



# Northern Osaka (Saito)

## Developing innovative drugs by integrating the knowledge of industry-academia-government

### Cluster Vision

The Northern Osaka (Saito) region is home to a number of superior research organizations including Osaka University, the National Cardiovascular Center, and the National Institute of Biomedical Innovation, and this region is also one of the few with such a concentration of leading Japanese pharmaceutical companies and start-ups of biotech companies.

This project of Northern Osaka (Saito) Biomedical Cluster supports the continuous generation of innovative research results in life sciences and will promote establishment of globally competitive pharmaceutical companies in the region. To accomplish these goals, we encourage potential regional research sites in the field of medical and pharmaceutical sciences, especially in biopolymers and molecular-targeted drugs, and promote technology transfer of research outcomes and creation of bio-venture businesses. These efforts will turn the region into a "Biomedical Cluster" that attracts leading scientists and companies from all over the world.

### Project Overview

In order to form a Northern Osaka (Saito) Biomedical Cluster centering on advanced research aimed at creating innovative molecular-targeted drugs, we supported a total of 24 research projects, including 9 research projects in 3 5-year programs that were performed with industry-academia-government cooperation, 13 applied research projects in a 2-year program, one project in cooperation with Kobe region to expand the cluster region, and one project in the Concerned Ministries program.

In addition to research programs, we also conducted educational projects to cultivate bio business personnel to develop business in many pharmaceutical and biotechnology companies of various sizes in the near future. Public relations was also actively addressed to attract attention in science and business fields. Furthermore, we cooperated with the Kobe region to carry out several joint projects in research and educational projects to form a more globally competitive cluster named the Kansai Biomedical Cluster.

Project Director  
Masanao Shimizu, Ph. D.



Chairman, Kinki Bio-Industry Development Organization; Director, The Japan Epilepsy Research Foundation; Director, Japan Antibiotics Research Association

### Toward full development of the Saito Biomedical Cluster

Within the Knowledge Cluster Initiative that began in 2002, the Northern Osaka (Saito) region has exploited its unique, industrial, and cultural characteristics to form the Saito Biomedical Cluster by promoting research and development of molecular-targeted drugs. Our research activities have resulted in the founding 4 start-up companies, 40 Japanese patent applications (13 of these are Patent Cooperation Treaty, or PCT, applications). To help commercialize these research outcomes, we provide various supporting activities, including a matching service between researchers and companies by "seeds and needs" exchange meetings and service for patent searches and market research. These activities will encourage researchers to commercialize their research results. Infrastructures for research and development have been established in the region during the past 5-year project. The "Saito Bio-Incubator" opened in the new city of Saito and the "International Culture Park City" opened in 2004. The National Institute of Biomedical Innovation was founded in April 2005, and their activities are now fully displayed. The second building of the Saito Bio-Incubator will open in 2008. They will help the region grow as a bio-medical cluster. We will continue making every effort to form the globally competitive Saito Bio-Medical Cluster in cooperation with the parties concerned.

### Cluster Headquarters

Adviser.....Tadamitsu Kishimoto (Former President, Osaka University; Former Member, Council for Science and Technology Policy)  
 President.....Koichi Yamanishi (Director General, National Institute of Biomedical Innovation)  
 Project Director.....Masanao Shimizu (Chairman, Kinki Bio-Industry Development Organization)  
 Chief Scientist.....Shoji Hori (Professor, Graduate School of Medicine, Osaka University)  
 Deputy Chief Scientist and Science and Technology Coordinator.....Bunji Kageyama  
 Science and Technology Coordinator...Hidehiko Nakagawa and Masako Sano

### Core Organization

Senri Life Science Foundation

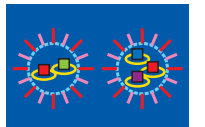
### Participating Research Organizations (Bold: Core Research Organization)

Industry...Dainippon Sumitomo Pharma Co., Ltd., AnGes MG, Inc., Kringle Pharma Inc., Nitto Denko Corporation, JEOL Ltd., Molecular Imaging Laboratory Inc., etc.  
 Academia...**Osaka University**, The Research Foundation for Microbial Diseases of Osaka University, etc.  
 Government...National Cardiovascular Center, Osaka Bioscience Institute Foundation, Osaka Medical Center for Cancer and Cardiovascular Diseases, etc.

### Main Results

#### 1. Development of an innovative drug delivery system for advanced medical treatment

The hemagglutinating virus of Japan (HVJ, the Sendai virus) envelope can be used as a vector to deliver therapeutic gene constructs to target cells. Using this vector, we have conducted research and development of effective treatment technologies for cancers and ischemic heart disease.



Rapid preparation of the HVJ-E vector containing a DNA library

#### 2. New approach to anti-infectious drug discovery based on interaction with the immune system

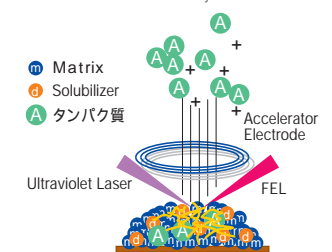
We have established new infectious disease treatment methods by combining chemotherapy with the patient's own immune responses in order to treat infectious diseases that have not been effectively treated thus far with chemotherapy alone. We have also developed treatment methods that are effective against drug-resistant bacteria and vaccine technologies that increase the effectiveness of anti-infectious drugs.



Vials containing SE36 malaria vaccine formulation produced by the Research Foundation for Microbial Diseases of Osaka University in accordance with GMP

#### 3. Creation of bio-molecular control technology by photon processes

Development of molecular-targeted drugs first requires discovery of bio-molecules that are the cause of a disease, and bio-molecular functions must be accurately regulated so that patients can recover. We developed technologies that allow the analysis of molecular structures and quantities by using photo process reactions and mass spectrometry of the concerned light (electromagnetic waves). Furthermore, we have performed research to find small molecules that can regulate the function of bio-molecules by laser irradiation of specific body parts of a patient.



Protein analysis method by MALDI using a free-electron laser (FEL)

