IN BRIEF

STEM CELLS

TAFs regulate stem cell promoters

Maston *et al.* showed that in human embryonic stem cells (ESCs), only 6 of the 14 human TATA-binding protein (TBP)-associated factors (TAFs) that make up the TFIID general transcription factor are present. They found that most active promoters in ESCs are bound by TAFs 3 and 5 and that the rest are bound by a newly identified complex containing the six ESC TAFs and TBP. Knockdown of one of the ESC TAFs or ectopic expression of one of the non-ESC TAFs induces differentiation, suggesting that the unusual TAF composition is required for pluriplotency.

ORIGINAL RESEARCH PAPER Maston G. A. *et al.* Non-canonical TAF complexes regulate active promoters in human embryonic stem cells. *eLife* **1**, e00068 (2012)

GENE EXPRESSION

Human cytomegalovirus protein repertoire

Stern-Ginossar *et al.* investigated regulation of protein expression in human cytomegalovirus (HCMV).They analysed patterns of mRNA and protein expression at four time points after infection using transcript analysis and ribosome profiling. Many previously unannotated open reading frames (ORFs), including short ORFs of 21–80 codons, were identified and confirmed by mass spectrometry. Analysis of gene expression through the time course revealed that protein expression was regulated at the level of transcription by the use of alternative transcription start sites that allow many proteins to be produced from one transcript.

ORIGINAL RESEARCH PAPER Stern-Ginossar, N. *et al.* Decoding human cytomegalovirus. *Science* **338**, 1088–1093 (2012)

GENOME INSTABILITY

A U-turn for mutagenesis?

Replication restart from collapsed replication forks can be mutagenic, such as when the end of the newly synthesized leading strand anneals to a nearby homologous (but non-allelic) sequence to restart replication ectopically. Mizuno *et al.* studied replication restart in fission yeast by analysing the effect of various engineered sequence features on chromosomal replication. They found that even when replication restart occurs correctly, if the replication fork encounters a palindromic sequence within the first few kilobases after restart, the replication machinery occasionally makes a U-turn, generating rearranged daughter chromosomes with absent or multiple centromeres. Such a mechanism might contribute to chromosomal rearrangements and copy number alterations in cancer.

ORIGINAL RESEARCH PAPER Mizuno, K. *et al.* Recombination-restarted replication makes inverted chromosome fusions at inverted repeats. *Nature* 25 Nov 2012 (doi:10.1038/nature11676)

CHROMATIN

pH regulation by histone acetylation

Little is known about the functional relevance of global differences in histone modification levels between cell types, such as normal and cancer cells, but this study suggests that global changes in histone acetylation are involved in the regulation of intracellular pH. The authors showed that global histone deacetylation, which is catalysed by histone deacetylases, takes place as the pH inside cells decreases. The released acetate anions are transported out of the cell by a mechanism that involves concomitant export of protons, preventing pH from falling further.

ORIGINAL RESEARCH PAPER McBrian, M. A. *et al.* Histone acetylation regulates intracellular pH. *Mol. Cell* 29 Nov 2012 (doi:10.1016/j.molcel.2012.10.025)