

Microtubules, an example for single particle analysis of filamentous proteins

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Abstract:

Microtubules are filaments that are present in all eukaryotic cells. As such they take part in many cellular events, among them cell division, organisation of cytoplasm and vesicle transport. These events are mediated by a plethora of proteins, among them the Kinesin motor protein superfamily. Yet the details of these interactions are still poorly understood. Kinesin 8 is of particular importance for mitosis as it facilitates nuclear movement, spindle positioning and chromosome segregation. Kinesin 8 is the only known Kinesin that functions as both a plus end motor and a microtubule depolymerase. We use electron microscopy to study the interaction of Kinesin 8 with the microtubule lattice. Images of microtubules decorated with Kinesin 8 are cut into segments and treated as single particles for 3D reconstruction.