CDB SEMINAR

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16:00~17:00 A7F Seminar Room

"HITCHHIKING" TO THE MICROTUBULE PLUS END: IDENTIFICATION OF A MOLECULAR MECHANISM

Summary

Microtubules are dynamic polymers that control many aspects of cell polarization, migration and division. Growing microtubules accumulate at their ends a set of regulators collectively known as microtubule plus-end tracking proteins, or +TIPs, which include the tumour suppressor APC, microtubule-actin cross-linking factor MACF/ACF7 and microtubule stabilizers and destabilizers, such as CLASPs and MCAK. These proteins participate in the feedback between microtubules, cortical actin filaments and focal adhesions and are important for the regulation of microtubule dynamics and cell polarity. Recently, it became clear that many +TIPs recognize the ends of growing microtubules through End Binding (EB) proteins, such as EB1. Using biochemical and structural approaches as well as live cell imaging and in vitro reconstitution, we uncovered a common principle underlying the interaction between EB1 and its numerous binding partners. We identified a short sequence motif necessary and sufficient for tracking growing microtubule ends in an EB1-dependent manner both in vitro and in cells. This finding provides a rationale for introducing mutations to specifically disrupt microtubule tip localisation of different factors and thus determine the importance of microtubule tip association of these multifunctional proteins.

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