that are not directly related to students' research in graduate school. In recognition of the knowledge and skills acquired in the CBI Program, many graduates start new career paths that conventional PhD holders did not take, such as the commercialization of new development technology while coordinating different departments in a company and the development of new business overseas.

Employment examples: 16 graduates in companies, 11 in research institutions, including universities, and 2 as public servants and other working places.



STUDENT VOICE



Mayuki NAGAO

Cross-boundary activities significantly broadened my career potential. The overseas program through Global Explorer in my second year provided a meaningful opportunity to reconsider my own research and valuable experience that I could not have acquired in my previous graduate school. Moreover, through the coursework, I was able to acquire a different perspective on my specialized field. Activities that seemed totally unrelated to my research also served to expand the network of personal contacts, train my thinking skills, and eventually enrich my research life. Moreover, I met people with whom I could share information that could not be obtained in graduate school, which has also become a valuable asset. Collaboration with students with versatile expertise and ideas always provides me with new discoveries. It is true that studying in both the Cross-Boundary Innovation (CBI) Program and the graduate school is not easy. However, the activities in both programs can sometimes generate synergy. Whether you can make the most of the CBI Program or not depends on you. In this sense, the CBI Program requires you to proactively tap into your potential. I will be more than happy if you used the CBI Program for research or career formation.

Masanori KANAMARU

In an environment where students and faculty members from different backgrounds work hard (while sometimes being thrown into the center of the Pacific Ocean), I came into contact with the concept of global diversity and fostered an interest in different fields. Moreover, in the General Cross-Boundary Innovation that I took in my third year and where companies and municipalities provide issues, I learned how to approach social issues, employ teamwork, and work tenaciously, which are required to resolve social issues. While the research time taken up by the CBI Program was not negligible, I believe I gained more than the lost research time. How am I going to use my expertise or identity? I believe that the courage to work in a different field, which I built through the CBI Program, will help me find and implement my own cross-boundary innovation in the future.




Professors and Lecturers

Tadashi KOBAYASHI	Program Manager and Vice-President of Osaka University
Michihiro KITA	Program Coordinator and Professor (Graduate School of Engineering)
Kenji TSUTSUMI	Professor (Graduate School of Letters)
Youichi IIKURA	Professor (Graduate School of Letters)
Toshihisa NISHIMORI	Professor (Graduate School of Human Sciences)
Keishin INABA	Professor (Graduate School of Human Sciences)
Kota FUKUI	Professor (Graduate School of Law and Politics)
Makoto HIROTA	Professor (Graduate School of Economics)
Shou SASAKI	Professor (Graduate School of Science)
Haruto ISHIKAWA	Associate professor (Graduate School of Science)
Yukio KAWAHARA	Professor (Graduate School of Medicine)
Yoshikatsu KANAI	Professor (Graduate School of Medicine)
Eiji MIYOSHI	Professor (Graduate School of Medicine)
Reiko OKAMOTO	Professor (Graduate School of Medicine)
Atsuo AMANO	Professor (Graduate School of Dentistry)
Masae KUBONIWA	Associate professor (Graduate School of Dentistry)
Kazumasa HIRATA	Professor (Graduate School of Pharmaceutical Sciences)
Hideki KOBAYASHI	Professor (Graduate School of Engineering)
Yoshiyuki SHIMODA	Professor (Graduate School of Engineering)
Youko AKIYAMA	Associate professor (Graduate School of Engineering)
Tetsusei KURASHIKI	Professor (Graduate School of Engineering)
Keishiro HARA	Associate professor (Graduate School of Engineering, Center for Open Innovation Research and Education)
Kensuke HARADA	Professor (Graduate School of Engineering Science)
Shinji SAKAI	Professor (Graduate School of Engineering Science)
Hisashi IWANE	Professor (Graduate School of Language and Culture)
Yasuhiro IMAO	Associate professor (Graduate School of Language and Culture)
Katsuaki WATANABE	Professor (Graduate School of Language and Culture)
Hisakazu MATSUSHIGE	Professor (Osaka School of International Public Policy)
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Seiji TAKASHIMA	Professor (Graduate School of Frontier Biosciences)
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Sayako KANAMORI	Specially Appointed Associate Professor (Center for the study of CO* DESIGN)
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