

Cryo-EM structural basis for dynactin-p150 binding to microtubules and its implication for microtubule dynamics

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Abstract:

p150 is a member of +TIPs, accumulating at microtubule plus ends. It plays key roles in initiating retrograde transport by recruiting and tethering endosomes and dynein to microtubules as well as in stabilizing microtubule ends. We present a direct visualization of the microtubule-p150 complex by cryo-EM and seek to understand the molecular mechanism of the control of microtubule dynamics by the p150 CAP-Gly domain. The neutralization of the acidic tubulin surface by the basic extensions of CAP-Gly results in the activation of the lateral association of tubulins resulting in oligomer formations. Upon the activation of microtubule polymerization, p150 induces tubulin oligomers to connect longitudinally. The two directional modes of assisted self-association of tubulin implicate a foundation for the dynamic behavior of microtubule ends and their regulation.

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