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

R&D Project Title: Innovation of drug discovery through visualization of structures beyond atomic coordinates

Project Leader : Koji Yonekura
Group director, RIKEN SPring-8 Center / Professor, IMRAM, Tohoku University

R&D Team : Tohoku University, The University of Tokyo, JEOL and so on

Summary :

We aim to overcome the limits of conventional measurement by developing advanced technologies in cryo-electron microscopy and also using X-ray free electron laser (XFEL). Our goal is high spatio-temporal resolution and rapid analysis of organic compounds and proteins, even at small quantities. This will enable us to elucidate “unseen” physical properties and phenomena, so-called “structures beyond atomic coordinates”, such as charge distribution, electronic structure, chemical bond polarity, protonation of functional groups, and electron motion. Its application will promote drug discovery for the treatment of new infectious diseases and intractable diseases. The technology can also be applied to the development of new materials, energy, the environment, and life science. In addition, we will develop a next-generation cryo-electron microscope to expand the global market share and establish a base for the analysis. Thus, the project is expected to contribute to the improvement of productivity in research and development sites as a common basic technology.