

Corporate Sponsored Research Program

Project Division of Fundamental Study on Cutting Edge of Genome Medicine

先端ゲノム医療の基盤研究寄付研究部門

Professor

Arinobu Tojo, M.D., D.M.Sc.

Project Associate Professor Hiroshi Yasui, M.D., D.M.Sc.

教授

医学博士

東 條 有 伸

特任准教授

博士(医学)

安 井 寛

Our major goal is to realize advanced genomic medicine. Major advancements in genome analysis have recently been reported from researchers around the globe, along with improvements in next-generation sequencing, leading to an era where genomic information can be collected and analyzed at low cost and in a short period of time. Thus, it is necessary to establish a framework for developing genome analysis while expanding our understanding of general society, academia, and medical associations, etc., in order to identify different diseases, such as hereditary diseases or non-genetic diseases.

In our department, comprehensive basic research on advanced genome medicine has been realized through our multidisciplinary collaborations among scientific experts; the Ethical, Legal, and Social Implications (ELSI) program; specimen preservation; electronic medical records access; and personal information protection.

1. Construction of infrastructure for research on advanced genome medicine

Hiroshi Yasui, Mikiko Suzuki, Megumi Isobe, Arinobu Tojo

In order to establish a framework for developing genome analysis while expanding our understanding of diseases, including hereditary and nongenetic diseases, we are using comprehensive approaches to advanced genome medicine. These approaches include addressing various issues, such as multidisciplinary collaborations among scientific experts; the Ethical, Legal, and Social Implications (ELSI) program; management of specimen preservation, clinical information, and personal information protection for genomic medicine as well as biobanking. Our mission also includes enhancement of social acceptance for genomic medicine.

2. Japan-US Comparative study for the promotion of the cancer genomic medicine in Japan

Hiroshi Yasui, Mikiko Suzuki, Arinobu Tojo

Regarding the spread of cancer genomic medicine Japan is behind not only Western countries but also China and Korea. We study to compare the current situation and the future prospects of cancer genomic medicine in Japan and the United States in order to contribute to design a policy to promote dissemination and uniformization of cancer genomic medicine for cancer patients in Japan.

3. Program for supporting biospecimen analysis for the diagnosis and treatment of hematological malignancies

Hiroshi Yasui, Arinobu Tojo, Kaoru Uchimaru¹, To-

shiki Watanabe²

¹Department of Computational Biology and Medical Sciences, Graduate School of Frontier Sciences, The University of Tokyo

²IMSUT hospital, The Institute of Medical Science, The University of Tokyo

To support cancer scientists in promoting translational research and genome medicine, we have established a platform for supporting cohort studies and biospecimen analysis. Under this program, we are collecting and managing clinical materials, including tumor cells, serum, and peripheral blood mononuclear cells from patients at high risk of hematologic malignancies as well as patients with blood cancer. We provide support for obtaining and/or analyzing biomaterials, as requested by researchers, and contribute to their clinical studies and publications.

4. Investigator-initiated clinical trials under an Investigational New Drug application for the development of novel cancer therapeutics and biomarkers

Hiroshi Yasui, Fumitaka Nagamura¹, Giichiro Tsurita², Kohzoh Imai³, Arinobu Tojo:

¹Center for Translational Research, IMSUT Hospital, The Institute of Medical Science, The University of Tokyo

²Department of Surgery, IMSUT Hospital, The Institute of Medical Science, The University of Tokyo

³Office of Support for Platforms for Advanced Technologies and Research Resources, The Institute of Medical Science, The University of Tokyo

Genome medicine and genome research, including pharmacogenomics and pharmacogenetics, are important for developing novel therapeutic agents for cancer and incurable diseases and identifying biomarkers. Our research aims to develop efficient approaches for conducting investigator-initiated clinical trials under Investigational New Drug (IND) applications to promote translational research and discover

biomarkers for prediction of the safety and efficacy of novel therapeutics through omics analyses, including genomics. We were conducting, supporting, summarizing or preparing three investigator-initiated clinical trials under INDs applications for the development of academic-oriented innovative anticancer drug especially novel cancer immunotherapy.

5. Development of novel immunodiagnostics and cancer immunotherapy

Hiroshi Yasui, Asako Kobayashi, Reika Li, Mikiko Suzuki, Arinobu Tojo

Novel immunodiagnostics to analyze immune function is important for the evaluate the activity of autoimmune diseases as well as development of cancer immunotherapy. We started to develop novel immunodiagnostics to evaluate activities of immune cells in patients with allogenic hematopoietic stem cell transplantation. It is also expected to contribute the development of the novel cancer immunotherapy in hematologic malignancies.

6. Support and management of translational research

Hiroshi Yasui, Arinobu Tojo

To promote translational research and genome medicine, we participate in the “Translational Research Network Program, Japanese Translational Research and Clinical Trials Core Centers” supported by the Japan Agency for Medical Research and Development, as members of the Translational Research Advancement Center at the University of Tokyo. The aim of the program is to promote translational research and investigator-led clinical trials aiming for practical applications of basic studies in academia, managing the assessment of scientific seeds and intellectual property rights, and therefore promoting the development of advanced medical arts, including genome medicine.

Publications

1. Yasu T, Momo K, Yasui H, Kuroda S. Simple determination of plasma ibrutinib concentration using high-performance liquid chromatography *Biomed Chromatogr.* 2019 Mar;33(3): e4435. doi: 10.1002/bmc.4435.
2. Momo K, Yasu T, Yasui H, Kuroda SI. Risk factors affecting the failed low-density lipoprotein level achievement rate in working-age male population at high cardiovascular risk. *J Clin Pharm Ther.* 2019 Oct;44(5): 715-719. doi: 10.1111/jcpt.12847. Epub 2019 May 6. PubMed PMID: 31062402.
3. Shima H, Tsurita G, Wada S, Hirohashi Y, Yasui H, Hayashi H, Miyakoshi T, Watanabe K, Murai A, Asanuma H, Tokita S, Kubo T, Nakatsugawa M, Kanaseki T, Tsukahara T, Nakae Y, Sugita O, Ito YM, Ota Y, Kimura Y, Kutomi G, Hirata K, Mizuguchi T, Imai K, Takemasa I, Sato N, Torigoe T. Randomized phase II trial of survivin 2B peptide vaccination for patients with HLA-A24-positive pancreatic adenocarcinoma. *Cancer Sci.* 2019 Aug;110(8): 2378-2385. doi: 10.1111/cas.14106.
4. Kubo T, Tsurita G, Hirohashi Y, Yasui H, Ota Y, Watanabe K, Murai A, Matsuo K, Asanuma H, Shima H, Wada S, Nakatsugawa M, Kanaseki T, Tsuka-

hara T, Mizuguchi T, Hirata K, Takemasa I, Imai K, Sato N, Torigoe T. Immunohistological analysis of pancreatic carcinoma after vaccination with survivin 2B peptide: Analysis of an autopsy series. *Cancer Sci.* 2019 Aug;110(8): 2386-2395. doi: 10.1111/cas.14099.

5. Kikuchi J, Hori M, Iha H, Toyama-Sorimachi N, Hagiwara S, Kuroda Y, Koyama D, Izumi T, Yasui H, Suzuki A, Furukawa Y. Soluble SLAMF7 promotes the growth of myeloma cells via homophilic interaction with surface SLAMF7. *Leukemia.* 2019, in press