For the promotion of citizens’ welfare and the revitalization of Kobe’s economy
Kobe Biomedical Innovation Cluster

Hiroo Imura
Chairman, Foundation for Biomedical Research and Innovation

We have been endeavoring in cooperation with industrial, academic and government organizations for the creation of a new research and development complex on the Kobe Port Island for the advancement of medical technology, which is considered a growth industry in the 21st century. The Kobe Biomedical Innovation Cluster is designed to revitalize the area’s economy, to promote the health and welfare of the citizens and to make international contribution.

During the first decade of the project, we have seen the establishment of key institutions for translational research, including the Institute of Biomedical Research and Innovation and the Kobe Translational Research Informatics Center, which play leading roles in bringing the fruits of basic research into clinical application. These core institutions have become major attractions for more than 200 medical-related companies which decided to locate themselves in the surrounding area.

As the construction of core facilities approaches completion, we are now entering a next phase of the project, towards the realization of the “Kobe Life Science Promotion Vision” put forth in March 2007 by the Kobe Life Science Promotion Commission.

We would like to continue our effort in promoting the project further with involvement by businesses all over the world and in cooperation with medical-related institutions and universities, the national government and Hyogo Prefecture together with the citizens.

Target Fields
- Research and development of medical devices
- Support for clinical research and trials
- Clinical applications of regenerative medicine

Functions
- Institute of Biomedical Research & Innovation: Translational research into clinical applications
- Medical Business Support Center: Support for commercialization
- Training Center: Human resource development
- Creating a next generation medical system

Goals
- Creation of employment and revitalization of the local economy
- Promotion of public health and welfare by providing advanced medical services
- Global contribution through the improvement of medical technology in Asian countries

Promotion body of the Medical Industry Development Project

Medical Industry Development Project Study Group

A discussion group, formed in October 1998 with Dr. Hiroo Imura (then President of Kobe City General Hospital) as the chair issued a report on the fundamental concept of this Project in March 1999.

Subsequently, the study group was established in August 1999 with participation by major universities and research institutions in Kyoto-Osaka-Kobe region as well as medical related businesses both in Japan and abroad, in order to materialize the concept.

Chairman: Hiroo Imura [President, Foundation for Biomedical Research and Innovation]
Advisory Institutions: Kobe University, Osaka University, National Cardiovascular Center, Kobe Medical Association, Hyogo Prefecture, Kobe City Medical Center General Hospital, RIKEN Center for Developmental Biology
Secretariat: City of Kobe, Kobe Chamber of Commerce and Industry, Foundation for Biomedical Research & Innovation

Network of prominent bio-clusters in Kansai region
Institute of Biomedical Research & Innovation (IBRI)

IBRI is a core institution designed to promote translational research bridging basic research and clinical application in three target fields - R&D of medical devices, support for clinical research and trials, and clinical application of regenerative medicine. The institute has a hospital function with 60 beds, and provides advanced therapies in the areas of imaging medicine, clinical research and regenerative medicine to tackle disorders that cannot be treated with standard medicine.

1. Three Target Research Fields at IBRI

1. Clinical Application of Regenerative Medical Technologies

   Clinical Application of Regenerative Medicine
   - Peripheral blood vessel regeneration therapy for chronic and critical lower-limb ischemia
   - Bone regeneration for intractable fractures
   - Chondrocyte therapy for gonarthrosis
   - Corneal epithelial regeneration using oral mucosa
   - Research on corneal endothelial regeneration using corneal endothelial somatic cells
   - Research on islet regeneration using tissue stem cells
   - Research on treatment of Parkinson's disease using pluripotent stem cells

   Example of Vascular Regeneration Therapy
   - Intramuscular implantation of endothelial progenitor cells (EPCs)

   Support for R&D and production of human-cell-derived pharmaceuticals and devices
   - Support for industrialization of regenerative medicine and tissue engineering technology
   - Compliance with good manufacturing practice (GMP) standards
   - Support services for CPC management
   - CPC for clinical research (5th floor of IBRI research building)
   - Rental CPC for companies (4th floor of IBRI research building, and Business Support Center for Biomedical Research Activities)
# Research and Development of Medical Devices

## PET Screening and Research
- Screening and research using PET for early detection and diagnostic confirmation of cancer, cerebral infarction, and cognitive disorders
- PET screening service started in January 2002, and insurance reimbursement approved in April 2002
- Two PET-CT units installed in December 2005
- PET-CT screening in cooperation with a private hospital started in February 2006
- Application of PET to drug discovery, R&D of PET machine and related devices

![PET-CT system](image)

![FDG-PET Examination: Detection of early-stage lung cancer](image)

## Radiotherapy Treatment and Research
- Highly precise irradiation with minimal damage to normal cells enabled the combination of CT unit and linear accelerator (linac)
- CT-linac radiotherapy services started in April 2002
- R&D started for high-precision radiotherapy machine in cooperation with a private company and Kyoto University in 2004
- Intensity-modulated radiotherapy approved as an advance-care therapy by national government in July 2006
- Approval obtained for production and sale of high-precision radiotherapy machine in January 2008
- Treatment started using high-precision radiotherapy machine in May 2008

![Brain angiography](image)

![High-precision radiation therapy machine](image)

# Support for Clinical Research and Trials

## Support for Clinical Research
- Reviews conducted by the ethics committee and category-specific review boards
- Support for clinical research in regenerative medicine, imaging medicine and pharmaceuticals
- Training of clinical research coordinators and other clinical research support personnel

## Clinical Trials
- Implementation of high-quality clinical trials
- Dispatching of clinical research coordinators
- Administration of the Clinical Trial Management Center of Kobe City Medical Center General Hospital

## Establishing a Network for “Community-Based Clinical Trials” in the Kobe Area
- Seminars on clinical trials jointly with Kobe Medical Association (since November 2002)
- Assistance through the institutional review boards, clinical trial management office and clinical research coordinators
- Strengthening support for the community-based clinical trials
2. Leading-Edge Medical Practices at IBRI

① Outline of Institute of Biomedical Research and Innovation hospital

IBRI Director: Youichi Nabeshima
IBRI hospital Director: Yukio Hirata
Address: 2-2 Minatojima Minamimachi, Chuo-ku, Kobe 650-0047
Departments: Vascular regeneration, Orthopaedic surgery, Ophthalmology, Hematopoietic stem cell transplantation, Integrated oncology, Neuroendovascular therapy, Image-based medicine, Radiation oncology, Diagnostic positron emission tomography (PET), Otolaryngology
Service Hours: 9:00 to 17:00, Monday to Friday (except holidays)
Patients are accepted by referral from Kobe City General Hospital and other local institutions, and after diagnosis or therapy are returned to the referring institution for any further treatment.
Beds: 60 (29 ordinary private rooms, 3 ordinary 4-bed rooms, 19 bioclean/semi-bioclean rooms)

② Clinical Practices Currently Pursued

① Hematopoietic stem cell transplants (bone marrow, peripheral blood, cord blood)
② High-precision radiotherapy with leading-edge radiotherapy devices
③ Advanced chemotherapy for lung cancer and other solid carcinomas
④ FDG-PET diagnosis for cancer
⑤ Neuroendovascular therapy using angiography (unruptured cerebral aneurysm)
⑥ Multifocal intraocular lens implants
⑦ Myringoplasty

③ Current/Planned Clinical Research Areas

① Early detection of dementia by combining PET and MRI images
② Clinical trials of pharmaceuticals and medical devices
③ Vocal cord regeneration (planned)
④ Retina regeneration (planned)

3. Pro-Cluster Kobe

In order to promote the formation of a biomedical cluster in Kobe, the "Pro-Cluster Kobe" provides a variety of R&D and commercialization support regarding intellectual property, funding, pharmaceutical affairs law and marketing for medical-related companies on Port Island and for local SMEs.

Experts in the "Pro-Cluster Kobe" provide consultation service regarding pharmaceutical affairs at the "Medical Device Support Plaza" located on the second floor of International Medical Device Alliance (IMDA) to assist the R&D of medical device. It also manages the "total commercialization support program" for the companies on the island and for local SMEs, and endeavors to promote collaboration among the industry, academic institutions and government organizations.

In addition, it promotes international collaboration with overseas clusters, such as the "Medicon Valley" in Europe.
Translational Research Informatics Center (TRI)

TRI is a data center for promoting translational research to bridge the gap between basic research and clinical application - first of its kind ever established in Japan. It aims to serve as a "control tower" for translational research, with capacities for gathering and disseminating information in collaboration with businesses, universities and research institutions.

- Promotion/management of translational research
- Promotion/management/operation of clinical trials and large scale cohort studies
- Providing medical/clinical research information
  - Cohort studies: Causal studies through comparative analyses between specific population and others.
  - (one of epidemiological methods)

Providing Information to the Public

The exhibition space on the second floor of the building presents an enjoyable environment for the public to learn about life sciences, including video presentations on the Kobe Medical Industry Development Project and newly developed medical treatment such as regenerative and gene-based therapies, a virtual experiment laboratory and a virtual site-tour with quizzes and DNA music (http://www.tri-kobe.org)

Construced by the City of Kobe
Managed by the Foundation for Biomedical Research and Innovation
Floor area: approx. 7,300 m²
URL: http://www.tri-kobe.org/english/index.html

Business Support Center for Biomedical Research Activities (BMA)

BMA provides rental laboratories for biomedical research, with access to special facilities that universities and research institutions cannot afford, including laboratories for radioactive isotope experiments, cell processing centers, and shared-use animal breeding and testing facilities managed by a specialized company, thereby reducing the risks of commercialization and shortening the time required for practical application of R&D outputs.

Managed by Kobe Urban Promotion Service Co. Ltd.
Floor area: approx. 11,620 m²

Kobe Biotechnology Research and Human Resource Development Center (BT Center) / Kobe University Business Incubation Center

The BT Center is a base for advanced and interdisciplinary research and training in biotechnology, transcending the established domains of study and university departments. It shares its facilities with the Incubation Center which nurtures venture businesses born out of Kobe University.

Managed by the Ministry of Education, Culture, Sports, Science and Technology
Floor area: approx. 3,060 m²
Consisting of Kobe Biotechnology Research and Human Resource Development Center (Floors 1-3) and Kobe University Incubation Center (Floors 1 and 4)
5 RIKEN Center for Developmental Biology (CDB)

CDB, as a world-class research institution in the field of developmental and regenerative biology, pursues basic and pilot research aiming at unveiling the mechanism of organic development and regeneration which leads to comprehensive understanding of life forms, and promoting regenerative medicine such as cell therapy and tissue regeneration. The Center broadly disseminates its research findings, and works closely with the Institute of Biomedical Research and Innovation and other neighboring research institutions and enterprises to conduct translational research and develop new medical technologies.

Managed by RIKEN Kobe Institute
Floor area: approx. 28,800 m²

Organization
Center Director: Dr. Masatoshi Takeichi (Professor Emeritus, Kyoto University)
7 Group Directors (including the Center Director)
14 Team Leaders
2 Project Leaders
6 Laboratory Directors
8 Unit Leaders
and approx. 210 full-time researchers

Main research
- Techniques for use of stem cells including human ES cells
- Birth mechanisms of cloned mice
- Vertebrate axis formation in zebrafish and mice
- Developmental mechanics of nematodes and drosophila

Drosophila  Zebrafish  Embryonic stem cell

6 RIKEN Center for Life Science Technologies (CLST)

CLST studies the biomolecular behavior of live animals, using PET and other imaging technologies, in order to promote innovation in the processes of drug formulation and thereby reduce the time and costs involved in pharmaceutical development.

CLST also performs translational research, in close collaboration with the Institute of Biomedical Research and Innovation, to break new ground in biomolecular imaging for fuller understanding of life processes.

Managed by RIKEN Kobe Institute
Floor area: approx. 4,500m²

Organization
Director: Dr. Yasuyoshi Watanabe
6 Team Leaders (including the Director)
3 Unit Leaders (including the Director)
Approx. 80 full-time researchers

Main research
- Developing efficient synthetic procedure for radiolabeling
- Strategically advanced functional evaluation methods for a novel molecular probe
- Pharmacokinetics (PK) studies and drug delivery systems (DDS) studies
- RIKEN original multiple molecular imaging

PET imaging of brains
Accumulation of β-amyloid peptide in the brain of patients with mild dementia and Alzheimer’s disease.

RIKEN Advanced Institute for Computational Science (AICS)

“K computer” is in preparation as a national project. (full operation in September 2012)
It is used in wide range of research areas in Japan and abroad.
In the life science area, it is used for the realization of advanced medical technology and the development of innovative medicine without side effects.

Managed by RIKEN Advanced Institute for Computational Science
Floor area: approx. 20,000m²
URL: http://www.aics.riken.jp/en/

No.1 performance in the world at the International Supercomputing Conference in both June and November 2011!
Kobe Healthcare Industry Development Center (HI-DEC)

HI-DEC provides rental laboratories and offices to support R&D and commercialization activities in healthcare-related fields, such as the development of health promotion devices and dietary foods, experimental and diagnostic/preventive devices.
Managed by the Organization for Small and Medium Enterprises and Regional Innovation, Japan
Floor area: approx. 2,100m²

Kobe Medical Device Development Center (MEDDEC)

MEDDEC provides rental laboratories and offices to promote the launching of new device-related businesses by facilitating the evaluation, improvement and diffusion of minimally invasive medical therapies, technologies and devices, such as catheters, stents, endoscopes and peritoneoscopes, which can ease burdens on patients.
Managed by the Organization for Small and Medium Enterprises and Regional Innovation, Japan
Floor area: approx. 3,600m²
Main functions:
• Support for R&D activities of medical device manufacturers
• Promotion of evaluation, improvement and diffusion of medical devices, tools and drugs
• Training for doctors and technicians using imaging devices and miniature pigs
• Development and improvement of medical equipment through collaboration between tenant companies and local SMES.

Kobe KIMEC Center Building (KIMEC)

An intelligent building symbolizing the advent of ICT society, the Kimec Center is a flagship of the second stage of Port Island development. In addition to office spaces, it encompasses wet laboratories suited for biomedical research.
Managed by Kobe City Development and Management Foundation
Floor area: approx. 17,125m²

Kobe International Business Center (KIBC)

KIBC provides warehouse, assembly and manufacturing spaces as well as R&D laboratories and offices all within the same building, allowing full integration of business functions from R&D through production, sales, distribution and administration.
Managed by Kobe City Urban Development Corporation
Floor area: approx. 20,000m² (North building 10,770m², South building 9,160m²)

Kobe Incubation Office (KIO)

A tenant building for venture businesses, etc.
Managed by Kobe City Urban Development Corporation
Floor area: approx. 7,500m²

Kobe Hybrid Business Center (KHBC)

KHBC is a center for research and development and provides rental laboratories to corresponding to new laboratory demands. In addition there are space for interchange among industries and research institutions and on-site day care center for children.
Managed by Foundation for Biomedical Research and Innovation
Floor area: approx. 3,900m²

International Medical Device Alliance (IMDA)

IMDA is a R&D center for advanced medical devices which utilizes strength in cooperation of clinical practice and medical engineering, and it also cooperate with "Kobe International Frontier Medical Center (will be open in 2014) which offers advanced health care service to domestic and foreign patients.
Managed by Foundation for Kobe International Medical Alliance
Floor area: approx. 6,300m²
URL: http://www.imda-kobe.org/english/imda/

Shimin Byoin Mae Building

It has rental offices and wet laboratories in addition to shops and restaurants.
Managed by Foundation for Kobe New Transit Co.,Ltd.
Participation of the Local SMEs in Medical-Related Fields

Small and medium-sized manufacturers in Kobe and nearby areas have long provided a wide range of technology for steel, shipbuilding and electric industries. Some of them have begun to apply their advanced skills in the medical field as well. To strengthen the order-receiving and sales promotion capacities of local companies through cooperative efforts, Kobe Biomedics Co., Ltd. was established in June 2003 with joint investment by the member companies of the "Medical Equipment & R&D Study Group" of the Kobe Machinery and Metal Manufacturers' Association.

Creating a "Health-Conscious City"

Overview and Purpose

"Health-Conscious City" Initiative is a comprehensive strategy aiming at promoting citizens' health as well as reinvigorating health-related industry and local communities with taking advantage of the research outcomes attained through the Kobe Medical Industry Development Project into healthcare and welfare fields. It includes the establishment of a system to provide the citizens with scientific support for their health promotion activities and to analyze data regarding their health, and the creation of a mechanism to provide scientific validation regarding the effectiveness of health-related goods and services.

The "Health-Conscious City Discussion Group" chaired by Dr. Hiroo Imura issued a report containing proposals for eight programs in July 2005, and the Initiative was designated as one of the Regional Regeneration Plans by the national government.

Dissemination of Health Information

The "Lively Kobe Health Club" website provides information on the prevention of lifestyle-related diseases, especially diabetes. (http://www.hatsuratsu-kobe.jp)

"Kobe Health Walks"

Each wards sponsor walking events to encourage citizens to engage in a casual, healthy activity as part of daily life.

Experimental Activities for Scientific Health Building

In cooperation with a local university, the city is promoting scientific health building for prevention of lifestyle-related diseases and minimization of care needs, through experimental sport and nutrition-related activities with public involvement. (See page 11)

Future Vision for "Creating a Health-Conscious City"
Regional Innovation Cluster Program  "Biomedical Kansai"  
(Ministry of Education, Culture, Sport, Science and Technology)

Kobe promotes the "Biomedical Kansai" initiative in collaboration with the Northern Osaka (Saito) area to involve the entire Kansai region for the formation of a super-cluster in life sciences, by taking advantage of the research strengths in advanced medicine and drug discovery that have been established in the respective areas.

Regenerative Medicine and Treatment/Prevention of Lifestyle-Related Diseases

Researches putting the most emphasis on "Advanced Medical Treatment" such as regenerative medicine and treatment of lifestyle-related diseases are being performed at the Institute of Biomedical Research and Innovation as a core institute in order to provide secure and safe medical services and scientifically promote public health and fitness.

"Integrative Celerity Research" and the Establishment of the "Medical Innovation System"

Sublimating the function of "Translational Research" that has already been established in Kobe Biomedical Innovation Cluster into "Integrative Celerity Research (ICR)" enables superior clinicians and researchers to be collected, which would lead to establishment of the basis for "Medical Innovation System".

Core Organization: Foundation for Biomedical Research and Innovation
Participating Research Institutions: Osaka University, Kobe University, Kyoto University, RIKEN Center for Developmental Biology, RIKEN Center for Life Science Technologies, National Institute of Biomedical Innovation, Osaka Prefecture University, National Cardiovascular Center

Translational Research Support and Promotion Program  
(Ministry of Education, Culture, Sports, Science and Technology)

Foundation for Biomedical Research and Innovation is commissioned by the Ministry of Education, Culture, Sports, Science and Technology to perform translational research support activities in collaboration with clinicians to bring promising basic research findings into clinical application.

Support for Translational Research on Promising Seed Technologies

Foundation for Biomedical Research and Innovation makes the most of its translational research support infrastructure to bring research findings into clinical application and the development of new pharmaceuticals.

- Seed Technologies Currently Supported
  Peripheral blood vessel regeneration in lower limbs,
  Bone regeneration for intractable fractures,
  Alveolar bone regeneration for periodontal disease,
  Chondrocyte therapy for gonarthrosis, etc.

Support for other Translational Research Institutions in Japan

Comprehensive support is provided for seed technologies possessed by six institutions: FBRI, Hokkaido University, Tohoku University, University of Tokyo, Kyoto University, Osaka University.

Regional Business Incubation Support Network Strengthening Project  
(Ministry of Economy, Trade and Industry)

In collaboration with the "BioBridge Kansai Project" (one of the Kinki Region Industrial Cluster Plans), a Cluster Manager of the Foundation for Biomedical Research and Innovation promotes matching of research needs and seed technologies in regenerative medicine through the network of researchers, medical doctors and businesses.
In March 2007, the “Kobe Life Science Promotion Vision” was published, putting forth strategies and measures to be taken for a cluster development in Kobe toward the next decades.

(1) Strategies for a cluster development in Kobe

One path envisaged by the “Kobe Life Science Promotion Vision” is the formation of a “Medical Cluster,” a concentration of advanced specialty clinics around the renewed Kobe City Medical Center General Hospital in order to reinforce Kobe’s clinical capacities. Another is the furthering of the “Health-Conscious City” Initiative to support scientific health building for the public, with participation by universities and citizens. By pursuing these paths, we aim to gather excellent clinicians, researchers, research institutions and medical-related businesses and create a “Medical Innovation System” - a mechanism to swiftly bring the benefit of research activities to the public - for the attainment of the goals of the Kobe Medical Industry Development Project, namely, the revitalization of Kobe’s economy, the promotion of the health and welfare of the citizens and to make international contribution.

① Provision of advanced medical services (formation of a “Medical Cluster”)
Kobe City Medical Center General Hospital was newly constructed adjacent to the Institute of Biomedical Research and Innovation in July 2011. With this hospital as a core, the Vision proposes the creation of a “Medical Cluster” - a concentration of medical institutions specialized in such fields as cancer treatment, transplantation and regenerative medicine which provide advanced medical services to patients in Japan and abroad in cooperation with the General Hospital.

② Support for scientific health building (“Health-Conscious City” initiative)
“Health-Conscious City” initiative, the Vision calls for the promotion of scientific health building in collaboration with local universities and companies.

Example of Scientific Health Building:
① “The Kobe walking support system” which support citizens to form and maintain walking habit

A pedometer is available for free of charge. Transmitting participants' steps information from the transmitter which is installed in some stores or public accommodation regularly, they receive a report about their number of steps from dedicated site or by mail.

② “Kobe Orthopedic and Biomedical Epidemiologic Study (KOBE trial)”

The long-term epidemiologic study has been performed for the purpose of examining relations of lifestyle and health.

Briefing session  Bone density test (ultrasound)  Gustatory test for salt
Medical Innovation System - a mechanism to accelerate innovation in the cluster

Integrative Celerity Research (ICR)

In between basic research and clinical research for the development of new medical technologies, pharmaceuticals and medical devices lie difficult challenges such as pre-clinical trials on animals, regulations and ethical considerations. Furthermore, additional difficulties such as regulatory approval, health insurance coverage, cost-benefit considerations and funding must be grappled with before the commercialization of research outputs and their application in hospital treatment and prevention services.

In order to overcome these challenges, the Vision calls for gathering of researchers and clinicians as well as the promotion of epidemiological studies through i) providing advanced medical services, and ii) supporting scientific health building.

These efforts would hopefully culminate in a “Medical Innovation System” which would facilitate efficient feedback between “researchers’ hypotheses” and “clinicians’ needs” and enable prompt delivery of research fruits born in Kobe to the public in the form of new treatment and prevention services.

Medical Innovation System

(2) The Kobe Cluster in the Future

Estimate of Economic Impacts in Kobe

<table>
<thead>
<tr>
<th>FY2005</th>
<th>FY2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical-related companies in Kobe city</td>
<td>12.4 billion yen</td>
</tr>
<tr>
<td>Medical-related companies in stage 2 of port island</td>
<td>7.1 billion yen</td>
</tr>
<tr>
<td>Core institutions</td>
<td>15.5 billion yen</td>
</tr>
<tr>
<td>Medical-related companies on port island</td>
<td>5.6 billion yen</td>
</tr>
<tr>
<td>Universities</td>
<td>11.3 billion yen</td>
</tr>
<tr>
<td>Medical-related companies in Kobe city</td>
<td>17.5 billion yen</td>
</tr>
<tr>
<td>Non-medical-related companies in stage 2 of port island</td>
<td>25.6 billion yen</td>
</tr>
<tr>
<td>Core institutions</td>
<td>24.1 billion yen</td>
</tr>
<tr>
<td>Medical-related companies on port island</td>
<td>25.6 billion yen</td>
</tr>
</tbody>
</table>

2.5 times growth

Economic impacts

40.9 billion yen

104 billion yen

The number of medical-related companies and project-related employees increased to 233 and 5,400, respectively, at the end of FY2012. The economic impacts in Kobe in FY2005 and FY2010 were evaluated as 40.9 billion yen and 104 billion yen respectively, showing about 2.5-fold growth during these 5 years.
## Roadmap for Research and Technological Development

The "Vision" presents a roadmap for the next five and ten years regarding research and technical development in cell and gene therapies and regenerative medicine, medical devices, and support for clinical trials and clinical research.

### Cell and Gene Therapies / Regenerative Medicine

- **5 years**
  - Clinical application of skin, bone, cartilage, cornea and vessel regeneration (as "advance-care therapies") at advanced specialty clinics

- **10 years**
  - Expansion of regenerative medicine into cardiac muscle, nerves and islets of Langerhans for treatment (as "advance-care therapies") at advanced specialty clinics
  - Culturing of blood (red cells) and platelets from cord blood and adipocytes

### Medical Devices

- **10 years**
  - Use of imaging technologies to develop new therapeutic instruments and devices with low somatic loads on patients

### Support for Clinical Trials and Clinical Research

- **10 years**
  - Establishment of a clinical trial network involving clinicians, patient groups and volunteers with financial support from the business sector
  - Creation of and support for red biotech venture firms utilizing molecular imaging technologies and new clinical trial facilities
  - Establishment of in silico bio-simulation and organic models

## Guiding Policies for the Realization of the Grand Design

### Guiding Policies for the future development of Port Island

The Port Island is envisioned to encompass the “Education Area,” “Medical Area” and “R&D Area,” each with the concentration of the capacities required to develop a self-reliant cluster.

### Guiding Policies for Realization of the Port Island Grand Design

#### Education Area

- For the promotion of scholarly interchange

#### Medical Area

- For the provision of advanced medical services catering to patient choices

#### R&D Area

- For the provision of a refreshing and comfortable environment for researchers to work and collaborate with one another

### Formation of a super-cluster of life science in Kansai

The Vision calls for the formation of a super-cluster encompassing the entire Kansai region by establishing an international academic and business network that involves Kobe University, Kyoto University and Osaka University in order to accelerate the commercialization of seed technologies.
### History of the Kobe Medical Industry Development Project

<table>
<thead>
<tr>
<th>Year</th>
<th>Month</th>
<th>Event and Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>September</td>
<td>City of Kobe announced the Kobe Medical Industry Development Project concept</td>
</tr>
<tr>
<td>1998</td>
<td>October</td>
<td>Kobe Medical Industry Development Project Discussion Group established (Chairman: Hiroo Imura, then the director of the Kobe City Medical Center General Hospital) Report presented in March 1999</td>
</tr>
<tr>
<td>1999</td>
<td>December</td>
<td>Kobe Medical Industry Development Project Study Group established Budget approved for &quot;Institute of Biomedical Research and Innovation (IBRI)&quot; and &quot;Riken Center for Developmental Biology (CDB)&quot;</td>
</tr>
<tr>
<td>2000</td>
<td>February</td>
<td>Selected as a national Special Reconstruction Project for New Industrial Structure Formation Foundation for Biomedical Research and Innovation established</td>
</tr>
<tr>
<td>2001</td>
<td>August</td>
<td>Selected as a national Urban Revitalization Project</td>
</tr>
<tr>
<td>2002</td>
<td>January</td>
<td>PET screening service started at the Institute of Biomedical Research and Innovation (IBRI) Selected as a Knowledge Cluster Initiative Project by the Ministry of Education, Culture, Sports, Science and Technology</td>
</tr>
<tr>
<td>2003</td>
<td>March</td>
<td>Riken Center for Developmental Biology (CDB) inaugurated Designated as a &quot;Special Zone for Advanced Biomedical Industry&quot; - one of the first national &quot;Structural Reform Zones&quot;</td>
</tr>
<tr>
<td>2003</td>
<td>April</td>
<td>Institute of Biomedical Research and Innovation (IBRI) began full-scale operation (see Photo 3 ) Translational Research Informatics Center (TRI) inaugurated</td>
</tr>
<tr>
<td>2004</td>
<td>March</td>
<td>BT Center inaugurated (Kobe Biotechnology Research and Human Resource Development Center / Kobe University Business Incubation Center) &quot;Health-Conscious City Discussion Group&quot; established (Report presented in July 2005)</td>
</tr>
<tr>
<td>2004</td>
<td>June</td>
<td>Business Support Center for Biomedical Research Activities (BMA) inaugurated</td>
</tr>
<tr>
<td>2005</td>
<td>August</td>
<td>Kobe Life Science Promotion Commission established (Report presented in March 2007)</td>
</tr>
<tr>
<td>2006</td>
<td>February</td>
<td>Kobe Medical Device Development Center (MEDDEC) inaugurated Portliner was extended. Station in front of the Institute of Biomedical Research and Innovation (IBRI) opened. Kobe Airport opened.</td>
</tr>
<tr>
<td>2006</td>
<td>July</td>
<td>&quot;Creating a Health-Conscious City&quot; initiative adopted as a national Local Revitalization Plan Intensity-modulated radiotherapy for solid tumors at the Institute of Biomedical Research and Innovation (IBRI) obtained advance-care license</td>
</tr>
<tr>
<td>2006</td>
<td>September</td>
<td>Kobe Healthcare Industry Development Center (HI-DEC) inaugurated</td>
</tr>
<tr>
<td>2007</td>
<td>March</td>
<td>Decided a location for &quot;the next generation supercomputer&quot; on Kobe Port Island. Selected as a Knowledge Cluster Initiative Project (Stage II) by the Ministry of Education, Culture, Sports, Science and Technology</td>
</tr>
<tr>
<td>2007</td>
<td>June</td>
<td>Selected as a Knowledge Cluster Initiative Project (Stage II) by the Ministry of Education, Culture, Sports, Science and Technology</td>
</tr>
<tr>
<td>2007</td>
<td>July</td>
<td>Selected as a Translational Research Promotion Program by the Ministry of Education, Culture, Sports, Science and Technology</td>
</tr>
<tr>
<td>2008</td>
<td>January</td>
<td>High-precision radiotherapy machine developed jointly by IBRI and Mitsubishi Heavy Industries and licensed for manufacture and sale under the Pharmaceutical Affairs Law IBRI/Mitsubishi high-precision radiotherapy machine received commendation for industry-academia-government collaboration by the Minister of Economy, Trade and Industry</td>
</tr>
<tr>
<td>2008</td>
<td>June</td>
<td>Ceremony for the 10th anniversary of Kobe Medical Industry Development Project and the symposium was held. (see Photo 4 )</td>
</tr>
<tr>
<td>2008</td>
<td>November</td>
<td>Adopted two projects proposed by Kobe researchers as &quot;Special Districts for Development of Advanced Medical Care&quot;</td>
</tr>
<tr>
<td>2009</td>
<td>June</td>
<td>Selected as &quot;COE (G-COE) for industry-academia-government collaboration&quot; by the Ministry of Education, Culture, Sports, Science and technology and Ministry of Economy, Trade and Industry (cooperation with Osaka and others)</td>
</tr>
<tr>
<td>2011</td>
<td>December</td>
<td>Designated as the &quot;Kansai international Strategic Innovation Zone&quot;</td>
</tr>
<tr>
<td>2012</td>
<td>September</td>
<td>Commencement of &quot;K Computer&quot; official services</td>
</tr>
<tr>
<td>2013</td>
<td>July</td>
<td>Administration of a world-unprecedented clinical research of utilizing autologous induced pluripotent stem (iPS) cells (Age-related Macular Degeneration: conducted by Riken CDB and IBRI)</td>
</tr>
</tbody>
</table>
“Rental rooms for convention/training in stage 2 of Port Island”

<Translational Research Informatics Center (TRI)>
1 convention room (capacity 200 seat)
4 training/conference rooms (capacity 12-45 seat)

Contact
Phone: +81-78-306-3655
Website: http://www.tri-kobe.org/rental/meetingroom.html

<Nichii Gakkan Company>
1 convention room
(capacity 300 seat, simultaneous interpretation booth available)
8 conference/seminar rooms

Contact
Phone: +81-78-304-5991
Website: http://www.nichigakkan.co.jp/kobe_pi/

“Recruiting KIBC Sponsors”

We are seeking sponsors (individuals, organizations, companies) who donate found to KIBC for its further development.
Your kind assistance and cooperation on this would be sincerely appreciated.

Contact
Phone: +81-78-322-6319
Fax: +81-78-322-6010
Website: http://www.city.kobe.lg.jp/information/project/iryo/iryoangyo-supporter2013.html
Email: iryo_sangyotoshi@office.city.kobe.lg.jp

For further information:
Kobe Biomedical Innovation Cluster Headquarters - City of Kobe
TEL: +81-78-331-8181 (ext. 2355) FAX: +81-78-322-6010
E-mail: iryo_sangyotoshi@office.city.kobe.lg.jp

Kobe Enterprise Promotion Bureau - City of Kobe
TEL: +81-78-331-8181 FAX: +81-78-322-6072
6-5-1 Kano-cho, Chuo-ku, Kobe 650-8570
URL: http://www.city.kobe.jp

Foundation for Biomedical Research and Innovation
TEL: +81-78-306-1700 FAX: +81-78-306-1708
2-2 Minatojima-Minamimachi, Chuo-ku, Kobe 650-0047
URL: http://www.fbrj-kobe.org/
E-mail: qanda@fbrj.org

Kobe Urban Promotion Service Co., Ltd.
TEL: +81-78-306-2540 FAX: +81-78-306-2539
2-2 Minatojima-Minamimachi, Chuo-ku, Kobe 650-0047
URL: http://www.kups.jp

Logo for Kobe Biomedical Innovation Cluster

The emblem is designed as the shape of the Port Island and the hexagon symbolizes six Kobe’s dynamism ‘urban infrastructure’, ‘culture’, ‘nature’, ‘human’, ‘industry’, and ‘government’.

2014.4