IN BRIEF

DEVELOPMENT

Multiciliogenesis from scratch

In higher vertebrates, multicilia are important for luminal flow and for the removal of thick mucus, and they form in specialized terminally differentiated epithelial cells. As each cilium requires a centriole, these cells must undergo massive centriole amplification to generate hundreds of centrioles. Although some are generated through a mother centriole-dependent (MCD) pathway, the majority are formed through a *de novo* pathway, which is mediated by a structure known as a deuterosome. Zhao *et al.* find that the deuterosome-dependent pathway is governed by DEUP1 (deuterosome protein 1), a paralogue of CEP63 (centrosomal protein 63). In the same way that CEP63 binds to CEP152 and then recruits PLK4 (polo-like kinase 4) to activate MCD centriole biogenesis, CEP63 binds to CEP152 and then recruits PLK4 for *de novo* formation of centrioles in multiciliated cells.

ORIGINAL RESEARCH PAPER Zhao, A. N. *et al.* The Cep63 paralogue Deup1 enables massive *de novo* centriole biogenesis for vertebrate multiciliogenesis. *Nature Cell Biol.* http://dx.doi.org/10.1038/ncb2880 (2013)

AUTOPHAGY

Selective degradation of P granule components

Autophagy involves the enclosure of intracellular material within the autophagosome and subsequent delivery to the lysosome for degradation. Selective autophagy is achieved through receptors that bind simultaneously to cargoes to be degraded and the Atg8 protein, which associates with the autophagosome membrane. Efficient degradation of specific cargoes also requires scaffold proteins that link the receptor–cargo complex with multiple ATG proteins. Li *et al.* report that the arginine methyltransferase ectopic P granules-11 (EPG-11) is required for the selective degradation of the P granule components PGL-1 and PGL-3 during *Caenorhabditis elegans* embryogenesis. EPG-11 methylated arginine residues in PGL-1 and PGL-3, which was necessary for the association of PGL-1–PGL-3–SEPA-1 complexes (PGL granules, in which SEPA-1 is a receptor) with the scaffold protein EPG-2 and with LGG-1 (the *C. elegans* orthologue of Atg8). Arginine methylation thus regulates PGL degradation via selective autophagy.

ORIGINAL RESEARCH PAPER Li, S. *et al.* Arginine methylation modulates autophagic degradation of PGL granules in *C. elegans*. *Mol. Cell* http://dx.doi.org/10.1016/j.molcel.2013.09.014 (2013)

EXOCYTOSIS

A sortilin for secretory granules

Eukaryotic cells contain a range of secretory organelles, including secretory granules, that store condensed cargo at high concentrations and mediate their release through exocytosis in response to extracellular stimuli. Although in mammalian cells the sorting of aggregated cargo can occur through a unique pathway, there has been interest in whether this is always the case for all cargo and in other systems. Here, the authors use expression profiling in the ciliate *Tetrahymena thermophila* to show that sorting of non-aggregated cargo in a specific type of secretory organelle, mucocysts, relies on receptors of the sortilin (also known as VPS10) family that are better known for their role in lysosome biogenesis. They propose that different types of cargo may be delivered to secretory granules through distinct means.

ORIGINAL RESEARCH PAPER Briguglio, J. S., Kumar, S. & Turkewitz, A. P. Lysosomal sorting receptors are essential for secretory granule biogenesis in *Tetrahymena*. *J. Cell Biol.* http://dx.doi.org/10.1083/jcb.201305086 (2013)