


iPS

Fundamental Technologies for Medicine Concerning the Generation and Regulation of Induced Pluripotent Stem (iPS) Cells



[Research and Development Objectives]
 Creating fundamental technologies for advanced medicine through generation and regulation of stem cells, based on cellular reprogramming

Program Supervisor (PS)
SUDA Toshio
 Director, International Research Center for Medical Sciences (IRCMS), Kumamoto University


The objective of this R&D area is to establish fundamental technologies contributing to advanced medicine through the development of cellular reprogramming technology. Remarkable progress has been made in this field recently, especially the generation of iPS cells. The research objectives include the advancement and simplification of this technology, the elucidation of pathological mechanisms through the development of model cells, the formulation of new therapy strategies, and novel methods for the early discovery of diseases. Specifically, included is research on cellular reprogramming and differentiation mechanisms using genomics, chromosome structure and epigenetic analysis; research on gene transfer regulation; high-throughput screening of reprogramming-inducing compounds; and research using iPS cells generated from patients with congenital diseases for the elucidation of pathological mechanisms. Moreover, the research also covers an area that may lead to the pioneering of new therapy methods and preventive medicine through the integration of stem cell research and pathological studies.

- R&D Area Advisors**
- SASAKI Hiroyuki** Professor, Kyushu University
 - SHIOMI Mikiko** Professor, The University of Tokyo
 - TAKAI Yoshimi** Professor, Kobe University
 - TAKEICHI Masatoshi** Team Leader, RIKEN
 - NAKANO Toru** Professor, Osaka University
 - HAYASHIZAKI Yoshihide** Director, RIKEN
 - MIYAZONO Kohei** Professor, The University of Tokyo

Started in 2010 ●●● 1st period

Direct reprogramming of fibroblasts into cardiomyocytes by defined factors and its application to potential regenerative therapies

IEDA Masaki
 Project Assistant Professor, Keio University



Started in 2010 ●●● 1st period

Search for pathogenesis and novel therapeutics of hematological malignancies based on generation of iPS cells from primary tumor cells

KUROKAWA Mineo
 Professor, The University of Tokyo

Started in 2010 ●●● 1st period

The generation of high-quality human iPS cells and their characterization

HANAZONO Yutaka
 Professor, Jichi Medical University

Started in 2010 ●●● 1st period

Construction of functional liver tissues using iPS cells

MIYAJIMA Atsushi
 Professor, The University of Tokyo

Started in 2010 ●●● 1st period

Establishment of the mouse model with human liver derived from iPS cells and its use for experimental therapy

YAMAMURA Ken-ichi
 Professor, Kumamoto University


Started in 2010 ●●● 1st period

Chemical regulation of nuclear epigenome and mitochondrial genome

YOSHIDA Minoru
 Chief Scientist, RIKEN

Immune Systems

Etiological Basics of and Techniques for Treatment of Allergic and Autoimmune Diseases



[Research and Development Objectives]
 Development of medical technology using immunoregulation to overcome allergic and autoimmune diseases including pollinosis

Program Supervisor (PS)
SUGAMURA Kazuo
 Chief Director, Miyagi Prefectural Hospital Organization

This R&D area aims to improve prevention, diagnosis, and treatment of human immunological diseases, centered on allergic and autoimmune diseases, and includes research for development of basic technologies for improvement of appropriate functioning of the immune system. Diseases centered on allergic responses and autoimmune systems vary from those that may lower the quality of life (QOL) of patients to those leading to death in serious cases. Deepened understanding of the immune mechanism and control of such diseases at levels of molecules, cells, organs, and tissues will be evolved into understanding of a higher-level control immune network system at individual levels, leading to clinical application. Specific examples of research projects include immunoregulatory mechanisms by regulatory cells, construction mechanisms of the mucous membrane immune system, autoimmune system, acquired immune system, and natural immune system and their control, etiological mechanisms of autoimmune and allergic diseases, immune and infection control mechanisms, development of drugs and vaccines against diseases and measurement of their effects, establishment of methods for diagnosis and treatment of diseases, and so forth.

- R&D Area Advisors**
- SAITO Takashi** Group Director, RIKEN Yokohama Institute
 - SAKAGUCHI Shimon** Professor, Osaka University
 - SHIBUYA Kazuko** Associate Professor, University of Tsukuba
 - TAKATSU Kiyoshi** President Professor, University of Toyama
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 - NOSE Masato** Professor Emeritus, Ehime University
 - HANAI Nobuo** President, Kyowa Hakko Kirin Co., LTD.
 - MIYASAKA Nobuyuki** Professor, Tokyo Medical and Dental University
 - YAMAMOTO Kazuhiko** Professor, The University of Tokyo

Started in 2010 ●●● 1st period

Control of allergic diseases by regulation of human mast cell activation

SHIBUYA Akira
 Professor, University of Tsukuba

Started in 2010 ●●● 1st period

Development of a new strategy targeting innate immunity for treatment of intestinal immune disorders

TAKEDA Kiyoshi
 Professor, Osaka University

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

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