IN BRIEF

PLANT DEVELOPMENT

A fruit-bearing microRNA

Fruit morphogenesis is a complex process that is only partly understood. Ripoll *et al.* show in *Arabidopsis thaliana* that microRNA172 (miR172) targets and inhibits the transcriptional repressor APETALA2, thereby facilitating normal fruit valve growth. In turn, the MADS-domain transcription factor FRUITFULL (FUL), which is a master regulator of fruit morphogenesis, as well as the transcription factors AUXIN RESPONSE FACTOR 6 (ARF6) and ARF8 bind to the promoter of the *MIR172C* gene and positively regulate miR172. As is the case with mutations in *FUL*, plants with combined mutations in *ARF6* and *ARF8* have defects in valve growth. Moreover, the effects of FUL, ARF6 and ARF8 binding (or lack thereof) on miR172 expression and valve growth are additive, and the authors found that FUL physically interacts with ARF6 and ARF8. Thus, miR172 is an essential regulator of fruit growth, linking auxin signalling to fruit morphogenesis.

ORIGINAL RESEARCH PAPER Ripoll, J. J. *et al.* microRNA regulation of fruit growth. *Nature Plants* **1**, 15036 (2015)

MEMBRANE TRAFFICKING

Recycling through a new complex

It is unclear whether the mechanisms that are involved in the recycling of endocytic receptors from endosomes to the plasma membrane require multisubunit tethering complexes. Bonifacino and colleagues now identify a tethering complex, which they term endosome-associated recycling protein (EARP), that is involved in endocytic recycling. EARP is structurally related to the Golgi-associated retrograde protein (GARP) complex, and both complexes comprise the ANG2, VPS52 and VPS53 subunits. However, the complexes differ in their fourth subunit: EARP contains syndetin, whereas GARP contains VPS54. The authors found that syndetin and VPS54 specify the localization of the EARP and GARP complexes to RAB4-positive recycling endosomes and the *trans*-Golgi network, respectively. EARP was also shown to interact with the SNARE protein syntaxin 6 to promote recycling of the transferrin receptor.

ORIGINAL RESEARCH PAPER Schindler, C. *et al.* EARP is a multisubunit tethering complex involved in endocytic recycling. *Nature Cell Biol.* http://dx.doi.org/10.1038/ncb3129 (2015)

POST-TRANSLATIONAL MODIFICATIONS

When ubiqutin piggybacks

RING E3 ligases bind to E2~ubiquitin thioester intermediates and catalyse the transfer of ubiquitin to substrates. In addition to binding to the E2 catalytic site, free ubiquitin has been shown to bind to the backside of E2 ligases, which promotes processive polyubiquitin chain formation. Huang and colleagues now show that ubiquitin bound to the backside of the E2 protein UBCH5B enhances RING-dependent ubiquitin transfer. Using a structural and biochemical approach, the authors showed that backside-bound ubiquitin stabilizes a catalytically favourable conformation of the E3–E2~ubiquitin complex, which promotes processive polyubiquitin chain formation as well as initial RING-mediated ubiquitin transfer. On the basis of their findings, the authors propose that backside-bound ubiquitin functions as an allosteric activator that enhances RING E3-dependent ubiquitin transfer.

ORIGINAL RESEARCH PAPER Buetow, A. *et al.* Activation of a primed RING E3-E2–ubiquitin complex by non-covalent ubiquitin. *Mol. Cell* http://dx.doi.org/10.1016/j.molcel.2015.02.017 (2015)