National Institute of Biomedical Innovation

National Institute of Biomedical Innovation

NIBIO

National Institute of Biomedical Innovation Message from the Director General

The National Institute of Biomedical Innovation (NIBIO) was established in April 2005, in the International Culture Park, Saito, Ibaragi City, Osaka, for the purpose to contribute to the creation of the innovative pharmaceuticals and the improvement of the national health.

According to the first term plan, from FY2005 until now, we performed three primary functions, ①Fundamental Technological Research ②Bioresources Research ③R&D promotion service, to reduce our achievement to society, serving as a "Mediator" between the basic research performed at universities and the application of such research carried out by private corporations.

In addition, we have promoted the action with close collaboration of organizations across industry, government and academia by making use of our strong point to be the only organization in Japan that performs totally by one stop "research, resources, and funding" with regard to the fundamental technologies such as the research and development of pharmaceuticals.

In this way, in the first term that lasted until FY2009, we were able to obtain epoch-making results of research, such that the world's greatest database of toxicogenomics was constructed and that two research themes (infectious disease vaccine, iPS cells drug development and application) led by NIBIO were adopted in "Super Special Consortia for supporting the development of cutting-edge medical care".

In the second term plan that began in FY2010, we promote the reinforcement of "Mediation function", making further great progress of autonomy, flexibility, and the power of winning the competitions as the research institute on the basis of the previous achievement.

We changed each name of the departments in our organization as following for the second term, ①Department of Fundamental Technical Research ②Department of Disease Bioresources Research ③ Department of Research and Development Promotion. Especially, we emphasize the importance of the rare diseases research and initiated bank for rare diseases to offer resources easily to the researchers of the whole country and to make good use of the database to the immediate treatment study of the rare diseases. Furthermore, we promote eagerly following three fields as the key domain ① Next-generation vaccines ②Development of a drug toxicity testing system ③Treatment of the rare diseases.

Our activities will be tied to the development of "Innovative pharmaceuticals from Japan" which become the base for "The safe society in which people feel relieve", and we want to develop still more as a core center of the Japanese "Life innovation".

The close collaboration of organizations across industry, government and academia is necessary for the coordinated development of new medical technologies. Therefore, while collaborating with the administration, the clinical spot, and the local government, in addition to industry such as pharmaceutical companies and academia such as universities, we are committed to carry out opening innovation and contribute to people and society. We look forward to your continuous support, understanding and collaboration.

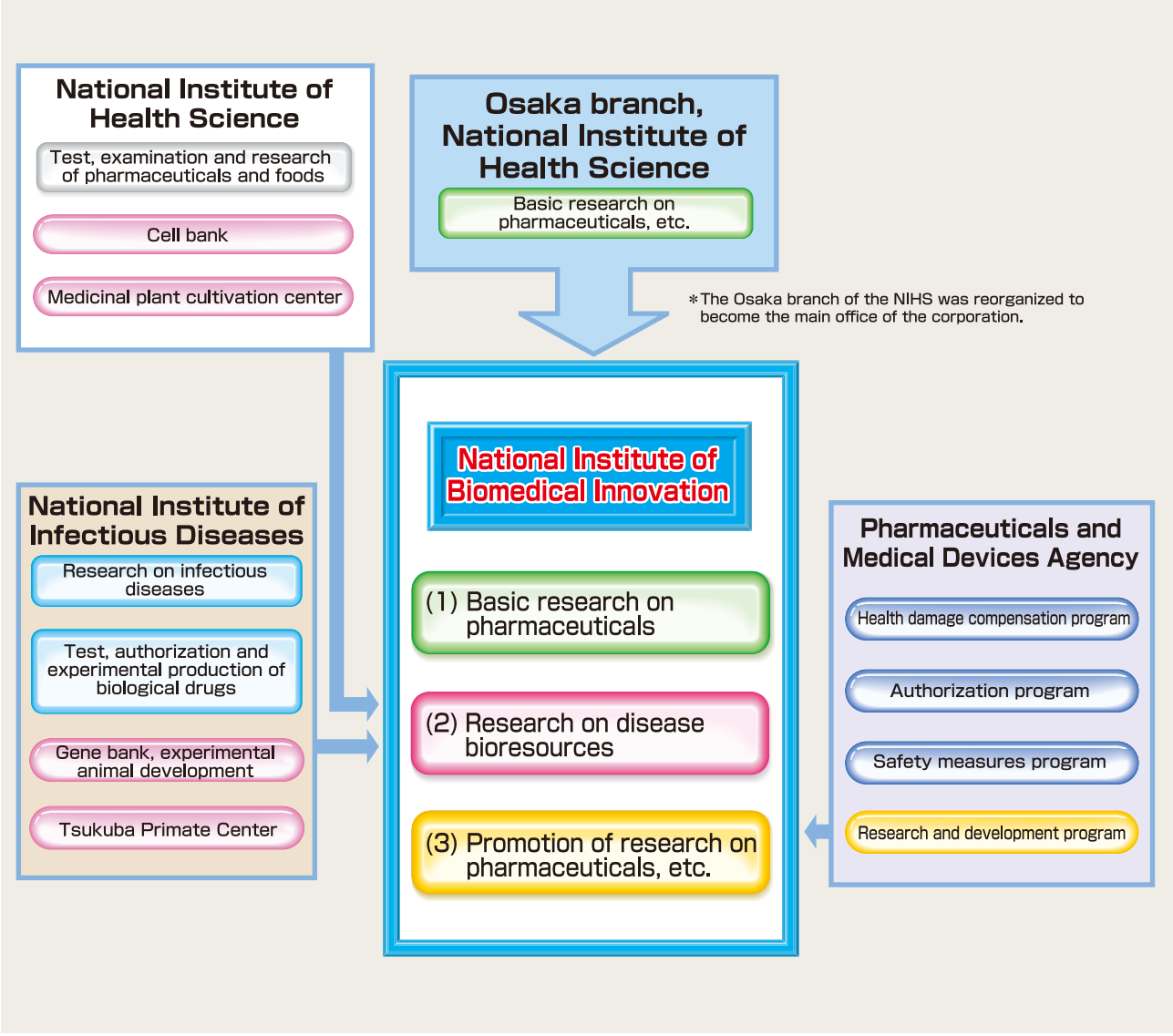
Koichi Yamanishi

General description of the National Institute of Biomedical Innovation

1. History

The National Institute of Biomedical Innovation was established in April 2005, with the Osaka branch of National Institute of Health Sciences as the nucleus and integrating aspects of the National Institute of Infectious Diseases and the Pharmaceuticals and Medical Devices Agency.

The institute was formed as part of the reorganization of the laboratories and institutes under the jurisdiction of the Ministry of Health, Labor and Welfare begun in 1995 to integrate organizations related to promoting the development of pharmaceuticals and medical devices distinct from the regulatory and promotion functions.



2. Objectives and programs

The development of more effective and safe pharmaceuticals and medical devices based on genomic and proteomic advances likely represents the best way to maintain health and improve quality of life. In the current and future global economy, Japanese industrial policy should promote and increase the international competitiveness of the Japanese pharmaceutical and medical devices industries.

The National Institute of Biomedical Innovation performs three primary functions, listed below, as an independent administrative agency facilitating new pharmaceutical and medical device development by supporting research and development at private corporations and universities.

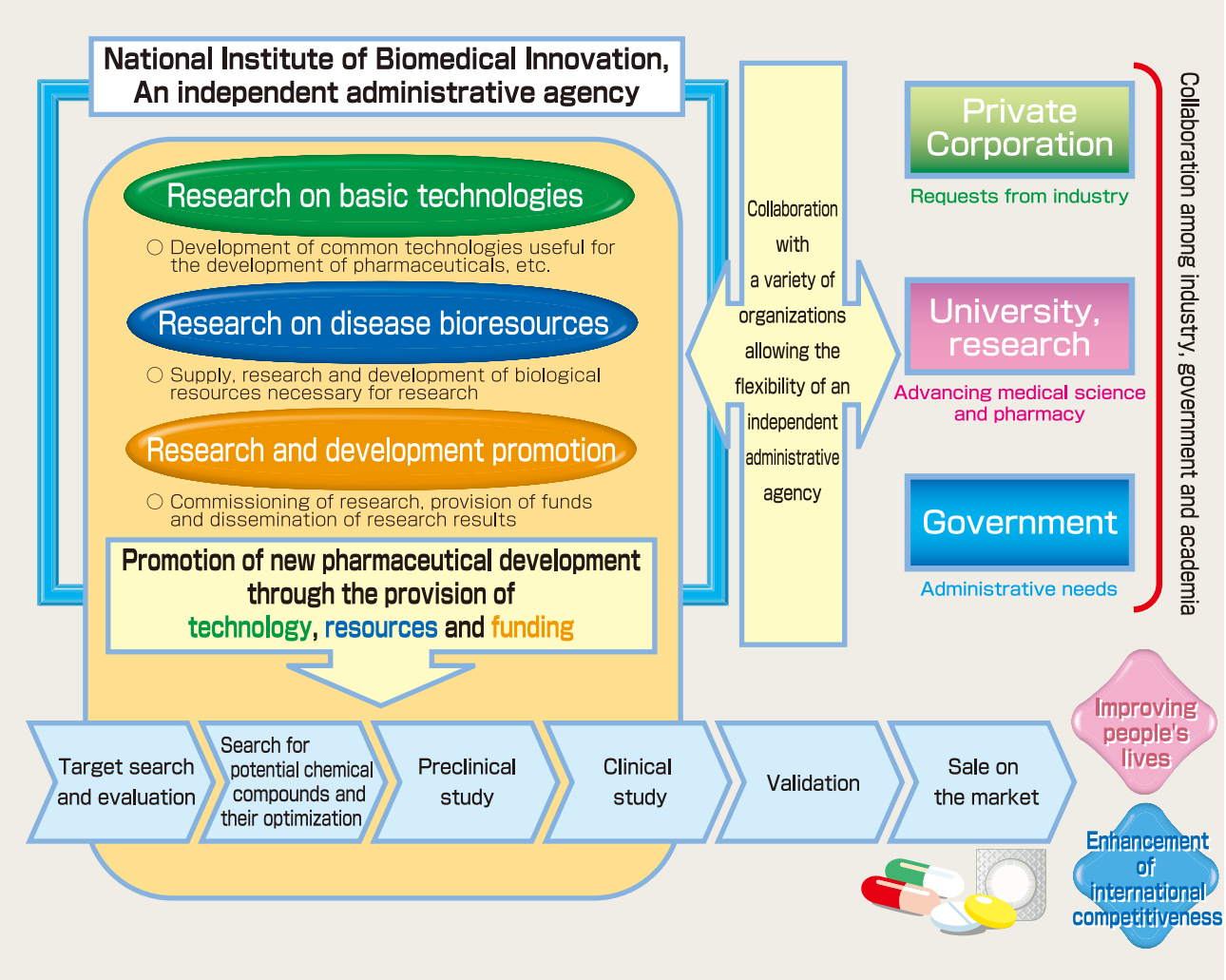
①Research on basic technology of pharmaceuticals

②Research on disease bioresources

③Research and development promotion of pharmaceuticals

FY2010 budget; ¥11.20 billion

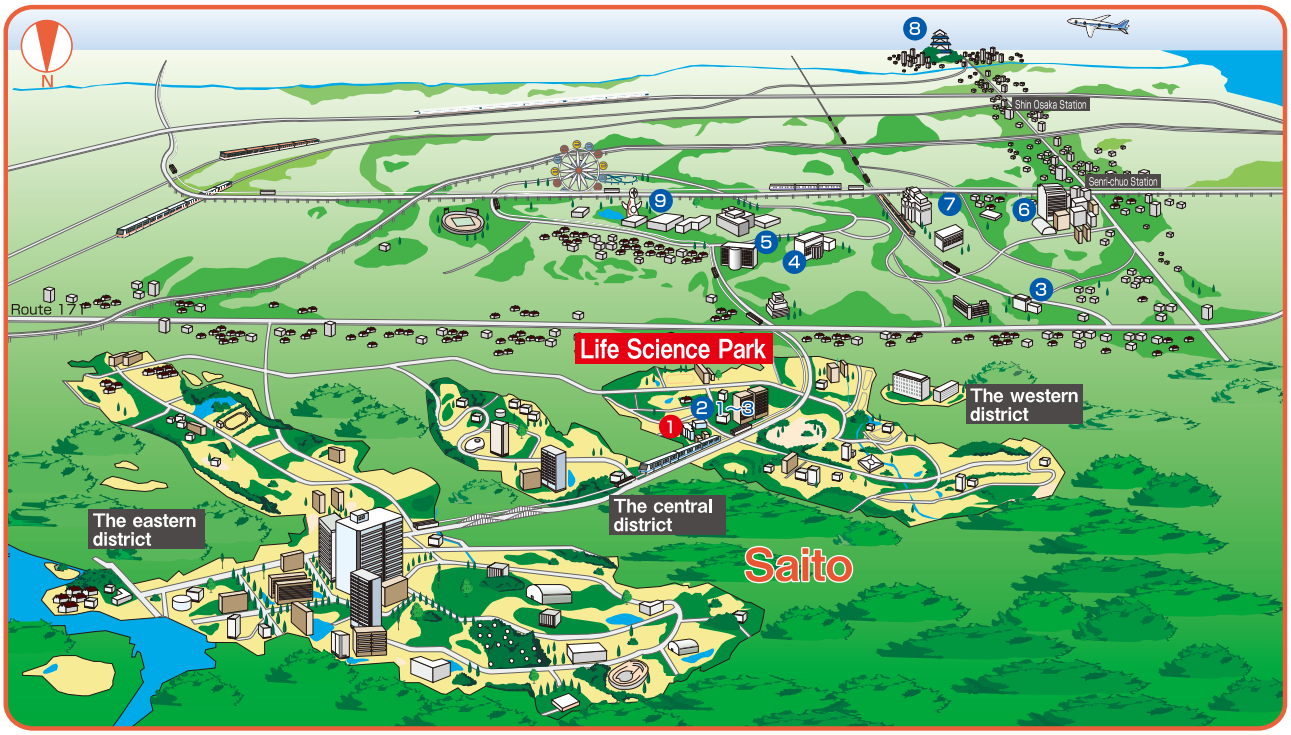
Breakdown
- Administration grant; ¥9.74 billion
- Facility construction subsidy; ¥180 million
- Government investment; ¥400 million
- Other; ¥880 million



3. As a part of the Osaka research community

The National Institute of Biomedical Innovation is a nation wide organization supporting the development of new pharmaceuticals in Japan while functioning as a core facility of "the Northern Osaka Bio Cluster." Osaka, as symbolized by Doshomachi, has been a hub of leading pharmaceutical companies, and many industrial, government and academic organizations involved in the development of new pharmaceuticals are found in the North Osaka area: Osaka University and the National Cardiovascular Center, Saito Bio Incubation Center, etc.

We wish to create technology for the future development of pharmaceuticals and medical devices by exploiting this accumulation of industry and academia, while actively promoting cooperation among industry, academia, and government.



1 National Institute of Biomedical Innovation

2-1 "Saito Bio-Incubator" Bio-technology Support Center

2-2 Saito Bio Hills Center

2-3 Saito Bio Innovation Center

3 National Cerebral and Cardiovascular Center

4 Osaka University

5 Osaka University Hospital attached to the Faculty of Medicine

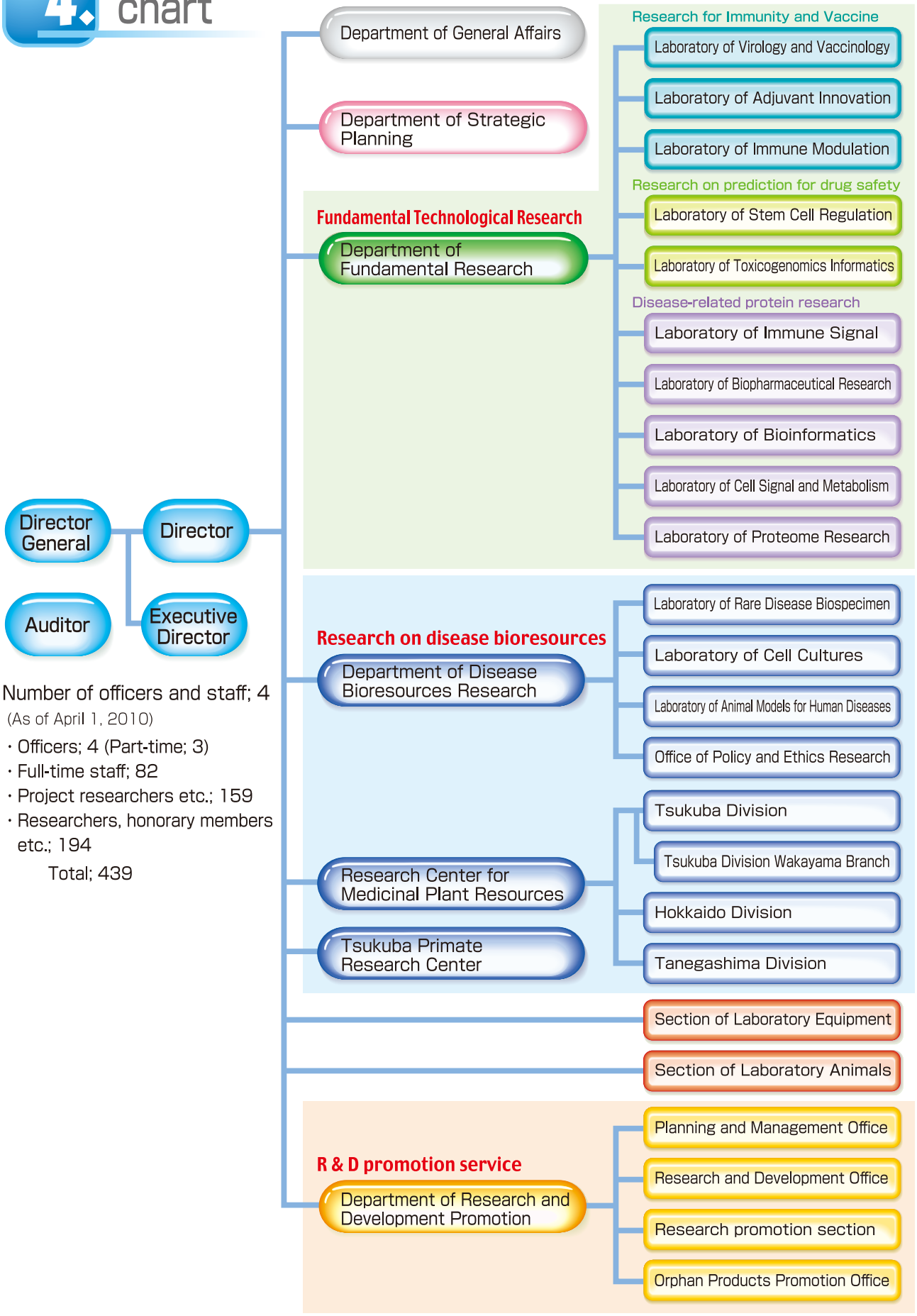
6 Senri Life Science Center

7 Osaka Bioscience Institute

8 Doshomachi (Pharmaceutical industry)

9 Expo '70 Commemoration Park

4. Organization chart



Number of officers and staff; 4

(As of April 1, 2010)

- Officers; 4 (Part-time; 3)
- Full-time staff; 82
- Project researchers etc.; 159
- Researchers, honorary members etc.; 194

Total; 439

5. Key Grounds, Key Projects

(1) Key Grounds

The National Institute of Biomedical Innovation (NIBIO) will be promoting the fundamental technological research on the following three fields as the key grounds in the second term plan, from FY2010 to FY2014.

① Research and Development for Next-Generation Vaccines.

The development of novel vaccines is necessary to overcome infectious diseases. We perform the research and the development for next-generation vaccines, ajuvants, and administration methods that are effective and efficient.

② Fundamental research for the development of the novel drug toxicity testing system.

For the purpose to accelerate the research for drug discovery, we carry out the fundamental research for the construct of the novel pharmaceutical toxicity testing system by using the method inducing differentiation of various stem cells such as ES and iPS cells.

③ Fundamental research of the treatment for rare diseases.

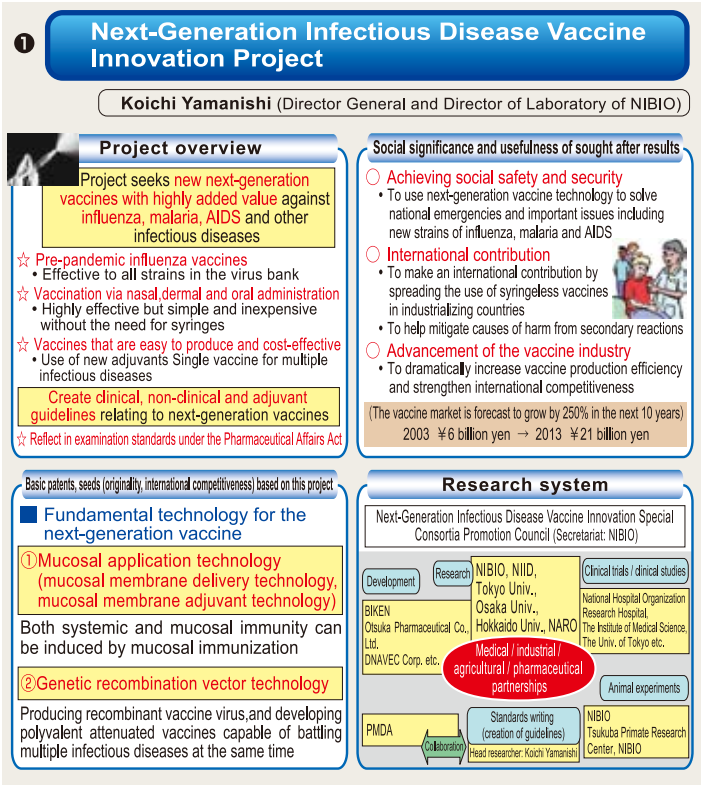
The rare diseases require the critical diagnoses and the effective treatments. Analyzing the molecular mechanism for such rare diseases, we research and develop the fundamental technologies for the pharmaceuticals with epoch-making diagnoses and treatments about rare diseases.

(2) Key Projects

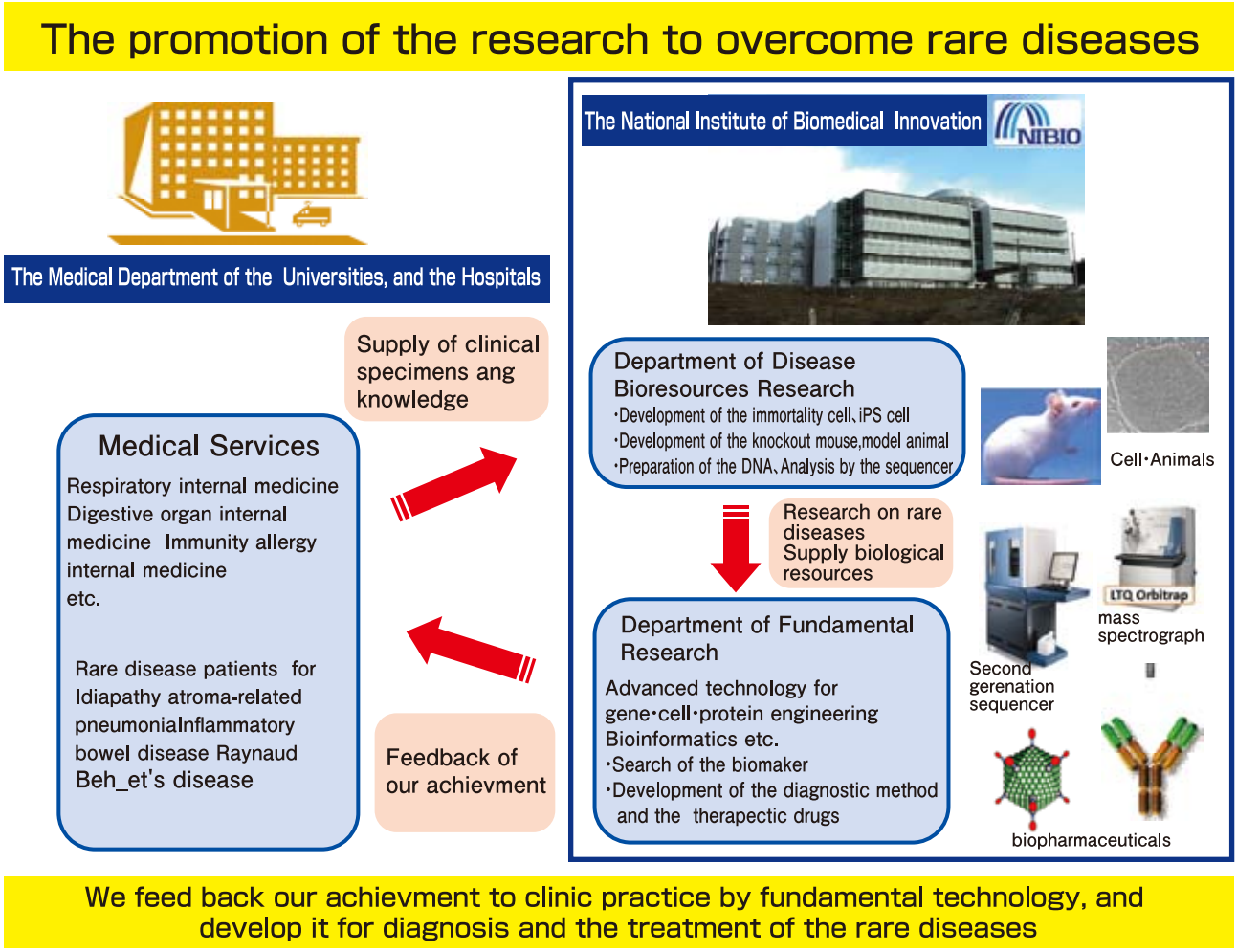
The National Institute of Biomedical Innovation (NIBIO) is working on the following key projects as industry-academic-government partnerships.

① Super Special Consortia for supporting the development of cutting-edge medical care (FY2008 - FY2012)

Two research topics headed up by NIBIO were selected for Super Special Consortia for supporting the development of cutting-edge medical care, for which the Cabinet Office, the Ministry of Education, Culture, Sports, Science and Technology, the Ministry of Health Labour and Welware and the Ministry of Economy, Trade and Industry accepted applications in FY2008 (143 proposals were received and 24 proposals were accepted).



② The promotion of the research to overcome rare diseases



③ Joint research with multiple pharmaceutical manufacturers

NIBIO promotes national projects as below in which multiple pharmaceutical manufacturers participate

① Toxicogenomics Project (FY2002 - FY2006):
Joint research with 15 pharmaceutical manufacturers

② Toxicogenomics Informatics Project (FY2007 - FY2011) :
Joint research with 13 pharmaceutical manufacturers

③ Drug discovery proteome factory (FY2003 - FY2007) :
Joint research with 20 pharmaceutical manufacturers

④ Drug discovery biomarker exploration research (FY2008 - FY2012) :
Joint research with 4 pharmaceutical manufacturers

⑤ Animal Models for Human Diseases research project (FY2005 - FY2009) :
Commissioned research from four pharmaceutical manufacturers

⑥ Vaccine development (adjuvant/immunity boosting agent) joint research (FY2008 - FY2010):
Joint research with four vaccine manufacturers

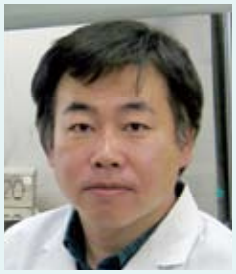
Fundamental Technological Research

– Developing Standard and Universal Technologies essential for Drug Discovery –

Numerous scientists at industrial and university laboratories are working tirelessly toward the development of novel pharmaceuticals, and we wish to utilize data from rapidly progressing basic sciences such as genomics and proteomics to develop technologies that are universally applicable in a wide array of pharmaceutical research and development areas.

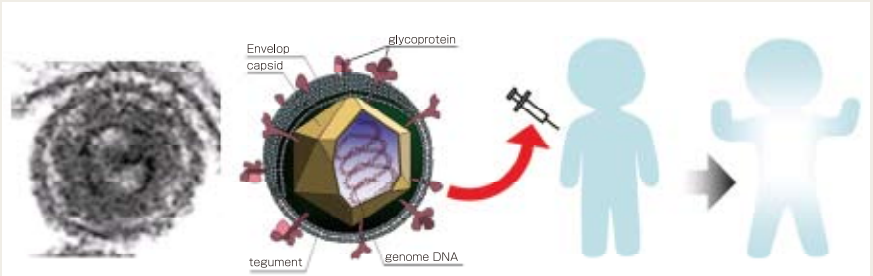
Laboratory of Virology and Vaccinology

Fundamental research developing the next-generation vaccines and anti-viral agents



Project Leader
Shigefumi Okamoto, DDS, PhD

To counteract emerging infectious diseases such as influenza and SARS, the development of vaccines, anti-viral agents, and effective administration methods are urgently needed. In this project, we wish to determine the mechanisms of herpes virus infection for the eventual development of next-generation vaccines and anti-viral agents.



What are herpes viruses?

There are many different herpes virus families including the viruses causing chicken pox (varicella virus) and cold sores (herpes simplex virus).

Vaccination strategies

Current vaccination strategies protect against only one virus. We wish to produce vaccines to provide defense systems against multiple infectious diseases such that a single vaccination protects against attack from many different types of viruses.

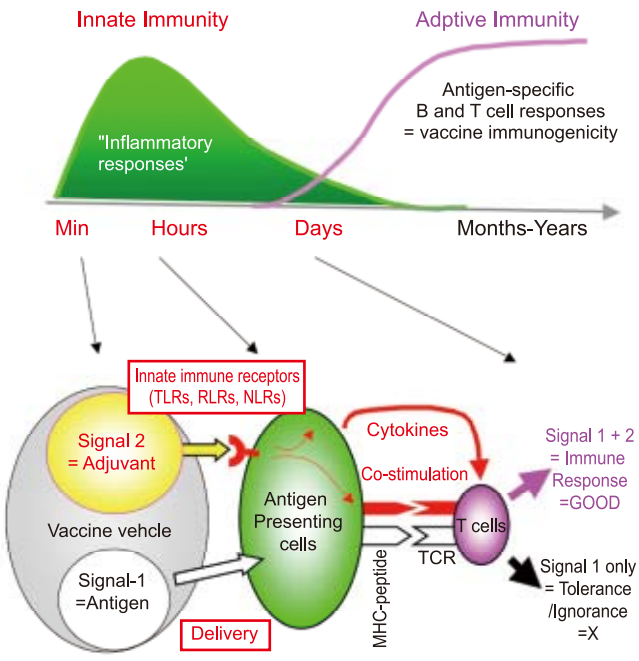
Laboratory of Adjuvant Innovation

Basic researches on, and development of, novel vaccine adjuvant(s) with innovative technologies

Project leader
Ken J. Ishii, MD, PhD

By elucidating the intra- and inter-cellular signaling pathways that mediate the immunogenicity of vaccines, we hope to gain some senses not only for developing more efficient technologies for vaccines and adjuvants, but also ensuring their safety to higher level.

Innate control of vaccine immunogenicity



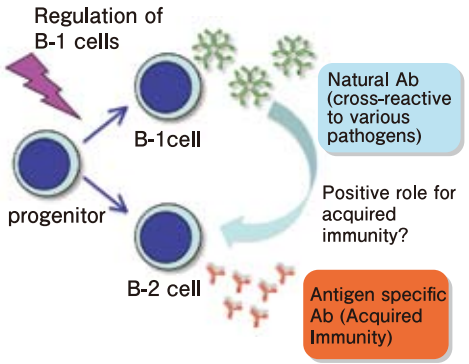
Laboratory of Immune Modulation

Fundamental research for adjuvant development

Development of adjuvant, a stimulant of immune response, is necessary for the practical use of next generation-vaccines. Regulatory mechanisms of natural antibody production and stimulatory signals making dendritic cells capable of CTL induction are being studied.

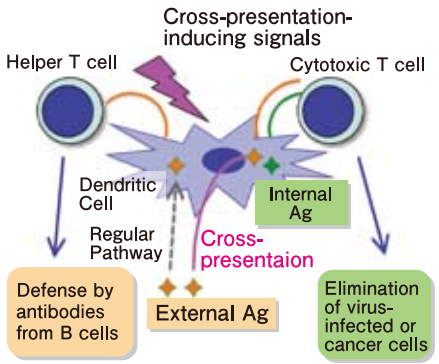
Project Leader
Taku Kouro, MD, PhD

Natural antibody-inducing adjuvant



<Effective for new / mutated pathogens!>

CTL-inducing adjuvant



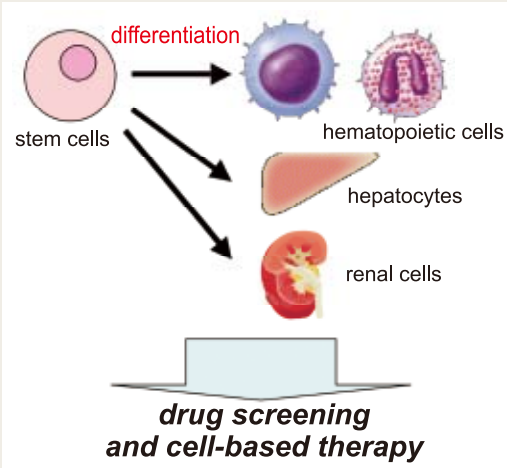
<Effective for viral infection and cancer!>

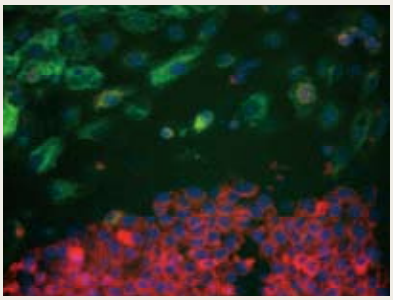
Laboratory of Stem Cell Regulation

Drug development by using stem cell-derived differentiated cells

Embryonic stem (ES) cells and induced pluripotent stem (iPS) cells show the characteristics of self-renewal and pluripotency. In our laboratory, functional cells, such as hematopoietic cells, immune cells, hepatic cells, and renal cells, are efficiently differentiated from stem cells. Our objectives are to use these differentiated cells for novel drug screening systems and cell-based therapy.

Project Leader
Kenji Kawabata, PhD





human hepatic cells (red)
differentiated from iPS cells

Fundamental Technological Research

– Developing Standard and Universal Technologies essential for Drug Discovery –

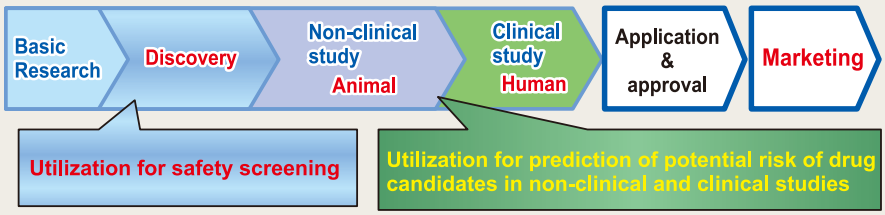
Laboratory of Toxicogenomics Informatics

Genomic toxicology for pharmaceutical toxicity prediction

We collect and analyze large amounts of gene expression data from drug-treated animals and cells together with toxicological parameters (e.g., blood biochemistry) in order to construct a data base, which is utilized for making more rapid prediction of toxicity of drug candidates.

Project Leader
Tetsuro Urushidani, PhD

We won the prize for the achievement of collaboration with industry,government and academia. (Cabinet Office) (2010.6)



Toxicogenomics Project
Term of research: 2002.4～2007.3
Collaborative project by the government and pharmaceutical companies
NIBIO + NIHS
15 Pharmaceutical companies
Improvement in efficiency of drug development in early stage

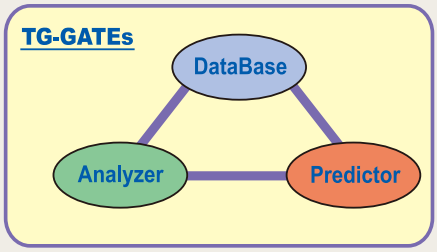
Toxicogenomics Informatics Project
Term of research: 2007.4～2012.3
Collaborative project by the government and pharmaceutical companies
NIBIO + NIHS
13 Pharmaceutical companies
Improvement in efficiency of non-clinical and clinical studies

- A large scale database of >150 drugs with sufficient quantity and high quality of Toxicological and gene expression data
- Development of TG-GATEs
  Database, Analyzer, Predictor

Overview of research

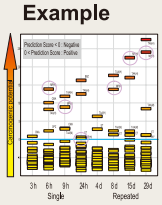
Development and application of safety biomarker
- Search of safety biomarker with informatics
- Transcriptome of blood
- - Omics (Metabolomics)
- Establishment of in vitro assessment systems to evaluate human safety

Application of genomic data for regulatory science
- Validation and guideline for gene expression analysis



- **Shortening and cost reduction for drug development**
- **Development of safer drugs**

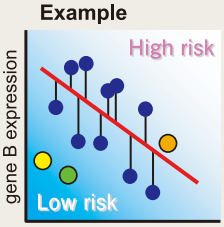
Example



Prediction of non-genotoxic carcinogenicity

Utilization in the early stage of drug development
- Prediction of potential risk of drug candidates
- Improvement of extrapolation of single dose data for long-term toxicity
- Ranking of candidate compounds
- Elucidation of molecular mechanism of toxicity

Example



Algorithm to predict safety (toxicity)

Laboratory of Immune Signal

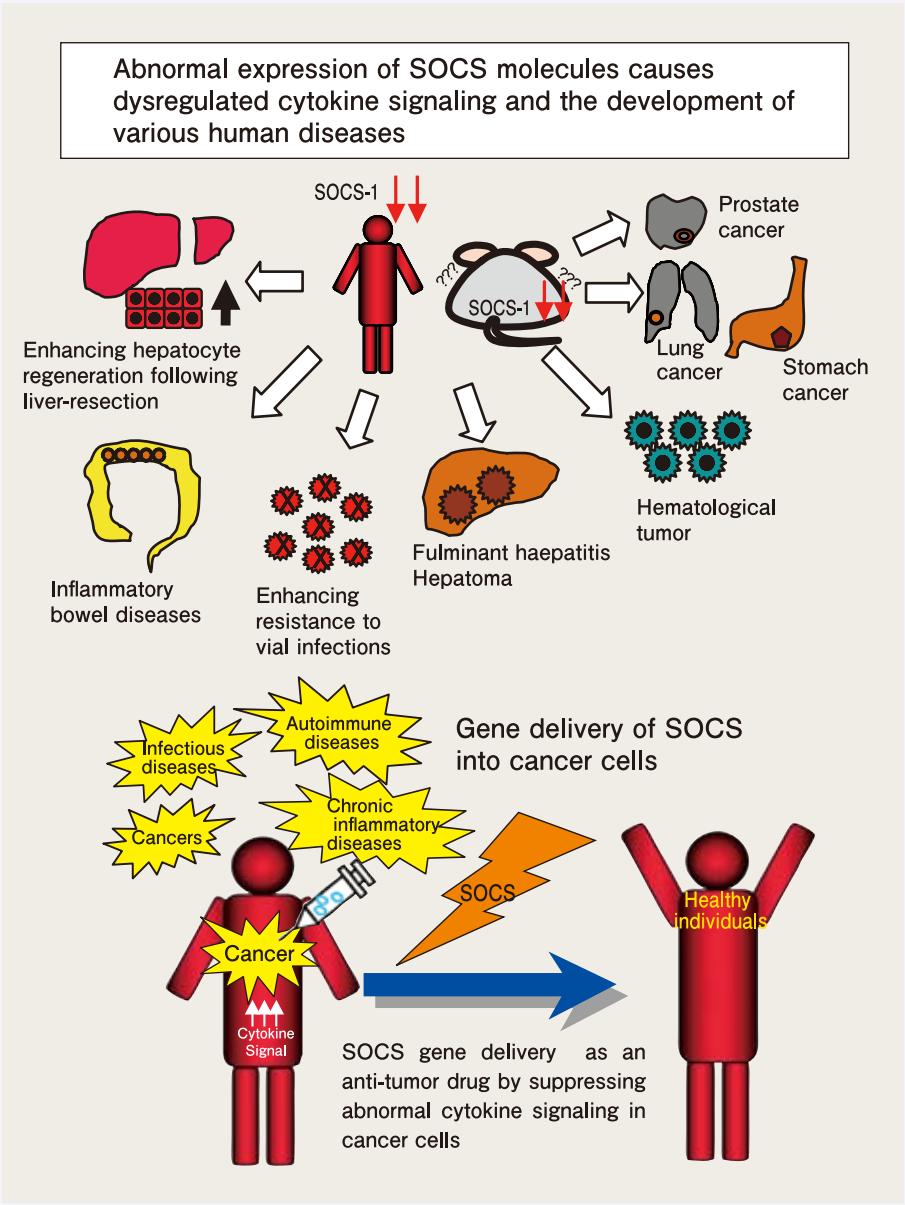
Fundamental research into the treatment of intractable diseases by SOCS gene delivery

Project Leader
Tetsuharu Naka, MD, PhD

Cytokines are proteins which regulate the functions of cells in the body. Abnormal cytokine intracellular signaling is understood to cause a number of human diseases, including cancers, chronic inflammatory diseases and autoimmune diseases.

The suppressor of cytokine signaling (SOCS) proteins are critical regulators of cytokine signaling. In our laboratory, we are investigating the role of abnormal SOCS expression in the development of human diseases.

Our research will lead to the development and clinical application of new therapies for intractable diseases such as cancer, using SOCS molecules.



Fundamental Technological Research

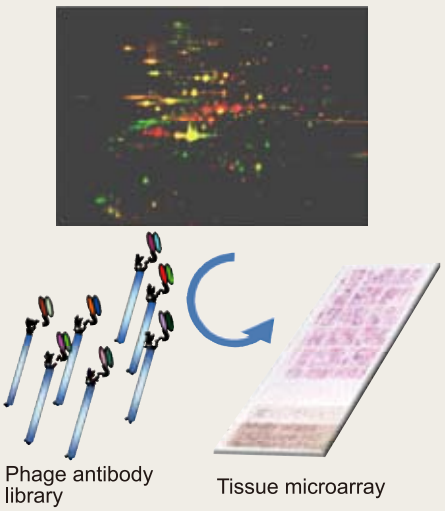
– Developing Standard and Universal Technologies essential for Drug Discovery –

Laboratory of Biopharmaceutical Research

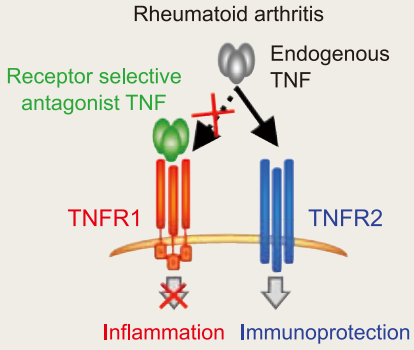
Development of biopharmaceuticals for refractory diseases

Project Leader
Shin-ichi Tsunoda, Ph. D.

Our project focuses on overcoming refractory diseases, such as cancer and autoimmune disease, by using a proteomics approach. We are searching for valuable diagnostic markers or therapeutic target proteins as well as developing novel biopharmaceuticals. Particular emphasis is placed on the phage display system, which can handle a large repertoire of antibodies or mutant proteins.



Technology for discovery of disease-related proteins

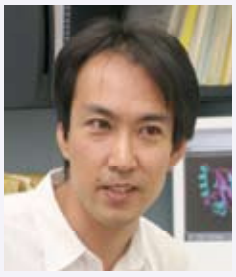


Inhibiting the TNFR1 signal (inflammation) but not TNFR2 signal (immunoprotection)

Technology for creating functional artificial proteins

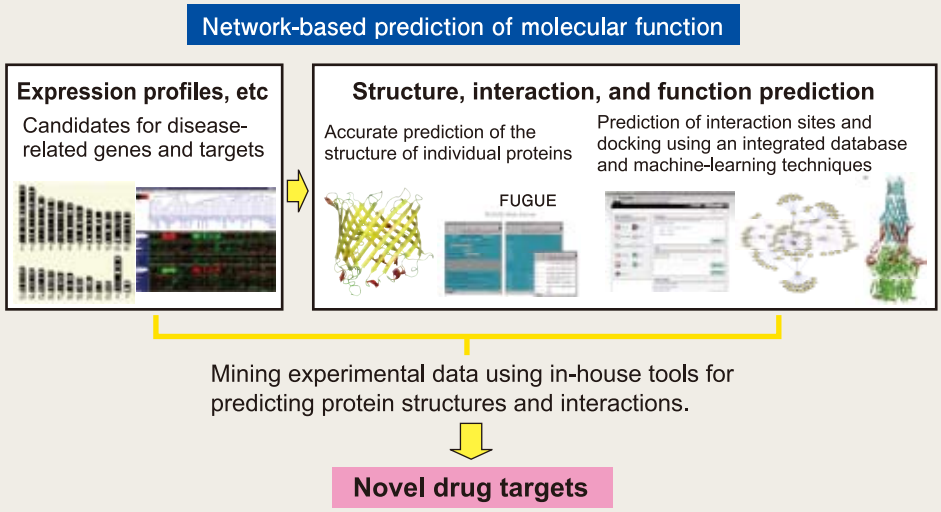
Laboratory of Bioinformatics

Bioinformatics for drug discovery



Project Leader
Kenji Mizuguchi, PhD

We carry out structural and functional bioinformatics research into complex systems with the ultimate goal of developing novel drugs. Our work aims to extract new knowledge from large-scale experimental data, such as genome sequences and protein three-dimensional structures, particularly to aid target discovery. Our approaches include both algorithm development and analyses of individual biological systems.

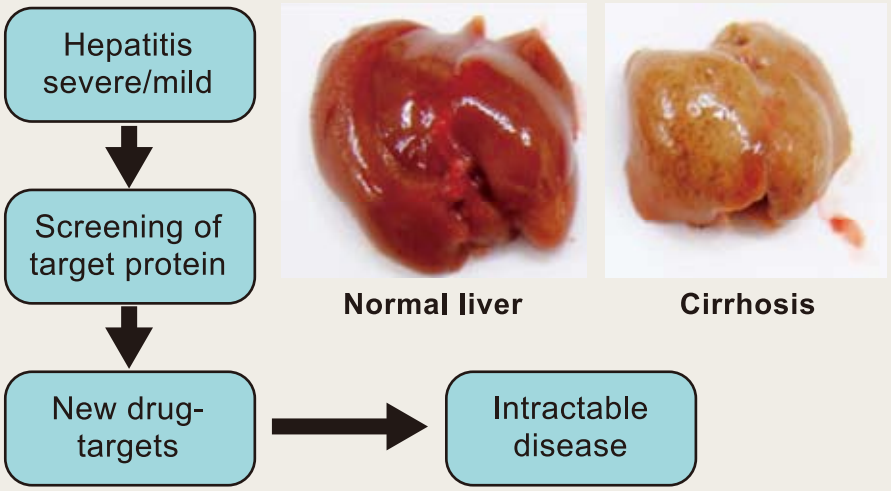


Laboratory of Cell Signal and Metabolism

New drug targets in intractable diseases

Metabolic disorders are known to cause refractory diseases, such as neuronal degenerative-disorders and hepatitis. We focus on the molecular mechanisms of the cause and the exacerbation of these diseases, and we have identified some of the key proteins involved in these disorders. In addition, we are developing spontaneous mouse models of several disease, including paralysis, dyslipidemia and hepatitis.

Project Leader
Hiroshi Takemori, PhD

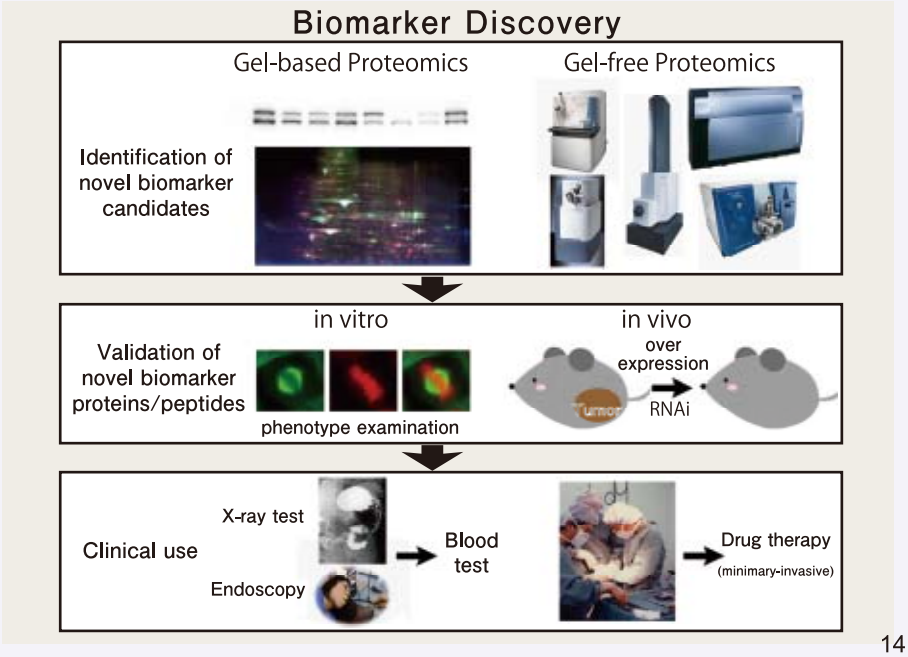


Laboratory of Proteome Research

Identification and functional analysis of novel biomarker candidate proteins and peptides

Project Leader
Takeshi Tomonaga, MD, PhD

In this project, our goal is to identify bona fide biomarkers useful for diagnosis and treatment of human diseases through functional analysis of candidate proteins by combining most recent proteomic technology with molecular and cellular biology.



Research on Disease Bioresources

– Exploration and development of cells, genes, experimental animals, etc. –

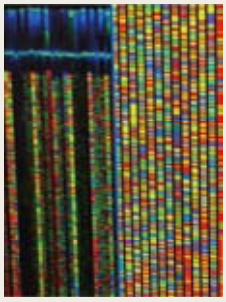
Disease bioresources such as genes, cells, and experimental animals are now essential for the development of pharmaceutical products and medical devices. The National Institute of Biomedical Innovation conducts a variety of research projects for the development of bioresources essential for future research, collecting and preserving a variety of disease bioresources, and providing them to many laboratories in Japan or other countries.

Laboratory of Rare Disease Biospecimen

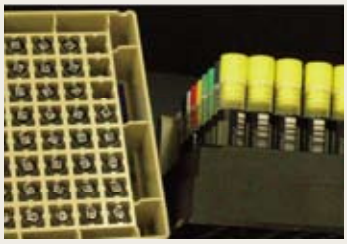
Leader of the laboratory
Directory of the Department
Tohru Masui, PhD

To develop diagnosis and treatment of rare diseases, it is essential to promote research by supporting stable and efficient infrastructure. We started to establish "Rare Disease Specimen Bank". The bank will provide quality controlled biospecimens to researchers in rare diseases research.

Second generation sequencer (left)



Sequencing data (center)



2D barcode tubes(right)

Office of Policy and Ethics Research

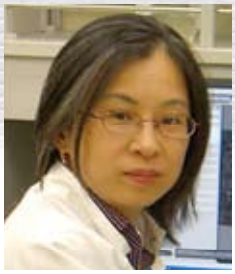
Research Leader and Director
Tohru Masui, PhD

The advancements in research techniques and study style of proteomics and genomics demand large scale biospecimen repositories of high quality. The Office is established to study on policy and ethics on research use of human materials and information. At the same time we are collecting data to construct a database of localization and availability of biospecimens. Our goal is to develop an internationally acceptable frame of policy and ethics on the use of human materials and information in Japan. This may lead us to achieve promotion of health and welfare of citizens.

Your cooperation is indispensable for a successful medial research.

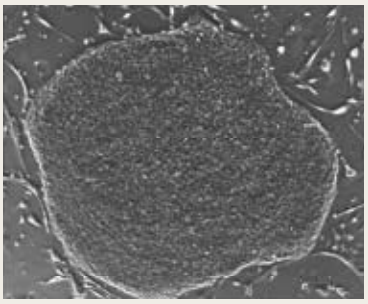
The Office introduces international key reports to Japanese researchers.

Laboratory of Cell Cultures



Project Leader
Miho Kusuda Furue, Ph.D., D.D.S.

As the JCRB Cell Bank, we are collecting human culture cells derived from various diseases patients, and human stem cells including induced pluripotent stem (iPS) cells and adult mesenchymal stem cells. The cells are qualified by testing for microbial contamination, virus contamination and cross culture contamination, and also by confirming their karyotype and cell characteristics. And then the qualified cells are provided to researchers. Further, we are developing the qualification method, functional evaluation method, and also culture method for human cells in order to support fundamental research on medical or pharmaceutical sciences.



Human iPS cell
JCRB 1331

Cells in Glass ampoules
for preservation

Nitrogen liquid tanks
for cell preservation

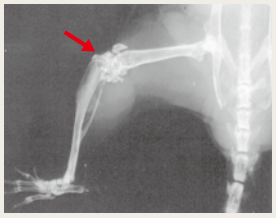
Laboratory of Animal Models for Human Diseases

Project Leader
Junichiro Matsuda, DVM, PhD

A variety of animal models for human diseases play essential roles in the biomedical research including pathogenetic analysis and the development of new drugs for rare and/or incurable diseases. To facilitate the research and development, we are developing new animal models of diseases by establishing spontaneous mutant mice, transplanting human organs or tissues to super SCID mice, and generating gene-modified animals. We are also maintaining, preserving, and providing these model animals and developing related technologies such as reproductive biotechnologies.

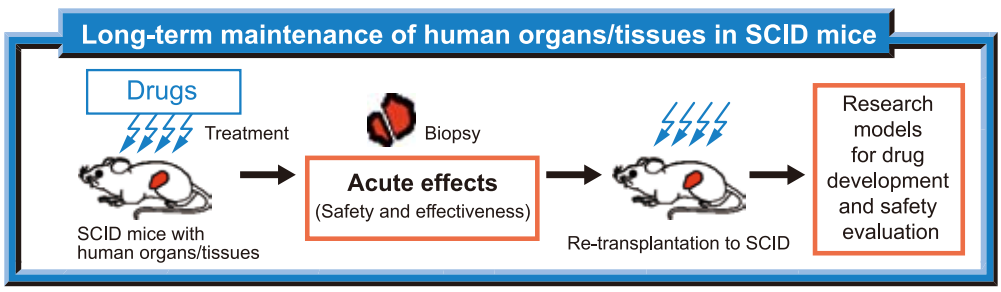
Nephrosis mouse showing severe edema.

GM1-gangliosidosis mouse (right) showing abnormal posture. Normal mouse(left)



Osteoarthrosis mouse

Project Leader
Taisei Nomura, MD, PhD



Research Center for Medicinal Plant Resources

Department Manager
Nobuo Kawahara,PhD

As best represented by Chinese herbal medicine, medical plants have been used as ingredients for pharmaceutical products from ancient times. The Research Center for Medical Plant Resources, the only comprehensive research center in Japan for medical plants, performs research and development on technology related to the cultivation and breeding of medicinal plants, chemical and biological evaluations. And we cultivate and preserve more than 4,000 species and groups of medicinal plants suitable to the vegetation of each area at three divisions and one branch in Japan, to supply seeds and seedlings and offer guidance on cultivation technology to various research institutes. Moreover, we open it to public "The database for the medicinal plants" that includes growth characteristic, cultivation method, related crude drugs and Kampo formulae of the major medicinal plants we possess.

General description of each division

Hokkaido Division (Nayoro City, Hokkaido)

【Features】 Performs research on the cultivation and rearing of top quality plants from medicinal plants in northern Japan. Plants used by Aynu are also collected.

【Representative plants】 Rhubarb, gentian, glycyrrhiza, astragali radix and saussureae radix, etc.

Rhubarb

Gentian

Tanegashima Division (Nakatane-cho, Kumage-Gun, Kagoshima Prefecture)

【Features】 Performs research on cultivation, collection and preservation of medicinal plants in southern Japan.

【Representative plants】 Cinnamomum sieboldii meissen, curcuma, rauwolfia serpentina, cassia angustifolia, etc.

Curcuma

Rauwolfia serpentina

Tsukuba Division (Tsukuba City, Ibaraki Prefecture)

【Features】 Preserves medicinal plant resources, performs chemical and biological evaluations, and conducts research using biotechnology and genetic technology while serving as the main facility of the research center. We have a collection of ephedraceae and crude drugs samples.

【Representative plants】 Ephedra, poppy, cimicifuga, bupleurum falcatum, etc.

Ephedra

Poppy

Tsukuba Division Wakayama Branch (Hidaka-cho, Hidaka-Gun, Wakayama Prefecture)

【Features】 Performs systematic preservation and cultivation of medicinal plants in Kinki area.

【Representative plants】
Tree peony,
paeoniae radix,
Lindera strychnifolia F. Vill.,
Phellodendron amurense,
angelica acutiloba,
etc.

Paeoniae radix

Tsukuba Primate Research Center

Department Manager
Yasuhiro Yasutomi,DVM,PhD

Monkeys are important experimental animals used at the final stage of development of drugs and medical technologies. Tsukuba Primate Research Center owns a large-scale breeding colony of experimental monkeys, mainly cynomolgus monkeys, and it is the only facility in Japan that both supplies laboratory-bred monkeys and performs medical research. In addition to quality control, supply research resource development, and basic technology development, we evaluate state-of-the-art medical technology, the efficacy of new drugs and safety assessments using monkeys.

Mission 1 Research resources development and supply of monkeys

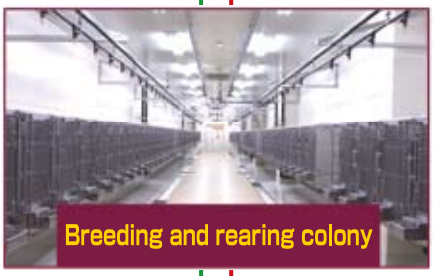
Basic resource

Supply of multipurpose, high-quality monkeys

- Supply monkeys without infectious diseases harmful to human beings but with detailed individual recognition data including ages, histories, families, and laboratory data
- Supply of special monkeys such an pregnant monkeys, embryos and aged monkeys

Provision of technologies and information

- Breeding and rearing technology
- Quality control technology
- Individual recognition information data base



Breeding and rearing colony

Consideration of animal welfare

Strategic resource

Spontaneous diseases model development

- Familial (hereditary) disease models such as retina macular degeneration and hyperlipemia
- Disease models such as obesity, diabetes, endometriosis, cardiovascular disease and osteoporosis

Experimental induction diseases models

- infectious diseases, nervous diseases, cardiovascular diseases, etc.

Provision of technologies and information

- Inspection technique, analysis technique, database

Mission 2 Management of a shared use primate facility

Infectious diseases experimental facility

Medical science experimental facility

Shared facilities are open to researchers outside of the center. For details, please refer to our Website.
http// tprc.nibio.go.jp

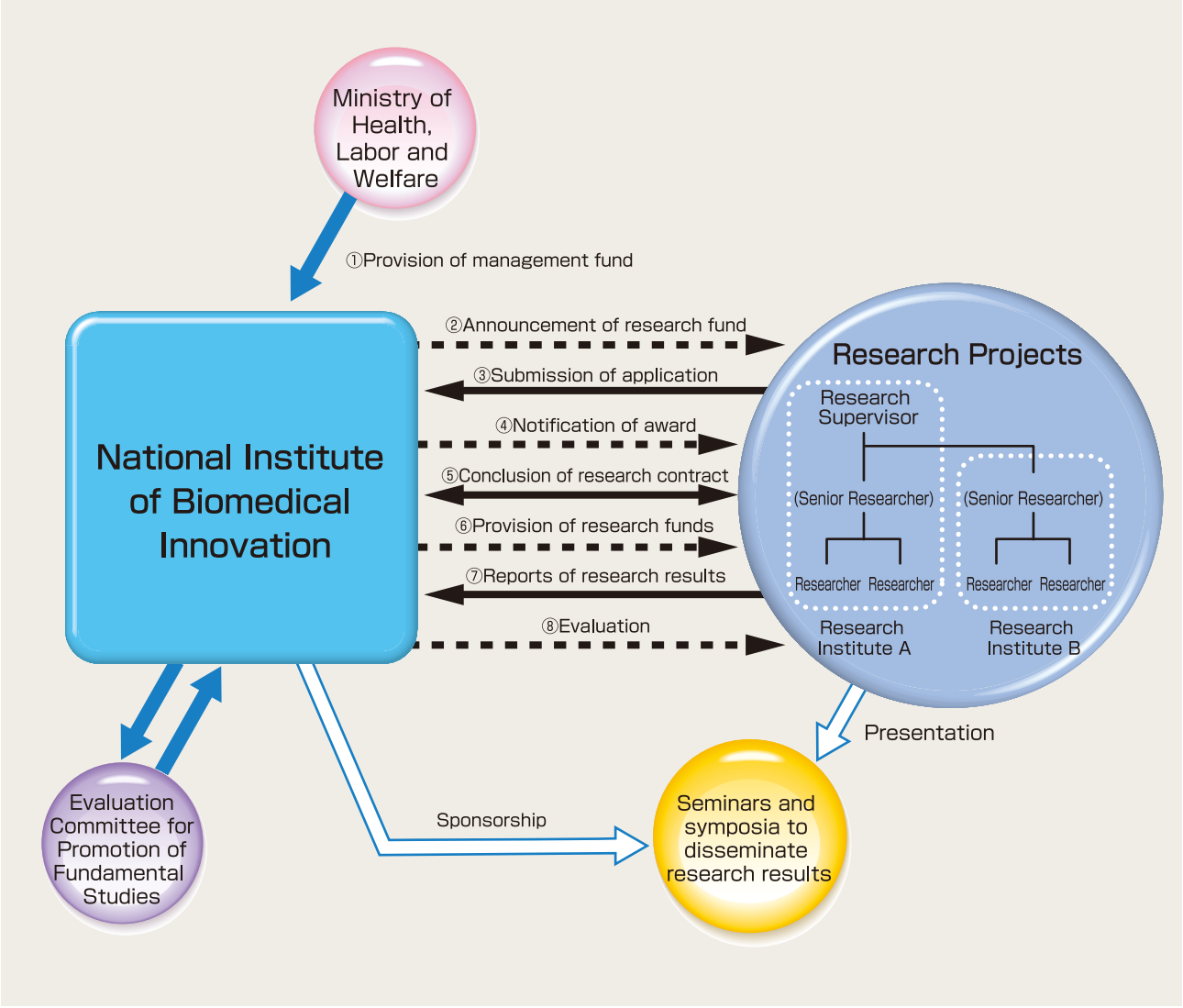
R & D promotion service

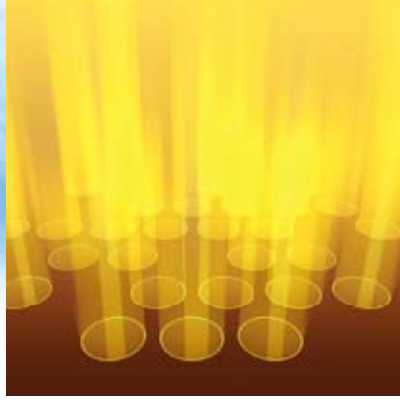
– Support of research activities at universities and private corporations, etc, by providing research funds –

In order to effectively promote the development of pharmaceuticals and medical devices, we need to facilitate research and development by supporting research activities and collaboration among universities, private corporations, national laboratories and institutes. By strictly evaluating proposed research, we provide funds to support highly promising research and development in research organizations and private corporations.

Research promotion program

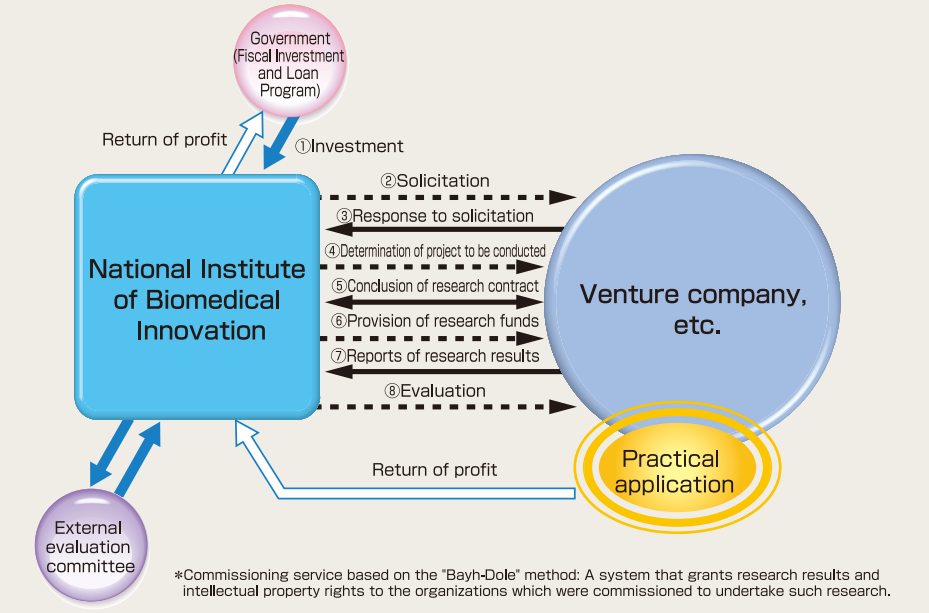
Through research contracts with national research institutes, universities, etc., we support these basic research projects that are promising for the development of innovative pharmaceuticals and medical devices to promote healthy life of nationals, and disseminate their results.





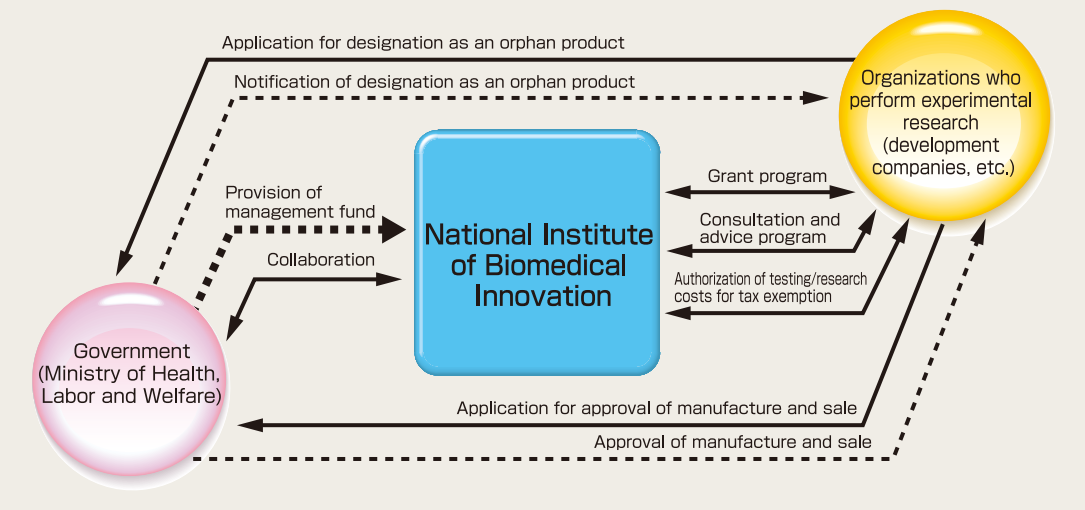
R&D promotion program

We provide venture companies who perform research on the practical application of pharmaceuticals and medical devices with funds through commissioning service based on the "Bayh-Dole" method (*). (From 2009, we suspend application of this program). We request payment of part of the profit obtained.



R&D promotion program for Orphan products

Currently, research and development of pharmaceuticals and medical devices for AIDS and other intractable diseases (termed as orphan products) by development companies is limited due to the reduced ability of organizations to recoup their costs because of the small population of affected patients despite great medical need. In promoting research and development of orphan products, we offer grants, consultation and advice programs.



The action for the social reduction of achievement about research

The National Institute of Biomedical Innovation (NIBIO) is reducing our achievement to society as following.

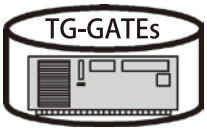
1. Reflection of our achievement into the criteria about new drug approval review.

We reflect our advanced achievement to the criteria about new drug approval review in the fields that had no criteria before. Besides, we reduce our advanced achievement to society by creating common foundation to all over the society, in addition to profit each private companies.

Case1.

The Ministry of Health, Labour and Walfare made out the vaccine guideline by utilizing our achievement from "next-generation infectious disease vaccine innovation" adopted in "Super Special Consortia for supporting the development of cutting-edge medical care".(2010.5)

Case 2



We make out the novel pharmaceutical toxicity testing system guideline by utilizing the achievement from "drug discovery and application by using iPS cells" adopted in "Super Special Consortia for supporting the development of cutting-edge medical care".

2. Practical application of the achievement

Case1.

As the achievement of Toxicogenomics Project, we constructed the world's greatest database of toxicogenomics. Domestic major pharmaceutical companies are utilizing the database for toxicity screening.

Case2

As the achievement of NIBIO·Research Center for Medical Plant Resources, we developed the novel species of Hatomugi. Some companies are developing the new products such as Yocinin, cosmetic, soap, liquor, sweets and so on by using it as material.

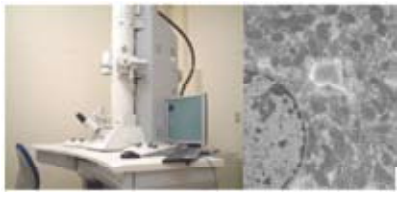
And we succeeded in the development of the water culture system of kanzou inconnection with remparies.

Section of Laboratory Equipments (SLE)

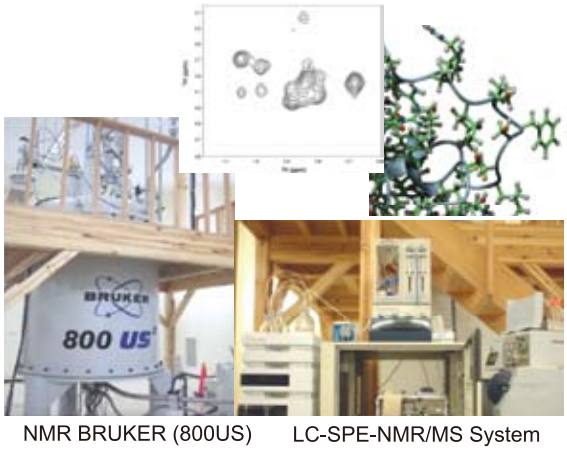
Chief Researcher
Takayoshi IMAZAWA

The SLE possesses a 800MHz nuclear magnetic resonance (NMR) spectrometer, scanning electron microscope/energy dispersive spectroscope (SEM/EDS) and transmission electron microscope (TEM). We have conducted an analysis of proteins and chemicals with low molecular weight, and diagnosis of ultra-structural morphology of biological samples.

SEM/EDS JEOL (JSM-6510LA)



TEM HITACHI (H-7650)



NMR BRUKER (800US) LC-SPE-NMR/MS System

Research facilities and locations

○ **National Institute of Biomedical Innovation**
6-8-7, Saito-Asagi, Ibaraki City, Osaka 567-0085, Japan
Phone: (+81) 72-641-9811 (main phone number)

○ **Reserach Center for Medicinal Plant Resources**

Tsukuba Division
1-2,Hachimandai, Tukuba City, Ibaraki Prefecture 305-0843, Japan
Phone: (+81) 29-838-0571 (main phone number)

Tsukuba Division, Wakayama Branch
1205-1,Habu,Hidakagawa-cho,Hidaka-gun,Wakayama Prefecture 649-1324,Japan
Phone: (+81) 738-22-0497 (main phone number)

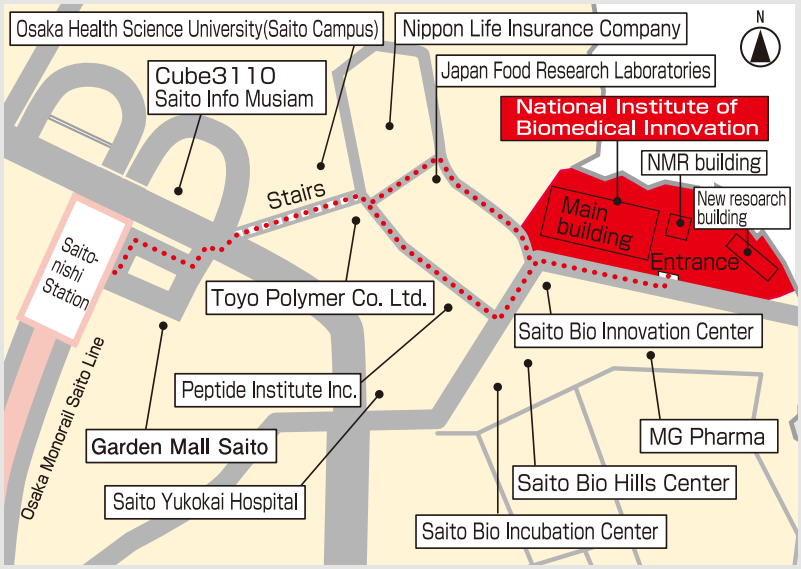
Hokkaido Division
108-4,Aza Ohashi,Nayoro City,Hokkaido 096-0065,Japan
Phone: (+81) 1654-2-3605 (main phone number)

Tanegashima Division
17007-2,Matsubarayama,Noma,Nakatane-cho,Kumage-gun,Kagoshima Prefecture 891-3604,Japan
Phone: (+81) 997-27-0142 (main phone number)

○ **Tsukuba Primate Research Center**
1-1,Hachimandai, Tukuba City, Ibaraki Prefecture 305-0843, Japan
Phone: (+81) 29-837-2121 (main phone number)

URL:http://www.nibio.go.jp/english

National Institute of Biomedical Innovation - Guide map



Map of Saito, Osaka
National Institute of Biomedical Innovation

Access

[Train] Take the Osaka Monorail to "Saito-nishi".
and walk 10 minutes.

[Taxi] about 20 min. from "Senri-chuo", about 15 min. from "Kita-senri" station

[Driving] About 15 min. from Ibaraki Interchange, Meishin Expressway
About 15 min. from Suita Interchange