Okayama University Integrated Report 2022

Pay it Forward

Digest

Okayama University Vision 3.0

A Research University that Together Create and Nurture a Bright Future

－Fourth Mid-term Target Period－
(2022-2027)

Under the SDG University Management, we are developing five strategies.

Global Engagement Strategy

Strengthening global engagement through collaborative efforts with various international organizations

Okayama University DX Promotion Plan

Digital transformation (DX) in pursuit of the SDGs

Education

Fostering pioneers capable of independently pursuing change on a continual basis
- Strengthen bachelor degree programs and links between high school and university education
- Graduate school education reforms
- Enhancement of recurrent education

Research / Industry–Academia Co-Creation

Promoting societal application of research results to address social problems
- Offer environments that help young researchers to take on new challenges based on free, open-minded thinking
- Concentrate and strengthen innovation creation functions within the University

University Management

Toward a resilient organization that is highly adaptable to change
- Strengthen governance system through enterprise risk management (ERM)
- Promote diversity & inclusion (D&I)
- Strengthen internal branding
- Achieve a more sound University Hospital management, diversify fiscal resources and carry out autonomous incorporated management operations
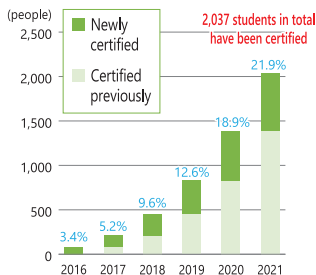
Fostering Advanced All-round Achievers

The University has fostered advanced all-round achievers who have acquired three core powers and put them into practice in the global arena through experience across three areas, i.e. across disciplines, across societies, and across cultures.
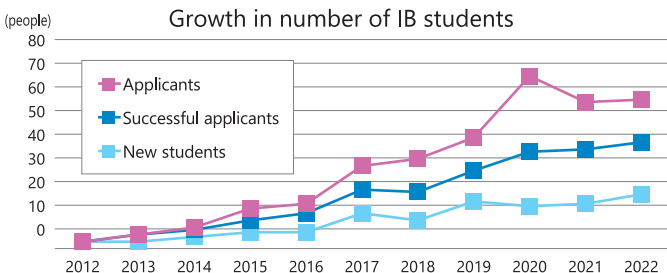

Advanced all-round achievers
Advanced all-round achievers (Global)
Three core powers
Advanced all-round achievers
Across three areas
Liberal arts strength
GPA in liberal arts courses
Basic requirements
Across societies
GPA in practical, socially collaborative courses
Linguistic ability
External English test results
Professional knowledge
GPA in major courses
Across disciplines
GPA in courses offered by departments other than the student's own
Across cultures
Study abroad, etc.

https://www.ipec.okayama-u.ac.jp/eng/

Growth in number of students certified as advanced all-round achievers

(people)
2,037 students in total have been certified

- Newly certified
- Certified previously

Year	%
2016	3.4%
2017	5.2%
2018	9.6%
2019	12.6%
2020	18.9%
2021	21.9%

Eligible students: 4th year or older
% in figure indicates the number of newly certified students with respect to the number of eligible students (2,972 in FY 2021)

Acceptance of International Baccalaureate (IB) Students

The University is at the forefront of other national universities in Japan in implementing International Baccalaureate (IB) admissions. We currently accept students using IB in all faculties and programs. We have been conducting various research surveys on IB education and public communications. To date, this have resulted in a total of 101 enrolled IB students (2012-2022) from 13 prefectures and 19 countries around the world.

Growth in number of IB students

(people)

- Applicants
- Successful applicants
- New students

Sabina Mahmood
Associate Prof, MD, Ph.D.
Institute for Promotion of Education and Campus Life, Okayama University
Center for Admission
Office Manager, International Baccalaureate Admission Section

KISHABA Tomoki
Medical School, Faculty of Medicine
Global youth representative at One Young World and the International Federation of Medical Students Associations (IFMSA)

TANAI Airi
Dental School, Faculty of Dentistry
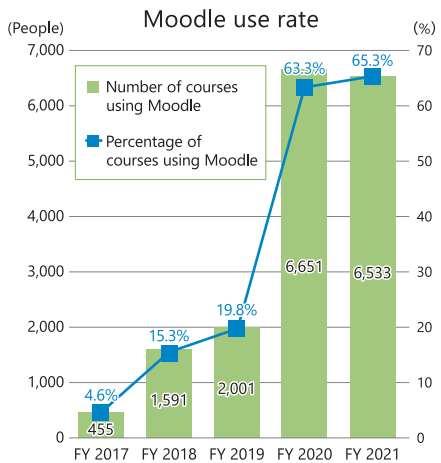Wins the Student Clinician Research Program (SCRP) Japan National Selection Competition, working on research

https://www.okayama-u.ac.jp/eng/international_admissions/InternationalBaccalaureate.html
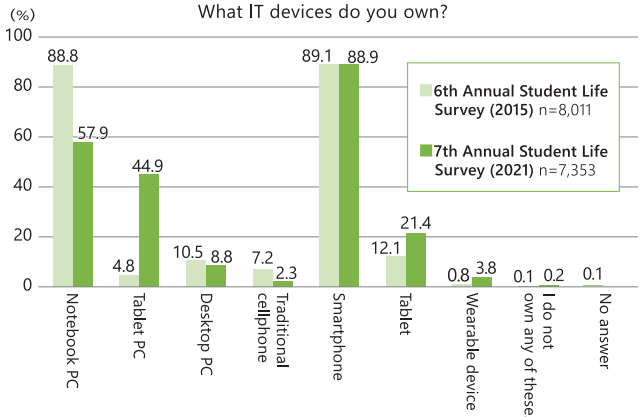
Learning Management Systems (LMS)

Okayama University has introduced Moodle (a learning management system) as a foundation for ICT-enhanced classes. Through FY 2019, the use rate was less than 20%, but in FY 2020, the use rate exceeded 60% as the need for online classes increased due to the outbreak of COVID-19.

Moodle use rate

(People) / (%)

- Number of courses using Moodle
- Percentage of courses using Moodle

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021
Number of courses using Moodle	455	1,591	2,001	6,651	6,533
Percentage of courses using Moodle	4.6%	15.3%	19.8%	63.3%	65.3%

IT equipment owned

What IT devices do you own?

(%)

- 6th Annual Student Life Survey (2015) n=8,011
- 7th Annual Student Life Survey (2021) n=7,353

	Notebook PC	Tablet PC	Desktop PC	Traditional cellphone	Smartphone	Tablet	Wearable device	I do not own any of these.	No answer
6th (2015)	88.8	4.8	10.5	7.2	89.1	12.1	0.8	0.1	0.1
7th (2021)	57.9	44.9	8.8	2.3	88.9	21.4	3.8	0.2	

Online class in progress

Fostering International Leaders

In January 2020, Okayama University signed a Memorandum of Understanding (MoU) with the United Nations Conference on Trade and Development (UNCTAD), the first of its kind in the world for a university, and based on the MoU, developed the "Joint Research and Training Course for Young Women Researchers from Developing Countries" for young researchers in Asia and Africa.

Online Presentation of Research Results of "Joint Research and Training Course for Young Women Researchers from Developing Countries" with UNCTAD

https://www.okayama-u.ac.jp/eng/news/index_id10510.html

Every year since 2015, Okayama University has sent students to the One Young World (OYW) Global Summit for Future Leaders, one of the world's largest gatherings of young leaders representing the next generation from 196 countries around the world, and participating students have built long-lasting connections with the next generation of leaders around the world as OYW ambassadors. In The Yomiuri Shimbun, Okayama University also highlighted its efforts to promote the development of next-generation leaders by providing opportunities for students to play an active role in their careers.

Published 2022.3.28 in
The Yomiuri Shimbun National Edition

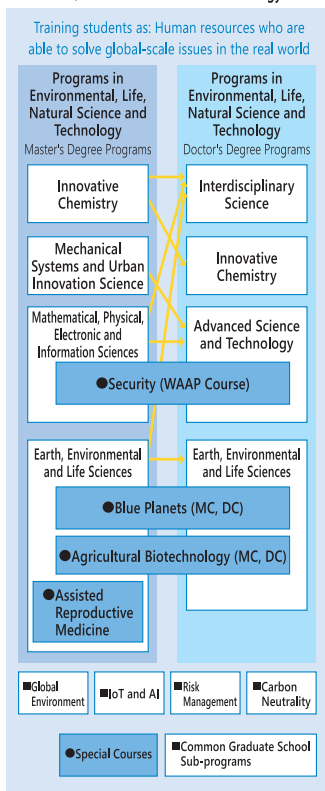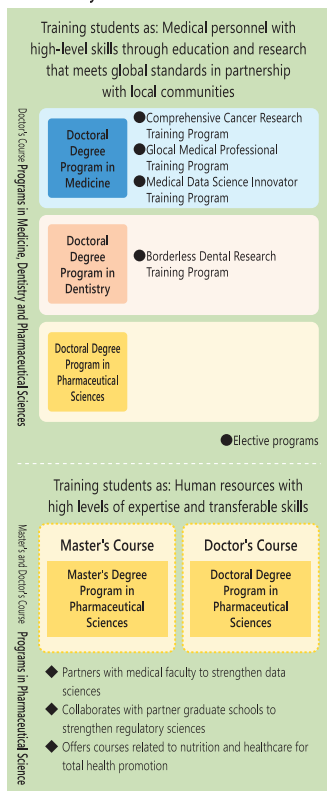https://globalengagementoffice.okayama-u.ac.jp/news/1634/

Graduate School Reform through Co-education and Co-creation

Student-centered graduate school reform to create and nurture together

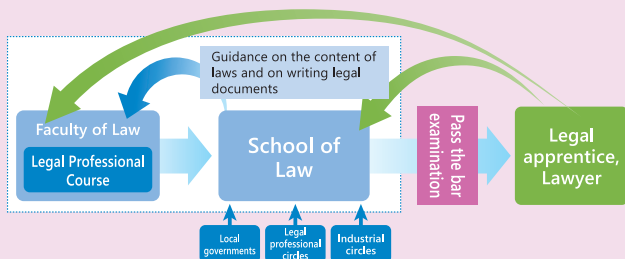### Overview of the Graduate School of Environmental, Life, Natural Science and Technology

Training students as: Human resources who are able to solve global-scale issues in the real world

Programs in Environmental, Life, Natural Science and Technology Master's Degree Programs	Programs in Environmental, Life, Natural Science and Technology Doctor's Degree Programs
Innovative Chemistry	Interdisciplinary Science
Mechanical Systems and Urban Innovation Science	Innovative Chemistry
Mathematical, Physical, Electronic and Information Sciences	Advanced Science and Technology

●Security (WAAP Course)

Earth, Environmental and Life Sciences	Earth, Environmental and Life Sciences

●Blue Planets (MC, DC)

●Agricultural Biotechnology (MC, DC)

●Assisted Reproductive Medicine

- ■Global Environment
- ■IoT and AI
- ■Risk Management
- ■Carbon Neutrality

- ●Special Courses
- ■Common Graduate School Sub-programs

Overview of the Graduate School of Medicine, Dentistry and Pharmaceutical Sciences

Training students as: Medical personnel with high-level skills through education and research that meets global standards in partnership with local communities

Doctor's Course Programs in Medicine, Dentistry and Pharmaceutical Sciences

Doctoral Degree Program in Medicine	●Comprehensive Cancer Research Training Program ●Glocal Medical Professional Training Program ●Medical Data Science Innovator Training Program
Doctoral Degree Program in Dentistry	●Borderless Dental Research Training Program
Doctoral Degree Program in Pharmaceutical Sciences	

●Elective programs

Training students as: Human resources with high levels of expertise and transferable skills

Master's and Doctor's Course Programs in Pharmaceutical Science

Master's Course	Doctor's Course
Master's Degree Program in Pharmaceutical Sciences	Doctoral Degree Program in Pharmaceutical Sciences

- ◆ Partners with medical faculty to strengthen data sciences
- ◆ Collaborates with partner graduate schools to strengthen regulatory sciences
- ◆ Offers courses related to nutrition and healthcare for total health promotion

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Growing together with your alma mater even after graduation
Legal Profession Course Initiative of the Faculty of Law and School of Law
— Making the most of close partnerships with local governments, the legal professional circles, industry and academia —

Guidance on the content of laws and on writing legal documents

Faculty of Law — Legal Professional Course → School of Law → Pass the bar examination → Legal apprentice, Lawyer

- Local governments
- Legal professional circles
- Industrial circles

DX Ecosystem in the Okayama Region

At Okayama University, programs such as the "Okayama IoT/AI/Security Course" for non-traditional students, "OASIS" for collaborative research between companies and researchers, and the "Cypher" organization for AI and data science researchers are actively connected to the "Data Science Club".

"Okayama University DX Core" is Exciting!

Space for collaborative research between companies and researchers

- Businessperson
- Faculty
- Graduate student

おかやまAI・セキュアIoT共創コンソーシアム

OASIS
Okayama AI Secure IoT co-creation consortium

OASIS

Non-traditional student courses
Ministry of Education, Culture, Sports, Science and Technology Approved "Brush up Program for Professionals"

- Graduate student
- Working adult

Okayama IoT/AI/Security Course

Okayama University DX Core

- Joint research
- Hackathons
- Ideathons
- Working groups
- Learning assistance
- Workshops
- Symposiums

Student ventures

TechSword

The Campus Venture Grand Prix MEXT Minister Prize FY 2021

Club activities that transcend the boundaries of literature, science, and academic class to solve problems using technology and the results of university studies.

- Undergraduate student
- Graduate student
- Faculty and staff

D.S.⅏

Data Science Club
Aiming to create new value through ideas and data science
Approximately 100 students and cooperating faculty and staff total (as of September 2022)

Research hub for AI and data science researchers across the university

- Undergraduate student
- Graduate student
- Faculty

Cypher
Cyber-Physical Engineering Informatics Research Division
Okayama University

Cypher

Enjoy your time with data science! Data Science Club

https://okadai-dsc.studio.site/

Digital Transformation for Smooth Medical Care

Okayama University Hospital introduced the outpatient visit support app for patients "HOPE LifeMark Concierge," the medical information sharing app "NOBORI," and the online reservation system for medical institutions "C@RNA CONNECT" to make the procedures easy.

Outpatient Visit Support App "Concierge"

Medical Information Sharing App "NOBORI"

https://www.okayama-u.ac.jp/user/hospital/index416.html

https://www.okayama-u.ac.jp/user/hospital/index417.html

Starting Operation of "Doctor Car"

A large-size ambulance "Doctor Car" was deployed from August 2021. Doctor Car, with a medical team on board comprised of a doctor, nurse, and clinical engineer, is used for wide-area transportation of patients inside and outside the prefecture and for severe patients using advanced medical equipment such as ECMO. It is also dispatched to disaster areas as a "DMAT Car" at the time of disaster.

Large-size Ambulance "Doctor Car" of Okayama University Hospital

Patients who need advanced medical equipment such as ECMO can be transported by a vehicle with more space than an ordinary ambulance.

https://www.okayama-u.ac.jp/user/hospital/news/detail290.html

Visualizing Our Finances

National university corporations are operating on a break-even basis. As part of our efforts to visualize our finances, we prepared an income statement using corporate accounting principles, as shown below.

FY 2021 (millions of yen)

Operating revenue (revenue from core operations)	**45,525**
Tuition, admission, and examination fees	7,647
Contracted research	3,621
Sales and service revenue	34,253
Other operating revenue	2
Operating expenses (expenses incurred for core operations)	**69,659**
Wages and salaries	34,078
Retirement allowance	1,661
Scholarships	1,049
Utilities	1,422
Supplies and materials	18,227
Depreciation	4,675
Other operating expenses	8,544
Operating profit (loss)	**△ 24,133**
Non-operating income or expenses (income or expenses other than the above)	**28,527**
Non-operating income	**28,657**
Operating grants	18,394
Subsidies	6,510
Donations	2,214
Research-related income (income from indirect Grants-in-aid for Scientific Research expenses, etc.)	624
Income from for-profit operations (rent income, etc.)	829
Other non-operating income	83
Non-operating expenses	**△ 129**
Interest expenses	△ 103
Other non-operating expenses	△ 25
Ordinary profit	**4,393**
Extraordinary gains or losses	**703**
Facility improvement grants	403
Other extraordinary gains	335
Extraordinary losses	△ 35
Profit	**5,097**
Amount equivalent to depreciation not included in the income statement	2,120
Profit (loss) after taking into account the amount equivalent to depreciation not included in the income statement	**2,977**

Research Strategy

Using an evidence-based research strategy, we selected priority research fields from the perspective of prioritizing resource allocation and implemented the Program to Support the Formation of Next-Generation Research Initiative (comprising nine research centers as of March 2021) with the goal of developing the University into a global research hub. The International Research Center Formation Program to Accelerate Okayama University Reform (RECTOR) was established in FY 2018 under the direct control of the President, and is currently running five programs on quantum coherence, photosynthesis, molecular imaging, astrophysics data analysis, and transcriptome. The program invites outstanding researchers working in leading countries in Europe and the United States in order to enhance global awareness and accelerate improvements in our research capabilities as a global leader through international joint research with our university researchers and young researchers.

Research Center Formation and Support for Young Researchers (2018-2021)

Input	Activities (Initiatives within the University)	Output	Outcome (2019-2021)
Investment amount 334,654,000 yen	**RECTOR Program**	●Employment of overseas principal investigators (PI) and young researchers	**Increase in external funding 780,863,000 yen**
Human resources ●Researchers ●Organization For Research Strategy And Development (URA) ●Research Cooperation Department	Program to Support the Formation of Next-Generation Research Initiative	●Joint research with research institutes in and out of Japan ●Exchange of researchers and students ●Application to international projects, such as Horizon Europe	●Number of papers 1,161 (40% increase) ●Number of papers co-authored by an international research group 376 (50% increase) ●Number of academic papers in top 10% by citations 109 (63% increase)
	Research Professor/Research Associate Professor Program	●Application to large-scale research projects ●Securing research time	●Number of Q1 journal papers 659 (53% increase)
	Incentive and Support Package for Young Researchers	●Building a network of young researchers	●Amount of external funding acquisition 2,317,774,000 yen (51% increase)

*Aggregate achievements of five centers in the RECTOR Program, 48 group representatives from the Program to Support the Formation of Next-Generation Research Initiative, and 28 research professors/research associate professors. Increase in amounts and percentages are based on 2016-2018
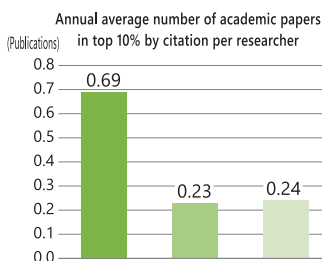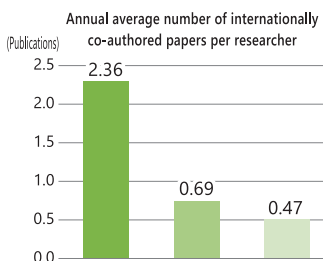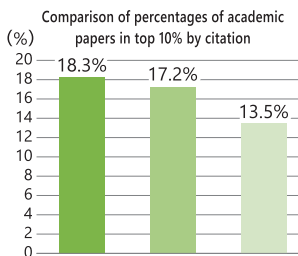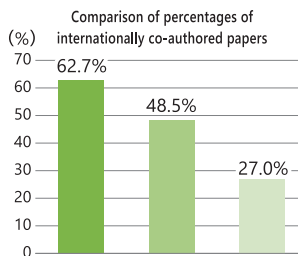

Photo: Markus Marcetic, ©The Royal Swedish Academy of Sciences

SHEN Jian-Ren, Director of the Research Institute for Interdisciplinary Science, is awarded the Gregori Aminoff Prize. Receiving the certificate and medal from the King of Sweden (Stockholm City Hall, June 2022)

Comparing RECTOR Program and WPI Centers

Comparison of percentages of internationally co-authored papers

(%)

- 62.7%
- 48.5%
- 27.0%

Comparison of percentages of academic papers in top 10% by citation

(%)

- 18.3%
- 17.2%
- 13.5%

Annual average number of internationally co-authored papers per researcher

(Publications)

- 2.36
- 0.69
- 0.47

Annual average number of academic papers in top 10% by citation per researcher

(Publications)

- 0.69
- 0.23
- 0.24

■ Three Okayama University RECTOR centers　■ WPI center (1)　■ WPI center (2)

*All the scale-adjusted paper metrics (percentage of papers, field-weighted citation impact, by researcher) of the three leading centers of the RECTOR Program (International Research Centers for Quantum Coherence, Photosynthesis, and Molecular Imaging) exceed those of the WPI centers (data as of November 2021)

Expansion of the OU Fellowship to Support Students in Doctoral Courses

The University regards graduate school students in doctoral courses as young researchers and works to provide them with the appropriate research environment.
As part of this effort, we expanded the OU Fellowship established in FY 2020, and created the new Type B in FY 2021 (renaming the previous OU Fellowship as Type A).

OU Fellowship Certificate awarding ceremony

🖥️📱 https://www.orsd.okayama-u.ac.jp/kenkyusha/ou-fellowship/ou-fellowship-eng/

Successes from Growth Investments

(1) RECTOR Program

External funding acquisition (636 million) is 4.4 times the investment amount (144 million between 2019-2021)
Number of papers co-authored by an international research group +75%, number of academic papers in top 10% by citation +138%, number of Q1 journal papers +77%

(2) Support for young researchers

Achievements by research professors/research associate professors (accredited between 2018-2020):
Amount of competitive external funds acquired +38%, number of papers co-authored by an international research group +13%

(3) Support for female researchers

Received an overall S rating from the Japan Science and Technology Agency's Initiative for Realizing Diversity in the Research Environment (Advanced Type, Distinctive Features Type)
Improved research skills of female researchers, compared to end of the second term

(4) Support for University-based startups and ventures

Won the Campus Venture Grand Prix's
Minister of Economy, Trade and Industry Award for two consecutive years (2020-2021)

Student Venture Activities

Published by the national newspaper, Nihon Keizai Shimbun, in March 17, 2022

Research Institute for the Dynamics of Civilizations

We have built the interdisciplinary research system through a linkage between the humanities and social sciences field and the natural science field, and will develop a new picture of history and expertise with six research institutes and companies in Europe represented by the University of Turin, Italy.
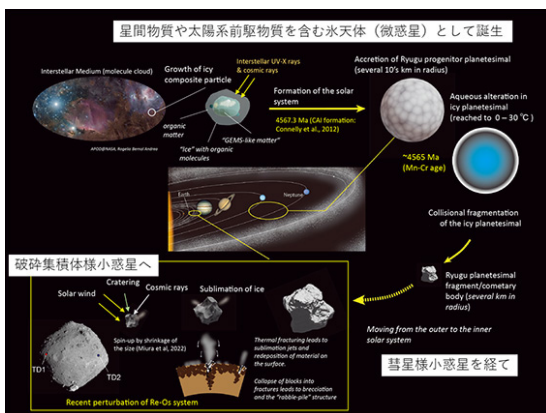

Sampling at Tobiozuka Tumulus in Okayama City
©Marco Merola

https://ridc.okayama-u.ac.jp/english/

Institute for Planetary Materials

We conducted comprehensive analysis of the samples collected and returned by explorer "Hayabusa2," the first such analysis in the world, and made important discoveries that will lead to exploration of the origin of life in the solar system. We will see a new picture of the evolution of substances in the solar system, which has continued for over 4.6 billion years.

The origin, evolution, and dynamics of asteroid "Ryugu" discovered by our comprehensive analysis

https://www.misasa.okayama-u.ac.jp/eng/

Revenue Structure Reform through IMaC

The Innovation Management Core (IMaC), created in October 2021, is a leader in combining Innovation Creation Functions with Revenue Structure Reform. IMaC has organized agile project teams formed across campus organizations to engage in cross-organizational industry-academia co-creation, thereby enhancing the speed and agility of new value creation. Thanks to the efforts of IMaC, there has been a steady increase in collaborative research with the private sector in the midst of the COVID pandemic.

> National University Innovation Creation Environment Enhancement Project (2020-2021)

> National University Management Reform Promotion Project (2021)

Trigger

Innovation Ecosystem from a Virtuous Cycle of Human Resources, Knowledge, and Funding

Innovation Creation Functions × Revenue Structure Reform

- Concentrate resources on priority areas, new fields, and solutions to social issues
- Secure, develop, and improve environments for excellent young human resources

- Secure private funding to translate research results into societal impact
- Convert existing resources into revenue

IMaC (Innovation Management Core)

Autonomous decentralized agile organization

★ Faculty, administrative staff, URAs get together to work on project-based, cross-organizational co-creation activities

■ Accelerate industry-academia collaboration and co-creation by strengthening academic and research capabilities through agile collaboration across university-wide organizations

■ Increase large-scale industry-academia co-creation research ↑, indirect expenses ↑, license fees ↑, industry-academia management expenses ↑
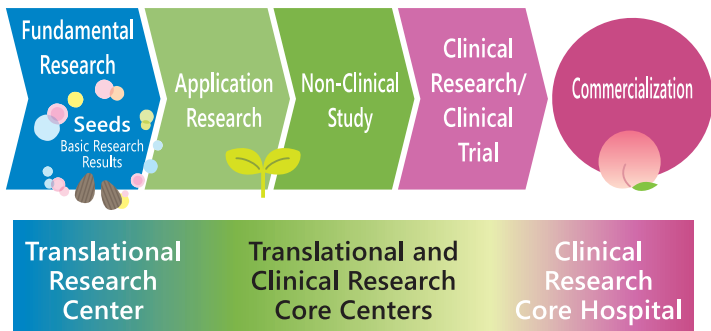
⇒ **Contributions to operations**

https://www.orsd.okayama-u.ac.jp/imac/

Top Runner of Medical Research
Okayama University Hospital

We provide seamless support from the seeds of medical research to commercialization at three locations: "Translational Research Center," "Translational and Clinical Research Core Centers," and "Clinical Research Core Hospital."

Fundamental Research
Seeds
Basic Research Results

Application Research

Non-Clinical Study

Clinical Research/Clinical Trial

Commercialization

Translational Research Center

Translational and Clinical Research Core Centers

Clinical Research Core Hospital

Okayama University provides support as the **only center** in the Chugoku and Shikoku region.

BIZEN Program

We started the BIZEN Program in full-scale from December 2021. This program provides a platform where innovation that contributes to medical field can occur through training people and developing technologies.
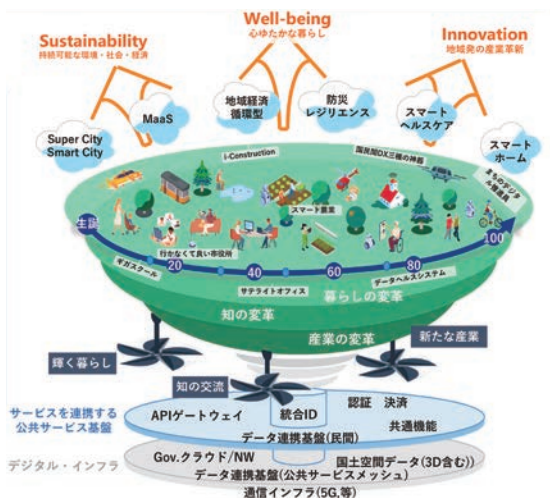
BIZEN
Business Innovation
Zone for Entrepreneurship

Industry
Companies
Entrepreneurs
(including students)

■Developing core human resources by OJT
■Utilizing inexpensive infrastructure
■Ensuring commercialization backed by science and on-site investigation

■Promoting solving medical issues
■Activating local economy

BIZEN Program

■Realizing the needs of medical practice
■Activating hidden seeds (research, object, person)

Government
Government Offices
Banks/Funds

Academia
Okayama University
Cooperative Medical
Institutions

http://shin-iryo.hospital.okayama-u.ac.jp/bizen/

Creating futuristic cities where people can live safely and securely

Source: Cabinet Secretariat, "Council for the Realization of the Vision for a Digital Garden City Nation (2nd meeting)" document

💻📱 **https://www.okayama-u.ac.jp/tp/news/news_id11060.html**

This initiative focuses on health and medicine with the goal of creating a pioneering model for solving problems in rural areas across Japan through the use of digital technology. Okayama University will play a central role in planning the concept, and will conduct demonstrations in Kibichuo Town on "medical health information collaboration," "digitizing maternal and child health information," and "expanding the role of paramedics in emergency medical care," with the aim of realizing this concept.

Simulated treatment in an ambulance by paramedics

Japan. Committed to the SDGs

OKAYAMA UNIVERSITY

SUSTAINABLE DEVELOPMENT GOALS

Okayama University supports the Sustainable Development Goals (SDGs)

This pamphlet uses eco-friendly paper and ink.