Disease-Related Metabolites

Creation of Innovative Technology for Medical Applications Based on the Global Analyses and Regulation of Disease-Related Metabolites

AMED-CREST

【Research and Development Objectives】

Creation of core technologies for early-stage drug discovery through the investigation of disease-specific profiles of biomolecules

Program Supervisor (PS)

SHIMIZU Takao

Project Leader, Department of Lipid Signaling, National Center for Global Health and Medicine

The aim of this R&D area is to create breakthrough technology platforms based on biomolecular dynamics analysis, the outcomes of which will contribute to medical applications such as drug discovery, disease diagnosis, and prevention. The technology platforms should increase the capacity of current systems to find, identify, and quantify disease-related metabolites and their associated factors as potential target molecules for disease control and broader medical applications.
In particular, metabolomics and other "omics" approaches are in great demand for the identification of disease-associated factors; therefore, these need to be developed. Further, we need the technology to identify proteins and other biomolecules related to these factors so they are within the scope. By combining biomedical research projects with the newly developing technology platforms, this R&D area aims to deliver proofs of concept for human disease control by taking full advantage of information obtained about core biomolecules as potential targets for medical applications.
The technical goals specified by the R&D area should be shared among individual research projects. Therefore, the management strongly encourages them to collaborate with others within this so-called virtual-network-type institute as well as with projects in the corresponding Precursory Research for Embryonic Science and Technology (PRESTO) Research Area (of the Japan Science and Technology Agency (JST)), both aiming for the establishment and sophistication of technologies in a team-oriented manner. The management also prioritizes smooth translations to clinical applications; therefore, it considers further efforts allied with other drug discovery programs.

R&D Area Advisors

ABE Keiko	Professor, Graduate School of Agricultural and Life Sciences, The University of Tokyo
UEMURA Daisuke	Distinguished Professor, Kanagawa University
ODA Yoshiya	Professor, Graduate School of Medicine Lipidomics, The University of Tokyo
SATO Taka-aki	Fellow, Director of Life Science Research Center, Shimadzu Corporation
SUZUKI Rami	Vice President Head, Medical Affairs Division, Janssen Pharmaceutical K.K.
TAKAI Yoshimi	Professor, Graduate School of Medicine, Kobe University
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NAGANO Tetsuo	Visiting Professor / Emeritus Professor, Drug Discovery Initiative, The University of Tokyo
NARUMIYA Shuh	Professor and Director, The Medical Innovation Center Graduate School of Medicine, Kyoto University
NISHIJIMA Masahiro	Professor emeritus, Showa Pharmaceutical University
MATSUZAWA Yuji	Director Emeritus. Supreme Adviser, Sumitomo Hospital

Started in 2013 ••• 1st period

Identification of disease-related lysophospholipid and its application to medical science

AOKI Junken
Professor, Graduate School of Pharmaceutical Science, Tohoku University

Started in 2013 ••• 1st period

Development of fundamental technologies for medical applications based on membrane phospholipids

ARAI Hiroyuki
Professor, Graduate School of Pharmaceutical Science, The University of Tokyo

Started in 2013 ••• 1st period

Formulation of a hub for metabolome analysis and development of medical basic technologies based on cancer specific metabolism

SOGA Tomoyoshi
Professor, Institute for Advanced Biosciences, Keio University

Started in 2013 ••• 1st period

Development of basic technology for identification of bioactive metabolites and target proteins

SODEOKA Mikiko
Chief Scientist, Synthetic Organic Chemistry Laboratory, RIKEN

Started in 2013 ••• 1st period

Development of user-friendly metabolomics technology for application to lifestyle-related diseases research

FUKUSAKI Eiichiro
Professor, Graduate School of Engineering, Osaka University

Started in 2013 ••• 1st period

PLA2 metabolome-based identification of novel lipid-metabolic maps linked to diseases from bench to clinic

MURAKAMI Makoto
Professor, Faculty of Medicine, Center for Disease Biology and Integrative Medicine, The University of Tokyo

Started in 2014 ••• 2nd period

Creation of search techniques for disease-related metabolic activities based on live imaging of clinical specimen and its application to drug developments

UESUGI Motonari
Professor, Institute for Chemical Research, Kyoto University

Started in 2014 ••• 2nd period

Creation of search techniques for disease-related metabolic activities based on live imaging of clinical specimen and its application to drug developments

URANO Yasuteru
Professor, Graduate School of Pharmaceutial Sciences, The University of Tokyo

Started in 2014 ••• 2nd period

Establishment of the platform for the control and prevention of allergy by omics-based understanding of its pathogenesis

OHNO Hiroshi
Team Leader, Center for Integrative Medical Science, RIKEN

Started in 2014 ••• 2nd period

Development of a novel medical application by systematic mining of metabolism regulator molecules

KABE Yasuaki
Associate Professor, School of Medicine, Keio University

Started in 2014 ••• 2nd period

Development of metabolite biomarkers of Parkinson's disease and identification of drug seeds from chemical screening based on the biomarkers

HATTORI Nobutaka
Professor and Chairperson, Graduate School of Medicine, Juntendo University

Started in 2014 ••• 2nd period

How gut microbiota shifts metabolites leading to neuro-endocrine disorders in mouse and man

FAGARASAN Sidonia
Team Leader, Center for Integrative Medical Science, RIKEN

Started in 2014 ••• 2nd period

Cancer diagnosis/drug efficiency evaluation biomarker research by comprehensive metabolomics/targeted proteomics and establishment of innovative integrated clinical diagnosis network

YOSHIDA Masaru
Associate Professor, Graduate School of Medicine, Kobe University

※ The names of the position, institution and organization are as of the end of the R&D pursuit area year.