Nagoya University was established in 1871 and is internationally recognized for its contributions to basic research including discoveries by its four Nobel Laureates: Ryoji Noyori (2001, chemistry), Osamu Shimomura (2008, chemistry), and Toshihide Maskawa and Makoto Kobayashi (who shared the 2008 prize in physics). Nagoya University is also the birthplace of the gallium nitride blue light-emitting diode, invented by Isamu Akasaki.

"'From Na-go-ya Dai-gaku to Nagoya University' is our adage, which captures the essence of our plans to globalize education and research," says Michinari Hamaguchi, president of Nagoya University, as he sets out his plans to create an environment for young scientists to conduct cutting-edge research that contributes to the global society. "Here Dai-gaku is Japanese for university, and this dictum refers to our commitment to improve the global visibility of Nagoya University. The funding from the MEXT [Ministry of Education, Culture, Sports, Science and Technology] Program for Promoting the Enhancement of Research Universities will be used to initiate reforms to enhance research programs, such as projects at the new Nagoya University Institute of Transformative bio-Molecules [ITbM, see sidebar], which is one of nine World Premier Initiative [WPI] projects chosen by MEXT."

Nagoya University’s research strategy is an integral part of a plan launched by President Hamaguchi in 2009, which includes improvements in internationalization and research through initiatives such as the G-30 Program and Super Global University Strategy as well as a program to specifically attract international students from Asia to study medicine and agriculture.

The G-30 Program offers English language courses and scholarships for approximately 50 international students annually. There are six courses and 11 programs for undergraduates and seven courses and 17 programs at the graduate school, all taught in English, in subjects ranging from engineering to economics. "We want to increase the number of international students from the current 2,200 [15% of the total number of students] to 3,000 [20%] by 2020," says Hideyo Kunieda, trustee and vice president for research and student support. "We also want to increase the number of Japanese students going overseas, from what is currently around 600, to 1,000—out of a total of approximately 2,200 students in one grade studying at Nagoya University—by 2020."

It is hoped that the Super Global University Strategy will support the establishment of classes at centers set up by Nagoya University in other countries. One example is the Center for Asian Legal Exchange (CALE), an umbrella organization managing the university’s Education and Research Centers for Japanese Law. The five centers, offering courses in Japanese law and language, are located in Uzbekistan, Mongolia, Vietnam, Cambodia, and Myanmar, with plans to open new centers in Indonesia and Laos. "We want to nurture people to devise laws applicable throughout Asia, similar to the laws governing the European Union," explains Hamaguchi. "Graduates from the courses given at CALE go on to influential positions in government and academia. They are also an important part of the Nagoya University's international network." Other similar centers have already been established in Germany, China, and the United States.

The university also invites international students from Asia to courses at its Nagoya campus in subjects related to medicine and agriculture. An example is the Young Leaders Program in Healthcare Administration, a one-year Master’s course that engages students from 14 countries in Asia and Eastern Europe. Other facilities for education include the Endoscope Training Center located in hospitals in Vietnam, and overseas centers such as the Technology Partnership of Nagoya University, Inc. (NU Tech) in North Carolina in the United States, and the “Europe Center” located in Freiburg, Germany.

One of the more recently established programs is the Women’s Leaders Program to Promote Well-Being in Asia, which was granted support in 2013 by the MEXT/JSPS (Japan Society for the Promotion of Science) under the Program for Leading Graduate Schools.

Students at Nagoya University can also take courses offered by the joint degree program in medical sciences...
with the University of Adelaide in Australia, the joint educational program with University of Freiburg and University of Strasbourg, and the Japan-U.S. Advanced Collaborative Education Program (JUACEP) with the University of Michigan and the University of California, Los Angeles.

**STRATEGIES AND GOALS**

“We have introduced a new incentive system to encourage our young researchers, taking them from a position of being a source of ‘labor’ to one of ‘leaders,’” explains Hamaguchi. “For instance, we will increase the salaries of researchers who acquire funding from competitive grants such as the WPI project.” Another important set of reforms are related to assignment of tenured faculty positions. Hamaguchi stresses the need for transparency and accountability in the process of appointing faculty positions. “All assistant professor positions will be part of our tenure-track system with evaluation within five years, after which tenured lecturer posts will be offered to those who meet our requirements,” explains Hamaguchi.

“It is essential to create an environment for young scientists to conduct interdisciplinary research that contributes to global sustainability,” adds Hamaguchi. “One of the most important aspects of the reforms is changing the mind-set of staff—both faculty and administration—to recognize the importance of the changes in the creation of an internationally competitive university.”

**Institute of Transformative bio-Molecules**

Kenichiro Itami, director of the Nagoya University Institute of Transformative bio-Molecules (ITbM), wants to change the world. “At ITbM, we want to design molecules to solve global problems related to the environment, food production, and medicine,” he explains. “Our international teams of chemists and biologists are creating unique bioactive molecules with highly specific and targeted functions with the goal of addressing the most daunting problems facing society.”

ITbM is a 10-year project with annual funding of US$5 million. It was launched in April 2013 after being selected by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) as one of the projects in WPI. Researchers at ITbM are undertaking three major projects: control of biological systems, visualization of biological systems, and synthesis of novel biofunctional molecules.

“Approximately 55% of our research staff are from overseas,” says Itami. “We have excellent bilingual research support staff, including our ‘WPI-Mother’ who plays a central role in looking after the daily needs of our overseas researchers both inside and outside the lab.”

The “mixed-labs” concept is an important feature of the research infrastructure of ITbM, where chemists, biologists, and theoreticians share the same laboratory space. “This under-one-roof approach is the driving force for our research,” says Itami. The ITbM has 10 principle investigators—seven based at Nagoya University and three overseas at ETH-Zurich in Switzerland, Queen’s University in Canada, and the University of Washington in the United States. Researchers at ITbM also collaborate with the National Science Foundation’s Center for Selective C-H Functionalization and RIKEN’s Center for Sustainable Resource Science. In addition to international collaboration, ITbM has also established three important centers at Nagoya University that are uniquely geared toward research. These are the Molecular Structure Center, the Chemical Library Center, and the Live-Imaging Center.

To achieve these goals Nagoya University has integrated previous resources such as the Office for Initiatives for Industry, Academia and Government Cooperation (which includes the Technology Licensing Office) and the University Research Administration (URA) Office to form the Science and Industry, Academia and Government Cooperation Center, led by the university’s Vice President Hideyo Kunieda. “Strengthening the gathering, analysis, and dissemination of information, enhancing the ability to initiate new projects, and having a single, unified system for interacting with external organizations are the central functions of the new research management system,” explains Kunieda. To support this, the number of URAs will increase from the present 34 to 44.

Hamaguchi notes that the program will also be an important means for increasing the number of tenured faculty members under the age of 35. “Japanese national universities all share this problem,” explains Hamaguchi. “Young scientists are often employed on short-term postdoctoral contracts, a situation that does not enable them to conduct the independent research necessary for tenured positions. The program aims to alleviate this situation.”

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