

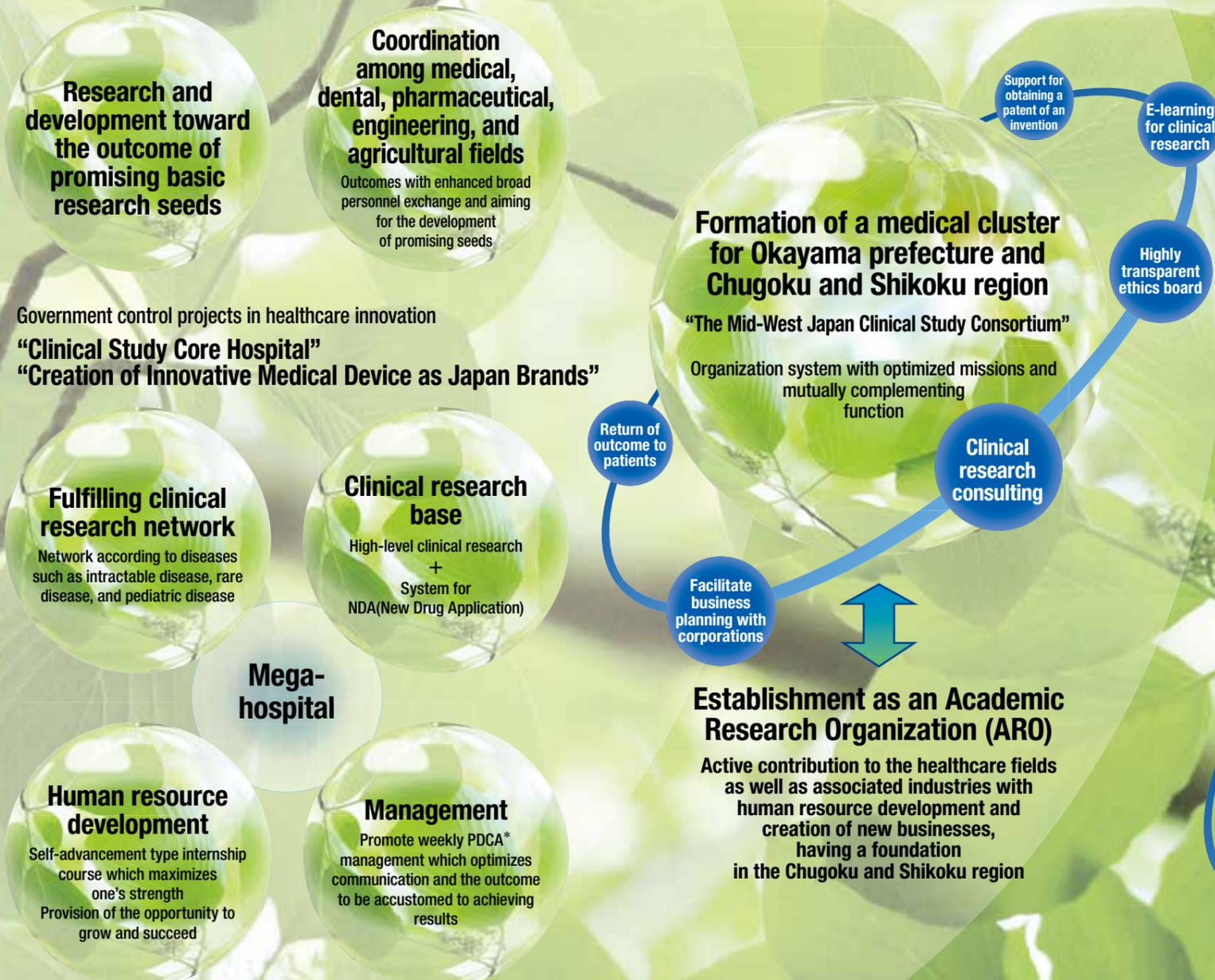
# Innovative medical research and development base aiming to extend the healthy life expectancy.

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”

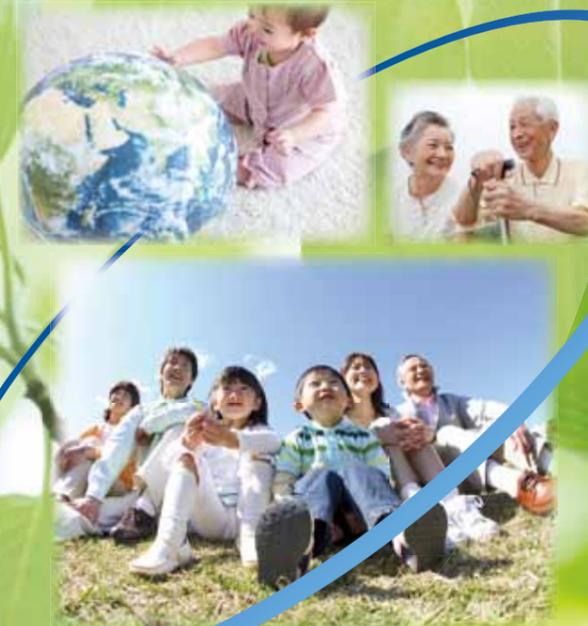


\* PDCA: Method in which by repeating the 4 steps of action Plan → Do → Check → Act, ensuring the process to be improved continuously.

## 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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# Formulation of a network among hospitals interweaving academics with the mega-hospital

## Footsteps toward the realization of the mega-hospital

Various hospital groups continue their independent activities in the Chugoku and Shikoku region. While organically linking these hospitals, Okayama University Hospital has formulated a network among hospitals which is strong like woven fabric and adaptable like pongee. The mega-hospital is created with the academic base as the foundation by interweaving the research universities of each prefecture as the warp and the affiliated hospitals of each of the prefectures as the weft. The network which has 83 hospitals with 200 or more beds with a total of 33 thousand beds supports the clinical research of seeds and functions as an important foundation to realize the creation of new medicine and medical devices while cultivating human resources. In addition, this network makes it possible for the cutting edge medical care promoted by Okayama University as the core hospital to be shared simultaneously among the affiliated hospitals, and broadly provides the opportunity to realize the extension of healthy life expectancy for many patients.

### 〈Seeds development〉

- ▶ Coordination among medical, dental, pharmaceutical, nursing, and technical fields
- ▶ Coordination between medical and agricultural fields
- ▶ Coordination between medical and engineering fields

### 〈Human resource development〉

- ▶ Coordination between life science and management science fields
- ▶ Coordination between life science and juristic fields (intellectual property)
- ▶ Hospital within bases

### 〈Network〉

- ▶ Coordination within bases
- ▶ Coordination among bases

## Research institution with all 5 cores functions

Okayama University was selected for the following 5 services and functions as a research institution which seamlessly links basic research to clinical research.



## Caravan tour to 57 hospitals

Following the first annual caravan tour to visit affiliated hospitals (visited 51 hospitals) of the last fiscal year, the second annual caravan tour to visit affiliated hospitals was conducted in fiscal year 2014 and visited 57 hospitals. In this caravan, the significance and purpose of ARO of Okayama University Hospital and the advantages of participating in this network were explained.



## Recruitment of study patients in 32 affiliated hospitals

Progressive approaches will be made in developments and clinical studies utilizing the mega-hospital network. In the 32 affiliated hospitals participating in the lung cancer group of the Chugoku and Shikoku region, close to 1000 registries are being formed. Recruitment for clinical study patients will be conducted through these registries.

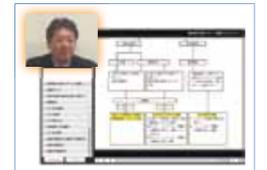


Held on April 19, 2014  
Scene of the lung cancer group joint conference

## Enhancing the skill level in 83 hospitals

### Establishing E-learning "OUH-Elearn"

This educational program develops the abilities of personnel associated with clinical research and trials, and will promote the expansion and progression of clinical research with ethical and scientific validity secured in the hospitals supporting the mega-hospital.



### Establishing an exclusive portal site

A mid-west Japan clinical study portal site has been established in order to transmit information on clinical studies and trials to affiliated institutions of Mid-West Japan Clinical Study Consortium, universities, and related parties of the companies.



## Developing human resource who can provide an exit strategy in 2 years

At Okayama University Hospital, an internship program has been developed for companies considering advancing into the medical device industry, in which acquisition of basic knowledge to the actual development of medical devices can be comprehensively studied. Personnel dispatched from companies are accepted and developed in the "professional development program" and "business development program" courses. We aim to become the place to create innovative medical devices by matching the technology seeds of the companies and the needs of the medical practice.

# Aiming for medical innovation from the patient's perspective

## Hope for blind patients

The world's first artificial retina developed by ophthalmologist and engineering

### Preparation and conducting the physician-led clinical trials of Okayama University-type retinal prosthesis

**Research summary** / With the teamwork of medicine and engineering, an artificial retina which recovers vision was developed for patients who have lost their vision due to retinitis pigmentosa and possess a defect only in their photoreceptor cell. It is simply made with photoelectric dye which converts light into electrical signals and polyethylene film as a substitute for the functions of the photoreceptor cells. It is highly biocompatible, inexpensive, and can be performed with current standard vitreoretinal surgeries.

The developed artificial retina is a new method, first in the world, and has applied and been granted patent, and acquired intellectual property rights.



Associate Professor  
**Toshihiko Matsuo,**  
Okayama University Graduate  
School of Medicine, Dentistry  
and Pharmaceutical Sciences  
Department of Ophthalmology

Seeds created in the university have gone through company startup and clinical research, and are at last in the phase of sponsor initiated clinical trials.

### Development of REIC gene drugs for intractable solid tumors

**Research summary** / "REIC/Dkk-3," which was discovered in 2000 at Okayama University, is a groundbreaking new cancer suppressor gene which selectively attacks and kills cancer cells and furthermore activates immunity. There are almost no side effects because necessary cells are not damaged. At Okayama University Hospital, the vaccination therapy developed based on this has been studied in clinical research on human prostate cancer since 2011, and conducted on 26 patients. Its efficacy has been confirmed.



Professor  
**Hiromi Kumon,**  
Okayama University Graduate  
School of Medicine, Dentistry  
and Pharmaceutical Sciences

## Realization of the international standard for breast cancer treatment

Optimal dose expansion for the patients with a physician-led clinical trial

### Phase I study of docetaxel 100 mg/m<sup>2</sup> for advanced or metastatic breast cancer

**Research summary** / The anticancer drug for advanced or metastatic breast cancer "docetaxel" is approved in the western world for up to 100 mg/m<sup>2</sup> as the maximum dosage. On the other hand, in Japan, the dosage is set as 60 to 75 mg/m<sup>2</sup> and it is considered that there are patients who are not given the full benefit of the drug.

A clinical study has been conducted since September of 2014 at Okayama University Hospital to evaluate the safety upon the administration of this drug to Japanese patients in the maximum dose of 100 mg/m<sup>2</sup>. The increased activation of Japanese participation in international collaborative clinical studies of this drug is also anticipated.



Associate Professor  
**Taizo Hirata,**  
Okayama University Graduate  
School, Department of  
Hematology and Oncology

Aiming to establish a standard treatment for refractory chronic GVHD  
Realize quality of life with the option other than steroids

### Multicenter physician-led clinical study of tamibarotene that targets refractory chronic graft-versus-host disease

**Research summary** / In 2012, Okayama University Graduate School discovered the preventive and treatment effect for chronic GVHD of tamibarotene in chronic GVHD mouse models (Nishimori, Maeda et al. Blood 2012). The incidence rate of this complication which develops after the blood cancer is cured with transplantation has not changed for the last 30 years and treatment is centered on the use of steroids. Furthermore, there are refractory cases in which steroids are not effective, and at present there are no secondary treatments backed with evidence for refractory cases. We would like to verify the preventive and treatment effect for chronic GVHD of tamibarotene with this clinical trial, and widely spread it as standard treatment.



Assistant Professor  
**Yoshinobu Maeda,**  
Okayama University Graduate  
School, Department of  
Hematology and Oncology

## Formation of a registry in 32 institutions in the Chugoku and Shikoku region

Effective development of the most advanced individualized medicine

### Research on individualized medicine for patients with HER2-positive lung cancer

**Research summary** / The treatment outcome for recurrent non-small-cell lung cancer, which is approximately 80 percent of all lung cancers, has not been adequate up until now. Since about 10% of non-small-cell lung cancer patients are HER2 positive, this patient population was extracted and a physician-led clinical trial was conducted, aiming to establish individualized medicine.

The study drug was "Trastuzumab emtansine (T-DM1)," which was shown to prolong survival in recurrent breast cancer with positive HER2. In non-clinical studies, it showed to be sensitive to the lung cancer cell nuclei which are HER2 positive.



Professor  
**Katsuyuki Kiura,**  
Okayama University Hospital  
Department of Allergy and  
Respiratory Medicine