IN BRIEF

GENE EXPRESSION

Transcription kinetics

Danko *et al.* studied the kinetics of RNA polymerase II (Pol II)-dependent transcription elongation using global run-on sequencing. They found that the elongation rate of the same gene differed between cell lines and in response to tumour necrosis factor (TNF) or 17β-oestradiol, and it increased as transcription progressed. Furthermore, an increased elongation rate correlated with a higher density of Pol II at genes, which translated to higher rates of mRNA production. The authors also determined how TNF and 17β-oestradiol influence Pol II kinetics to stimulate gene expression; TNF promoted the release of paused Pol II at target genes, whereas 17β-oestradiol increased Pol II initiation. So, during transcription, elongation rate is variable, and the kinetics of Pol II initiation, pausing and elongation can be influenced by signalling pathways.

ORIGINAL RESEARCH PAPER Danko, C. G. *et al.* Signaling pathways differentially affect RNA polymerase II initiation, pausing, and elongation rate in cells. *Mol. Cell* 21 Mar 2013 (doi:10.1016/j.molcel.2013.02.015)

CELL SIGNALLING

Inside GPCR signalling

von Zastrow and colleagues provide direct evidence that G protein-coupled receptor (GPCR) signalling occurs at endosomes, in addition to the plasma membrane. They generated a conformation-specific antibody (nanobody (Nb80)) that functions as a biosensor for activated (that is, agonist-bound) β2 adrenergic receptor (β2AR), a prototypical GPCR. Without agonist, Nb80–GFP localized to the cytoplasm in mammalian cells. After the addition of the agonist isoprenaline, Nb80–GFP was rapidly recruited to the plasma membrane, where it colocalized with β2ARs. β2ARs are known to be internalized after activation. Importantly, the authors observed that internalized β2ARs were not bound to Nb80–GFP; Nb80–GFP was later recruited to activated β2ARs at early endosomes. Use of another nanobody, Nb37, that is specific for activated G proteins, showed that G protein activation occurred at β2AR-containing endosomes, which contributed to the cellular cyclic AMP response. This directly shows that GPCRs signal from endosomes and the plasma membrane.

ORIGINAL RESEARCH PAPER Irannejad, R. *et al.* Conformational biosensors reveal GPCR signalling from endosomes. *Nature* **495**, 534–538 (2013)

CELL CYCLE

A checkpoint escape

In most dividing cells, the spindle assembly checkpoint (SAC), which monitors kinetochore–microtubule interactions, signals to prevent anaphase onset until all chromosomes are correctly attached to the metaphase spindle. Here, Shao *et al.* reveal that *Xenopus laevis* oocytes do not respond to a SAC. The authors first developed a karyotyping technique that allows the analysis of meiotic chromosomes after nuclear envelop breakdown. When treating oocytes during meiosis I with microtubule-depolymerizing drugs that destroyed the spindle, they observed that homologous chromosomes could still divide into single pairs of chromatids, and on time. This suggested that oocytes could progress to meiosis II and arrest at metaphase II, as normal, without a spindle. Similarly, defective oocytes exhibiting monopolar spindles proceeded through monopolar anaphase without delay, indicating that, in *X. laevis*, the metaphase-to-anaphase transition is not under SAC regulation.

ORIGINAL RESEARCH PAPER Shao, H. *et al. Xenopus* oocyte meiosis lacks spindle assembly checkpoint control. *J. Cell Biol.* 8 Apr 2013 (doi:10.1083/jcb.201211041)