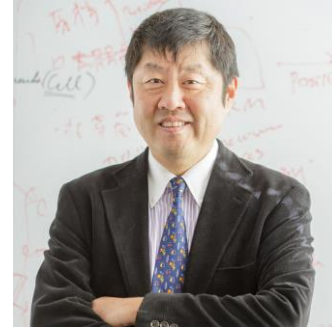


# Realization of common platform technologies, facilities and equipment that create innovative knowledge and products

**R&D Project Title:** Functional Imaging combined with AI to Elucidate Socio-cellular Response and its Application to Industry and Medicine

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## Summary :

There is a need to understand the interactions between individual cells in tissues and populations, at all levels from microorganisms to human cells. To clarify the types and functions of cells in tissues and populations (e.g. biofilms), fluorescent protein expression, such as GFP and nucleic acid sequencing are used. However, since these technologies are necessary for genetic recombination and cell disruption, it is difficult to apply them to temporal observation and cell diagnosis. Cells have autofluorescence derived from intracellular metabolites and proteins, and the autofluorescence spectrum of a cell can be used as a "fingerprint" reflecting the type and functions of that cell. In this research, we establish a technology called "Functional Imaging" to estimate the type and function of cells by acquiring the autofluorescence spectrum of each single cell that analyzes the differences in the autofluorescence information spectrum using AI without destruction and processing. In addition, we also verify the practicality of these technologies through applying them to research on cell-cell interaction, the screening of bacteria for useful substances, and distinguishing between normal cells and cancer cells.

