SAPPORO
HEALTH INNOVATION

Smart-H

Regional Innovation Strategy Promotion Program

Sapporo Health Innovation ‘Smart-H’

Hokkaido University Research and Business Park Project Promotion Council

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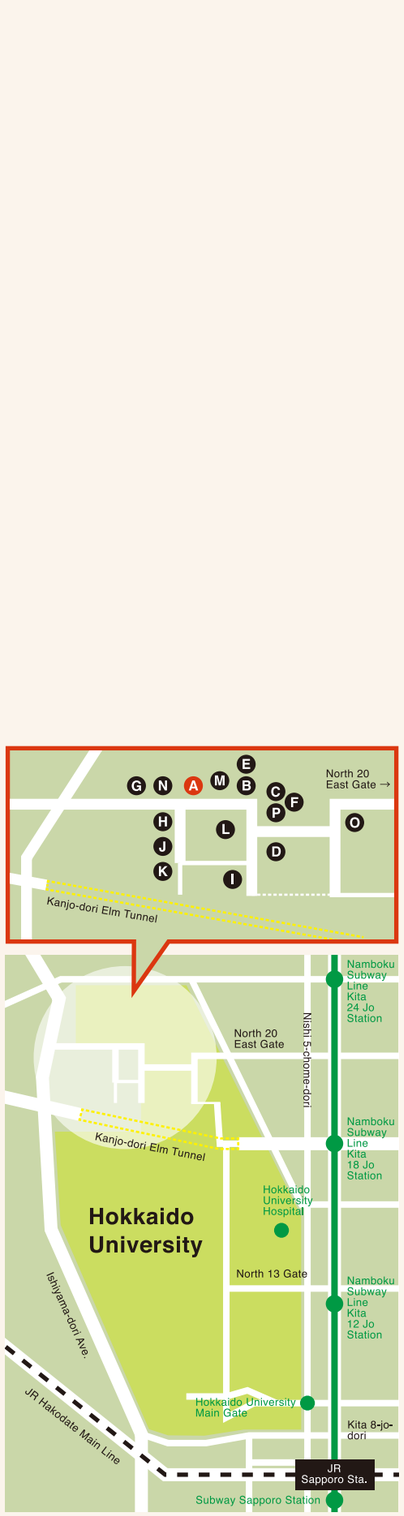
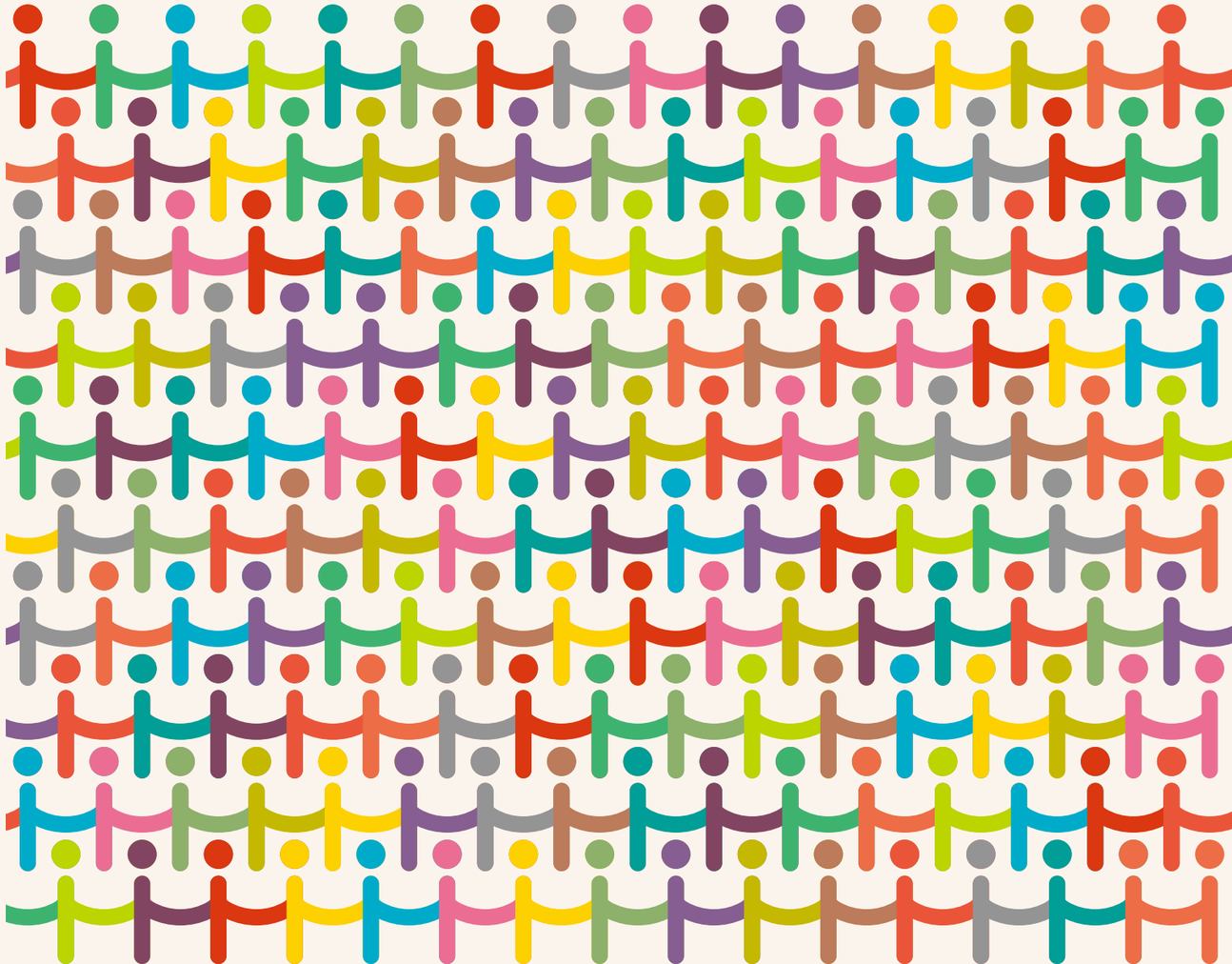
- A Hokkaido University Northern Campus Bldg. No.3
- B Frontier Research Center for Post-Genome Science and Technology
- C Creative Research Institution Sousei , Hokkaido University
- D Hokkaido University Research Center for Zoonosis Control
- E Shionogi Innovation Center for Drug Discovery
- F Research Institute for Electronic Science, Hokkaido University
- G Hokudai Business Spring
- H Hokkaido Institute of Public Health
- I Hokkaido Research Organization
- J Hokkaido Institute of Environmental Sciences
- K Geological Survey of Hokkaido
- L Hokkaido Industrial Research Institute
- M Center for Promotion of Platform for Research on Biofunctional Molecules,Hokkaido University
- N Northern Advancement Center for Science and Technology (NOASTEC Foundation)
- O Institute of Low Temperature Science, Hokkaido University
- P Catalysis Research Center, Hokkaido University

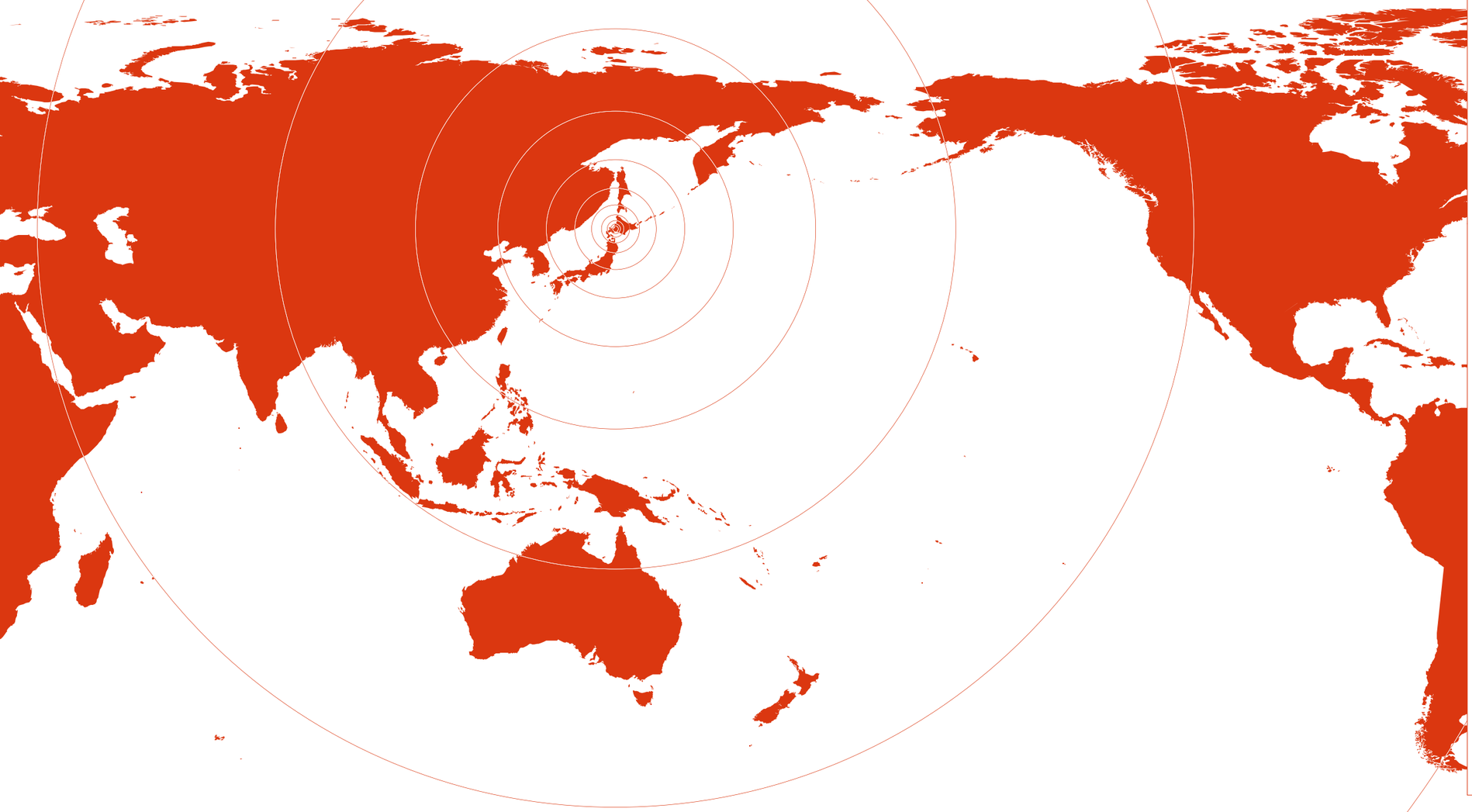




Create a future where people can live healthy lives

Establishment of the nation's health by "life-innovation"

Now, From Hokkaido to the World



Greeting

It is vital that Japan continuously creates innovations in economic and social areas as well as conducting strategic efforts based on new inspirations breaking down conventional ideas in order to ensure sustainable development. Those efforts should be performed not only by national governments but also by regions through maximizing regional characteristics and strengths in a proactive manner.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) initiated "Regional Innovation Strategy Support Program" so as to support individual regions to enable to create innovations by making the most of science and technology infrastructures developed and refined thus far in 2011. On the basis of "regional innovation strategies" drawn up and presented by the regional Innovation Promotion Council, national governments designate them as "regional innovation strategy promoting regions," and the MEXT renders "Regional Innovation Strategy Support Program" to the selected regions.

Regional Innovation Strategy "Hokkaido University Research & Business Park Project" proposed and applied by the Hokkaido University Research & Business Park Project Promotion Council was selected as a region focused on strengthening international competitiveness of the Regional Innovation Strategy Promoting Regions. Centering on MEXT' s Regional Innovation Strategy Support Program, the Regional Innovation Strategy Promotion Program, Sapporo Health Innovation 'Smart-H' has been enthusiastically advanced.

This project is the effort to optimize high knowledge and state-of-the-art technologies relating to health science and medical care which have been acquired by placing 'food' , Hokkaido' s strength and advantage as the core of the projects theme. Especially, with a focus on the bio-functionalities of food, effects and mechanism of the functionalities should be scientifically clarified. Furthermore, by actively and unprecedentedly utilizing foods rich in functionalities in collaboration with medical science, maintaining, promoting and restoring the general health conditions of people should be fulfilled. These efforts have been carried out in the Hokkaido University Research & Business Park, so called "the base of knowledge" situated in the Northern Campus Area of Hokkaido University. Toward the future, the international Hub of Health Science and Medical Integration should be the platform where many researchers, companies and local residents meet together. From this Hub in Hokkaido, health innovations will be generated while contributing to realization of our nation's society with health and longevity.

I would like to ask for your continuous support and cooperation.

Project Director
Sapporo Health Innovation 'Smart-H'
Regional Innovation Strategy Promotion Program

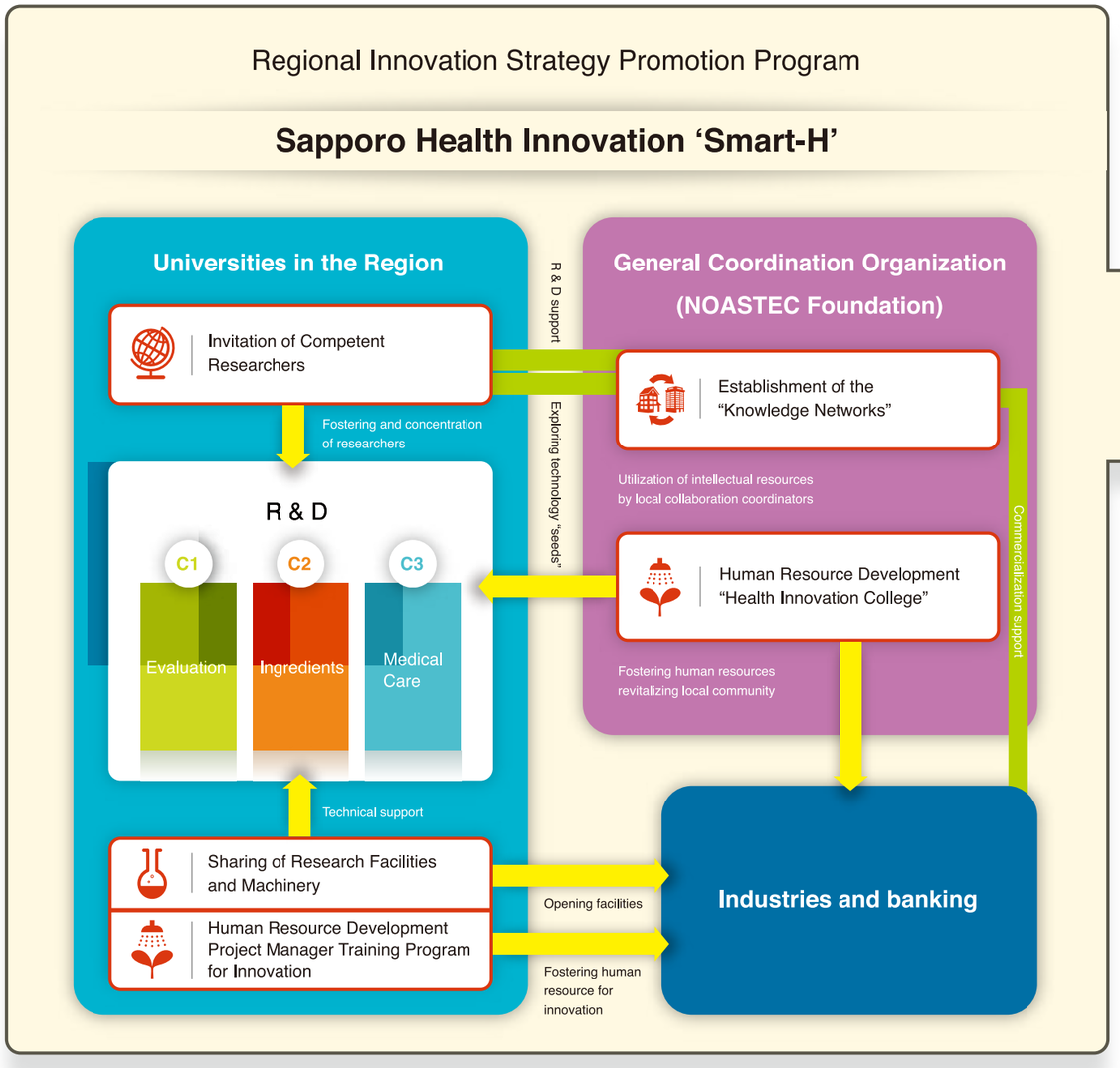
Executive Director
Northern Advancement Center for
Science and Technology

西岡純二

Junji Nishioka

Efforts through ‘Smart-H’ aimed at Creation of the Hub of Health Science and Medical Integration

Hokkaido University Research & Business Park, which is designated as a Regional Innovation Strategy Promoting Region, has been conducting the Regional Innovation Strategy Promotion Program “Sapporo Health Innovation ‘Smart-H’” in order to create regional innovation while utilizing the MEXT’s support program, Regional Innovation Strategy Support Program. This program targets to create the Hub of Health Science and Medical Integration in the Hokkaido University Research & Business Park by maximizing the Hokkaido’s uniqueness and benefit of food production and natural environment with the aim of advancing ‘Health Innovation’ which contributes to maintaining, promoting, and restoring the general health conditions of people



Hokkaido University Research & Business Park

Hokkaido University Research & Business Park (HU R&BP), which is composed of 16 research institutes engaged in primarily in life science research, is situated in the Northern Campus Area of Hokkaido Univerity located in the center of Sapporo. The HU R&BP functions as the base promoting comprehensive efforts from R&D to business creation in concerted actions among industry, academia, government and banking led by Hokkaido University Research & Business Park Promotion Council consisting of the following 12 organs . (as of August, 2014)

12 Organizations

・Hokkaido University ・Hokkaido Government ・City of Sapporo ・Hokkaido Economic Federation ・Hokkaido Bureau of Economy, Trade and Industry
・Hokkaido Bureau of Development ・Northern Advancement Center for Science and Technology (NOASTEC Foundation) ・Hokkaido Research Organization
・Japan Science and Technology Agency ・National Institute of Advanced Industrial Science and Technology Hokkaido ・Development Bank of Japan
・Small and Medium Enterprises and Regional Innovation Japan Hokkaido Chapter

Regional Innovation Strategy Promoting Regions

From Fiscal 2011, the Ministry of Education, Culture, Sports, Science & Technology (MEXT), the Ministry Economy, Trade and Industry (METI) and the Ministry of Agriculture, Forestry and Fisheries (MAFF) have jointly selected regions with excellent original visions toward the creation of regional innovations from a long-term perspective and designate them as “regional innovation strategy promoting region.” The external expert committee examines and is responsible for establishing regional innovation strategies and is proactively carrying out projects as either “regions focused on strengthening international competitiveness” or “regions focused on advancement of research function/industrial concentration” according to the potential of the individual regions.

Selected as a Region focused on Strengthening International Competitiveness

Hokkaido University Research & Business Park was selected as a region focused on strengthening international competitiveness in August 2011 with the reasons that HU R&BP possesses higher potentials such as internationally excellent university’s technology seeds and concentration of businesses which attract people, goods and capital from overseas.

Creation of the Hub of Health Science and Medical Integration

Sustainable generation of health innovation and contribution to the realization of a healthy society that has longevity

MEXT Regional Innovation Strategy Support Program

The Regional Innovation Strategy Support Program provides support for proactive and self-sustainable local activities, such as the formation intellectual assets and the development of human resources, in regions where MEXT’ s assistance is expected to contribute largely to the realization of their strategies. Regions eligible for receiving support are selected from among the regional innovation strategy promoting regions. Each selected region can combine following programs to promote projects for generation of innovation. The details are as follows.

Concentration researchers who play core roles in regional innovation strategies

<Invitation of Competent Researchers> The researchers will contribute to the realization of a regional innovation strategy and will support younger researchers who will be responsible for future regional visions. (They are invited outside of the region designated for this program in principle.)

Establishment of knowledge networks of universities and other research institutes

<Establishment of Knowledge Networks> Local Collaboration Coordinators play a role in matching universities’ outstanding research seeds with the technology needs of specific companies in the region and in generating new businesses.

Development and implementation of human resource fostering program in order to realize regional innovation strategies

<Human Resource Development> The program develops and supports a human resource development program which contributes to fostering people who will actively be engaged in the creation of new businesses in the region and in the revitalization of the region.

Sharing research facilities and machinery among universities and research institutes in the local community

<Sharing of Research Facilities and Equipment> Some personnel have been placed so that they receive inquiries on the operation of equipment and technical matters, and that the university’ s facilities can be shared among regional companies.

A Base for R&D and Development Promotion Worldwide

With an aim to create the Hub of Health Science and Medical Integration, various research and development projects have been conducted through industry-academia-government collaborations in the fields of “Ingredients project” , “Evaluation project” , and “Medical Care project” . Achievements of such projects have led to the formation of an international base for R&D while displaying actual performance and results to the world.

Column 2

Ingredients Project about Adding High Value to Foods

Column 1

Evaluation Project Concerning the Functionality of Food

Column 3

Medical Care Project about Contributing toward the Development of Preventive Medicine

Food Functionalities

- **Sturgeons** (collagen ingredients) [Takagi Group, Hokkaido University]
- **Medical plant cultivation system** [Marutani Group, Hokkaido University]
- **Grifola frondosa** (Mushroom) (lipid metabolic improvement) [Sato Group, HRO]
- **Medical plant** [Kojoma Group, Health Sciences University of Hokkaido]
- **Sphingolipids/ceramides** [Igarashi Group, Hokkaido University]
- **Squash/Pumpkin** (Anti Urinary Disturbance Improvement) [Ehara Group, HRO]
- **Sea urchin** (enteric environment improvement) [Ura Group, Hokkaido University]
- **Natural physiologically active substance** [Kobayashi Group, Hokkaido University]
- **Intestinal bacteria and lipocyte evaluation** [Ishizuka Group, Hokkaido University]
- **Assessment of the intestinal environment** (Research Center for Improvement of Enteric Environment) [Nakamura Group, Hokkaido University]
- **Nuclear receptor assay system** (functionality assessment) [Morita Group, AIST Hokkaido]
- **Advanced lipid analysis** (Lab for Advanced Lipid Analysis) [Hui Group, Hokkaido University]
- **Antioxidant property analysis** (Research Center of Anti-oxidation Activity Analysis) [Wakamiya Group, Asahikawa Medical University
- **Human intervention study** (Health Information Science Research Center) [Nishihira Group, Hokkaido Information University]
- **Integrated research into diet and medicine**

Preventive Care

- **Zoonotic disease, therapeutic and vaccines** [Kida Group, Hokkaido University]
- **Development of the Real-time Tumor-tracking Proton beam Therapy System with Molecular Imaging** [Shirato Group,Hokkaido University]
- **Physical exercise and health** [Okita Group, Hokusho University]
- **Cohort**

Regional Innovation Strategy Support Program initiated by MEXT

Base for the leading-edge R & D

- **The Proton Beam Therapy Center of Hokkaido Hospital**
  The world-leading Real-time Tumor-tracking Proton beam Therapy System with Molecular Imaging

- **National Institute of Advanced Industrial Science and Technology (AIST) Hokkaido**
- **NOASTEC Foundation Green Chemicals Center (GCC)**
  Galenic plants production by utilizing the Entirely Artificial Environment Plant Factory

- **Faculty of Advanced Life Science, Hokkaido University**
  World-leading ceramides research laboratory led by Professor Igarashi

- **Hokkaido University Research Center for Zoonosis Control**
  Development of new prevention methods and treatments for influenza while forging collaborative relationships with venture companies in drug discovery

Base for wide-ranging application in evaluation

- **The Health Information Science Center of Hokkaido Information University**
  Community-based human clinical trial that centers on the functionalities of foods, "Ebetsu Model"

- **Health Innovation and Technology Center (HITEC) of Health Sciences Faculty of Hokkaido University**
  The development of a new analysis technique to support health improvement through diet and the formation of local and expanded area networks as well as international ones based on the Laboratory for Advanced Lipid Analysis

- **The Research Center for Anti-oxidation Activity Analyses of Asahikawa Medical University**
  Creation of a new model of local preventive medical care based on food functionalities

- **National Institute of Advanced Industrial Science and Technology (AIST) Hokkaido**
  Nuclear receptor assay system for functionalities of foods

New Medical Tourism

Curative Medicine Vaccines

Medical Equipment

Maintaining, promoting, and restoring people’s general health status

Promotion of “Health Innovation”

Analysis Evaluation Service

Cosmetics/ Medical Ingredients

Food/ Foods with Functionalities

Evaluation Project

Column 1: Reinforcement of the capability of analysis and evaluation centering on food functionalities

Intestinal bacteria and lipocyte evaluation

Research project

"The basis of health maintenance through diet: Control of intestinal bacterial flora and adipocyte"

Lead researcher: Satoshi Ishizuka, Associate Professor, Research Faculty of Agriculture,Hokkaido University

Research Project Overview

High fat foods, particularly those with high sucrose contents, are believed to be one of the causes of metabolic syndrome. Those foods have also been found to cause changes in the intestinal flora. Similar changes in intestinal flora can be induced by the oral administration of bile acid. Through the profile analysis of the bile acid in the intestine and the analysis of intestinal flora, we can clarify the mechanism by which high fat foods cause metabolic syndrome. Furthermore, we can establish an experimental model to clarify the effect of food microorganisms, such as lactic acid bacilli and bifidobacteria, on the innate immunity of intestinal mucosa and adipose tissue.

Assessment of the intestinal environment

Research project

"Health and medical care innovation opened up by the functionality of the food evaluated by intestinal environment assessment"

Lead researcher: Kiminori Nakamura, Associate Professor, Faculty of Advanced Life Science,Hokkaido University

Research Project Overview

We can assess the interaction of food and intestinal function, such as immunity, absorption, and tissue regeneration, through research on the intestinal environment. The aim of this research is to clarify the relationship between the intestinal environment and disorders such as metabolic syndrome and inflammatory bowel disease. In particular, a new evaluation system on the intestinal environment may be anticipated by clarifying the relationships among diet, α-defensing, and disease.

<Sub-projects>

1. Assessment of the intestinal environment 2. Visualization of intestinal tract function
3. Improvement of systems for the analysis and assessment of the intestinal environment
4. Research on the diet and tissue regeneration

Advanced lipid analysis

Research project

"The development of new analysis technique to support health improvement through diet and the formation of local and extended area network as well as international ones based on the Laboratory for Advanced Lipid Analysis"

Lead researcher: Shu-Ping Hui, Professor, Faculty of Health Sciences, Hokkaido University

Research Project Overview

It becomes more obvious that ectopic fat accumulation is a more serious problem than he deposition of cholesterol with respect to adiposis. Ectopic lipids cannot be diagnosed in conventional blood tests because they are distributed inside cells. In this study, in addition to measuring trace amounts of neutral lipid at nanomolar levels which are undetectable by conventional methods, we will make it possible to determine the quantity of lipid stored within cells and will develop an assessment system focusing on obesity and lipid oxidation. We are performing these joint research and commissioned analysis projects using the various lipid analysis apparatus integrated into the Laboratory for Advanced Lipid Analysis.

<Sub-projects>

1. Commissioned analysis using the Laboratory for Advanced Lipid Analysis 2. Formation of an information network
3. Analysis of lipids within single cells 4. Development of sports foods
5. Development of carbon nano tube sensors
6. Identification and commercialization of the health benefits of oysters

Nuclear receptor assay system

Research project

"Development of assessment and analysis methods for functional components of Hokkaido's food products with the nuclear receptor assay system"

Lead researcher: Naoki Morita, Group Leader, Bioproduction Research Institute, National Institute of Advanced Industrial Science and Technology Hokkaido (AIST Hokkaido)

Research Project Overview

Nuclear receptors are a class of proteins found within cells. Those have ability to regulate the expression of genes with a ligand which is a molecule ingested into cell. Through use of this capability, it is possible to estimate how functional components in foodstuffs affect a human body. We will improve the functionality assessment system for Hokkaido's food products with the assistance of the nuclear receptors assay system that AIST Hokkaido possesses. Also, a novel assay system with secretory luciferase will be developed in order to reduce the time for analysis and trace moment-moment change of the bio-functionality of food.

Antioxidant property analysis

Research project

"Creation of a new model of local preventive medical care based on food functionalities including the antioxidant ingredient database"

Lead researcher: Nobutaka Wakamiya, Professor, School of Medicine, Asahikawa Medical University

Research Project Overview

Utilizing the food material database built up by the Research Center for Anti-oxidation Activity Analyses, we will establish a clinical evaluation center for the major ingredients in Hokkaido food products and supplements. We also will develop a local model for preventive medical care and for human resource development that will contribute to the health improvement of the local residents.

<Sub-projects>

1. Establishment of a clinical evaluation system for the antioxidant functions of food
2. Development of a model for clinical intervention studies for food and supplements
3. Development of human resources for food science
4. Establishment of an internationally-comparable antioxidant ingredient database

Human intervention study

Research project

"Research on the development of next-generation high-performance functional foods by the 'fusion' of diet and medical care"

Lead researcher: Jun Nishihira, Professor, Faculty of Medical Informatics,Hokkaido Information University

Research Project Overview

Taking advantage of the "Ebetsu model" for human clinical trials, we have accumulated scientific evidence of the functionalities of foods that can be applied in the medical field. Also, we have conducted the search for the seeds of drug discovery and the development of next-generation high-performance functional foods with a view of cooperation with the Hokkaido Organization for Translational Research (HTR). In addition, we will aim to establish a system that makes it possible to seamlessly develop research in the "functional food" and "health" fields in a "medical" clinical investigation.

Integrated research into diet and medicine

Research project

"The construction of new infrastructure for the project management during the development of functional foods based on clinical practice"

Research Project Overview

The Hokkaido Organization for Translational Research (HTR) will work with the Hokkaido Information University in accordance with the development of its human clinical trial, "Ebetsu model."

Ingredients Project

Column 2: Establishment of “Hokkaido brand” and high added value food ingredients

Sturgeons

Research project

“Development of sturgeon farming and techniques to utilize useful parts of the sturgeon”

Lead researcher: Yasuaki Takagi, Professor, Graduate School of Fisheries Science,Hokkaido University

Research Project Overview

The use of marine collagen has attracted attention due to the low risk of infectious pathogens compared with animal collagen. It becomes obvious that sturgeon collagen (especially type-II) has excellent characteristics such as a high denaturation temperature and high water affinity. This competence is expected to be used in areas of cosmetics (moisture retention, etc.) and medical supplies (substrate for cartilage regeneration, etc.). Together with advanced research into the use of sturgeon collagen, we will develop sturgeon farming techniques for caviar to expand on its use for promoting regional industry developments.

<Sub-projects>

1. Developing sturgeon farming techniques
2. Researching cosmetic and medical uses for sturgeon collagen, focusing on type-II collagen

Sphingolipids/ceramides

Research project

“The formation of a world center for sphingolipid health science and the development of drugs and functional foods that focus on its anti-aging properties”

Lead researcher: Yasuyuki Igarashi, Professor, Faculty of Advanced Life Science,Hokkaido University

Research Project Overview

We will elucidate whether functional materials in foods (sphingolipids, ceramides) are absorbed from the intestinal tract and will clarify the mechanism of the functionalities of absorbed materials. With the results of our research, we will develop new pharmaceuticals and utilize the fruits of our research in new industries. In addition, we will establish a hub of research and development by cooperating with companies through joint research as well as creating a world-class network of researchers, the "Sphingo Cluster".

〈Sub-projects〉

1. The development of a three dimensional model of skin and the screening methods for food materials
2. Development of ceramide-containing foods with the aim of cancer treatment and preventing cancer recurrence such as in tongue cancer and others.
3. Nutri-epigenomic analysis based on ceramide-containing foods
4. Enhanced fat metabolism and obesity prevention with yeast-derived phytoceramide-containing foods
5. Experimental study on the effects of ceramide-containing foods for Alzheimer' s disease prevention

Medical plant cultivation system

Research project

“Comprehensive research on plant cultivation systems under entirely artificial environments”

Lead researcher: Tomomi Marutani, Professor, Research Faculty of Agriculture,Hokkaido University

Research Project Overview

"The Entirely Artificial Environment Plant Factory" can control all conditions that are required to grow plants such as temperature and lighting. By utilizing the plant factory, we have established cultivation techniques of galenic plants of which supply depends largely on overseas.

〈Sub-projects〉

1. Establishment of supply system for excellent quality seedlings
2. Establishment of cultivation techniques that allow stable production throughout the year
3. Development of cultivation techniques to increase the medicinal and functional content of galenic plants

Squash/Pumpkin

Research project

“Formation of new production areas in Hokkaido for edible pumpkin seeds and the evaluation of their effect on anti-urinary disturbances”

Lead researcher: Kiyoshi Ehara, Research Staff Member, Hokkaido Research Organization

Research Project Overview

Focusing on a demand for edible pumpkin seed, we are developing a brand-name product as a new material produced in Hokkaido. In addition, since there are findings that indicate the summer squash species are effective in treating anti-urinary disturbances, we will evaluate the bio-functionality of pumpkin seed and clarify the mechanism of action of the pumpkin seed.

Grifola frondosa

Research project

“Verification of Grifola frondosa as a highly-functional prebiotic food and the dissemination of low-cost cultivation technology”

Lead researcher: Mayumi Sato, Senior Research Manager, Forest Research Department,Hokkaido Research Organization

Research Project Overview

Mushrooms exercise their various bio-functionality through an intestinal environment which is affected by intestinal bacterial flora. However, the details of the mechanism are not yet clear. This research will evaluate the effects of dietary fiber and protein of the "Taisetsu Hana No Mai No.1 (the Hen of the Woods) on the enteral environment, and to clarify the mechanism of lipid metabolism and natural immunity enhancing effects brought by the changes in the intestinal environment. Moreover, based on the scientific evidence by the human interventional test, the Taisetsu Hana No Mai No. 1 will be promoted as a functional food with the prebiotic effects.

Sea urchin

Research project

“The study of functional substances in sea urchin that may benefit human health — the plan to totally develop sea urchins in rocky-shore denudation into food products”

Lead researcher: Kazuhiro Ura, Assistant Professor, Graduate School of Fisheries Sciences,Hokkaido University

Research Project Overview

Research and development regarding improvement in total sea urchin utilization will be carried out. The sea urchins which live in rocky-shore denudation areas are unsuitable for consumption and may be a cause of rocky-shore denudation themselves. The research laboratory has developed a system that effectively cultures the unused sea urchins. This project will aim to develop and commercialize prebiotic functional food that benefits human health by utilizing sea urchins which are not well grown despite that system.

Medical plant

Research project

“Investigation of functionalities of the substances in Hokkaido wild plants”

Lead researcher: Mareshige Kojoma, Associate Professor, School of Pharmaceutical Sciences, Health Sciences University of Hokkaido

Research Project Overview

Humans have found useful substances for medicine from many species of flora and fauna over a long period of time. This laboratory is engaged in multidisciplinary research including botany, organic chemistry, analytical chemistry, pharmacology, plant physiology, molecular biology, and breeding science based on pharmacognosy that focuses on Hokkaido's plants for natural medicine. The research project will examine the pharmacological function of ingredients contained in wild plants grown in cold and snowy regions and plants that the Ainu people have used as medical herbs.

Natural physiologically active substance

Research project

“Search for natural physiologically active substances”

Lead researcher: Junichi Kobayashi, Professor, Faculty of Pharmaceutical Sciences,Hokkaido University

Research Project Overview

Research on isolation and molecular-structure determination of bioactive substances contained in wild herbs and microorganisms are conducted in this laboratory. From among separated natural products, the useful materials will be explored for the lead components of new medicines such as antineoplastic drugs, anti-infective agents, and medicines to prevent and cure metabolic syndrome. Substances that may be of use for clarifying the control mechanisms of protein which is vital for the maintenance of biological functions including ionic channels will be studied.

Medical Care Project


Column 3:Contributions to preventive medicine and overcoming common health problems around the world

Zoonotic disease, therapeutic and vaccines

Research project: "Development and practical application of new diagnoses, prevention methods and treatments for influenza"

Lead researcher: Hiroshi Kida, Professor, Graduate School of Veterinary Medicine,Hokkaido University

Research Project Overview

Based on the fundamental research results related to influenza and respiratory diseases from the Research Center for Zoonosis Control, we will develop and commercialize adjuvants for infection inhibitors and vaccines, as well as therapeutic drugs and vaccines to prevent worsening of influenza and respiratory diseases.

Development of the Real-time Tumor-tracking Proton beam Therapy System with Molecular Imaging

Research project: "Health Innovation Project based on patient-friendly cutting-edge medical technology"

Lead researcher: Hiroki Shirato, Professor, Graduate School of Medicine,Hokkaido University

Research Project Overview

We are developing the world-leading real-time tumor-tracking Proton Beam Therapy System with Molecular Imaging, which is used in the medical treatment for liver cancer and other diseases. Based on the results of clinical research, we will establish a research platform for the "Program of Disease Prevention, Diagnosis, and Treatment Planning" which will meet international standards. We will also invite researchers worldwide to share disease information and treatment expertise.

〈Sub-projects〉

1. Development of proton beam therapy systems
2. Development of a system for sharing patient treatment information

Physical exercise and health

Research project: "Realization of health-oriented society including physical exercise: Development of the index of immobilization and suitable kinetic therapy for Hokkaido"

Lead researcher: Koichi Okita, Professor, Graduate School of Lifelong Sport Hokusho University

Research Project Overview

In the effort to prevent against obesity by appropriately utilizing 'physical exercise' and 'food habits', this study will develop methods to assess and analyze the effectiveness of 'physical exercise' with a focus on myokine and brain-derived neurotrophic factors (BDNF). Furthermore, the research on the regional foodstuffs associated with the secretion of these substances will be conducted. First of all, the current status of immobilization of Hokkaido citizens will be analyzed. Based on the results of the survey, the fundamental physical strength, skeletal muscle mass, and amount of physical exertion which may contribute to extend a healthy life expectancy will be investigated. The optimal biomarkers will be obtained. Based on the findings from the study, assistive devices for physical exercise and guidelines for kinetic and behavior therapy adapted to cold and snowy regions will be developed. Consequently, by maximizing accumulated scientific knowledge, an innovation hub as well as anti-obesity science will be created.

Cohort

Research project: "Cohort study"

Research Project Overview

In Hokkaido, various types of cohort studies are conducted in cooperation with local communities, mainly by Sapporo Medical University. Through the utilization of these organizational frameworks and databases, the long-term effects on health caused by Hokkaido's foodstuffs will be considered as well as the awareness toward health of local residents will be evaluated.

Programs for Human Resource Development

Health Innovation College(Northern Advancement Center for Science and Technology)

Health Innovation College (HIC) fosters professionals who can utilize the contemporary knowledge about food functionality to help people maintain and promote good health and avoid developing diseases. HIC also fosters professionals who can develop innovative food products with functional ingredients to encourage prosperity in the food industries.

Basic Program

Qualified Attendee:

- Certified persons such as registered dietitians, functional food consultants, and health-care professionals
- Personnel in food industries that engage in product development
- University students, Graduate students

Advanced Programs

Qualified Attendee:

- Persons who completed the Basic Program

・Programs were developed with cooperation of Prof. and Dr. Jun Nishihira, Hokkaido Information University, and Prof. and Dr. Takanori Moriyama, Graduate School of Health Science, Hokkaido University
・These programs are supported by the Hokkaido Association of Functional Food Consultant and the Hokkaido Dietetic Association

e Learning

Study program on the Internet provided for students who cannot attend the Basic or the Advanced Program

Curriculum:

- [Food Functionality and Health] (10 classes)
- [Food and Health Information] (15 classes)

Contact:

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e-mail: innovation@noastec.jp
URL: http://www.healthinnovation-hokkaido.jp/hic/index.html

Project Manager Training Program for Innovation (Hokkaido University)

The innovation manager training course aims to produce new innovation leaders to create sustainable innovation. Future innovation leaders are expected to have expertise to launch new R&D projects and businesses, generate intellectual asset and promote international cooperation.

Basic Education Course

Qualified Attendee:

- Students, business personnel, and local government personnel engaged in research and research planning

Practice Course

Qualified Attendee:

- Companies, universities, and research institutes

Syllabus

Cooperation between government, industry and academia to generate innovation

・Basic knowledge of the government, industry and academia cooperation
・Structure of Cooperation
・Cooperation Process
・Government, Industry and Academia Cooperation Coordination
・Innovation ・Management and Strategy

Development Cooperation/Japan Society for Intellectual Production

Contact:

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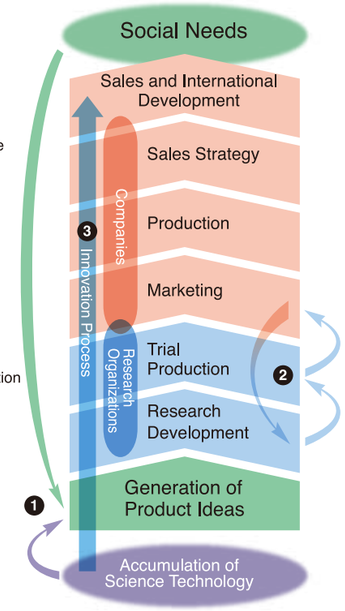
Qualification for a project manager

1. Sagacity for imagining the possibilities of business prospects, with ability of understanding of science and social needs.
2. Interactive strategy between commercialization and research development to create a cycle making sellable products.
3. Knowledge and coordination skills for each step of the innovation process.

(①②③corresponds with the number in the chart.)



Sharing of Research Facilities and Machinery

The Health Innovation & Technology Center (HITEC) of the Health Sciences Faculty of Hokkaido University provides private businesses and researchers with well-developed research facilities and equipment, which contributes to R&D conducted by companies.For use of the facilities and equipment, please contact HITEC or the Promotion Office for Regional Innovation Strategy of NOASTEC Foundation.

Research Facilities and Equipment possessed by HITEC

Collaborating with overseas laboratories and domestic sectors	Automated Biochemical Analyzer
Ultracentrifuge Machine	Atomic Force Microscope
High-Performance Liquid Chromatography (HPLC)	Mass Spectrometer (TSQ×2, LXQ, LTQ, Orbitrap XL)

Research Fund ⇅ Regional Promotion

Sample Analysis Finance Consultant ⇅ Development of Kit Data Analysis

Science Information ⇅ Technological Support

Large-scale Project

‘Food’ ‘Inspection’ ‘Pharmaceutics’

Lipid Researchers

Analysis Menu

- Quantitative analysis of medium- and long-chain fatty acids (HPLC internal reference method)
- Lipid Peroxidation Qualitative and Quantitative Analysis
- Lipoprotein: Particle Calibrator (barometer for arterial sclerosis),Subclass Analysis, Oxidized Lipoprotein Quantity
- Identification and Quantitative Analysis of Antioxidants
- Antioxidant activity measuring method (antioxidant capacity inhibiting the oxidation of lipid, ORAC assay, DPPH assay)
- Cell experiments and animal model for human diseases for development of functional foods.

Contact

Health Innovation & Technology Center (HITEC), Health Sciences Faculty, Hokkaido University
Kita 12 Nishi 5, Kita-ku, Sapporo 060-0812, Japan
Tel: +81-11-706-3395 e-mail: lipids@hs.hokudai.ac.jp
http://www.hs.hokudai.ac.jp/innovation/e_index.html

Organization Chart for Efficient Implementation

(Innovation Promotion Council)
Hokkaido University Research and Business Park Project Promotion Council
(12 organizations from industry, academia, government and banking,
Chairperson: Director General, Department of Policy Planning and Coordination,Hokkaido Government)

Regional Innovation Strategy Promotion Conference
Discuss and plan project strategies and action policies

Research Development and Business Promotion Conference
Discuss progress of R&D Projects and business creation in a cross-sectoral manner

Project Director

Advisory Board

External Evaluation Committee
Assess objectively overall projects and R&D

Super Task Force (International Technology Trend Investigation Unit)
Provide expert investigation and advice on potential needs and development possibility for future

Advisors
Provide advise on the creation of business and intellectual property

General Coordination Organization: Northern Advancement Center for Science and Technology (NOASTEC Foundation)

Vice Project Director

Research & Development (19 themes)
- Assessment of food functionalities
- Development of ingredients
- Preventive care

Establishment of knowledge networks
- Support of R&D and business creation (5 local collaboration coordinators
- Exploring new projects
- inter-regional collaboration

Development of human resource
- Health Innovation College (NOASTEC Foundation)
- Project Manager Training Program for Innovation (Hokkaido University)

Sharing of research facilities and equipment
- Well-developed research facilities that private businesses and researchers can utilize

Universities and Public Research Institutes
- Hokkaido University
- Asahikawa Medical University
- National Institute of Advanced Industrial Science and Technology (AIST) Hokkaido
- Hokkaido Research Organization
- Hokusho University
- Health Sciences University of Hokkaido
- Hokkaido Information University

Industries
- Research projects participating companies
- Hokkaido Association for Bio-Business
- Hokkaido Bio Technology Industrial Cluster Forum
- NPO Hokkaido Bio-Industry Association (HOBIA)
- Hokkaido Platform Entrance (HoPE)