Mitochondrial complex I through the lens of electron cryomicroscopy

Jamie Blaza, University of York, Biology Department

The advent of high-resolution electron cryomicroscopy (cryoEM) allows radically different approaches to many problems in structural biology as tiny quantities of isolated material can be imaged and crystals are not required. Mammalian complex I is a good example of the types of targets that can now be tackled: nearly a MDa in size, comprised of 45 unlike subunits, and membrane-bound, the mammalian enzyme had been refractory to structural elucidation with crystallography despite sustained efforts over decades but is an accessible target for cryoEM. The talk will cover the biological insights gained in the structure, regulation, and mechanism of this huge complex. As studying mitochondrial complex I with cryoEM represents a mature enterprise in this new fast-moving era I will also share some of the quite hard-won technical lessons that will hopefully help other projects that are just getting started.