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Japan's Rigaku Corp develops solution to accelerate biopharmaceutical R&D

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Novel electron density topography technology to reveal biological macromolecules' properties



Rigaku Corporation, a Rigaku Holdings Group company and global partner for X-ray analysis from Lab to Fab in Japan, has developed a technology called Electron Density Topography (EDT), with patents pending. The new technology clarifies the structure and dynamic characteristics of biological macromolecules, including antibodies, protein complexes, and virus particles, in solution.

EDT enables direct observation of biological macromolecules in solution, reducing artifacts resulting from measurement conditions. EDT is anticipated to improve the R&D processes for innovative biopharmaceuticals, including monoclonal antibody-based therapies and advanced drug delivery systems.

The technology provides information about the overall shape, molecular characteristics and internal structure of biological macromolecules from the distribution of electrons that determines a molecule's chemical properties. EDT has also enabled direct observation of the electron density of biological macromolecules without prior information about the samples.

In drug discovery, there is a clear need to determine at the early stages of development whether a drug has the expected structure and desired characteristics to optimize resources. EDT is a technology that meets this requirement and is expected to be used in basic research and development for biopharmaceuticals such as antibody drugs.

The first instrument with EDT capabilities will be deployed at Rigaku's Life Science Laboratory, a facility in Cambridge, Massachusetts, in Q4 2024.