IN BRIEF

CELL MIGRATION

Neutrophils cast slings against the flow

During inflammation neutrophils roll slowly on microvessel walls, prior to their extravasation. Cell flattening and long rear membrane tethers maintain slow neutrophil rolling at high shear stress. Here, Sundd *et al.* report that 'slings' forming at the front of rolling neutrophils can also act as potent breaks during rolling. *In vitro* and *in vivo* imaging showed that detached tethers swing to the front of rolling neutrophils to form long slings that contain 'sticky patches' of the P-selectin ligand PSGL1. As neutrophils roll over the sling and transfer load between consecutive PSGL1 patches, the interaction between LFA1 on slings and ICAM2 on the neutrophil surface ensures tight neutrophil wrapping by slings, thereby retaining them close to the microvessel wall. Interestingly, measurements of the forces applied by tethers and slings on rolling neutrophils indicate that these structures could be sufficient for slow neutrophil rolling at high shear stress.

ORIGINAL RESEARCH PAPER Sundd, P. *et al.* 'Slings' enable neutrophil rolling at high shear. *Nature* 1 July 2012 (doi:10.1038/nature11248)

ORGANELLE DYNAMICS

A mitochondrial flirtation with the nucleus

The subcellular distribution of mitochondria may influence cellular functions by controlling the local levels of second messengers including reactive oxygen species (ROS). Al-Mehdi *et al.* describe how perinuclear clustering of mitochondria can regulate hypoxia-induced gene expression. Hypoxia was found to trigger microtubule-dependent accumulation of mitochondria near the nucleus in pulmonary artery endothelial cells. This correlated with high nuclear ROS levels and oxidative modifications at the *VEGF* (vascular endothelial growth factor) promoter. The resulting increase in binding of hypoxia-induced factor 1α (HIF1α) to the *VEGF* promoter and in VEGF mRNA levels suggested that mitochondrial localization can regulate hypoxia-induced gene expression.

ORIGINAL RESEARCH PAPER Al-Mehdi, A. B. *et al.* Perinuclear mitochondrial clustering creates an oxidant-rich nuclear domain required for hypoxia-induced transcription. *Sci. Signal.* **5**, ra47 (2012)

TRANSLATION

Lessons in maturation

Two groups provide insights into quality control during ribosome biogenesis, showing that maturation of the pre-40S ribosomal subunit actually requires association with both the 60S subunit and the translation initiation factor eIF5B. A late step in 40S maturation requires the cleavage of 20S pre-ribosomal RNA (rRNA) to mature 18S rRNA by the endonuclease Nob1. Lebaron *et al.* show that Nob1-mediated cleavage of the 20S pre-rRNA is regulated by pre-rRNA association of Fun12, the yeast homologue of eIF5B. The 60S ribosomal subunit also associates with pre-40S particles, and the authors propose that this is a trigger for Nob1-mediated cleavage. In the second study, Strunk *et al.* also find that eIF5B promotes association of the 60S subunit with the pre-40S particle, to form an 80S-like particle. However, these are not functional as they lack mRNA and initiator tRNA. The translation termination factor Rli1 is required to dissociate such non-functional complexes and drive formation of a mature ribosome.

ORIGINAL RESEARCH PAPERS Lebaron, S. *et al.* Proofreading of pre-40S ribosome maturation by a translation initiation factor and 60S subunits. *Nature Struct. Mol. Biol.* 1 Jul 2012 (doi:10.1038/nsmb.2308 | Strunk, B. S. *et al.* A translation-like cycle is a quality control checkpoint for maturing 40S ribosome subunits. *Cell* **150**, 111–121 (2012)