R&D Theme

Development of technologies for collecting patient biospecimens and data for the realization of optimal medicine (My Medicine)

Progress until FY2022

1.Outline of the project

Since many intractable cancers are found as advanced cancers, clinical data and biological data derived from patients are limited, which is a major obstacle to elucidating the onset factors. In addition, the technology for acquiring various biological data from minute amounts of specimens and the mechanism for accumulating and sharing data are immature.

In this theme, we are collecting clinical specimens (blood and cancer tissue, nearby normal tissue), clinical data (blood biochemical data, images, etc.), blood, body fluids, feces, etc.

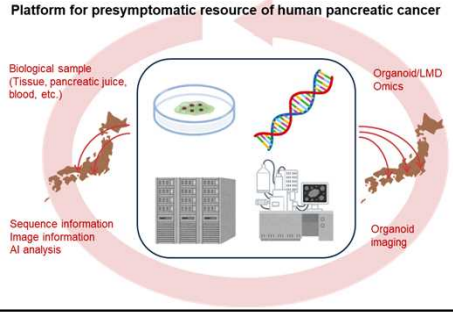
In parallel, we are establishing and accumulating organoids from the patient tissue samples. Patient organoids can be used for various experiments that are not possible with patient samples only. They are an innovative technology that opens up great possibilities for understanding developmental processes of cancer.

We are building a database by acquiring various biological data, including genomes, from the patient tissue samples.

2. Outcome so far

Building a patient biospecimen bank:
We have obtained approval from the ethics committee for common efforts at Keio University, Kyoto University, and Kobe University. Surplus residual specimens obtained by various methods (endoscopy, surgery, etc.) are accumulated at each facility. Furthermore, we have established organoids and their omics are underway.

Construction of the organoid culture platform:
We have confirmed that patient-derived organoids can be established using a standardized method, and have accumulated the number of specimens. Through comprehensive analysis, we discovered new phenomena and molecular mechanisms that occur with the progression of pancreatic cancer.



Furthermore, we have developed new organoid culture techniques such as co-culture with fibroblasts.

Construction of a multi-level integrated analysis shared database:
We have advanced the development of a whole-genome data analysis infrastructure for clinical specimens and organoids. RNA analysis has also progressed. Furthermore, the acquisition of comprehensive lipid metabolite profiles and lipid mediator profiles and the standardization of protocols for metabolic analysis are progressing.

3.Future plans

Samples of precancerous lesions, very early cancers, and advanced cancers have been collected, and patient organoids have been established. Along with the progress, we will proceed with the analysis using the platform sharing multi-level integrated analysis.