



Kobe University Research Highlights

– enhancing collaboration with Europe –



Kobe University

Formally established in 1949, Kobe University is a national university based in western Japan. Its roots date back further, to 1902, when it was originally known as Kobe Higher Commercial School. Today, Kobe University is one of Japan's leading comprehensive universities with 10 faculties 15 graduate schools and a great number of research centers and institutions.



Our Mission

– Toward an outstanding research university excelling in advanced and integrated research in the humanities and sciences –

Kobe University is an academic institution that has continued to encourage forward-looking and independent thinking in working toward our ideal of creating 'harmony between theory and reality'. Building on these traditions, we are now endeavouring to further utilise our strengths in collaboration and integration. We pledge to become an outstanding research university that meets the highest international standards for teaching and research and can serve as a center for value creation that will help to solve the issues facing our society both at present and in the future. (*extracts related to research)

Our Research Initiatives

– Working with society, for society –

To realize our mission and to meet the demands of our society with increasing diversity, the university has created the 'eXtreme project' for holographic technology and nine 'KAITAKU' projects ('kaitaku' means 'developing' in Japanese) within the Organization for Advanced and Integrated research as our interdisciplinary flagship projects for world-class research.

We have also been taking progressive steps in relation to value creation and its implementation including;

- 1) Medical Device Innovation Platform (MeDIP),
- 2) the Graduate School of Science, Technology and Innovation, the newest graduate school aiming for producing entrepreneurs, and
- 3) Kobe University Value School (V.School), a novel platform for interdisciplinary research, education and social contribution with 'value' being the keyword.

Through multi-faceted academic exchanges with major overseas universities in joint research and collaborative education, Kobe University will dramatically enhance its role as a 'hub campus' that attracts talented personnel from around the world and equips students with an international perspective. Through these international collaborations, Kobe University will endeavour to produce novel academic values and strive for the inclusive and sustainable development of our society in the with/post-COVID-19 era.

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Healthy aging through disease prevention and active engagement in life

Disease prevention

Dementia is a huge social issue, with the number of sufferers in Japan predicted to reach 7.3 million (a prevalence rate of about 20%) by 2025. There is a high demand for preventive intervention because once symptoms become apparent it is difficult to recover patients' cognitive functions, even with therapies that modify the disease.

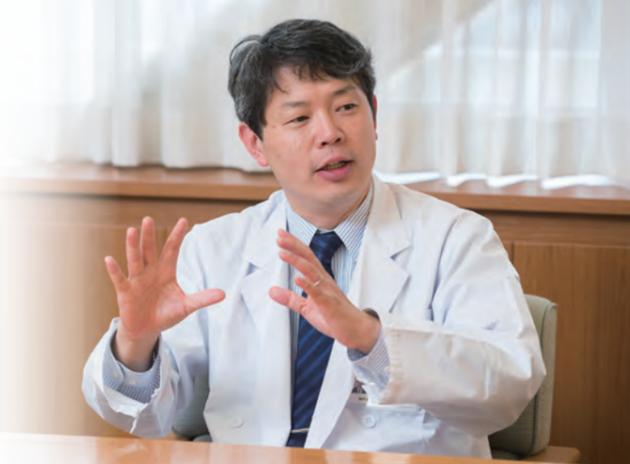
Kobe University launched the **Dementia Prevention Project** in 2018 as an interdisciplinary project. We provide opportunities for elderly people to receive preventive intervention (a weekly dementia prevention class named 'Cognicare', which is currently being conducted using a web conferencing system due to the effects of COVID-19), and periodically evaluate cognitive and physical functions with the participants' agreement. Through the above mentioned activities, we have constructed a bioresource bank for storing surplus specimens from the regular blood tests. This can be utilised for various research purposes.

We have recently started a 3-year grant-funded project (2020 -2022) to conduct a randomised controlled trial of 200 citizens of Tamba City in Hyogo Prefecture, which will contribute to the Japan-multimodal intervention trial for the prevention of dementia (J-MINT). This will provide evidence for the effectiveness of intervention methods. We examine whether multifactorial interventions such as lifestyle-related disease management, weekly exercise, cognitive function training, and nutritional management can reduce the progression of cognitive impairment in people at risk of dementia.

Message from Researcher

The project aims to prevent dementia through preventive intervention research and the construction of a cohort study of elderly people, while simultaneously implementing these methods socially by holding 'Cognicare' classes in collaboration with local authorities and care facilities. I am convinced that the project will contribute towards increasing healthy life spans and thus cultivate 'social innovation'.

Hisatomo KOWA, Ph.D
Professor, Graduate School of Health Sciences



Core project members



Narihiko KONDO, Ph.D
Professor, Graduate School of Human Development and Environment



Yoshiaki KIDO, Ph.D
Professor, Graduate School of Health Sciences

International Collaboration

The J-MINT study is the Japanese version of the FINGER study, which was first conducted in Finland, and is part of the World Wide Finger study. In order to advance our research including this J-MINT study, we initiate international collaboration and the dissemination of research results at international symposia and conferences. We also have a student exchange program with FH JOANNEUM University of Applied Sciences, which is conducive to training researchers.

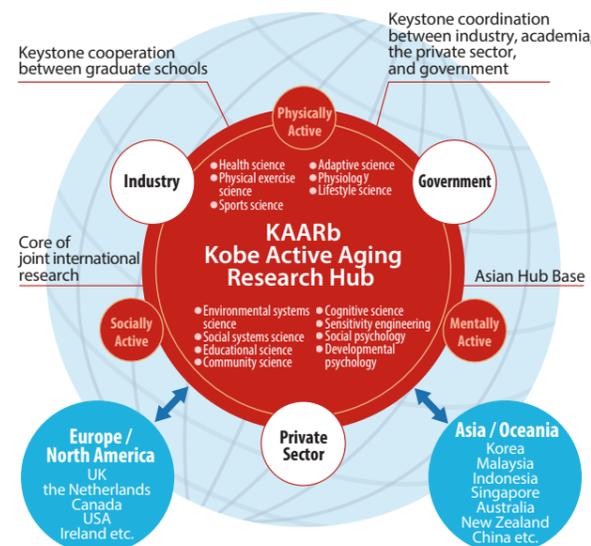
Information on related research facilities

Graduate School of Health Sciences <http://www.ams.kobe-u.ac.jp/en/>

Graduate School of Human Development and Environment <http://www.h.kobe-u.ac.jp/en/node/1023>

Graduate School of System Informatics <http://www.csi.kobe-u.ac.jp/english/>

Active engagement in life



Since its establishment in 2015, the **Kobe Active Aging Research Hub (KAARb)** at the Graduate School of Human Development and Environment has been acting as a center for the creation of innovative research activities in which various possibilities related to active aging will be investigated and assertive social implementations will be attempted; this includes global propositions for support that were developed from said investigations.

More specifically, KAARb carries out four main activities. Firstly, the hub conducts fundamental, applied and practical research activities, which cover research pertaining to active aging that widely ranges in scale from individual to society-based studies. Secondly, KAARb internationally disseminates its research that mainly focuses on the Asian population, thereby contributing to a research field that is predominantly European. Thirdly, the hub carries out support activities, which connect industry with private and public sectors not limited to universities, and aids research projects that cultivate a variety of human resources. Finally, KAARb conducts networking activities, which enrich global research networks. Through these four activities, KAARb aims to become an open interaction platform for advanced active aging research with its partner organisations.

Message from Director

Communication, in particular international exchanges, always greatly inspire me, deepen my thoughts, and bring me great joy. When I find out that we share common ideas and have identified similar problems, I am sure that we can mutually contribute towards making the aging world better. At the same time, I am very pleased that we are able to develop friendships in the process. I hope to strive towards the expansion of international research collaboration, including through the HORIZON Europe programme.

Keiko KATAGIRI, Ph.D
Professor, Graduate School of Human Development and Environment



International Collaboration

Aging is one of the most important global issues. As Japan the world's most aged society, we assume that by sharing our knowledge, experiences and practices, we can contribute towards other countries' knowledge in the field of gerontology. In this sense, we believe that developing a network among academic professionals is of great importance.

Initially, we developed a close academic network with two esteemed aging institutes located in the University of Hong Kong, and Ewha Womans University (South Korea) respectively. These institutes are located in East Asian countries that share similar societal values and where the aging population is rapidly increasing. We have already started several research projects together.

We are also strengthening our network with Europe and the United States. We are convinced that they are pioneers in the field of gerontology, whilst Japan is the world's most aged society and has ample experience and practice. Mutual communication should benefit all parties. In particular, we believe that the long history of traditional European philosophy will provide suggestions in consideration to well-being of older adults.



Information on related research facilities

Graduate School of Human Development and Environment <http://www.h.kobe-u.ac.jp/en/node/1023>



Migration studies for inclusive communities

The Graduate School of Intercultural Studies promotes migration studies in the **Migration Research division of the Research Center for Promoting Intercultural Studies (Promis)** with over 100 researchers including domestic and international collaborators. In our research project, the ‘exploration of various problems due to intensified modern migration on a global scale’ is one of the main topics and a pressing issue. The purpose of the project is to establish and develop an international center for migration research.

Nowadays, there are fears within the receiving society concerning the rise of social, political and economic instability due to intensified migration, divisions in local communities due to increased multiculturalisation, and the erosion of citizens’ sense of solidarity with one another, which is critical for welfare redistribution and is leading to the instability of the welfare state. The rise of populist groups that advocate anti-immigration in EU countries can be said to be one of its reflections. This project investigates knowledge and policies which modern societies in Japan, the EU, and other parts of Asia require in order to structure sustainable and secure spheres of life.

This project is based on ‘Research on the Public Policies on Migration, Multiculturalization and Welfare for the Regeneration of Communities in European, Asian and Japanese Societies,’ which has been adopted as a Core-to-Core Program (A: Advanced Research Networks) by the Japan Society for the Promotion of Science (2016-2020). The research is organised into the following six joint research groups: (1) Borders and Human Rights for Migrants, (2) Governance on Migration, (3) Intimacy/Publicness beyond Borders, (4) Localised Multiculturalism and Nationalism, (5) Cultural Policies about Immigration and Refugee, (6) Migration Dynamics and Adaptation to Host Societies. The project is being conducted in close collaboration with research centers in the EU and Asia and promotes interdisciplinary research collaboration.

Kazunari SAKAI, Ph.D
Professor, Graduate School of Intercultural Studies



Message from Researcher

Around 2016, the year this project started in, the European refugee crisis had reached a peak, the Rohingya refugee crisis was getting more serious, and the former President Donald Trump announced the policy to construct the U.S.-Mexico border wall to repel illegal migrants. It was a time when friction and conflict over the international movement of people rose to the surface all over the world and this project was launched as a way to meet the needs of the times. Based on our advanced research activities in this field, we will establish a research center on global migration in the Graduate School of Intercultural Studies at Kobe University in FY2022, to serve as a hub for this international collaborative research, promoting permanent and world-class international academic research activities.

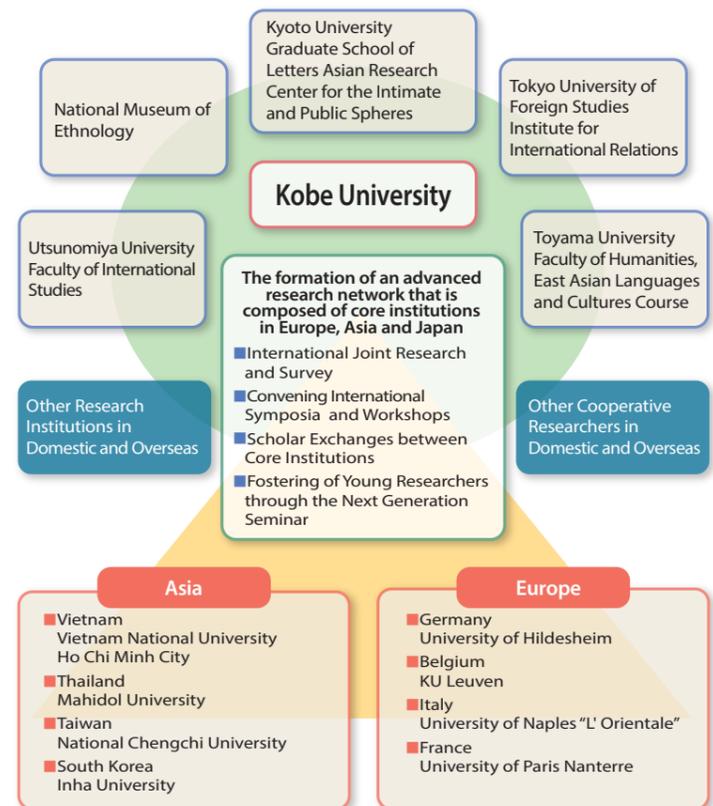
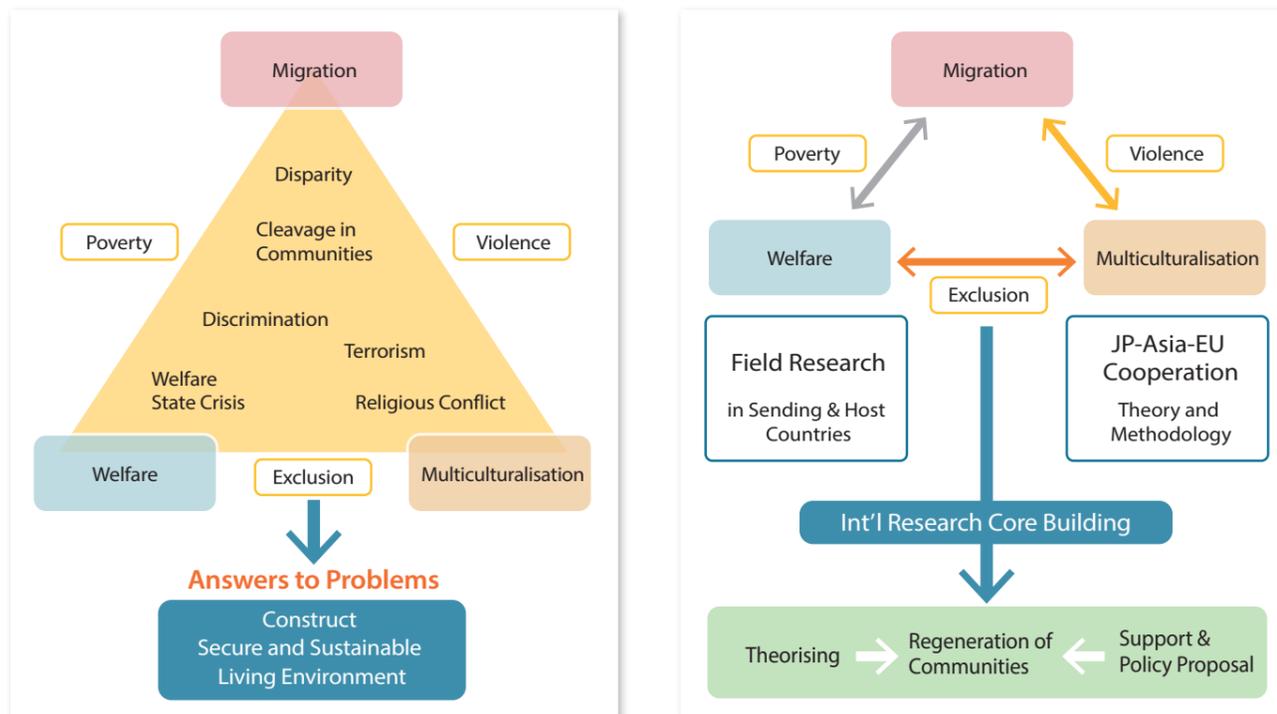
International Collaboration

Through this project, we have built a consortium consisting of leading universities in the EU and Asia with unique characteristics.

In the EU, we have partnerships with hub universities in countries that have many migrants and issues related to multiculturalisation and welfare policies, such as KU Leuven (Belgium) in EU studies, University of Paris Nanterre (France) in History and International Relations, University of Naples “L’Orientale” (Italy) in Asian and Mediterranean studies, and the University of Hildesheim (Germany) in Cultural Policies. In the United Kingdom, which left the EU, we have also been deepening our collaboration with migration studies departments of the University of Cambridge and the University of Essex.

In Asia, we are collaborating with Mahidol University in Thailand and the Vietnam National University Ho Chi Minh City, Vietnam, where migration from other ASEAN countries has increased in recent years. We are also working with Inha University in South Korea and National Chengchi University in Taiwan, which are receiving more and more migrant workers from other parts of East Asia. Mahidol University in particular is one of the best migration research centres in Asia and is increasing its research exchange with our project members.

In addition, we are beginning to collaborate with research institutes in Eastern Europe, such as Poland and Romania, as well as the United States and Mexico. Consequently this project is expected to develop into a global network hub for migration studies.



Information on related research facilities

Promis <http://web.cla.kobe-u.ac.jp/group/Promis/index.html>



Envisioning disaster-resilient society of the future

Kobe University has been comprehensively researching how to ensure the safety of cities since the 1995 Great Hanshin earthquake. Consequently, researchers are currently working out how to design a sustainable, resilient city with the vision of 'hundred-year plans to achieve thousand-year dreams'.

The new academic research unit that was formed in 2018 is called 'MIRAI: Multidisciplinary Integration for Resilience and Innovation' ('mirai' means 'future' in Japanese). Striving towards such a vision involves keeping ideas and inspiration circulating around Kobe University and other institutes for disaster research including the RIKEN Center for Computational Science's Fugaku supercomputer, Hyogo Earthquake Engineering Research Center's E-defense system, and JAMSTEC (Japan Agency for Marine-Earth Science and Technology).

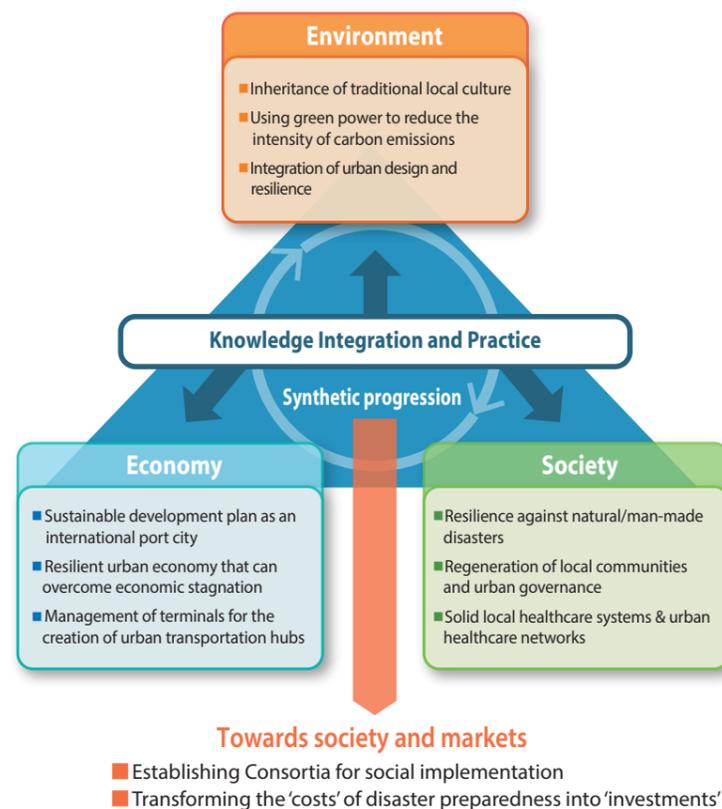
Knowledge Interaction for innovation

MIRAI has established multiple research units aiming to integrate knowledge of disaster prevention and management through the three major pillars of society, economy and environment. These research units include experts in engineering, health sciences, humanities and Business & Economics from Kobe University. The units work on various projects simultaneously and explore the development of 'Urban Science' as a novel research framework. A multidisciplinary meeting is organised every month to inspire new ideas and perspectives across all projects. There are also different groups that students can get involved in too, such as the Creative Dojo ('Research Unit for Future Creation & Innovation Creative Dojo') and various events, such as academic symposia, which allow us to achieve greater mutual understanding across disciplines.

Community engagement

MIRAI promotes industry-university collaboration with the aim of establishing a platform for open interactions with society and enabling research outcomes to be smoothly implemented. At present, we work with various private and public sectors, including Kobe City Government, Hanshin Expressway and SUN-TV, to implement government-subsidised projects and joint research.

From 'Resilience' to a 'Safe and Secure' future society



Information on related research facilities



Research Center for Urban Safety and Security (RCUSS) <http://www.rcuss.kobe-u.ac.jp/English/index-e.html>

The Research Center for Urban Safety and Security (RCUSS) was established on May 11, 1996, approximately one year after the Great Hanshin-Awaji Earthquake. It was set up to renew and expand the former Reclamation Engineering Research Institute at Kobe, and aims to create a genuinely safe and secure urban society.

Atsushi IIZUKA, Ph.D

Professor, Research Center for Urban Safety and Security



Message from Researcher

I am now working on the Integrated Earthquake Simulation (IES); which is a project that was recently developed into an integrated engineering system.

This project used the K computer (RIKEN's previous model of supercomputer) to process large amounts of data such as geographic information and property registers. This allows us to conduct an earthquake simulation over an entire city and provides more concrete guidelines for disaster reduction and prevention policies. Using technologies like IES that we have developed as a base, each industry can commercialise them by creating business models.

As the unit leader of MIRAI, I will take the initiative to work with overseas partners and invigorate the university by circulating knowledge, ideas and inspiration for designing the future of society.



International Collaboration

MIRAI collaborates with various international partners including Gadjah Mada University (Indonesia), Chengdu University of Technology (China) and Hanoi Medical University (Vietnam).

Recently, MIRAI have started to collaborate with the University of California, Berkeley, which conducts earthquake simulations for the entire city of San Francisco. Kobe and UC Berkeley agreed to organise annual workshops entitled 'Kobe PEER Workshop' during the period from 2020 to 2025 in order to explore grand designs for societies in the 22th century.

There are also several members of the MIRAI projects who are engaged in highly active collaborations with European institutions and researchers. A research team led by Professor Akihiko HOKUGO from the Graduate School of Engineering has been involved in a research project for disaster studies entitled 'LINKS- Strengthening links between technologies and society for European disaster resilience' awarded funding from the EU Horizon 2020 programme's Secure Societies (SU-SEC) section.

Professor Hiroshi OKUMURA, the dean of Graduate School of Humanities has taken the initiative to establish a research consortium for cultural heritage studies with colleagues in Japan, Hungary and UK, of which the Graduate School of Humanities is also a member. One of their aims is collaboration through HORIZON Europe.

MIRAI envisions the disaster-resistant cities of 100 or even 1000 years in the future. To realize this mission, we encourage our researchers to collaborate with overseas institutions.





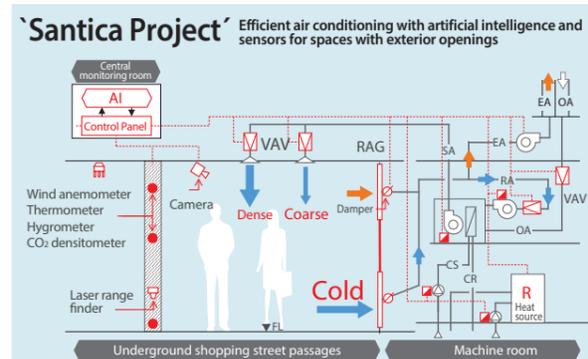
Towards super smart communities through cyber physical systems

Kobe University has been comprehensively researching how to establish a super smart community by developing cyber and physical techniques, e.g. in collaboration with Kobe City Government.

In order to accelerate our research and promote the social implementation of developed technologies, the **'Research Center for Integration of CPS-related Techniques toward Actualization of Super Smart Community Concept (CPS3C)'**, was established in 2017 at the Graduate School of System Informatics. The objective of the center is 1) to realize methodologies and techniques for utilising system information, i.e. meaningful information which is found within large-scale and complex systems that are based on high-speed and large-capacity computing technologies, and 2) to design highly useful frameworks and structures for cyber-physical systems.

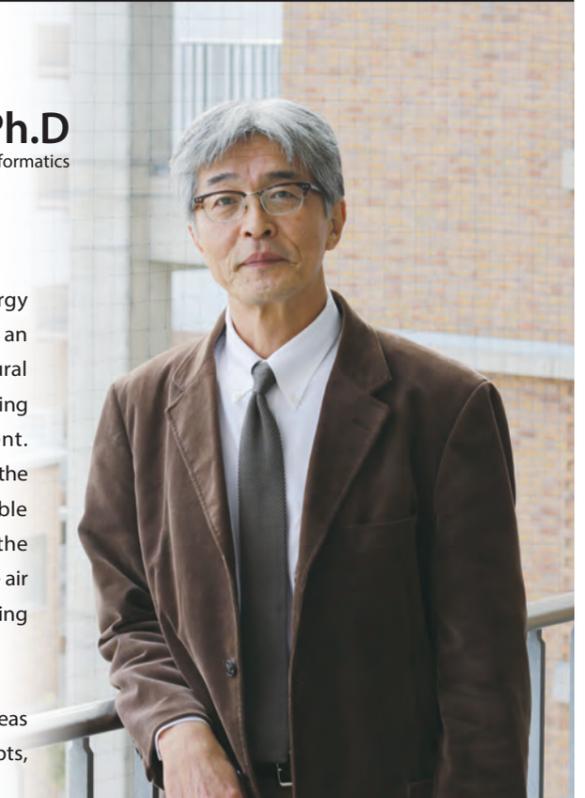
The CPS3C aims to perform a demonstrative experiment on smart energy and to establish a consortium on smart mobility. First of all we have a project to develop an airflow control system based on AI technologies that analyse the movement of people and air currents. We are carrying out this project on 'Santica', which is an underground shopping complex in the heart of Kobe. In collaboration with companies and a local provider, the project developed next-generation heating, cooling and ventilation technology, in addition to achieving a 40% reduction in energy consumption in the underground mall. We are exploring how we can apply our technologies to other large-scale public facilities (such as shopping areas, railway stations, airports, and other large spaces).

Secondly, 'the Autonomous Mobilities and Social Systems Consortium' studies the possibilities of a wide range of autonomous mobilities in social systems and obtains guidelines for their implementation, taking advantage of the characteristics of Kobe city, which has a compact, three-dimensional transportation network that includes urban areas from the mountains to the waterfront, in addition to the rural areas in the north and west, and sea and air routes.



Hisashi TAMAKI, Ph.D

Vice-Dean, Graduate School of System Informatics



Message from Researcher

Recently, I have been working on the design and utilisation of smart energy systems. I am convinced that the renewal of conventional energy systems is an important countermeasure against the effects of global warming and natural disasters. A self-sustainable decentralised energy system is one of the promising solutions that will enable future societies to be sustainable and resilient. The 'Nushima project' and the 'Santica project', which are both supported by the Ministry of the Environment (Japan), attempt to construct a self-sustainable decentralized energy system prototype based on DC power feeding and the utilization of renewable energy, and to investigate a system of controlling the air conditioning at underground shopping malls by understanding and predicting the environmental conditions using IoT technologies, respectively.

As the director of the CPS3C, I am taking the initiative to collaborate with overseas partners and to intensify and variegate our activities by exchanging concepts, knowledge and approaches for realizing the future smart community.

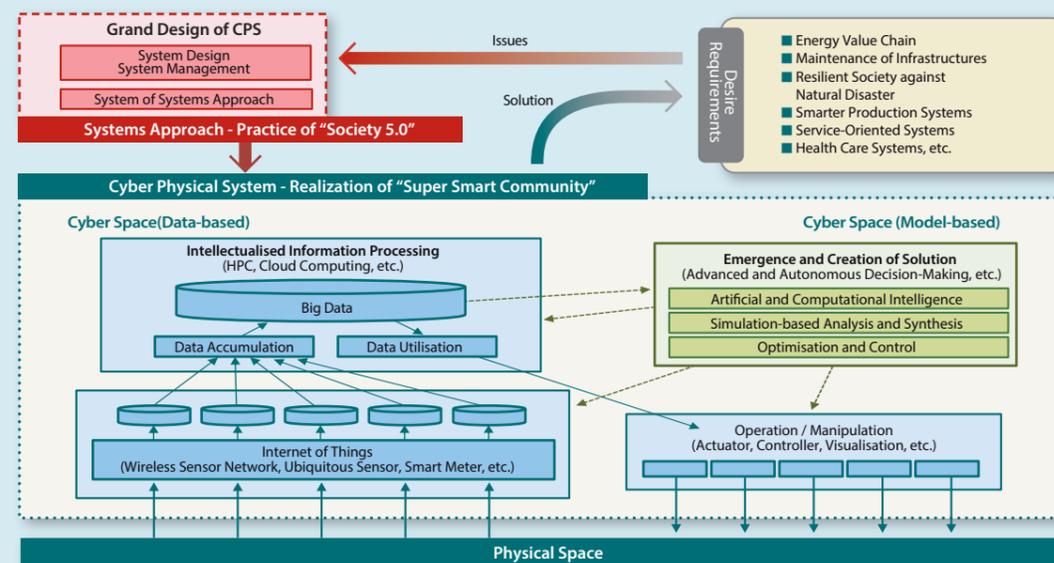
International Collaboration

Smartness has become highly relevant to our communities, precisely because such qualities can effectively address the new demands of our societies in the fields of technology, or for our society in global transition. With its aim of cultivating both new technologies and value creation, the CPS3C enhances international research partnerships. At present, we have established a research network with the Université Grenoble Alpes (France), Vrije Universiteit Brussel (Belgium) and the Politecnico di Milano (Italy) and have started to collaborate with Universitat Politècnica de Catalunya (Spain) on a wide range of smart technologies.

Furthermore, our cutting-edge research activities attract the interest of various researchers and policy makers worldwide. The CPS3C promotes the dissemination of research results at international symposia and welcomes research visits to our facilities.



Integration of CPS-related Techniques toward Actualisation of Super Smart Community Concept : CPS3C



Information on related research facilities



Graduate School of System Informatics <http://www.csi.kobe-u.ac.jp/english/index.html>

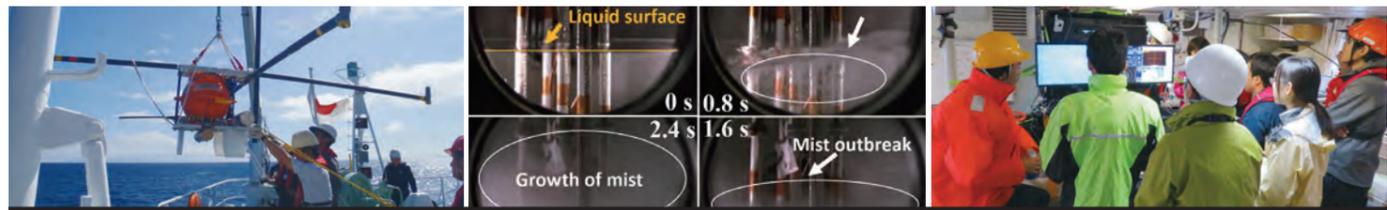
Promotion Office for Super Smart Communities

Established in the Innovation Commercialization Division in 2019 in order to promote industry-academia collaboration on smart communities at Kobe University. The office supports CPS3C initiatives for the social implementation of their smart technologies.

UDC078 (Urban Design Center KOBE) <https://www.udc078.jp/>



Established by CPS3C initiatives as a general incorporated association that provides a practice systems approach to urban design. UDC078 is a member of the UDC Initiative, which is the Japanese network for industry-government-academia collaborations on urban planning for the future.

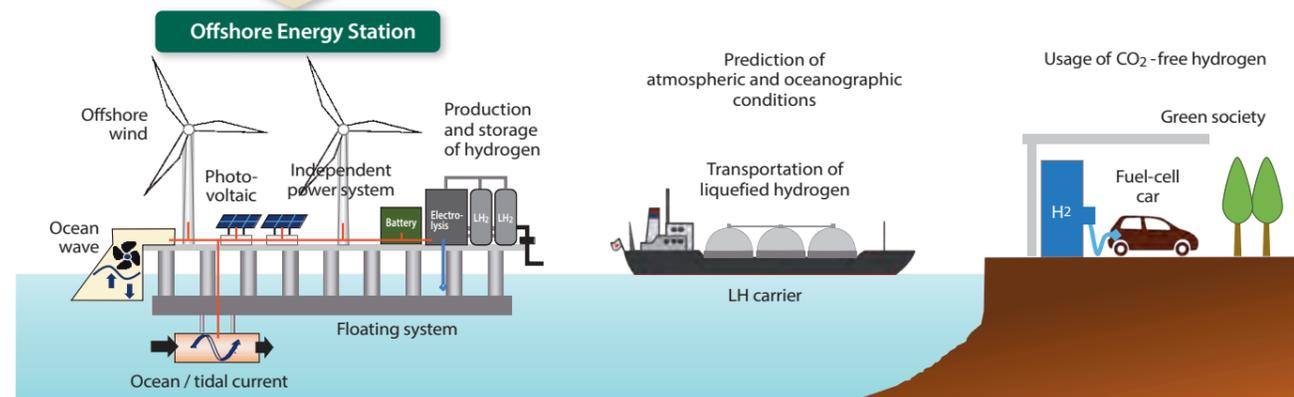
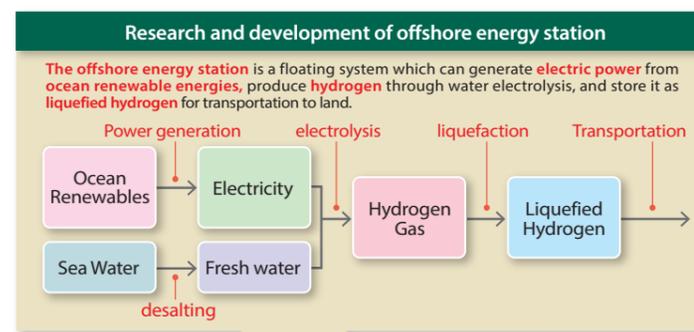


Offshore renewable energies and hydrogen: Future energy sources

Japan has the 6th largest exclusive economic zone in the world, and the development of offshore renewable energies, which are non-fossil, non-nuclear and non-foreign energy sources, are expected to contribute to the reduction of greenhouse gases and radiation contamination risks, in addition to improving the rate of national self-sufficiency. In order to implement offshore renewable energies on a large scale, it is necessary not only to reduce the installation costs but also to establish technologies to stabilize power output and to store energy offshore. This is because it is difficult to connect the generated energy to the onshore grid due to large fluctuations in power output and the long distance to the coast.

'Research and Development of Offshore Energy Station to Generate Electric Power and Hydrogen from Offshore Renewable Energies' is one of the university's flagship 'KAITAKU' projects. Under the leadership of Professor Teruo OHSAWA (Graduate School of Maritime Sciences) the project was established in the Organization for Advanced and Integrated Research (OAIR) with the aim of conducting fundamental research on hydrogen and offshore wind energy. We believe that liquefied hydrogen has the potential to be the key technology for storing the huge amounts of power generated by offshore renewable energies, such as that generated by offshore wind farms, on a floating system.

Therefore, we are developing an offshore energy station which can generate green electricity from offshore renewable energies, produce hydrogen through water electrolysis and store it as liquefied hydrogen for transportation to land. The R&D for this study consist of five stages: 1) Installing offshore renewable energies, 2) Designing a floating body system for energy storage, 3) Designing an independent power system, 4) Developing a hydrogen production system and 5) Establishing liquefied hydrogen storage technologies. The final goal of this research is to construct technologies to safely realize all these processes on a moving offshore platform, including power generation from renewable energies, the conversion of energy from electricity to hydrogen, and the liquefaction of hydrogen for storage and transportation purposes. We are also exploring how we can advance our research further in cooperation with the private sector.



Shore-Wind – nachha

Teruo OHSAWA, Ph.D
Professor, Graduate School of Maritime Sciences



Message from Researcher

Since commercial offshore wind farms and offshore facilities for hydrogen production have yet to be established on a commercial scale in Japan, our project on offshore renewable energies and hydrogen has been quite challenging. In this context, the Japanese government has recently declared its goal of realizing a carbon-neutral, decarbonised society by 2050 and formulated a 'Green Growth Strategy towards 2050 Carbon Neutrality' in October 2020. This goal certainly requires the further development of technologies related to the production of hydrogen from renewable energy resources, in addition to technologies to stabilize electricity transmission with hydrogen. Our team will keep striving to contribute towards the marine sector's efforts to realize a decarbonised society.

International Collaboration

The project promotes international collaboration in accordance with the Graduate School of Maritime Sciences' traditions stretching back over 100 years. The school's motto is 'The spirit to be active internationally' and we currently welcome joint research in the following fields:

- 1) The implementation of liquefied hydrogen storage technologies; such as LH2 superconducting level sensors, LH2 pumps.
- 2) The development of a hydrogen production system; such as Seawater MHD hydrogen generator.
- 3) Design of floating body systems; including types, mooring systems, tank tests, and simulations.
- 4) Installation of offshore renewable energies: including floating LIDAR, and energy production forecasts.
- 5) The design of an independent power system; electronics devices for renewable energy stabilization.

We are also conducting the following prominent research activities.

In collaboration with NTNU (Norwegian University of Science and Technology); Research into the development of optimization solutions for complex systems relating to maritime safety, economics, and ocean environments. Specialised hydrodynamic methods are used to develop ship and ocean analysis systems for maritime activities, such as ocean transportation.

Research into Wind power; Development of a mesoscale model of an advanced integrated wind field analysis method. This method can be applied to offshore wind farm development issues. It can be used to aid decisions regarding the optimal positioning of turbines on a farm, as well as what type of turbine is most appropriate.

In collaboration with EC-Nantes (École Centrale de Nantes); Development of advanced model experimental technologies, sensors and equipment for floating wind turbines in extreme conditions. These technologies that allow turbines to withstand strong winds, waves and currents enable new types of floating wind turbines to be developed, and are also useful for reducing the construction and installation costs.

Information on related research facilities

The Graduate School of Maritime Sciences <http://www.maritime.kobe-u.ac.jp/en/index.html>

Kobe University is the only national university in Japan with a graduate school for maritime sciences, offering a unique range of education and research from the perspective of 'human activities related to the ocean'. The school has a long history of providing education for the crews of merchant ships and possesses various research facilities and vessels including the training ship 'Fukae-maru', the ship navigation simulator system, and the ship model basin, and the hyper-cryogenic laboratory. In April 2021, the Faculty of Maritime Science will be restructured into **the Faculty of Oceanology** to provide undergraduate courses that will cultivate new generations who possess a broad interdisciplinary knowledge of ocean-related issues.





Engineering Biology with and for open innovation

With the United Nations paving the way for a better and more sustainable future by adopting the Sustainable Development Goals (SDGs), the international community has begun to strive for a 'bio-economy,' with the aim of reconciling economic growth with environmentally responsible action through the strategic use of biological resources and biotechnology. **The Engineering Biology Research Center (EGBRC)** at Kobe University has taken the initiative in this regard by, for example, making efficient use of biomass and other renewable resources and applying environmentally friendly biotechnology to the manufacturing of functional materials and general-purpose chemicals that help to enrich our lives.

On the other hand, recent years have seen revolutionary developments in biotechnologies that include DNA sequencing, bioinformatics, and genome synthesis/editing, which have been harnessed to engineering biology that can trigger hitherto unavailable 'potential biofunctions.' Driving this rapid progress in the biotech industry are increased automation and Internet connectivity between devices through the use of big data and robotics. The EGBRC is building a platform that combines Digital, Biotech, and Robotics by integrating computational technology for metabolic pathway design, enzyme selection and gene sequence design. By optimally combining elements of dry (information technology) and wet (biotechnology) technology, we aim to develop a smart-cell creation technology that can be used for general-purposes. The 'smart cell,' defined as a highly functional designed cell with controlled expression of the function, can contribute towards fundamental medical treatments (which was impossible in the past), the drastic reform of industrial manufacturing processes, and the prevention of food shortages around the world.



EGBRC Engineering Biology Research Center
Kobe University

Information on related research facilities



Engineering Biology Research Center <http://www.egbrc.kobe-u.ac.jp/en/index.html>

The EGBRC consists of six research units each aligned with Kobe University's core technologies—namely, the Bio-based Fuel and Chemical Research Unit, Biologics Research Unit, Functional Food Material and Agrobio Research Unit, Chemical and Process Research Unit, Advanced Platform Technology Development Unit, and Bioeconomy Research Unit. By extensively promoting inter-unit collaboration, the EGBRC facilitates interdisciplinary work for its researchers. The EGBRC also taps into the know-how it has gained from experience in government-subsidized projects and joint research, while at the same time designing a research framework that encompasses multiple fields. In this way, it is able to flexibly respond to the ever-diversifying needs of the industrial sector and to enhance opportunities for industry-university collaboration and open innovation.

The EGBRC has made available a wealth of equipment and instruments that are necessary for research in engineering biology, a cutting-edge field that straddles multiple disciplines. By putting in place a system for shared use by researchers from both Kobe University and elsewhere, we support interdisciplinary research and industry-university collaborative research.

Tomohisa HASUNUMA, Ph.D

Director of Engineering Biology Research Center/
Professor, Graduate School of Science, Technology and Innovation

Message from Researcher

Established on July 1, 2018, the EGBRC at Kobe University is charged with the mission of exploring the frontiers of engineering biology by leveraging Kobe University's unique features and strengths. **The EGBRC is the sole research center in Japan that aims to create innovation in this emerging interdisciplinary field.** Our goal is to make the EGBRC a hub for innovation that combines 'hardware,' or tangibles such as research space and equipment, and 'software,' or intangibles such as researchers and intellectual property. We will achieve this by building and expanding a research and development platform while simultaneously promoting advanced research and development through industry-university-government collaboration.



International Collaboration



Ken-ichi YOSHIDA, Ph.D
Professor, Graduate School of Science,
Technology and Innovation

Building on our extensive track record of teaching/researching engineering biology, in addition to partnerships with outside institutions, we intend to shape the bio-economy by creating the kinds of innovation that meet demands from the government and society at large, including the bio-production of a variety of useful substances. The EGBRC is a research center, which was established through the development of the iBioK (innovative Bio-production Kobe; <http://www.org.kobe-u.ac.jp/bioproduction/en/index.html>) project supported by MEXT (Ministry of Education, Culture, Sports, Science and Technology), Japan from 2008 to 2019. This project had hosted an annual series of iBioK international conferences that invited a number of internationally prominent researchers. Recently, the EGBRC has participated international alliances, including the Global Biofoundry Alliance (GBA), which discusses 'bio-foundries' that integrate platform technologies in advanced biotechnology, disseminates research results, shares cutting-edge research trends, and examines business models. In this way, we are contributing towards the development of the bio-economy.

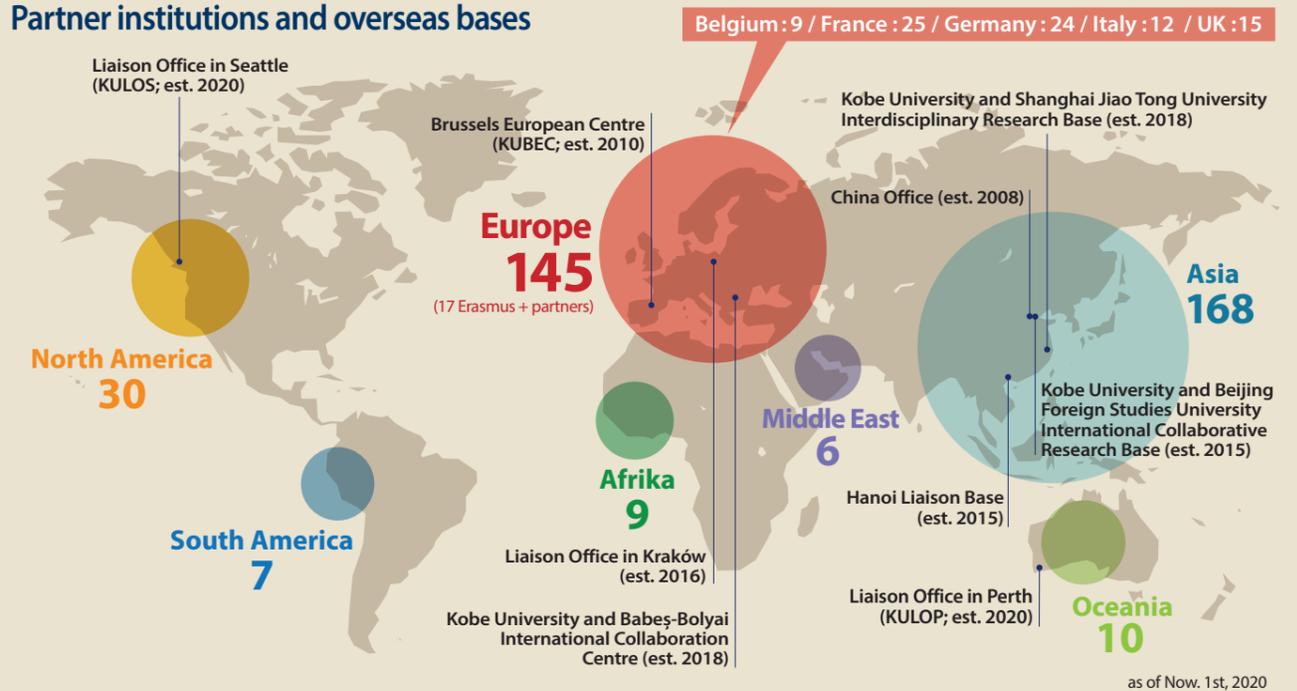
Professor Ken-ichi YOSHIDA, a core member of the EGBRC, is active as the first FEMS (Federation of European Microbiological Societies) Ambassador for Japan (since 2019). He was also the executive director of Kobe University Brussels European Centre (2014-19) and is currently the executive director of the Centre for EU Academic Collaboration of Kobe University (2019-).



Global BioFoundry Meeting 2019



Partner institutions and overseas bases



Ever since it was opened to the world one and a half centuries ago, Kobe has been daily witness to a cross-border exchange of people, goods, and capital. Today, Kobe boasts a long history as one of the oldest international port cities in Japan.

Taking locational advantage of this cosmopolitan city, Kobe University has been contributing to the global community through our innovative research and cultivation of rich understanding and strong leadership skills. The University also aims to play a leading role as an interface between overseas institutions and corporations and Kobe-based businesses, public and private organisations, with Kobe University serving as a hub campus to realize such connections.

Our Initiatives for Europe

From early on, Kobe University has recognised the crucial importance of partnerships with universities and institutions in Europe. The Kobe University Brussels European Centre (KUBEC) was established in 2010 as the first Japanese University liaison office in Brussels to enhance our international competitiveness and promote the exchange of students and researchers between Europe and Japan. We also hold the Overseas Advisory Board meeting annually in KUBEC to gain perspectives from global intellectuals.

We are actively participating in research and education programmes with Europe including HORIZON 2020, Erasmus+ and the ICI-ECP double-degree project. In recognition of our initiatives for Europe, Kobe University was awarded the first Jean Monnet Centre of Excellence in Japan.

We are confident in our continuous initiatives to strengthen the partnership between Japan and Europe through international activities and events including the annual symposia in Brussels.

Our advisory board members (in Europe)

- His Excellency Mr. Herman Van Rompuy (former President of the European Council)
- His Excellency Dr. Hans-Gert Pöttering (former President of European Parliament)
- Prof. Ing. Jiří Drahoš (Senator of the Czech Republic and former President of the Czech Academy of Sciences)
- Dr. Michael Reiterer (former Ambassador of the European Union to the Republic of Korea)
- Professor Hilary Lappin-Scott, OBE (Honorary Distinguished Professor, Cardiff University and Director and CEO, Lappin-Scott Consulting Ltd.)



KUBEC activities over the 10 year period



+ 900 participants attended the Annual Symposia



+ 50 workshops and
+ 800 participants

KU's participation in European Programmes

FP7 [2013-2017]

'Japan-EU Partnership in Innovation, Science and Technology (JEUPISTE)'

HORIZON 2020 [2016-]

'Agile CoCreation of Robots for Ageing (ACCRA)' (2016-2019)

'Strengthening links between technologies and society for European disaster resilience (LINKS)' (2020-2023)

Bilateral Cooperation-Industrialised Countries Instrument Education Cooperation Programme (ICI-ECP) [2013-2016]

'EU-Japan Advanced Multidisciplinary Master Studies (EU-JAMM)'

Erasmus+ Key actions- Mobility for learners and staff- [2014-]

-Partners-

Aegean University / Babeş-Bolyai University / Ca' Foscari University of Venice / Comenius University / Eötvös Loránd University / Gdansk University / Nicolaus Copernicus University / Trier University / TU Dresden / Jagiellonian University / Juej Dobrila University of Pula / University of Belgrade / University of Naples "L'Orientale" / University of Rijeka / University of Silesia / Vilnius Gediminas Technical University / Vrije Universiteit Brussel

Jean Monnet Centre of Excellence [2015-]

'Strengthening the Academic Basis of EU Studies in Japan, Kobe' (2015-2018)

'Consolidation of the Kobe Academic Base for EU Studies' (2019-2021)

Jean Monnet Chair [2015-]

<Prof. Masahiko YOSHII> 'Kobe Programme for Enhancing European Studies' (2015-2018)

<Prof. Noriyuki INOUE> 'Kobe Programme for a Refined Network in EU Studies' (2019-2021)

Jean Monnet Network [2019-]

'European Transoceanic Encounters and Exchanges (ETEE)' (2019-2022)

Kobe University At a Glance



Kobe University founded in **1902**

4 campuses / **10** faculties / **15** graduate schools

Staff **3,734**

1,673 Teaching Staff

2,061 Administrative Staff (incl. technical staff and nurses)

Students **16,080**

11,521 Undergraduate Students

4,559 Graduate Students

Mobility **3,253**
academic year 2019

724 Visiting Researchers/Faculty Members

2,529 Outbound Researchers/Faculty Members

(all data as of May 1, 2020)

Facilities for promoting research activities



Office of Research Management http://www.research.kobe-u.ac.jp/gksh-web/ura/international/index_en.html

The Office of Research Management is responsible for creating grant proposals, surveys, and data collection as part of the University's practical strategies to support research activities. The office also supports faculty members' activities for enhancing internationalisation in relation to research.

Innovation Commercialization Division <http://www.innov.kobe-u.ac.jp/index.html>

The Innovation Commercialization Division initiates the university's social engagement with its 3 departments of 1) Industry-Academia Collaboration and Patents, 2) Social Implementation, and 3) Promoting Open Innovation. This includes offices in the department of social implementation, which foster two pilot projects related to 1) 'Dementia Prevention' and 2) 'Super Smart Community' which is responsible for the current 'Smart Brain City' project.

Faculties & Graduate Schools

Letters / Humanities

Global Human Sciences

Intercultural Studies

Human Development and Environment

Law

Economics

Business Administration

Science

Medicine

Health Sciences

Engineering

System Informatics

Agriculture/Agricultural Science

Oceanology (restructured in AY2021)/ Maritime Sciences

International Cooperation Studies

Science, Technology and Innovation

Research at Kobe

Visit Research at Kobe for more information:
http://www.kobe-u.ac.jp/research_at_kobe_en/index.html

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