

IN BRIEF

CHROMATIN

Gene-specific targeting of the histone chaperone ASF1 to mediate silencing.

Goodfellow, H. *et al. Dev. Cell* **13**, 593–600 (2007)

The ASF1 histone chaperone participates in chromatin dynamics through nucleosome assembly and reassembly, and also functions in gene regulation in yeast. This study, which used RNAi knockdown and overexpression in *Drosophila melanogaster*, reveals a role for this chaperone in the repression of Notch target genes. ASF1 carries out this function through its recruitment to DNA by the Suppressor of Hairless–Hairless complex that functions downstream of Notch. These findings indicate that nucleosome assembly and disassembly at specific sequences contribute to chromatin-mediated gene regulation during development in multicellular organisms.

BEHAVIOURAL GENETICS

Wasp gene expression supports an evolutionary link between maternal behavior and eusociality.

Toth, A. L. *et al. Science* 27 September 2007 (doi:10.1126/science.1146647)

These authors used the honey bee genome to construct a transcriptome for studying reproductive altruism in the related wasp *Polistes metricus*. Foundresses, which reproduce and care for offspring, show greater similarities in gene expression to workers, which only care for offspring, than they do to queens and gynes, which are reproductive but do not provide care. This is despite the fact that the same individual goes through gyne, foundress and queen castes in a lifetime, and suggests that maternal care rather than reproductive activity was involved in the evolution of eusociality.

STEM CELLS

JMJD1A and JMJD2C histone H3 lysine 9 demethylases regulate self-renewal in embryonic stem cells.

Loh, Y.-H. *et al. Genes Dev.* **21**, 2545–2557 (2007)

This study reveals that *Jmjd1a* and *Jmjd2c* — histone H3 lysine 9 demethylase genes — are regulators of the characteristic chromatin state that allows self-renewal of embryonic stem (ES) cells. Both genes are regulated by OCT4, and depletion of either enzyme leads to ES-cell differentiation, decreased expression of markers for these cells, and induction of lineage-specific markers. Furthermore, JMJD2C is a positive regulator of *Nanog*, which encodes a transcription factor that has a key role in ES-cell self-renewal.

GENE REGULATION

Rapid, transcript-specific changes in splicing in response to environmental stress.

Pleiss, J. A. *et al. Mol. Cell* **27**, 928–937 (2007)

This paper highlights regulated splicing as a mechanism for rapid and specific gene expression changes in response to environmental stress. The splicing of most ribosomal protein-coding genes from *Saccharomyces cerevisiae* was rapidly inhibited after amino-acid starvation; on exposure to toxic ethanol levels, the splicing of two different sets of transcripts was either inhibited or upregulated. These findings also provide an explanation for the presence of introns in ~5% of genes from this species, from which alternative splicing is absent.

DOI:
10.1038/nrg2266