

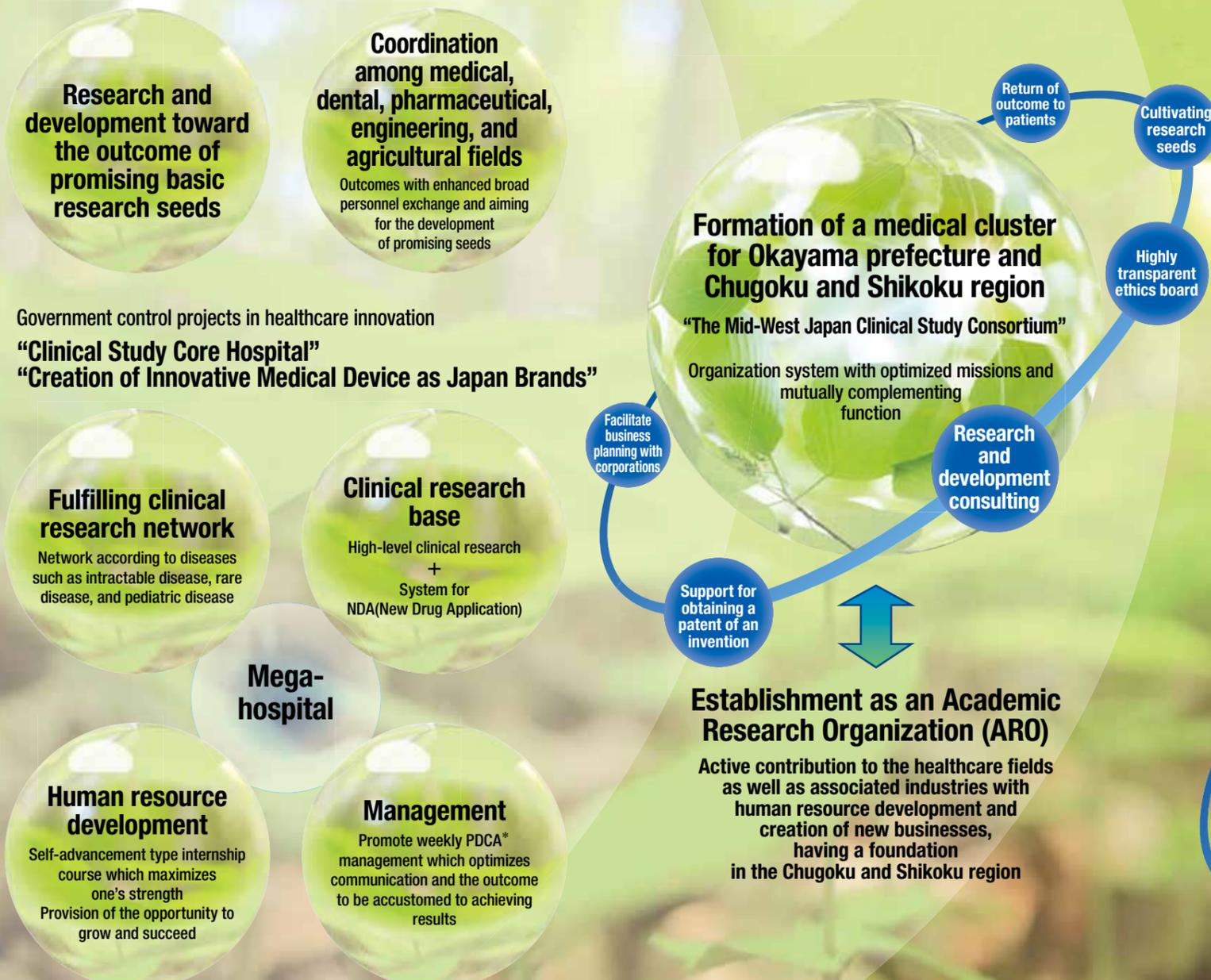
# Innovative medical research and development base aiming to extend the healthy life expectancy.

Promote contribution and implementation to society and put the “various needs aiming to extend the healthy life expectancy” into practical use in a high level and rapid manner.

Government control projects in medical research innovation

“Acceleration of a translational research network”

“Promotion to strengthen research universities / Top Global University Project”



Government control projects in healthcare innovation

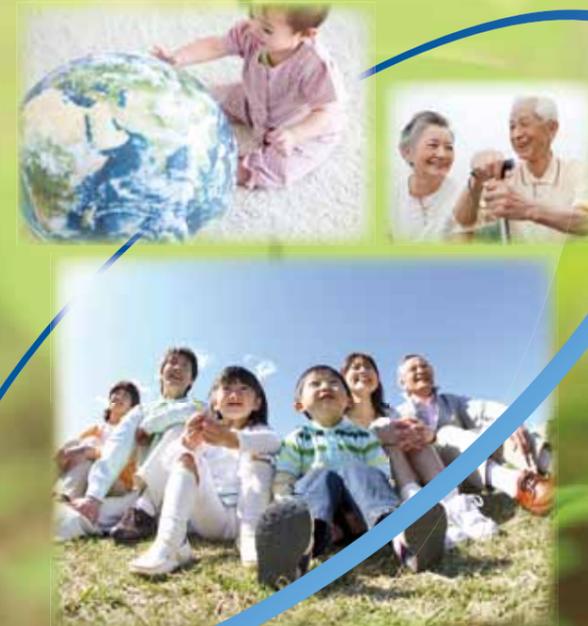
“Clinical Study Core Hospital”

“Creation of Innovative Medical Device as Japan Brands”

## Philosophy of Okayama University

We will contribute to the progression of human society through the creation of high-level intelligence (research) and the accurate devolution of knowledge (education and contribution to society).

## Contribution to a healthy longevity society



### Acceleration from improving the system to realization of research outcomes

Okayama University has been selected as the academia base for 4 areas of government control projects. “Promotion to strengthen research universities (2013)”, “Clinical study core hospital (2013)”, “Creation of medical device in Japan (2014)”, and “Acceleration of a translational research network(2014)”



By cultivating a cooperation system with the field of health and caretaking, science and engineering, as well as agriculture around the Graduate School of Medicine, Dentistry and Pharmaceutical Sciences, the coordination among medical, dental, pharmaceutical, engineering, and agricultural fields is strongly promoted.



A system which promotes creative and innovative research is being expanded not only within the university but also in the Chugoku and Shikoku region with the Mid-West Japan Clinical Study Consortium as the foundation. Cooperation and interaction among the researchers are becoming active now.



The creation of the Mega-Hospital (83 hospitals with 200 or more beds, 33 thousand beds) formulated by Okayama University in the last fiscal year was broadly acknowledged in the Chugoku and Shikoku region as the “base to lead innovative medical technology progressing with the community.”

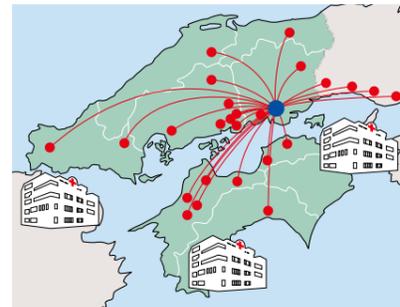
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\* PDCA: Method in which by repeating the 4 steps of action Plan → Do → Check → Act, ensuring the process to be improved continuously.

# Re-engineering as a base of research focusing to create a healthy longevity society

As a research institution with all 3 cores of “Promotion to strengthen research universities / Top Global University Project” which is the core of basic research, “Clinical study core hospital,” which is the core of clinical research (practical application), and the “Acceleration of a translational research network” which connects basic research and clinical research, Okayama University will lead the way for the medical care the world needs and fully contribute to the development of humankind.



Network within the base of Okayama University

### Hardware

Okayama University established the “Center for Innovative Clinical Medicine” which functions as the TR center. Promising seeds will be discovered from medical universities and university hospitals, as well as the Mid-West Japan Clinical Study Consortium, and will be selected, evaluated, and reviewed to become a bridge for the support of clinical research and implementation of clinical studies of the Center for Innovative Clinical Medicine.

### Software

A basic education program on intellectual property and a forum on intellectual property are held for the business people, researchers, and students of the Chugoku and Shikoku region, and e-learning education is given to persons involved in the institutions participating in the Mid-West Japan Clinical Study Consortium.



# Through coordination with other institutions, seeds are developed from various viewpoints

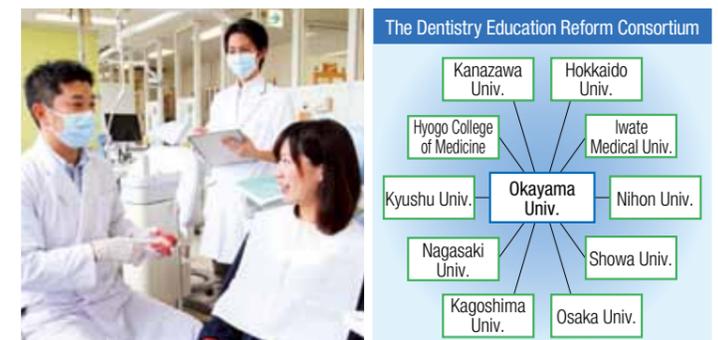
## Coordination with the network among universities of the Chugoku and Shikoku region

Through the network among universities of the Chugoku and Shikoku region, efforts are made for the development of collaborate seeds. For example, collaborate research is performed on the “Development of a device for blood screening for asbestos exposure and mesothelioma” and “Prevention of renal dysfunction induced by chemotherapeutic agents with 5-aminolevulinic acid” with Kawasaki medical school, and together with Okayama University of Science, the internship programs for the promotion and structural improvement program for the creation of medical devices born in Japan are co-hosted.



## Coordination with the Dentistry Education Reform Consortium

In order to realize a healthy longevity society, promotion of a new education and research aiming for health enhancement, care prevention, and prevention of fragility based on “eating” of the elderly is in need. At Okayama University Hospital, seeds associated with dentistry are developed while coordinating with the “Dentistry Education Reform Consortium.” Efforts are made in the research areas such as “Maintenance of a normal oral cavity function,” “Sophistication of areas regarding oral cavity diseases and systemic illness,” and “Dental care responding to the super-aging society.”



# The future pictured by Okayama University Hospital: Aiming for medical innovation from the patient's perspective

## Development of a mastication ability measuring equipment using a food mass granularity analysis system

Professor **Shogo Minagi**, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences (dental)

**Research summary** / If there was an equipment which could easily perform an objective evaluation of mastication for the judgement in improvement of food form, it would be a great help in the clinical setting. The thesis of this research is the establishment of an objective mastication evaluation method as to whether the food form can be improved in the elderly who require care from "blender food" to "chopped food" and furthermore from "chopped food" to "bite-sized food."

## Development of a mandibular joint traction equipment

Professor **Shogo Minagi**, Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences (dental)

**Research summary** / Osteoarthropathy of the mandibular joint not only invokes the collapse in the occluding relation, but also can cause obstruction of the airway. This research develops an equipment which mechanically tractions the joint in order to drastically shorten the treatment duration. The traction equipment under development can be expected to produce an immediate traction effect and a drastic treatment renovation.

## Development of a medical robot for CT guided needle puncture

**Takao Hiraki**, lecturer at Okayama University Hospital **Tetsushi Kamekawa**, **Takayuki Matsuno**, lecturers at Okayama University Graduate School of Natural Science and Technology (engineering)

**Research summary** / The demand for CT guided interventional radiology is increasing with the growing aging population because it is minimally invasive, can be performed in a short amount of time, and inexpensive. On the other hand, the operator is easily exposed to radiation since the procedure is performed right by the CT equipment. By developing a robot for interventional radiology which can be remotely controlled away from the CT equipment, we aim to eliminate radiation exposure in the operator.

## Development of contrast media for articular cartilage

Okayama University Graduate School of Medicine, Dentistry and Pharmaceutical Sciences (medical and pharmaceutical) / **Toshitaka Ohashi**, **Hiroki Kakuta**, **Satoshi Hirohata**, **Keiichiro Nishida**

**Research summary** / This research aims to develop a drug which can enhance the image of the articular cartilage tissue on X-rays. If this can clearly evaluate the progression of the lesion in the articular cartilage, contribution to the early diagnosis and development of new medications for articular disorders including rheumatism can be anticipated.

## Company-based multicenter clinical trial on myocardial regeneration for cardiac failure in children

Professor **Hidemasa Oh**, Okayama University Hospital

**Research summary** / For severe congenital heart diseases such as hypoplastic left heart syndrome, the only treatment option may often be a "heart transplant," but in the current situation in Japan, there are few child brain-dead donors. In this research group, "regenerative medicine" in which the heart stem cell of the child with the congenital heart disease is harvested and cultured, and then transplanted in the heart muscle to strengthen its function is developed for the first time in the world, and clinical research is ongoing.

## Prevention of renal dysfunction induced by chemotherapeutic agents with 5-aminolevulinic acid

Professor **Yoshio Naomoto**, Kawasaki Medical School Department of General Surgery

**Research summary** / The anti-cancer drug cisplatin requires admission to the hospital for forced diuresis with massive transfusion and diuretics in order to prevent renal dysfunction and decreases quality of life. Inoue et al of Kochi University (Terada Y.et al, 2013) has shown for the first time that 5-aminolevulinic acid inhibits the increase of serum BUN and creatinine due to cisplatin as well as the pathological renal tubular damage. We aim for the clinical application of this to establish a new method to prevent renal dysfunction which will surpass the conventional massive transfusion method.

# Performing research and acquiring patent for seeds are supported.

For the research outcomes and research seeds born in universities, university hospitals, and research institutions in the Chugoku and Shikoku region, performing research and acquiring patent for seeds are supported at each location.

## 〈Main contents of support〉

For faster actual utilization of the seeds, the following are performed.

- Search and selection for seeds including seeds outside the base
- Support for planning a development strategy towards the actual utilization of the seeds
- Progress management and evaluation of the seeds
- Support acceptable by international standards, responding to overseas coordinating research institutions, and support in responding to overseas regulatory authorities, with the purpose of expanding the seeds internationally
- Support for matching activities with companies
- Support for securing and utilizing strategic intellectual property
- Structure a network with the purpose of accomplishing clinical trials rapidly

Service able to be provided inside and outside of the base

# Research is supported through provision of various services.

As a part of the research support for researchers of the institution, Okayama University Hospital Center for Innovative Clinical Medicine performs consultations and support and accepts entrustment of studies and services regarding research. For clinical study support services, registration fiduciary services, statistical analysis fiduciary services and biobank usage, research support is scheduled to be accepted for entrustment as specified in the separate price list.

- Fare-paying services related to clinical studies
- Fare-paying services associated with clinical research
- Sharing services for various devices in biobank
- Free services related to clinical studies (e-learning)