

Regulation of microtubule plus-end dynamics in Drosophila wing epithelium

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Microtubules, composed of alpha and beta tubulin heterodimers, are part of the extensive cytoskeleton network in the cell that performs a wide range of activities in different cell and tissue systems. Recently, a focus on the contribution of microtubule-based forces has revealed its role in governing cell and tissue morphogenesis. The patterning of the microtubule array plays a central role in determining the cell's shape. For example, in Drosophila wing epithelium, we see a distinct non-centrosomal network of MTs aligned perpendicular to the apico-basal axis along the proximal-distal axis of the wing tissue during tissue remodeling. Previous data from our lab has shown that microtubule alignment is required for cell and tissue elongation during this process. Notably, the increased stability of microtubule plus ends is critical in increasing load-bearing capacity and a potential mechanism contributing to cell shape changes. Here we found that Orbit, the human homolog of CLASP family proteins, plays a key role in regulating the plus end dynamics of apical interphase microtubules at the cell junctions, which might help in the stabilization of microtubules that in turn generate pushing forces required to assist in cell and tissue elongation.

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