

IN BRIEF

AUTOPHAGY

Autophagy regulates lipid metabolism

Singh, R. *et al. Nature* 1 Apr 2009 (doi:10.1038/nature07976)

Nutrient deprivation induces triglyceride (TG) hydrolysis to supply energy and causes intracellular proteins and organelles to be delivered to lysosomes for degradation by autophagy. A new study identifies a crucial role for autophagy in the regulation of lipid metabolism. Inhibition of autophagy increases TG accumulation and the number of lipid droplets (LDs) where TGs are stored. TGs and LD-associated proteins colocalize with autophagic compartments, and inhibition of autophagy blocks breakdown of TGs. Notably, an abnormal increase in intracellular lipids impairs autophagic clearance. Reduced autophagy in the ageing liver might contribute to the accumulation of lipids and the increased incidence of metabolic disorders.

PRIONS

Regulation of embryonic cell adhesion by the prion protein

Málaga-Trillo, E. *et al. PLoS Biol.* 7, e55 (2009)

The accumulation of misfolded prion protein (PrP) causes neurodegenerative disorders, but what are the physiological functions of PrP? Málaga-Trillo *et al.* show that knockdown of PrP impairs cell adhesion, disrupts morphogenetic movements and causes developmental arrest in zebrafish embryos. PrP accumulates at cell contacts and is required for the localization of E-cadherin adhesion complexes to the plasma membrane. PrP induces Ca²⁺-independent cell adhesion, and its accumulation at sites of cell contact coincides with the activation of Src-related Tyr kinases and reorganization of the actin cytoskeleton.

RNA DECAY

A role for ubiquitin in the clearance of nonfunctional rRNAs

Fujii, K. *et al. Genes Dev.* 15 Apr 2009 (doi:10.1101/gad.1775609)

Defective ribosomal RNAs (rRNAs) are removed by a quality control system called non-functional rRNA decay (NRD). rRNAs, such as 25S rRNA, are surrounded by ribosomal proteins in the ribosome, the dissociation of which might be required to make rRNAs accessible for degradation. The authors identified two components — Msm1 and Rtt101 — of an E3 ubiquitin ligase complex that functions in DNA repair in a genetic screen. Ubiquitylated proteins are absent from ribosomal fractions in *msm1Δ* and *rtt101Δ* mutants, which have impaired NRD. Inhibition of ubiquitylation blocks NRD, which suggests that removal of ribosomal proteins by ubiquitylation facilitates NRD.

CELL DIVISION

Kinetochore asymmetry defines a single yeast lineage

Thorpe, P. H. *et al. Proc. Natl Acad. Sci. USA* 3 Apr 2009 (doi:10.1073/pnas.0811248106)

Saccharomyces cerevisiae divides asymmetrically to produce mother and bud cells during each cell division, so lineage-specific asymmetric divisions were thought not to occur in yeast. Thorpe *et al.* now show that four kinetochore proteins are segregated asymmetrically only during the division of haploid spores and in the mother cell lineage that is derived from them. Whether the asymmetrical segregation of kinetochores, which anchor chromosomes to the mitotic spindle, cause nonrandom segregation of chromatids to a specific lineage is still unknown.