Industry-Academia and Community Collaboration at Hiroshima University

Hiroshima University Organization for the Promotion of Industry-Academia and Community Collaboration
Vision for Industry-Academia and Community Collaboration at Hiroshima University

Hiroshima University positions social contribution as one of its important missions alongside education and research, and will contribute to the peace and development of regional and international communities through collaboration with society and industry. Hiroshima University will enhance its presence as a Super Global University through the promotion and achievements of industry-academia and community collaboration.

**Action Principles**

To achieve the above Vision for its industry-academia-government and community collaboration, Hiroshima University takes actions according to the principles listed below:

1. **Establishing Hiroshima Research Complex and contributing to regional revitalization**
   Hiroshima University will take an initiative in setting up a research complex as the state-of-the-art base for promoting innovations through the integration of multiple fields. Based on this research complex, education/research activities that attract world attention will be promoted through industry-academia-government cooperation. By gathering, developing, and utilizing human resources, and by gathering and creating new businesses, the research complex will help to nurture and expand networks both inside and outside the Hiroshima region, contributing to regional revitalization.

2. **Enhancing organized, medium to long-term collaboration with society and industry**
   Hiroshima University will establish better partnerships with companies inside and outside Japan, national and local governments, and other institutions through sharing challenges and promoting collaborative or sponsored research with these organizations. To further develop and deepen its networks with society and industry, the conclusion of comprehensive agreements and the setting up of collaborative research laboratories, etc., will be encouraged, thereby enhancing organized collaboration in the medium to long run.

3. **Promoting open innovation and formulating an ecosystem for local revitalization**
   Hiroshima University will play a leadership role in making open innovation a default, and thereby formulating an ecosystem to create new industries in cooperation with companies inside and outside Japan, universities/research institutes, and national/local governments.

4. **Promoting international industry-academia collaboration**
   Hiroshima University will reinforce industry-academia collaboration from an international perspective, with the aim of enhancing its international presence.

**Strategies**

1. **Setting clear KPI (Key Performance Indicator)**
   Toward achieving the Vision, set quantitative objectives and ensure that the progress and achievements are always shared throughout the entire organization.

2. **Promoting Continuing Education**
   Engage proactively in fostering of human resources who can flourish their talents and competencies in the local and international communities by sharing our educational programs with society. The programs consist of Entrepreneurship education, Management of Technology (MOT) education, and Design Thinking approach and seek to provide learners with opportunities of education, training, and supports to become the kind of person that tries an entrepreneurial chance to start own businesses and makes innovation happen in industry.

3. **Creating touch points between students and society**
   Develop educational programs focusing on internships or community involvements through the mutual understanding with local communities and industry, so as to encourage contacts between students and society.

4. **Promoting the launch of venture business from Hiroshima University**
   Develop an environment to support startups by providing funding for incubation and lending facilities, with the aim of promoting ventures based on the research accomplishments of Hiroshima University.

5. **Enhancing intellectual property management**
   Make efforts to strengthen the financial foundation of the university with an establishment of “Creative cycle of knowledge” in which intellectual properties owned by Hiroshima University are registered to increase the licensing fee through the transfer of the intellectual property rights to domestic/overseas companies; this becomes a financial source for new research activities.

6. **Making effective use of facilities**
   To support industry-academia-government collaboration and new business development, ensure that the offices and experimental facilities under the control of the Center for Collaborative Research & Community Cooperation are properly managed and effectively utilized.

7. **Enhancing and implementing risk management**
   Establish and operate a practical and effective risk management system, in order to prevent risks that may arise in the course of promoting industry-academia-government collaboration, such as conflicts of interest and outflow of technologies while ensuring accountability to society.

8. **Establishing partnerships with local communities**
   Conduct research and activities to resolve the problems of local communities by employing the human and intellectual resources of Hiroshima University, and thereby establish partnerships with local communities.

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Executive Vice President
(Industry-Academia-Government and Community Collaboration)
Hiroshima University

Yoshihisa Kawahara
Industry-Academia and Community Collaboration at Hiroshima University

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Profile

(as of May 1, 2018)

Hiroshima University

Founded May 1949, incorporated in April 2004
Organizations 12 Faculties, 11 Graduate Schools, 2 Institutes, research facilities, libraries, a hospital, attached schools, etc.
Students Faculties: 10,810, Graduate Schools: 4,559, and others
International students 1,660 students from 73 countries and regions
Executive Board members 10
Faculty members 1,764 Staff members 1,685
Campuses 249 ha in Higashi-Hiroshima City, 16 ha in Hiroshima City
I. Access to Research Results and Seeds

HIMAWARI is a database of research seeds that faculty members of Hiroshima University are working on, made accessible to the public through the Internet for the purpose of promoting collaboration with industries.

1. By using the “Keyword Search” above, you can find your interested research summary, Profiles of Faculty and Research Scholars and other related information.

2. Contents for members only are also available.

3. [Contact] Global Innovation Division / Industry-Academia Collaboration Division
   TEL: +81-82-424-4302  FAX: +81-82-424-6189
   E-mail: techrd@hiroshima-u.ac.jp

Research and Technology Portal HIMAWARI

HIMAWARI is a database of research seeds that faculty members of Hiroshima University are working on, made accessible to the public through the Internet for the purpose of promoting collaboration with industries.

Research and Technology Guide

Hiroshima University Research and Technology Guide 2014 is a compilation of summaries of the research results of Hiroshima University faculty members, issued in a digital book format.


By making the results of research at Hiroshima University widely known, the Research and Technology Guide will help to reinforce industry-academia-government collaboration, as well as to encourage researchers to improve their level of research. It can also be used as a tool to promote collaboration with industry, such as collaborative research and technology transfer.

Events

Technology seeds of Hiroshima University are presented at various events, such as New Technology Presentation Meetings (Tokyo area meetings, regional meetings) and Innovation Japan.
II. Systems of Collaboration

01 Technical Consultation

Various consultation services are available, including a “consultation desk” to receive inquiries and provide consultation for companies regarding their technical problems or development potentials, and “company visits” to directly provide consultation. Our staff members with corporate or administrative experience will support consultants in organizing their problems and finding appropriate faculty members.

02 Academic Instruction

Faculty members of Hiroshima University are willing to provide, upon request, part of the broad knowledge they have accumulated through their education and research activities. The purpose of this service is to respond to the needs of companies that cannot be satisfied by joint research. An instruction fee of 20,000 yen per hour will be charged for this service.

03 Collaborative Research/Sponsored Research

Collaborative research is conducted jointly by researchers in companies and university faculty members. Researchers may work on their collaborative research separately at the facilities of their respective locations. In order to increase the efficiency of collaborative research, Hiroshima University encourages collaborative research partner companies to enter into a comprehensive research collaboration agreement, thereby enabling organized and continuous collaboration for research. Sponsored research is commissioned by companies and conducted by the faculty members of Hiroshima University. Research results are reported to the sponsor companies.
Hiroshima University aims at maintaining a long-term foundation for industry-academia collaboration inside the university and achieving the further enhancement of university research and greater contribution to the industry.

**Key characteristics**
The University and companies jointly operate collaborative research laboratories based on mutual consultation.
- Appropriate research staff are assigned.
- Research themes and periods are set in view of commercial application of the results.
- Associated intellectual properties and achievements are shared.

**Advantages of Collaborative Research Laboratory**

**Advantages for both parties**
- Communication among researchers involved in collaborative research and with other researchers in the university is enhanced, enabling the concentration of broader knowledge and insights, the acceleration of research, and the understanding of important social needs associated with the selected themes.
- The acquisition of external funds for necessary research and development becomes easier.

**Advantages for industry**
- Flexible research focused on the company’s business, products and technology strategy can be promoted.
- Better access to the university facilities and equipment are ensured.
- Industry-academia personnel exchange can be enhanced, contributing to human resources development.
- Fundamental research to develop seeds for future business opportunities can be easily initiated in the collaborative research laboratory.
- Flexible personnel utilization, such as dispatching corporate researchers to the collaborative research laboratory, is enabled.

**Outline of the Collaborative Research Laboratory system**

| Research fields | All fields, including social sciences and humanities, life science, science, and engineering, or their interdisciplinary fields. All divisions of Hiroshima University, such as graduate schools, research institutes, and hospital, are eligible. |
| Name | An appropriate name, either “XXX Collaborative Research Laboratory” or “XXX Collaborative Research Division,” should be selected according to the research theme. The name may indicate the sponsor company if requested. |
| Organization | A Collaborative Research Laboratory consists of at least one Professor, Associate Professor, Lecturer, or Assistant Professor. Part-time staff may be accepted if necessary. |
| Location | A location inside Hiroshima University designated by the division concerned |
| Duration | Two to five years. Extension is possible. |
| Research expenses | In addition to the ordinary expenses for collaborative research (facilities, supplies and travel costs), usage fees for the laboratory location, payments to research staff, and maintenance costs for intellectual properties shall be borne by the sponsor company. |

**Steps to opening a Collaborative Research Laboratory**

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**Steps to opening a Collaborative Research Laboratory**

1. **Application**
   - Application documents
     - Application for Setting a Collaborative Research Laboratory
     - Resumes of prospective faculty member(s) and Letter of Acceptance

2. **Submission**
   - Faculty Meeting or equivalent organ

3. **Approval**
   - President

4. **Application**
   - Report

5. **Notification of result**
   - Education and Research Council

6. **Agreement documents**
   - C (Collaborative Research Laboratory) Agreement

7. **Contract request**

8. **Contract conclusion**

**Sponsor company**

- Hiroshima University
- Companies
05 Donations, Endowed Laboratories, Endowed Research Division

Donations
Hiroshima University accepts donations from a wide range of parties for the purpose of supporting scientific research, educational promotion and other administrative operations of the university.

Endowed laboratories, Endowed research division
Endowed laboratories or endowed research divisions are set and operated under the independent control of the University for the purpose of making effective use of scholarship funds donated by private businesses, etc., thereby contributing to the advancement and enhancement of education and research. The duration of an endowed laboratory or endowed research division is from two to five years in principle, which may be extended.

06 Comprehensive Research Collaboration

Under a comprehensive agreement concluded between each company and Hiroshima University, collaborative research and human resources development activities are conducted in an organized manner. This system enables:
- systematic promotion of research through the sharing of medium to long-term issues,
- organized GO/STOP judgment in promoting research activities, and
- cooperation in broad fields including human resources development.

07 Hiroshima University Phoenix Cooperative Consortium

Hiroshima University established the cooperative consortium for the promotion and research of Industry-Academia-Government collaboration (Hiroshima University Phoenix Cooperative Consortium) in 2010, with the aim of further contributing to local communities through the enhancement of services, particularly targeting local industries. Through the Phoenix Cooperative Consortium, members are able to extend flexible support in various fields, including technical problem solving, research assistance, and human resources development.

Membership fees
Entry fee: Free
Annual fee: Regular member (companies) ¥60,000 per membership
Regular member (individuals) ¥10,000 per membership
Supporting members (local governments, public organizations, etc.) ¥10,000 per membership
* The holding of multiple memberships is appreciated.

Members
Companies and organizations in support of the Council’s objective
Total members: 157 (as of March 31, 2017)
- Regular members: 124
- Supporting members: 33

Operation
Operation of the Council is supported by the general assembly, the activity evaluation committee, activity promotion meetings, and the secretariat.

Services for members

1. Innovation Training Program for young engineers of local companies
Offers free training courses in various fields to registered member companies (in the evening, once a month, for two hours).

2. Phoenix Salon
Arranges talks by experts of the University and companies, as well as the informal discussions based on the talks.

3. Night forum for exchange with researchers
Offers easy explanation of the research projects by Hiroshima University researchers in each field.

4. Financial support for collaborative research and research teams
Offers financial support for research or research teams for solving the problems of member companies. (Contribution always welcome.)

5. Lectures at companies
Supports the dispatch of lecturers from the University to member companies.

6. Access to unpublished patent information of the University
Members are allowed access before other parties.

7. Technical consultation
Faculty members and specialists with abundant experience in various fields provide consultation for member companies (available at any time). Professional consultation on invention-related matters, such as patentability evaluation, is also available.

8. Access to the latest information
The latest information is available through the members-only website, member e-mail newsletters, and the magazine “Tsunagaru.”

Inquiries, Membership Application
Hiroshima University Center for Collaborative Research & Community Cooperation
1-3-2 Kagamiyama, Higashi-Hiroshima
City 739-8511
TEL: +81-82-424-4302
FAX: +81-82-424-6189
E-mail: techrd@hiroshima-u.ac.jp
Center of KANSEI Innovation Nurturing Mental Welfare

At the Center of KANSEI Innovation, we develop BEIs (Brain Emotion Interfaces) that enriches inter-human and object-human relations connected by KANSEI with a combination of state-of-the-art brain sciences, optical technology, and information communication technology. Our mission is to exploit products and services in various fields such as clothing, food, housing, vehicles, household electrics, education, and medical care that nurture its mental values as their usage. Leading to innovation in the inter-human and object-human relations, we aim to create a society full of happiness where “objects” are in harmony with our “minds”.

Implementation System

Project Leader: Takahide Nouzawa (Mazda Motor Corporation)  Research Leader: Shigeto Yamawaki (Hiroshima Univ.)


Hiroshima Innovation Center for Biomedical Engineering and Advanced Medicine

• Hiroshima Innovation Center for Biomedical Engineering and Advanced Medicine was established to promote industry-academia-government collaborative research projects, taking advantage of unique local characteristics and utilizing the research results for the revitalization of local industries. After being adopted by the Japan Science and Technology Agency as a Project for Regional Industry-Academia-Government Collaborative Research Center Development in 2010, the Center launched support programs during the period from AY 2011 to AY 2015 while endeavoring to achieve the strategic goals. As a result, the Center earned high evaluation for having established a sustainable system for creating innovations. (General evaluation S)

• Starting from AY 2016, the Center will work more actively in communicating information both inside and outside the area, making its research facilities and equipment available to local businesses and universities, and thereby steadily implementing its local innovation strategies through its research and development activities.

Outline of the Hiroshima Medical-Engineering Monozukuri Innovation Project

[Development of safe, reliable and comfortable next-generation automobiles, with human medical engineering-applied advanced functions]

• Research and development of driver assistance systems (drowsy driving prevention, pedestrian detection, user-friendly audio system, etc.), energy-saving air-conditioning systems

• Research on impact of electromagnetic waves, research and development of high-efficiency power electronic devices

• Development of new businesses (medical and welfare equipment, etc.) through collaboration between manufacturing industry and medicine

• Research and development of medical image analysis systems, operation simulation systems, medical tools and materials

• Research and development of welfare devices, health devices, and medical treatment support systems

• Establishment of cell processing centers and stem cell banks for emergency exposure, and research and development of cell therapy and regenerative medicine

• Developing young human resources to support medical-engineering collaboration

• Medical engineers, mechanical engineers, electronics technicians, clinical testing professionals, and innovative monozukuri technicians
III. Venues for Collaboration

01 Hiroshima University Industry-Academia Collaborative Research Office

Lends laboratories for collaborative research with companies, to promote the practical application of research.

- Laboratories: 8 rooms
  - 71 m²: 5 rooms, 64 m² + 7 m² (darkroom): 1 room, 68 m² + 3 m² (storage for cylinders): 1 room, 61 m² + 11 m² (anteroom): 1 room

- Period for use
  - A maximum of three years, in principle. The period may be changed based on annual review of the usage status.

02 Hiroshima University Innovation Plaza

Available for industry-academia-government collaborative research or collaborative research between researchers inside and outside Hiroshima University, as well as for interactions among researchers

- Facility outline
  - Area of premises: 6,499 m² (owned by Hiroshima Prefecture)
  - Total floor area: 2,601 m²
  - Rooms: 24 laboratories (51 m²), a seminar room, an office
  - Completion: October 2001
  - * Transferred from Japan Science and Technology Agency (JST) to Hiroshima University in December 2014

[Contact] Industry-Academia-Government and Community Collaboration Group
TEL: +81-82-424-4497 FAX: +81-82-424-6189
E-mail: syakai-soumu@office.hiroshima-u.ac.jp
03 Hiroshima Industry-Academia Collaborative Research Center (Hiroshima Prefecture)

Hiroshima Industry-Academia Collaborative Research Center, established by the Hiroshima Prefecture, offers laboratories and research rooms for basic/leading research and development projects responding to the needs of industry through industry-academia collaboration.

1) Laboratories and other rooms
- Reinforced-concrete (RC) structured three-story building, with a total floor area of approx. 3,000 m²
- 12 research rooms (32–96 m²), 12 laboratories (48–144 m²), 3 offices (32–64 m²), a meeting room, etc.
- Each room equipped with a security system
- Usage fee: 2,300 yen/m² monthly (discount may be applicable)
- Parking lot available for approx. 70 cars

2) Collaborative research equipment
- Rental devices are available for those involved in research and development of universities or companies.
  - Transmission electron microscope (TEM) for observation of cross sections or diffraction images of samples
    JOEL JEM-3000F (300 kV, FE)
  - Photoelectron spectrometer (ESCA) for analysis of surface texture of samples
    VG ESCALAB220i-XL

04 Hiroshima University Incubation Offices (Higashi-Hiroshima area, Hiroshima area)

Rental spaces
Available for those involved in projects using research results or human resources of Hiroshima University

- Higashi-Hiroshima area
  Incubation office: 9 rooms (53 m²: 7, 28 m²: 1, 25 m²: 1)
- Hiroshima area
  General Research Building: 7 rooms (82 m²: 1, 41 m²: 5, 26 m²: 1)
- Rental fee: 5,000 yen per m² annually

05 Hiroshima University Venture Business Laboratory (Higashi-Hiroshima Campus)

Hosts various programs, including the Program for Development of Entrepreneurship for students; Higashi-Hiroshima Startup School, also targeting working people; and an open course titled “Innovative Entrepreneurs.” The Hiroshima Entrepreneurship Program, adopted by the Ministry of Education, Culture, Sports, Science and Technology as a 2014 Enhancing Development of Global Entrepreneur Program, is also conducted.
Global Innovation Division

In 2017, the Global Innovation Division was newly established at the Center for the Collaborative Research & Community Cooperation. When comparing the word “innovation” with its synonym “invention” which means new ideas, the innovation means “to create unprecedented value”. Researchers and inventors personally create new ideas, but they do not assume general customer, that is, a market transaction, and the impact can be limited. On the other hand, the innovation premises profitable corporate activities, forms a market with organizational efforts and gives an impact to our society. This is exactly one of the themes undertaken by Center for Collaborative Research & Community Cooperation promoting collaboration between industry, academia and government, and Global Innovation Division takes a mission to focus on its activities with an international perspective. By continuously expanding the impact of innovation from the Hiroshima region to the world, Hiroshima University will form an innovation ecosystem in this area.

International Industry-Academia-Government Collaboration and Recent Activities

1) Promotion of collaboration in Latin American region
- Hiroshima University (HU) signed an MOU with University of Guanajuato (2015), National Polytechnic Institute (IPN) (2017), National Autonomous University of Mexico (UNAM) (2017), National University of Colombia (2018), Private University of Technology of Santa Cruz (UTEPSA) (2018), and National University of San Marcos in Peru (2018). HU will strengthen collaboration with universities and private enterprises in Latin American countries.
- HU invited the partner universities in Latin American countries and had 2018 Global Innovation Week in Hiroshima with various programs including a symposium on triple-helix collaboration and entrepreneurship as well as pitching event for start-up candidates.
- Hiroshima University Guanajuato Center opened in Guanajuato University (2017), as the information dissemination base in Latin America and to deepen industry-academia collaboration.
- HU held a seminar on the environment and food & agriculture at the Guanajuato University and the IPN (2017, 2018). These seminars will continuously be held in the future.
- Training of three Mexican trainees for JICA Mexico-Japan Strategic Global Partnership Program was successfully complete (2017). This program is expected to continue in 2019.

2) Promotion of collaboration in Asia
- HU has continuously conducted training program for local engineers with Bandung Institute of Technology, MOU partner, at the Japanese industrial park in Indonesia.
- HU hosted a triple-helix seminar in Vietnam with Vietnam National University Ho Chi Minh City, Hiroshima Prefecture and HU’s partner companies on the environment in 2016 and on food and agriculture in 2017.
- HU has held a triple-helix seminar in Myanmar since 2016 with HU’s partner enterprises, local government agencies and local universities. The seminar focuses on proposing solutions to the local issues such as the traffic (2016), geotechnical (2017) and environmental issues through development (2018).
- HU started collaboration with Singapore Economic Development Board (EDB) in 2017 and has held triple-helix seminars in Hiroshima (2017) and Singapore (2018).
- The university agreement with the Indian Institute of Technology Madras was concluded (2017). Comprehensive agreement with an Indian company was concluded with whom collaborative researches and employee education are in progress (2017, 2018).

3) Promotion of collaboration in Europe and America
- Collaborate with the University of Munster, a partner university, on industry, academia and government collaboration, and entrepreneurship. HU invited a lecturer from University of Cambridge to continuously hold lectures on international industry, academia and government collaboration (since 2015).
- HU will develop a framework for collaboration with European and American companies.

4) Supporting Japanese companies actively expanding overseas

Visualize HU’s Research and Technology and Strengthen Information Dissemination
- English brochure “Industry-Academia and Community Collaboration at Hiroshima University”
- English HP
- Collection of products born from collaborative researches (Japanese, English, Chinese)
- Templates of various agreements including collaborative/sponsored research and patent license
- Introduction of the latest technology of HU via the Hiroshima University Quarterly Technology Newsletter in English (since December 2010)
- Web version Himawari “Research outcome database”
V. Community Cooperation

For Mutual Development of Community and University

The Community Cooperation Division of Hiroshima University acts as an interface between Hiroshima University and the community, not only in education and research but also in various fields of collaboration. The objective of our activities is “to build a new partnership between the University and the community.” To this end, we are promoting various activities to connect the University and the community and create new values, based on the four keywords: “open,” “connect,” “collaborate” and “create.”

<table>
<thead>
<tr>
<th>Keyword</th>
<th>Mission</th>
<th>Concrete Action</th>
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</table>
| Open    | Act as a one-stop consultation window of Hiroshima University, aiming to be an “open university,” and “open” the University’s human resources and intellectual resources to the community. | • Technical consultation  
• Campus guide  
• Public relations activities |
| Connect | Promote education and research that contribute to the community by connecting the various needs of the community with the University’s human resources and research seeds. | • Community cooperation promotion projects |
| Collaborate | Serve as a coordinator to apply the University’s research results in specific fields of the community for implementation and promote a synergistic relationship with the community. | • Coordination of cooperation projects with external organizations  
• Collaboration agreement with local governments  
• Satellite Office activities |
| Create  | Create a new era of cooperation between Hiroshima University and the community through various collaboration practices, information exchange and interaction with other local communities. | • Investigation/research regarding university and community cooperation  
• Theory construction and educational activity regarding the University’s community cooperation |

Keyword: “Open”

As a one-stop consultation window of Hiroshima University, which aims to be an “Open University,” the Community Cooperation Division sends out information on the University’s diverse human and intellectual resources and activities to the community, and carries out technical consultations, campus guided tours, and public relation activities to facilitate access to the University.

Technical Consultations

As an integrated one-stop consultation window of Hiroshima University, we offer advice and information on a wide range of matters, including introductions to researchers, and collaborative research.

Campus Guide

As part of the community cooperation activity of Hiroshima University, guided tours are conducted by student guides in collaboration with the Hiroshima University Museum. Anyone can join a regular guided tour of the University, conducted from 1:00 p.m. every Friday (no reservation required). We also provide guides to Open Campus events and the University Festival, as well as guides for groups, special seasonal tours, the satellite museum of Hiroshima University Museum, and tours of the nature observation route “Hakken no Komichi” (Pathway to Discovery).
**Keyword: “Connect”**

**Hiroshima University Community Cooperation Promotion Project**

We aim to contribute to finding solutions to various problems faced by the community and revitalizing the community by utilizing the knowledge and technology of Hiroshima University, faculty members and students. In AY2011, this project replaced the Hiroshima University Local Community Contribution Research launched in 2002.

Under the new project, two types of cooperation systems were established to tackle a wide variety of challenges in cooperation with the community: “Research Cooperation” (Type A), a project that requires specialized research and technology development, and “Community Cooperation” (Type B), a project that involves Hiroshima University’s faculty and other staff members as well as students. Between AY2002 and AY2015, we received a total of 443 requests from the community, and implemented 114 research projects.

**Example of Type A (Research Cooperation)**

- **Research on Ecology of Black Seabream and Biochemical Features of Edible Part**
  - Project Leader: Prof. Tetsuya Umino, Graduate School of Biosphere Science
  - Requested by: Onomichi Seinen Suisan Kyougikai (Onomichi Youth Council on Marine Products), Onomichi City

A biochemical investigation of “Lemon flavored Black Seabream” expected to be a specialty from Onomichi City was conducted and its good taste was verified.

**Example of Type B (Community Collaboration)**

- **Creation of a disabled-friendly guide map of the Miyajimaguchi/Miyajima area (implemented in AY2013)**
  - Project Leader: Toshiki Egusa, Program of Health Sciences, Faculty of Medicine (student)
  - Requested by: Hatsukaichi City Welfare Association for Persons with Disabilities

A guide map was created for disabled people who visit the island of Itsukushima (popularly known as Miyajima), where Itsukushima Shrine, a World Heritage Site, is located. The guide map, prepared based on on-site inspections, shows disabled-friendly access routes and tourist attractions.

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**Keyword: “Collaborate”**

**Coordination of Community Cooperation Activity**

In response to requests from outside the University, we coordinate various collaborative research projects with outside the University. We have yielded practical results by introducing local governments to our researchers. We also support community development projects involving students.

**Cooperation Agreements with Local Governments**

At present, we have concluded agreements with six local municipalities to promote collaborative projects.

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**Keyword: “Create”**

**Studies and Research for University-Community Cooperation**

To reinforce our efforts to promote university-community cooperation, we carry out studies on other universities and communities with a successful history of collaboration, exchange information with relevant institutions, and participate in open lectures held in various local communities to collect information.
VI. Venture Business Creation

Support for Creating and Nurturing Venture Businesses

We provide a variety of support for the creation of venture businesses, from the Management of Technology (MOT) Education Program for students and faculty members, to the Entrepreneur Training Course and the Higashi-Hiroshima Startup School. In addition to the provision of consultation services and information concerning venture business, we offer funding to faculty members and students under the Venture Incubation Program. We also provide those who start a business with an incubation office and various forms of support, including preferential treatment in the use of patents obtained by the University.

Provision of Incubation Facilities (*1)

[Higashi-Hiroshima Area]
Incubation facility: 9 rooms
(7 rooms with 53m², 1 room with 28 m², 1 room with 25 m²)

[Hiroshima Area]
Integrated Research Building on Kasumi Campus: 7 rooms
(1 room with 82m², 5 rooms with 41 m², 1 room with 26 m²)

Rental fee ¥5,000/m² per year

Hiroshima University-Originated Venture Business Start-ups

Cumulative total of 60 businesses between AY2000 and AY2017

[Hiroshima University-Originated Venture Businesses]
Number of University-Originated Start-ups

[Contact] Education & Venture Business Creation Division
TEL: +81-82-424-7880   FAX: +81-82-424-7881
E-mail: office@vbl.hiroshima-u.ac.jp
VII. Human Resource Development

Innovation Training Program for Young Technical Experts Working for Local Companies (Sponsored by the Phoenix Cooperative Consortium)

- **Date & Time:**
  Second Monday of each month (if this day falls on a national holiday, then the next day)
  17:00–19:00
  (*1.5 hour lecture + Q & A session + technology exchange, etc.)

- **Venue:** Higashi-Hiroshima Campus, Hiroshima University
- **Field:** Chemistry, materials, machinery, food, processing, management of technology, etc.
- **Lecturer:** Hiroshima University faculty members and experts from within and outside the University
- **Eligible Applicants:** Young and mid-level technical experts from Hiroshima University Phoenix Cooperative Consortium member companies

**Major Features:**
- Allows busy participants to take part in a flexible manner.
- Provides training useful for manufacturing in a systematic and continuous manner.
- Enables participants to build up a broad network of connections.
- Features a wide variety of topics ranging from base technology, to the latest technology trends, and practical technology implementation.
- Open to Phoenix Cooperative Council member companies free of charge; a completion certificate is issued.

**[Where to Apply] Secretariat of the Phoenix Cooperative Consortium**
TEL: +81-82-424-4302   FAX: +81-82-424-6189
E-mail: techrd@hiroshima-u.ac.jp

MEXT “COC (Center of Community) Program”

Human Resource Development Center of the Hiroshima Innovation Center for Biomedical Engineering and Advanced Medicine (AY2011 – AY2015)

As part of the local innovation strategy program (P. 7), we implemented various projects to develop human resources in the fields of biomedical engineering and advanced medicine. Completion certificates were awarded to participants in each course.

- **Medical ergonomics technicians (Participants: 60)**
  Professionals who possess sufficient knowledge of ergonomics to allow them to engage in the development of automobile parts and components, which play an important role in the creation of vehicles that realize safe and comfortable driving, and the development medical and welfare equipment

- **Medical informatics technicians (Participants: 16)**
  Professionals who have sufficient knowledge of information science, medicine and engineering to allow them to acquire and analyze biological and life information from various angles and apply the specialized knowledge to creating a medical information system, developing new medical equipment, diagnosing and treating intractable diseases, and promoting preventive medicine

- **Cell culture expert (Participants: 38)**
  Professionals equipped with the ability to appropriately use cell culture solutions, equipment and facilities and employ cell culture techniques to regulate cells used for research into safe and secure regenerative medicine and cell remedies as well as for clinical application

- **Food clinical testing professionals (Participants:34)**
  Professionals capable of carrying out human clinical trials safely to test the effectiveness of newly developed food, including functional food, and conducting appropriate evaluation

- **Innovative monozukuri technicians (Participants: 44)**
  Professionals who have the expertise to understand and effectively use advanced high-precision/high-function fabricating equipment and information equipment/systems, and who recognize the importance of handing down skills and know-how from generation to generation in small- and medium-sized manufacturing companies

**[Contact]**
Hiroshima Innovation Center for Biomedical Engineering and Advanced Medicine
TEL: +81-82-257-1609   FAX: +81-82-257-1623
E-mail: kyoten@hiroshima-u.ac.jp
Enhancing Development of Global Entrepreneur Program (EDGE Program)

Hiroshima University launched the Hiroshima Entrepreneurship Program in AY2014, which was selected for the EDGE Program run by the Japanese Ministry of Education, Culture, Sports, Science and Technology. To revitalize the creation of innovations on a national and local community level, we seek to promote the start-up of venture businesses based on research results, develop innovative talents equipped with the ability to promote the creation of new businesses by existing enterprises, and develop an innovation ecosystem that enables such innovators to fulfill their potential.

This one-year program, designed for students, young researchers and working people both from the humanities and science, consists of a general course and a seeds course. At the end of the program, a Phoenix Entrepreneur Competition is held, and the winners are provided with the opportunity to be hired as a “Phoenix Entrepreneur” for one year and to receive continuous support.

Program Framework

Participants: a wide range of people, including those from the fields of sciences and humanities
Open to undergraduate/graduate students, young researchers and working people

Development of the Seven Abilities Required for Successful Entrepreneurs

The abilities to be tough, be decisive, find issues and resolve them, manage risk, communicate, challenge, and be interdisciplinary

Formulation of Innovation Ecosystem

Higashi-Hiroshima Startup School

The Higashi-Hiroshima Startup School is held every year under the sponsorship of Higashi-Hiroshima City, the Higashi-Hiroshima Chamber of Commerce and Industry, and Hiroshima University Center for Collaborative Research and Community Cooperation. This comprehensive and intensive course, designed for students and working people who aspire to start up businesses as well as for fledgling venture business owners, features the provision of systematic knowledge necessary to start up a business (including company formation, fund procurement, and business planning) and an introduction to practical management theory by business owners and entrepreneurs who are active in the real world and business startup cases.

In AY2015, a total of 11 lectures were delivered in five days between June 20 and July 11.
VIII. Creation and Utilization of Intellectual Property

The Intellectual Property Division takes charge of the total planning and management of the creation, protection and application of new intellectual property being developed within the University, and the promotion of education and research on intellectual property. We contribute to society by promoting innovations and revitalizing industry through the “creative cycle of knowledge.”

The Intellectual Property Division handles:
- The application, protection and management of intellectual property rights (patents, design rights, trademarks, breeders’ rights)
- Technology transfer agreements (licensing/transfer)
- Tangible material transfer agreements
- Program/software license agreements

[Contact] Intellectual Property Division
TEL: +81-82-424-5597
FAX: +81-82-424-6133
E-mail: chizai@hiroshima-u.ac.jp
IX. Industry-Academia Collaborative Research Achievements

Sources of Research Funding (AY2017)

<table>
<thead>
<tr>
<th>Type</th>
<th>No. of cases</th>
<th>Amounts received (million yen)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joint research</td>
<td>434</td>
<td>782</td>
</tr>
<tr>
<td>Sponsored research</td>
<td>335</td>
<td>2,423</td>
</tr>
<tr>
<td>Donated funds</td>
<td>6,797</td>
<td>1,856</td>
</tr>
</tbody>
</table>

Trends in Research Funding Sources (AY2006–AY2017)

<table>
<thead>
<tr>
<th>Year (AY)</th>
<th>Joint research</th>
<th>Sponsored research</th>
<th>Donated funds</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>1,460</td>
<td>1,468</td>
<td>1,474</td>
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<tr>
<td>2007</td>
<td>1,846</td>
<td>1,826</td>
<td>1,864</td>
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<tr>
<td>2008</td>
<td>1,646</td>
<td>1,648</td>
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</tr>
<tr>
<td>2009</td>
<td>1,550</td>
<td>1,589</td>
<td>1,668</td>
</tr>
<tr>
<td>2010</td>
<td>1,500</td>
<td>1,598</td>
<td>1,725</td>
</tr>
<tr>
<td>2011</td>
<td>1,500</td>
<td>1,598</td>
<td>1,725</td>
</tr>
<tr>
<td>2012</td>
<td>1,500</td>
<td>1,598</td>
<td>1,725</td>
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<tr>
<td>2013</td>
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<td>2014</td>
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<tr>
<td>2015</td>
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<tr>
<td>2016</td>
<td>1,500</td>
<td>1,598</td>
<td>1,725</td>
</tr>
<tr>
<td>2017</td>
<td>1,500</td>
<td>1,598</td>
<td>1,725</td>
</tr>
</tbody>
</table>

Commercialization of Research Results

Hiroshima University product catalogue

Examples of Commercialized Products

Peeling Sponge
Melted from black tea

- The company of black tea soaps are sold as fermented tea soaps, occasional use for cooking, and grey dishes, etc.
- The melamine foam top removed from the black tea soaps
- The effectiveness on removing stains is increased by black tea soaps
- The black tea soaps are sold as a Kit, including black tea powder

PXB Mouse®
Elegant models of mice with human organs.

- The XB model is a new mouse model that can be infected with hepatitis B and C, it is also possible to infect the human liver, it is used as a predictive model for the study of the safety of pharmaceutical drugs. These disease models can be combined with hepatitis B and C, it is also possible to use a model for studying the effects of drug resistance.
- The XB model is also effective for in-vitro experiments, including PBX mice to test the effects of new drug development.

Examples of tests utilizing PXB mice

- DMPK test
- Toxicity tests
- Efficacy tests
- Pharmacodynamic tests
- Pharmacokinetic tests
- Safety tests

Related
X. Organization Structure

Organization for the Promotion Industry-Academia and Community Collaboration

Organization Director (President)

Vice Director (Executive (in charge of industry-academia collaboration & community cooperation))

Vice Executive (Industry-Academia Collaboration)

Vice Executive (Community Cooperation)

Executive Manager, Department of Community Collaboration

Industry-Academia-Government and Community Collaboration Group

Deans and Directors

Director of the Center for Collaborative Research and Community Cooperation

Other persons who are deemed necessary by the Organization Director

- Executive Manager, Department of Community Collaboration
- Industry-Academia-Government and Community Collaboration Group

Divisions of Center for Collaborative Research and Community Cooperation

Global Innovation Division / Industry-Academia Collaboration Division
- Promotion of collaborative/sponsored research in Japan and abroad
- Technology/needs survey, training, education, etc.

Education & Venture Business Creation Division
- Education/research for venture business creation
- Creation of University-originated venture business, etc.

Intellectual Property Division
- Intellectual property acquisition management and utilization
- Education and promotion of intellectual property

Community Cooperation Division
- Consultation window for the University’s community cooperation
- Coordination of community collaboration projects

Collaborative Research Division for Policy Issues of Higashihiroshima City
- Promotion of collaborative researches with Higashi-Hiroshima City
- Coordination of collaborative projects with Higashi-Hiroshima City

Hiroshima Branch Office
- Responsible for medicine, dentistry and pharmaceutical sciences, health science, and social sciences

- The Center of KANSEI Innovation Nurturing Mental Wealth (COI)
- Hiroshima University Hiroshima Initiatives Promotion Center (COC)