Kobe Medical Industry Development Project

Takashi MIKI
Director, Planning and Coordination Bureau
City of Kobe
Where is KOBE?

KOBE
- 6th largest city in Japan
- Population: approx. 1.5 million
- Area: 550 km²
- GDP: approx. €43 billion (¥6 trillion)

KANSAI area
- Japan’s Second Largest Economic Zone
- Population: approx. 21 million
- GDP: approx. €640 billion (¥89 trillion)

Berlin
Population: approx. 3.5 million
Area: approx. 891 km²
Convenient Transportation

**AIR**
- Kansai International Airport
  - (30 min. by marine transport)
- Kobe Airport
  - (Opened on February 16th, 2006)

**SEA**
- Port of Kobe

**OVERLAND**
- Bullet train, Highway

**SEAPORT**
- Port Island
- Kobe Airport Marine Air
Kobe Medical Industry Project
Core Facilities

To Sannomiya Port Liner Kobe City General Hospital

To Port Island

Kobe Airport (Opened on Feb. 16th 2006)

Port Liner

Kobe City General Hospital

Kobe Airport

To downtown

Planning site for relocation of the Kobe City General Hospital (2010)

Core Facilities

BT: Kobe Biotechnology Research and Human Resource Development Center
BMA: Business Support Center for Biomedical Research Activities
IBRI: Institute of Biomedical Research and Innovation
KIBC: Kobe International Business Center
KIO: Kobe Incubation Office
MEDDEC: Kobe Medical Device Development Center
TRI: Translational Research Informatics Center

To Kobe Airport
History

- 1998.10: Established the Kobe Medical Industry Development Project Discussion Group. Chairman – Dr. Hirô Imura (President of Kobe City General Hospital at that time).
- 1999.12: Budgeted for IBRI and RIKEN CDB (Millennium Project).
- 2000.2: Approved as the Special Earthquake Restoration Project.
- 2001.8: Approved as the 2nd selection of the Urban Renaissance Project.
- 2002.4: Approved as the Knowledge Cluster Initiative.
- 2003.4: Approved as the Deregulation Zone for Advanced Medical Industry.
Core Functions

- Develop as a focal point for R&D of highly advanced medical technology
- Establish a streamlined process from basic research to clinical application and industrialization

Target fields
☆ Medical device ☆ Clinical research and trials ☆ Regenerative medicine

Core functions
- Translational research
- Support for business development
- Human Resource Development
- Construction of a next generation medical system

Goals
- Create new employments and revitalize local economy
- Provide high level medical services and welfares for Kobe citizens
- Contribution on an improvement of medical technologies in Asian countries
Developing Japan’s First Life Science Cluster

Data complied by Bechtel/ SRI (2000)

◆ Primary factors behind the development of industrial clusters
  ① Preparation of core research facilities
  ② Structured cooperation with universities and research institutions
  ③ Effective use of airport facilities

◆ Project aims (economic effect)
  - New employment created:
    23,000 (Kansai region)
    18,000 (Kobe)
  - Production generated:
    530 billion yen (Kansai region)
    330 billion yen (Kobe)

Effective collaboration with related research institutions and universities

Kansai regional network

Port Island
Kobe Medical Industry Development Project
Core Facilities
Kobe Airport
Synergy with
Kobe Airport

Access to world markets

Upgrade existing industries
Attract related industries

Spring-8
Kobe Univ.
AIST
TERC
Kyoto Univ.
Osaka Univ.
Saito (International Culture Park) Project

AIST : National Institute of Advanced Industrial Science and Technology
Institute of Biomedical Research and Innovation

Administration: Foundation for Biomedical Research and Innovation

Medical treatments and clinical researches being carried out:

① Hematopoietic stem cell transplants
   (Bone-marrow transplants, cord blood stem cell transplants)
② Peripheral blood vessels regeneration of the lower extremities and cardiovascular regeneration
③ Dental implants and regeneration of alveolar bone
④ Diagnosis and medical treatment using PET and CT-Linac
⑤ Cerebrovascular therapy
⑥ Chemotherapy for cancer
⑦ Clinical trials on pharmaceuticals and medical devices
Cell Processing Center

IBRI

Olympus Corporation:
Regenerate bone by differentiate stem cell of bone marrow into osteocyte on the $\beta$-TCP which has bio-affinity

Terumo Corporation:
Regenerate myocardium by cultivate skeletal myoblast of skeletal muscle

ArBlast Co., Ltd.:
Regenerate alveolar bone in dental surgery area by cultivate stem cell of bone marrow

Stem Cell Science KK:
Produce therapeutic use cell

BMA

Teijin Limited:
Establish new therapy which is to cultivate chondrocyte in vitro, and return to damaged articular cartilage

Hitachi Medical Corporation:
Manufacture regenerative medicine materials, and establish safety

Genemedicine Japan Inc.:
Develop every kind of GMP graded virus vector for gene therapy
Medical Devices Development Study Group (consists of 70 companies, most of them are members of Kobe Machinery and Metal Firms Association Inc. and 11 medical device companies) participate in.
Support for Clinical Trials

- Operation of Clinical Trial Model Project: Installation of the clinic (October 2000)

- Cooperative clinical trials with local hospitals and clinics:
  - Establish network between IBRI and local medical institutions to handle life-style-related diseases
  - Community Based Clinical Trial Study Meetings (2000. 12 ~ 2001. 7)
  - Basic Agreement (2002. 3)
  - Co-sponsoring community-based clinical trial seminars with Kobe Doctors Association (2002. 11 ~)

- Training for Clinical Trial Coordinator: Operation of training sessions for non-experienced and experienced people
RIKEN Center for Developmental Biology (CDB)
~ A world-class center in the field of embryology and stem cell research ~

Research Groups
- Director: Dr. Masatoshi TAKEICHI Ph.D.
- 7 core program directors including Director Takeichi
- 23 creative research promotion programs
- Number of researchers: 243 (30 research groups)

Major research fields
- Mechanism of Development
- Mechanism of Regeneration
- Application to Medicine
Other Core Facilities

Translational Research Informatics Center (TRI)
- Providing information and supporting for translational research
- Management of clinical trial and supporting data management
- Establishment of management system of disease data and outcome research data
- Providing cancer-related information via internet

Business Support Center for Biomedical Research Activities (BMA)
- Support bio-ventures and companies related to regenerative medicine
  - Cell Processing Center
  - Animal laboratory
  - RI facility
Kobe Biotechnology Research and Human Resource Development Center (BT Center) / Kobe University Business Incubation Center

State-of-the-art and cross field research and human resource development

Kobe Medical Device Development Center (MEDDEC)

- R&D and training of catheter and endoscope
- Operating room
- MRI laboratory
- Device development corner for small-medium companies
- Rental laboratory
- Breeding and observation space
Other Core Facilities

Kobe Healthcare Devices Development Center (tentative name)
Building completion in September 2006
Development of
- Bio-experiment devices
- Diagnostic and preventive devices
- Healthcare devices

Molecular Imaging Research and Development Center
Building completion in September 2006
- RIKEN, venture company
- Speeding up the process of identifying candidate materials for the design of new drugs and medications
Incentives for businesses

Kobe Biomedical Venture Fund
- Total 6.3 billion yen ⇒ invested in total 69 companies
- Sumitomo Mitsui Banking Corporation Group
- Venture capital fund specific for biomedical industries
- Technical assessments carried out by Technology Assessment Committee handled by FBRI

Kobe Life Science IP Fund
- 0.5 billion yen ⇒ invested in 3 companies
- Nomura Research & Advisories
- Starting up venture companies based on intellectual properties

Incentives based on the Kobe Enterprise Zone Ordinance
- Tax reductions, Subsidies
- Establishment of the Pilot Enterprise Zone
  Land rents for 10 years without charge (Port Island 2nd stage)

Establishment of the Pro-Cluster Kobe
- Industrialization Support, Human Resource Development, Providing Information
MedCollabo KOBE
~ Business Network in the project ~

Establishment: November, 2004
Mission/Objectives: To enhance relationship among companies in the project
To promote and accelerate the formation of “KOBE Biomedical Cluster“
Support Organizations: Foundation for Biomedical Research and Innovation,
The Kobe Chamber of Commerce and Industry

“KOBE Medical Industry Development Project”
Port Island 2nd Stage Zone

- Coordination of Joint R&D, Alliance and Tie-up with outside academics and companies
- Planning Business Tour, Joint promotion, etc.
- Making proposals to the city of Kobe office and the central government

IBRI (7)
KIBC (35)
KIMEC (13)
BMA (14)
TRI (3)
KIO (4)
MEDDEC (9)
IBRI (7)
KIBC (35)
KIMEC (13)
BMA (14)
TRI (3)
KIO (4)
MEDDEC (9)

Plant Area (4)
Kobe Airport
Kimelec (13)
IBRI (7)
KIBC (35)
BMA (14)
TRI (3)
KIO (4)
MEDDEC (9)

Total: 87 companies
The Number of Companies

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Profiles of 87 companies

Company Size
- Giant companies: 21%
- Others: 26%
- Ventures: 53%

Activity in Kobe
- Research, Development: 67%
- Manufacturing, Service: 25%
- Sales: 8%
- 58%
Support System to promote International Bio-Venture

Asian Bio-Cluster
- Medical Device
- Pharmaceutical
- Generic
- Bio-venture

EU-Bio-Cluster
- Drug Development
- Diagnosis
- Therapeutic device
- Drug Delivery System

Network of Universities and Research Institutes in Kansai area

Satellite Office in Kobe (PRO-CLUSTER KOBE)

Bio-venture Promotion Fund

Create International Bio-venture in Kobe

Cooperation between universities and companies

Licensing

Support to obtain a patent

Marketing Support

Pharmaceutical Companies
Trading Companies
CRO
Venture Capital
Medical Devices

MEDDEC
TRI
Development Support
Clinical Research
① Local support system to maintain citizens’ health

② Utilize seeds of companies

③ Attract and accumulate health-related companies

④ Strategy to attract more tourists and revitalize economy by establishing health-related leisure activities

- Healthcare promotion for Kobe citizens
- Revitalize local economy
- Improve Kobe’s fascination

Tourists from inside and outside Japan

Kobe City General Hospital

Academic Zone

On going health management by medical checkup at home

Medical Institutions

Counseling

Sports facilities

Health Insurance Associate Companies

Kobe Medical Industry Development Project Core Facilities

Kobe Airport

Kansai International Airport
Propose a cluster promotion plan to invigorate local economy.

Propose a new plan of research and technology development in life science field.

Propose grand designs of after 10 and 20 years.

Outline of Kobe Life Science Innovative Program

Academic Zone
- Kobe Gakuin University
- Hyogo College of Medicine
- Shukugawa Gakuin College

Medical Zone
- Kobe City General Hospital
- Planned site for relocation of Kobe City General Hospital
- BT Center
- BMA TRI
- KIMEC
- CDB

Research Zone (Core facilities Zone)
- IBRI
- KIBC
- KIO

R&D Zone (Companies/ Venture Zone)
- KIBC
- KIO
- PEZ
- MEDDEC
- Molecular Imaging R&D Center and Healthcare Devices Development Center

Council Member (formed in April 2005)
- Chairman: Hirô Imura (Chairman of FBRI)
- Member:
  - Researchers of university and research institute in Kansai area in medical, engineering and social science field
  - Business community of Kobe
  - Local Doctor’s Association
  - Local small & medium sized companies
  - Companies expanded into Port Island 2nd stage

Observer:
- Hyogo prefecture
- Ministry of Health, Labour and Welfare
- Ministry of Economy, Trade and Industry
- Ministry of Education, Culture, Sports, Science and Technology