

Microsymposium

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Electron cryomicroscopy of rotary ATPases

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Ion-translocating rotary ATPases serve either as adenosine triphosphate (ATP) synthases, using energy from a transmembrane ion motive force to create the cell's supply of ATP, or as transmembrane ion pumps that are powered by ATP hydrolysis. The members of this family of enzymes each contain two rotary motors: one that couples ion translocation to rotation and one that couples rotation to ATP synthesis or hydrolysis. Our group uses electron cryomicroscopy (cryo-EM) of single protein particles to study the structures of rotary ATPases. We also work to develop new methods for cryo-EM to facilitate these studies. The structures that we have obtained have illuminated several aspects of how structure relates to function in these remarkable molecular motors.

Keywords: cryo-EM, Membrane proteins, Rotary ATPase, V-ATPases, ATP synthases