

**P008** Microtubules activate actin assembly at an ectopic site in bent fission yeast cells

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During cytokinesis, spindle microtubules are thought to provide a positive spatial cue that induces the formation of an actin-based contractile ring. In fission yeast, microtubules play an analogous role in cell polarization. Work in our lab and others have elucidated a pathway for NETO (new end take off), in which cells initiate bipolar growth. In this pathway, microtubule plus ends deposit tea1p and tea4p at the cell tip, where they recruit the formin for3p and a formin-activating protein bud6p to assemble actin cables and initiate polarized cell growth. Here, we have developed a new system to test whether microtubules can induce actin assembly at ectopic sites on the cell surface. By actively manipulating fission yeast cells into micro-fabricated holes, we can bend these rod-shaped cells and observe them in real time. Immediately upon cell bending, the microtubules begin to contact and shrink from abnormal locations at the sides of cells. Within minutes, polarity factors such as bud6p, formins, and cdc42p are recruited to these ectopic sites and assemble actin cables from these sites. This process is dependent on microtubules, mal3p (EB1) and membrane trafficking, but surprisingly, is independent of much of the tea1-tea4 pathway involved in NETO, suggesting that a new pathway is responsible for these effects. These studies on microtubule and formin-dependent actin assembly are likely to provide mechanistic insights into contractile ring assembly and placement in animal cells.