*Nature Reviews Molecular Cell Biology* | Published online 17 Feb 2016

# IN BRIEF

## CELL DEATH

### Molecular insights into execution of necroptosis

Necroptosis is a form of inducible necrotic cell death that involves cell membrane rupture. MLKL is a major effector protein of necroptosis, but how it mediates this process is poorly understood. Quarato *et al.* used detailed structural analyses of MLKL to propose a model in which MLKL sequentially engages with the plasma membrane for necroptosis execution. MLKL first oligomerizes through interactions in a region known as the brace. This targets MLKL to the membrane, followed by interaction of the protein N-terminal helix bundle (NB) with membranous phosphatidylinositols. These interactions occur in two steps that engage distinct residues of the NB, with the second step inducing a conformational change in MLKL that displaces the brace from the NB and might serve as a 'plug release' mechanism, unleashing the membrane-permeabilizing activity of the NB.

**ORIGINAL ARTICLE** Quarato, G. *et al.* Sequential engagement of distinct MLKL phosphatidylinositol-binding sites executes necroptosis. *Mol. Cell* http://dx.doi.org/10.1016/j.molcel.2016.01.011 (2016)

## MORPHOGENESIS

### Cadherin gradients sharpen somite boundaries

Somites are mesodermal segments, which give rise to the vertebrae and associated muscles. They originate sequentially, in an anterior-to-posterior (head-to-tail) wave, and as they mature, outer somite cells undergo epithelialization to form sharp boundaries between adjacent segments. McMillen *et al.* used zebrafish embryos to study the involvement of the adherens junction protein cadherin in this process. They found that within each somite, a posterior-to-anterior gradient of stable cadherin-based adhesions is established; thus, cells with large differences in stable cadherin adhesions are juxtaposed at somite boundaries. Analysis of cell mosaics revealed that juxtaposition of cells with different cadherin levels promotes the deposition of fibronectin-based extracellular matrix at boundaries and is sufficient to induce boundary formation. These effects were further associated with a cadherin-mediated increase in cytoskeletal contractility and hence local tissue stiffness at somite boundaries.

**ORIGINAL ARTICLE** McMillen, P. *et al.* A sawtooth pattern of cadherin 2 stability mechanically regulates somite morphogenesis. *Curr. Biol.* http://dx.doi.org/10.1016/j.cub.2015.12.055 (2016)

## ORGANELLE DYNAMICS

### How peroxisomes hitchhike on endosomes

In eukaryotic cells, intracellular transport largely depends on microtubules and their motors, accompanied by adaptor and regulatory proteins. Reck-Peterson and colleagues previously performed a screen to identify novel regulators of organelle transport in the filamentous fungus *Aspergillus nidulans*. Now, they have used this data set to study the regulation of peroxisome dynamics, focusing on a protein they named peroxisome distribution mutant A (PxdA), which they found to specifically affect peroxisome distribution. The authors revealed that PxdA is associated not only with peroxisomes, but also with moving endosomes, and that a large fraction of peroxisomes are not directly transported by microtubule motors but hitchhike on endosomes, using PxdA as a linker. Endosomal hitchhiking has previously been reported in other fungi, and it would be interesting to investigate whether similar mechanisms operate in higher eukaryotes.

**ORIGINAL ARTICLE** Salogiannis, J. *et al.* Peroxisomes move by hitchhiking on early endosomes using the novel linker protein PxdA. *J. Cell Biol.* **212**, 289–296 (2016)