4. Introduction to <Individual Type Research (PRESTO) "Metabolism and Cellular Function">

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As genomic structures of various organisms including human are elucidated, life science is shifting to and developing in post-genomic research for the utilization of the genomic information. The research for protein functions is being advanced by structural and proteomic analyses. In addition to the research about genes and proteins, another important theme which is the aim of this research area, is the elucidation of the dynamics and functions of the metabolites and the control of cellular functions. Metabolites contain substrates for energy metabolism, cell membrane components, physiologically active substances, etc. produce by enzymes. The metabolomic analytical techniques, in which metabolite groups are analyzed in a systematic or comprehensive method by mass spectrometry, etc., has brought research on cellular metabolism into a new era.

The research area is aimed at development of new analytical techniques which contribute to metabolomic research, identification of metabolites that prescribe specific cellular conditions, the discovery of new metabolic processes, the elucidation and regulation of cellular functions with information on alterations of metabolites, by the metabolomic analysis at state of mutation, pathology, development in microorganisms, animals, and plants, etc. Metabolic research in Japan is ranked high by international standards in various fields as lipids and carbohydrates. So, Japan can lead the world in metabolomic research. I expect the discovery of new physiologically active metabolites, the development of diagnostic methods with disease-specific metabolic markers, therapeutic drugs for metabolic diseases, the organisms which product useful metabolites efficiently.