



Feature Medical Innovation Consortium

Pioneering the future of medicine through joint efforts of the medical and dental fields

Amid the rapid progress of precision cancer medicine, genome editing and other technologies based on molecular biology, how best to translate these cutting-edge technologies into practical applications has emerged as an issue. TMDU has established the Medical Innovation Consortium whose mission is to develop genomic medicine and AI systems, utilizing a biobank and big data for that purpose, and achieve their implementation in society. Leveraging its strengths in both clinical applications and basic research, TMDU has launched initiatives to realize medical innovation through joint efforts of the medical and dental fields.

Reinforce TMDU's strengths and collaborate with industry and institutions in Japan and overseas

Completion of the human genome sequencing in 2003 triggered accelerated technological innovation in the molecular biology field. Technological innovation is transforming the nature of medicine.

With the aim of realizing “future medicine,” TMDU established the Medical Innovation Consortium in the Division of Advanced Multidisciplinary Research of the Institute of Research in December 2018. This is the second consortium embodying the Life Course Consortium Concept, following the Organ and Tissue Neogenesis Consortium established in 2017. The M&D Data Science Center, which will open in April 2020, will support these initiatives.

Dr. Toshihiro Tanaka, Director of the

Consortium, explains its structure: “While taking advantage of TMDU’s strengths as a comprehensive medical university, we envisage the consortium serving as a base for industry-academia-government collaboration. As well as promoting cooperation and exchanges with overseas universities and researchers, including the inviting of world-leading researchers to TMDU, we will emphasize the cultivation of fruitful relationships with external parties, such as alliances with industry and with governmental organizations and agencies.”

Consisting of three key organizations and 14 units dedicated to medical innovation

The Medical Innovation Consortium consists of three key organizations: the Basic and Exploratory Science Division and the Applied and Clinical Science Division, with the Information Integra-

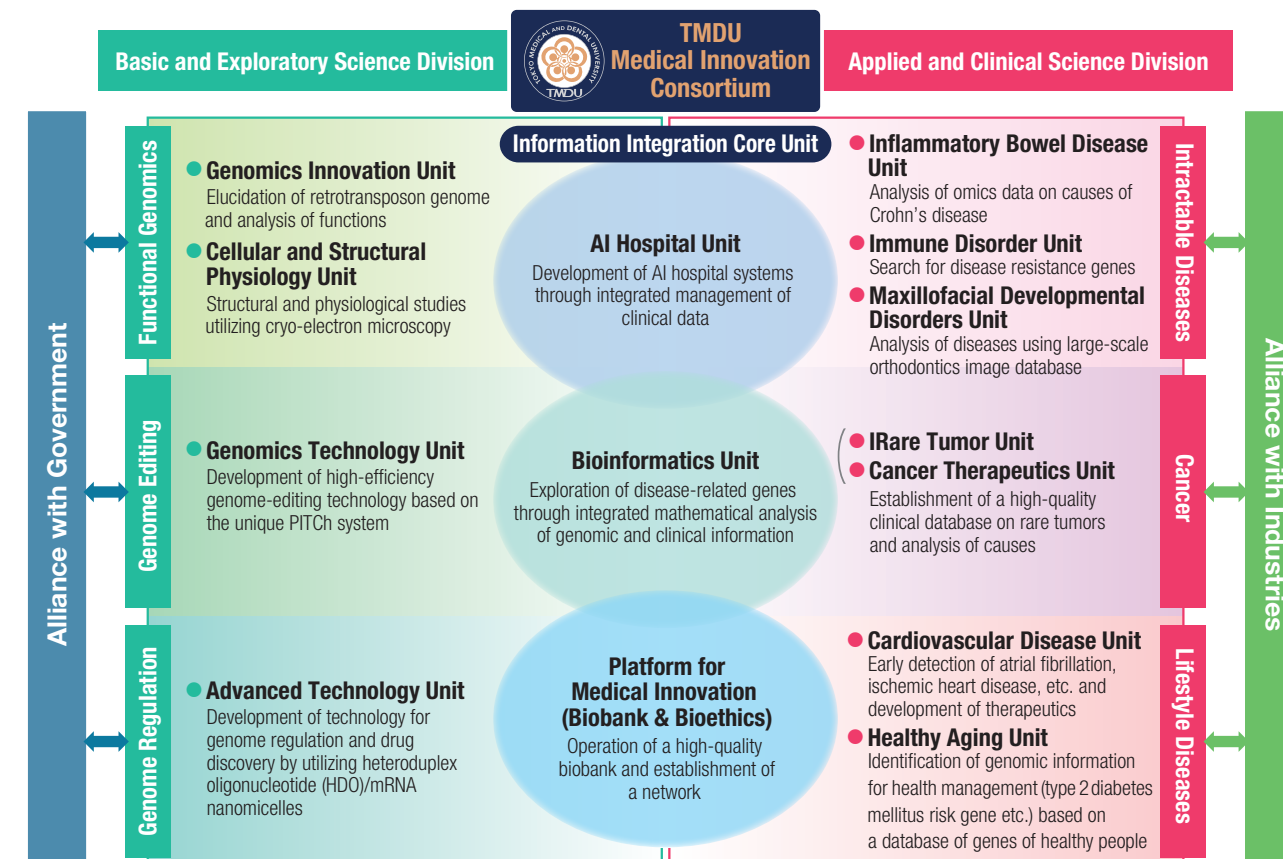


Dr. Toshihiro Tanaka
Director, Medical Innovation Consortium

tion Core Unit linking these two divisions.

The Basic and Exploratory Science Division searches for undiscovered genome functions and develops new knowledge and technology in such fields as cell-structure physiology research using cryo-electron microscopy, genome editing, and oligonucleotide and mRNA therapeutics.

In the promising field of oligonucleotide therapeutics that has been attracting keen interest in recent years, this division’s Advanced Technology Unit is studying heteroduplex oligonucleotide (HDO) technology, which is highly effective for regulation of gene expression and expected to reduce side effects. TMDU intends to apply its research outcomes in the treatment of



intractable diseases and preemptive medicine targeting changes associated with aging.

The Applied and Clinical Science Division develops therapeutics for refractory diseases, cancer and lifestyle-related diseases. For specified target diseases, the division aims to achieve clinical applications by integrating basic research with big data through the utilization of data analytics to exploit the available big data.

The Immune Disorder Unit, one of the seven units of the Applied and Clinical Science Division, aims to clarify the causes and conditions of immune diseases, such as articular rheumatism, immunodeficiency, and allergic diseases by analyzing big data and establishing disease models. It also envisages realization of personalized genomic medicine.

The Information Integration Core Unit links the Basic and Exploratory Science Division and the Applied and Clinical Science Division. Consisting of the AI Hospital Unit, the Bioinformatics Unit,

and the Platform for Medical Innovation (Biobank & Bioethics), the Information Integration Core Unit supports the two divisions’ research units

through provision of big data analytics, processing of high-quality biological samples and clinical information, and support concerning bioethical issues.

Kick-off symposium to publicize the consortium’s initiatives

ON DECEMBER 9, 2019, TMDU held a kick-off symposium titled “Pioneering the Future of Medicine” to mark the launch of the Medical Innovation Consortium. In addition to presentations introducing the consortium and units’ research themes, keynote speaker Designated Professor Yusuke Nakamura focused on how AI will change medicine and discussed personalized medicine and the AI hospital concept, which are aspects of future medicine.

The symposium, held at the Akio Suzuki Memorial Hall in the M&D Tower, attracted a large audience that included many people from outside TMDU, indicating the high interest in this initiative.

“The overarching theme of the Medical Innovation Consortium is development of ‘future medicine.’ Our mission is to harness TMDU’s long-cultivated sophisticated technological capabilities and facilitate their application for the benefit of society. We intend to advance toward our goal by capitalizing on the respective strengths of the consortium partners, drawn from within and outside TMDU, through enhanced collaboration,” says Consortium Director Toshihiro Tanaka.

“Future medicine” will start realizing its promise in step with the advances achieved by the Medical Innovation Consortium.