



KOBE UNIVERSITY

Inspiring a new generation of innovators

With the opening of its new Graduate School of Science, Technology and Innovation in early 2016, Kobe University will bring together ideas from across the sciences and commerce to forge new areas of innovation.

Kobe city, located just 30 kilometres west of Osaka, is a major historical centre of commerce and one of the first Japanese port cities to open up to the rest of the world after the end of the country's policy of isolation in the mid-1800s. This long commercial and ideological interaction with the West has given Kobe a reputation of being an international and cosmopolitan city — an important player in the modernization of Japan and a place where great things happen. And it was in this melting pot in 1902 that Kobe University has its origins.

"Kobe University started as a higher commercial school," says President Hiroshi Takeda. "This commercial tradition formed the groundwork for some of Japan's top achievements in education and research, particularly in business administration and economics, and we have produced many

of the business leaders who helped lay the foundations of modern Japan."

At the same time, Kobe University has built an international reputation for education and research in the natural sciences, life sciences and medicine, from bioproduction to advanced membrane technology, infectious disease research, synthetic biology and planetology. One of Japan's greatest contributions to the life sciences — the discovery and development of induced pluripotent stem (iPS) cells — was made by Kobe University's Shinya Yamanaka, who received the 2012 Nobel Prize in Physiology or Medicine for the achievement.

"While continuing to work towards more in-depth research in each field, we also emphasize combinations of and collaborations between different academic areas by engaging in various advanced and interdisciplinary research projects," says Takeda. "In 2007, we created a unique interdisciplinary organization, the Organization of Advanced Science and Technology, to streamline graduate school education and promote advanced research and collaboration across five of our science graduate schools. The Graduate



President Hiroshi Takeda

School of Science, Technology and Innovation will further support advanced interdisciplinary research in the natural sciences as well as equip our students with the entrepreneurial skills needed to commercialize academic research results."

Bridging the gap

The new Graduate School of Science, Technology and Innovation is unique in Japan in embedding education and capacity-building in innovation, commercialization, entrepreneurship and enterprise into a graduate science programme. With this initiative, Kobe University is aiming to nurture a new generation of science professionals with a commercial mindset and

the ability to take an idea from research to the securing of intellectual property rights, development of production technology and eventually market development.

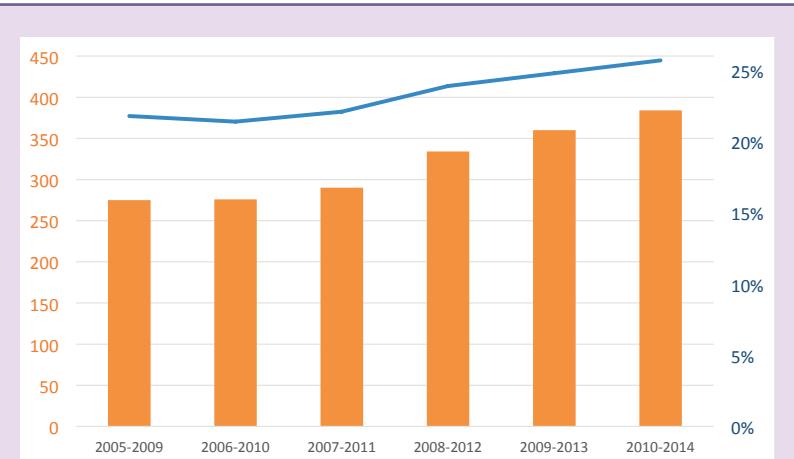
"The so-called valley of death, where research and development does not connect to commercial success, has become an issue for industry worldwide," says Takeda. "I hope that the people we train in this new graduate school will have the ability to solve these industry problems and lead innovation. I believe that this initiative could revitalize industry in Japan, and maybe even internationally."

In yet another first for a Japanese university, the establishment of the new graduate school is accompanied by the creation of the university's own venture company, which will incubate and commercialize the research results coming out of Kobe University.

"This new Graduate School of Science, Technology and Innovation is a trial in Japan," says Akihiko Kondo, who will assume deanship of the new graduate school in April 2016. "With this graduate school, we will draw on Kobe University's strengths in bioproduction, membrane technology, communication technology and medical science, and combine them with each other, with partners from industry, and with education and training in entrepreneurship, finance and innovation to create new commercial fields of technology."

Kobe University has been involved in developing several biological production processes that are now used in industry, bringing together fields such as synthetic biology, metabolic engineering and bio-pharmaceuticals. It is Japan's centre for synthetic biology research — the engineering of 'designer' biomolecules and organisms — and has developed strong synergetic relationships with local biomedical companies in the medical application of synthetic biology technologies. The university also hosts the Integrated Biorefinery Center, a commercial pharmaceutical production facility and Japan's sole collaborative facility for bioproduction.

Membrane technology has long been an area of strength for Kobe University. The Center for Membrane and Film Technology is the only research centre of its kind in Japan and serves as a central research hub



Source: InCites™

International collaboration

Both the number (orange bars) and proportion (blue line) of internationally co-authored papers are increasing at Kobe University. Researchers at the university are actively engaging in international collaborations across a wide range of fields from astrophysics to economics.

for advanced membrane research. "Our researchers are leaders in the recovery and separation of carbon dioxide, desalination, gas separation, membrane antifouling technology and the emerging area of forward osmosis for separating and concentrating target molecules," says Kondo.

In medical science, the Graduate School of Science, Technology and Innovation will pursue many promising areas of research, building on Kobe University's pedigree in iPS technology. "In addition to further developing iPS technology itself, we are involved in cancer therapy and drug discovery, as well as advanced vaccine development and the computationally assisted search for new drug candidates," says Kondo. "Computational science is critical to many areas of advanced research, from calculating new materials for photosynthesis and catalysis, to the design of enzymes and cells. Multiscale supercomputer simulations will open many new interdisciplinary opportunities for innovation."

A national innovation hub

The holistic integration of research, development and commerce at Kobe University does not end at the campus gates. The university's collaboration and joint research activity extends well into Kobe city and beyond — an area awash with national research institutes and world-class research facilities, including the Port Island super science cluster, the SPring-8 high-energy particle accelerator and SACLAC X-ray free electron laser, and the K computer — one of the fastest supercomputers in the world.

"Kobe University successfully blends tradition with innovation, and humanities with the social and natural sciences," says Takeda. "We provide special education programmes, including some offered entirely in English, with the aim of producing globally minded students. And we pursue innovation through interdisciplinary research. In this way, we will continue to strive to meet the challenge of creating new values in order to solve current issues and support the society of the future."

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