

## IN BRIEF

**CELL SIGNALLING****Mindbomb 1, an E3 ubiquitin ligase, forms a complex with RYK to activate Wnt/ $\beta$ -catenin signaling**

Berndt, J. D. *et al. J. Cell Biol.* **194**, 737–750 (2011)

In addition to Frizzled receptors, WNT signalling can be activated by binding of WNT ligands to receptor-like Tyr kinase (RYK) receptors, but the downstream events are not clear. This study identifies the E3 ligase Mindbomb 1 (MIB1) as a RYK-interacting protein. MIB1 was found to colocalize with RYK at intracellular membranes and to promote its ubiquitylation. This decreased RYK levels at the plasma membrane and promoted its degradation. Interestingly, depletion of RYK or MIB1 resulted in reduced expression of canonical WNT signalling target genes, highlighting an involvement in this pathway. Indeed, RYK and MIB1 regulated protein phosphorylation upstream of  $\beta$ -catenin (a key mediator in the canonical WNT pathway). So, MIB1 seems to have a central role in  $\beta$ -catenin-dependent WNT signalling downstream of RYK.

**PLANT CELL BIOLOGY****Chaperonins facilitate KNOTTED1 cell-to-cell trafficking and stem cell function**

Xu, X. M. *et al. Science* **333**, 1141–1144 (2011)

Plasmodesmata are channels that traverse plant cell walls and connect neighbouring cells. Plant cells use them to communicate by the selective trafficking of signalling factors; however, the molecular mechanisms underlying this trafficking are unknown. This study shows that the maize homeotic protein KNOTTED1 (KN1; which functions in stem cell maintenance and moves between cells) physically interacts with CCT8, a subunit of the chaperonin complex, and requires it for cell–cell trafficking. When expressed in *Arabidopsis thaliana* leaves, KN1 had been shown to move from the mesophyll to the epidermal cell layer. Here, the authors show that CCT8 is required in destination cells, suggesting that chaperonins might facilitate KN1 trafficking by refolding translocated, partially unfolded proteins. Importantly, SHOOT MERISTEMLESS (STM), the functional homologue of KN1 in *A. thaliana*, also interacted with CCT8 and required CCT8 for stem cell function. Thus, chaperonin-dependent protein trafficking seems to be important for stem cell function in plants.

**CELL SIGNALLING****Cytoskeletal control of CD36 diffusion promotes its receptor and signaling function**

Jaqaman, K. *et al. Cell* **146**, 593–606 (2011)

Although signalling receptors were thought to cluster upon ligand binding, recent evidence suggests that they can also exist in pre-formed clusters, for example, as a result of interactions with the cytoskeleton. Jaqaman *et al.* now show, by using quantitative live-cell single-molecule imaging approaches, that the diffusion and clustering of the macrophage receptor CD36 is indeed organized by the cytoskeleton. They observed that 27% of CD36 moved with a linear trajectory in the absence of ligand; this movement resulted from diffusion within linearly confined regions and favoured ligand-independent receptor clustering. Depolymerization of filamentous actin or inhibition of myosin II in macrophages reduced linear CD36 movement, as did microtubule depolymerisation. Thus, linear CD36 movement depends on the actomyosin and microtubule cytoskeleton. As inhibiting either of these cytoskeletons reduced CD36 clustering and signalling in the absence and presence of ligand, respectively, the cytoskeleton has a functional role in organizing CD36.