

Doctoral Program
for World-Leading Innovative & Smart Education

The Frontier Development Program for Genome Editing



HIROSHIMA UNIVERSITY



OCHI Mitsuo
President of Hiroshima University
Director-General of the program

Hiroshima University was selected for the MEXT WISE Program (Doctoral Program for World-leading Innovative & Smart Education) in AY2018. Since then, the University has offered the Frontier Development Program for Genome Editing, an integrated Master's-Doctoral degree program designed to cultivate doctoral professionals capable of driving innovation across society.

Since AY2025, following the end of the government-funding period, the program has entered a self-sustaining phase. Building on the educational and research foundations established over the years, the University continues to advance the program as one of its own initiatives. The program has also produced graduates who are making significant contributions across academia and industry, demonstrating the program's success in cultivating highly capable professionals.

Genome editing is an innovative biotechnology that enables precise modification of the genomes of a wide variety of organisms through the use of artificial DNA-cutting enzymes, known as genome editing tools. Its applications have rapidly expanded beyond basic research into industrial and medical fields, including biofuel production, crop improvement, and drug discovery. To ensure responsible implementation of these technologies in society, it is essential to promote world-leading research and development while fostering talented professionals with due consideration to ethical and social issues.

Hiroshima University is home to several of Japan's leading researchers in genome editing, who have made outstanding contributions in the field and play central roles in the governance and operation of the Japanese Society for Genome Editing. We are also promoting industry-academia co-creation through the JST COI-NEXT (Open Innovation Platform for Industry-academia Co-creation) program under the concept of Bio × Digital Transformation (BioDX), which seeks to unlock the full potential of biological functions to address societal challenges such as emerging infectious diseases, food security, and carbon neutrality. Through these efforts, Hiroshima University will continue to work toward realizing a bioeconomy that contributes to achieving the Sustainable Development Goals (SDGs) from Hiroshima.

We warmly welcome individuals from diverse backgrounds who share the vision of this program and aspire to create new industries and help shape the future together with us.



SHIMADA Masayuki
Program Director

Executive Vice President
(Education and Peacebuilding)
Hiroshima University

This program aims to cultivate individuals who will lead the creation of new industries in biotechnology through a curriculum delivered by leading genome editing researchers from Japan and around the world.

The program offers two distinct courses: the five-year Life Science Course, which focuses on new industry creation, and the four-year Medical Course, which covers disease research as well as the development of genome editing-based therapies and pharmaceuticals. Through these courses, students acquire systematic knowledge and technical skills in genome editing, from basic principles to practical applications.

In addition, the program provides practical education by integrating diverse learning opportunities, including ELSI (Ethical, Legal, and Social Issues) education, internships at the Center for iPS Cell Research and Application (CiRA) at Kyoto University, and research activities at overseas institutions.

Hiroshima University has established a strong track record of excellence in genome editing and has earned high recognition in this field. Building on these strengths, the program aims to foster the ability to address societal challenges through cutting-edge research by making use of networks across industry, academia, government, and the public sector.

We will continue to improve and expand the program's educational offerings and remain committed to ensuring that students develop the practical skills and initiative required to succeed on the global stage.



YAMAMOTO Takashi
Program Coordinator

Professor,
Genome Editing Innovation Center
Hiroshima University

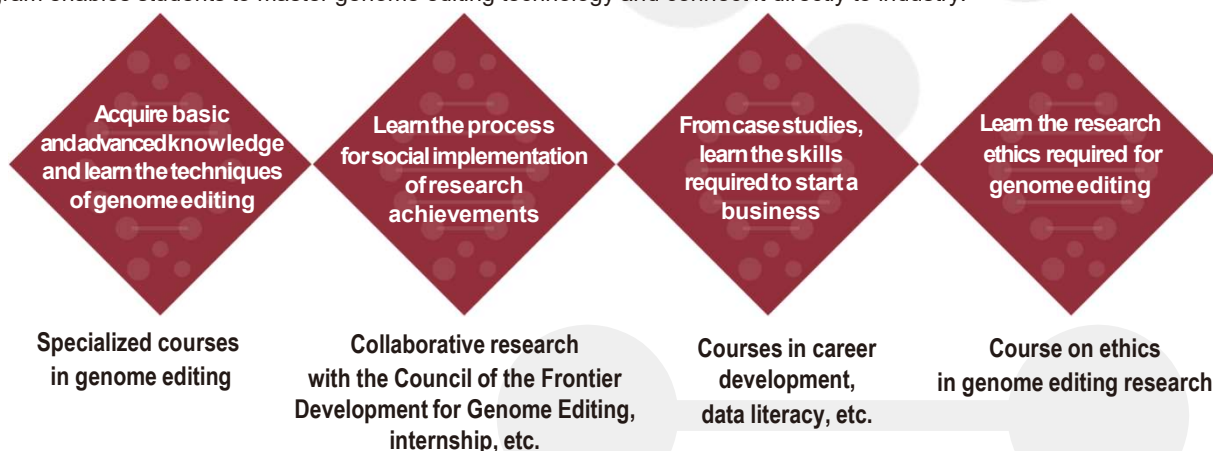
Genome editing technology needs to be actively utilized in order for industries to solve fundamental human problems related to food, energy, and diseases. Hiroshima University has led the genome editing field over the years. In 2012, it established the Genome Editing Consortium, and in 2016, the Japanese Society for Genome Editing, centered around Hiroshima University's researchers.

The global market of genome editing is expected to rapidly grow in many fields, including life science research, the biotechnology industry, breeding of animals and plants, medical care, and drug discovery. The competition to develop these technologies is getting more intense. Thus, Hiroshima University is one of the best places in Japan to learn genome editing because it has served as the domestic base of genome editing research and can collaborate with a wide range of organizations.

Why don't you join us in advancing genome editing technology?

Program overview

This program has been accepting students since April 2019, and has been implemented as a degree program across several graduate schools. This program established the Life Science Course (5-year curriculum) and the Medical Course (4-year curriculum) in order to provide students with opportunities to acquire basic and applied knowledge and to learn techniques of genome editing. This program enables students to master genome editing technology and connect it directly to industry.



Life Science Course (5-year curriculum)

In the first and second years, students will learn basic and advanced genome editing techniques. From the third year, they will conduct research utilizing the knowledge they have acquired. Through basic courses on social implementation of technologies and internships, they will be trained to become experts able to work at the cutting edge of genome editing technology.

Medical Course (4-year curriculum)

After systematically learning the basic and advanced genome editing technologies in the first and second years, students will conduct research for their doctoral thesis, utilizing knowledge that they have acquired. In addition, through internships at domestic and overseas partner institutes, they will be trained to be able to work at the cutting edge of genome editing in the medical field.

• Admission

The selection for this program is carried out for the applicants who have passed the Graduate School Entrance Examination or who have applied for it. Visit our website to check the Application Guidelines for details.

(URL: <https://genome.hiroshima-u.ac.jp/en/recruitment/index.html>)

• Financial support

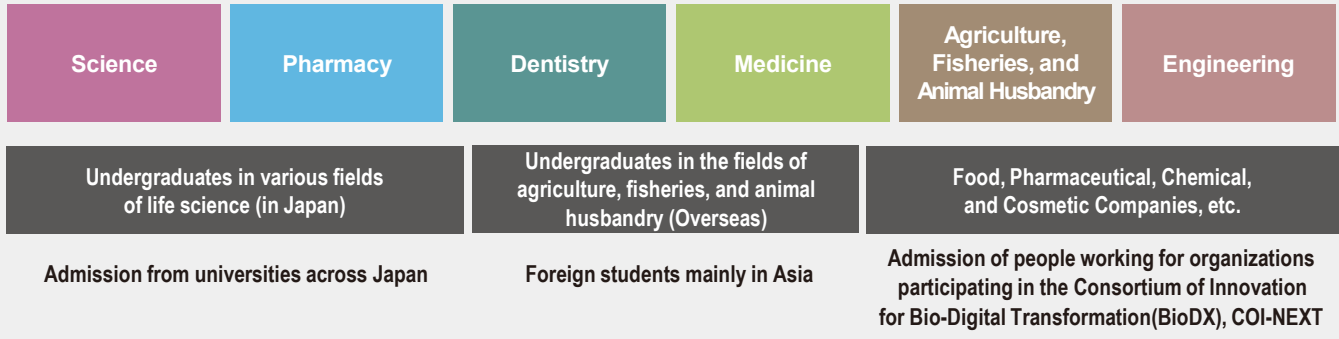
- (1) 50,000 yen per month will be provided for up to three students for six months. Those who are recognized as having excellent academic performance and making outstanding achievements in academic activities after enrolling in the university will be eligible for this program. (Details of the application, including timing, will be announced after admission.)
- (2) Free tuition will be provided for the third and later years of the Life Science Course and all years of the Medical Course. (Some students may not be eligible due to their academic performance.)
- (3) Travel grants will be provided up to the amount specified by the program for an internship.
- (4) From April 2025, travel grants will be provided up to the amount specified by the program for students' joint research/ research activity at overseas universities/institutions.
- (5) Ikenoue Student Dormitory is exclusively available for program students for 2 years for a charge (monthly boarding fee is 4,700 to 15,000 yen; in addition, students must pay common expenses and utility expenses).

* The forms for financial support described in (1), (2), (3), (4) and (5) are up to date as of April 1, 2025, but may be subject to change in the future. The support is provided only within the standard course term.



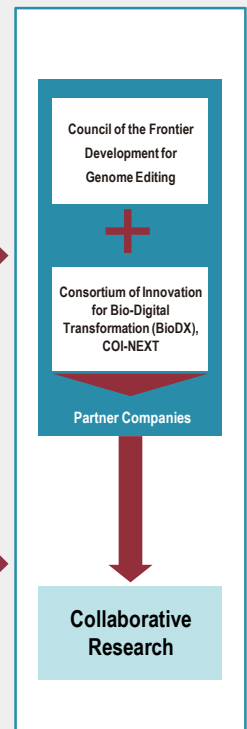
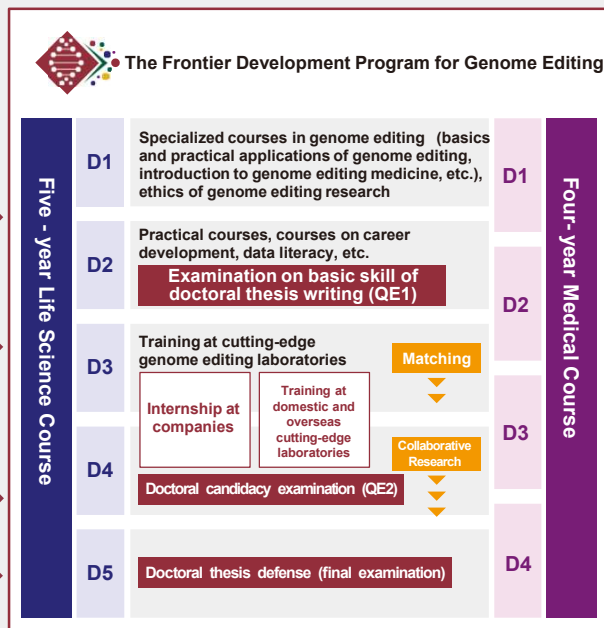
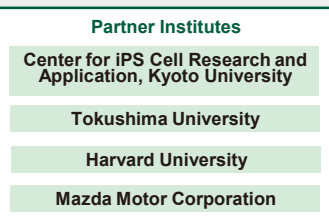
Opening up the Future with Genome Editing

Genome editing is the fundamental technology of life science, and this program is open to students from a wide range of backgrounds.



Doctoral Program for World-leading Innovative & Smart Education

Program provider



Students acquire the ability to apply technologies to society (ability for social implementation) under an organization that enables them to experience the speed of advanced research.

Produce genome editing researchers who develop new industries.

Developers of industrial genome editing technologies

Developers of genome editing-based therapies and drug discovery

Food and Chemical Companies

Pharmaceutical and Bio-venture Companies

University Researchers, Venture Companies

Entrepreneurs of venture businesses related to genome editing

Developers of basic genome editing research

Consortium Council of the Frontier Development for Genome Editing + Consortium of Innovation for Bio-Digital Transformation (BioDX), COI-NEXT

One of the features of this program is that fostering students' cutting-edge and practical R&D capability through collaborative research with private companies in the Council of the Frontier Development for Genome Editing and/or organizations participating in the Consortium of Innovation for Bio-Digital Transformation (BioDX), formed in the COI-NEXT.



As of July 2026

YAMAMOTO Toshihide

General Manager, Technical Research Center, Mazda Motor Corporation

To achieve carbon neutrality in the automotive sector by 2050, Mazda believes that it is essential to combine vehicles with internal combustion engines, including hybrid vehicles, with liquid fuels produced from microalgae (biomass) in line with its multi-solution strategy. For this reason, we would like to expect for the technologies that Hiroshima University and Institute of Science Tokyo are working on to improve production efficiency of microalgae oil and fat, including genome editing research.



KODAMA Daisuke

General Manager, Functional Materials Department, Institute of Future Creation, R&D Division, Kewpie Corporation

Kewpie has taken various initiatives to settle out with the problem regarding people who are suffering from egg allergies. We have conducted joint research with Hiroshima University and PtBio Inc. aimed at developing allergen-reduced eggs. Ultimately, utilization of genome editing technology made it possible to eliminate Ovomuroid which is a major allergen in egg white. We hope that genome editing technology will be one of the promising technologies to solve various social issues, including allergies, and establish the bioeconomy.



The Frontier Development Program for Genome Editing

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