

# Cryo-Electron Microscopy – Revolution in Molecular Biology

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Structural biology aims at determining the mechanisms of biological macromolecules (in particular proteins and nucleic acids) at the level of individual atoms. Over the years, protein crystallography dominated the field producing hundreds of thousands of high-quality and often very high resolution atomic structures. Cryo-electron microscopy (cryo-EM) lagged behind, usually providing low-resolution structural information which precluded building atomistic models of the studied molecules. Approximately ten years ago, thanks to the development of new types of cameras and new algorithms, cryo-EM underwent a sweeping revolution and now provides structural information at resolutions comparable to crystallography. This allowed structural studies of macromolecules which were out-of-reach for crystallography and structural biology, mostly because they could not be coaxed to crystallize due to their complicated architectures and flexibility. In this talk, I will present the basic principles of cryo-EM and show our recent results obtained using this methodology which explained the mechanism of action of proteins involved in DNA transposition and DNA repair.