IN BRIEF

CYTOSKELETON

Discrimination for a good cause

Microtubules are subject to several post-translational modifications, such as tyrosination. Tubulin Tyr ligase (TTL) catalyses the re-addition of a Tyr residue to the carboxyl terminus of detyrosinated α-tubulin, and this has several important cellular roles. Prota *et al.* identified various structures of TTL in complex with tubulin by X-ray crystallography. They found that TTL specifically recognizes the curved conformation of unassembled α-tubulin–β-tubulin dimers and binds tubulin adjacent to the dimer interface. The proximity of α-tubulin to the TTL active site and the observation that α-tubulin contains two C-terminal acidic residues necessary for TTL binding explain how TTL discriminates between α- and β-subunits. These structures also show why TTL cannot bind straight microtubules and thus selectively modifies unassembled tubulin. Notably, the tubulin-contacting residues are conserved among TTL orthologues. Moreover, nucleotide binding was important for the shaping of the TTL active site, suggesting that tyrosination reactions are coordinated with nucleotide exchange.

ORIGINAL RESEARCH PAPER Prota A. E. *et al.* Structural basis of tubulin tyrosination by tubulin tyrosine ligase. *J. Cell Biol.* **200**, 259–270 (2013)

CELL ADHESION

α-catenin form and function

Cell adhesion requires dynamic links between adherens junctions in the plasma membrane and the underlying cytoskeleton. Catenin proteins that associate with cadherins in these junctions lie at the heart of this connection, and there is much interest in the structural basis of how the α-catenin subunit mediates communication between F-actin and the β-catenin–cadherin complex. Here, Tepass and colleagues assess which domains of α-catenin are required for normal adherens junction integrity and cell adhesion in *Drosophila melanogaster*. They analyse the functional consequences of expressing mutant or fusion proteins that separate α-catenin function from β-catenin association and the effects of α-catenin oligomerization states. Their results support a model in which monomeric α-catenin mediates the essential link between the β-catenin–cadherin complex and F-actin, whereas dimeric α-catenin provides a cytoplasmic pool for subunit exchange.

ORIGINAL RESEARCH PAPER Desai, R. *et al.* Monomeric α-catenin links cadherin to the actin cytoskeleton. *Nature Cell Biol.* 17 Feb 2013 (doi:10.1038/ncb2685)

POST-TRANSLATIONAL MODIFICATIONS

Dishing up the right protein to the proteasome

Unlike proteins tagged with Lys48-linked ubiquitin, Lys63-polyubiquitylated proteins are directed to the lysosome rather than the proteasome. Because they do bind the proteasome *in vitro*, the authors postulated that other factors may prevent this interaction *in vivo*. Indeed, they show that ESCRT-0 components preferentially bind to proteins tagged with four or more Lys63-linked ubiquitin molecules and that reduction of ESCRT-0 levels increases binding of Lys63-tagged proteins to the proteasome in cells. Interestingly, Lys48-ubiquitylated proteins were specifically bound by RAD23, and this promoted their association with the proteasome. So, these ubiquitin-binding proteins determine whether a protein is targeted to the proteasome for degradation or to the endosome–lysosome pathway.

ORIGINAL RESEARCH PAPER Nathan, J. A. *et al.* Why do cellular proteins linked to K63-polyubiquitin chains not associate with proteasomes? *EMBO J.* 11 Jan 2013 (doi:10.1038/emboj.2012.354)