

## IN BRIEF

## EPIGENETICS

MeCP2, a key contributor to neurological disease, activates and represses transcription

Chahrour, M. *et al. Science* **320**, 1224–1229 (2008)

Methyl-CpG-binding protein 2 (MECP2) is a transcriptional regulator that is essential for brain development. The authors examined changes in gene expression in the hypothalamus of mice that either lacked or overexpressed MECP2. MECP2 regulated a large number of genes, and activated more genes than it repressed. The authors also showed that CREB1 is a direct target of MECP2. As MECP2 was previously thought to be mainly a transcriptional repressor, these findings might have consequences for the treatment of syndromes that result from abnormal MECP2 expression.

## NEUROIMMUNOLOGY

Microglia cells protect neurons by direct engulfment of invading neutrophil granulocytes: a new mechanism of CNS immune privilege

Neumann, J. *et al. J. Neurosci.* **28**, 5965–5975 (2008)

To investigate how microglia protect the brain from damage induced by ischaemia and the subsequent infiltration of immune cells, the authors used an oxygen- and glucose-deprivation model of ischaemia in hippocampal slice cultures. Addition of polymorphonuclear neutrophils (PMNs) increased neuronal damage, but addition of microglia to the cultures protected against this exacerbation, suggesting that the two cell types interact. Indeed, microglia engulfed and phagocytosed both inactive and active PMNs, and blocking this process reduced neuronal viability. These findings point to a novel way by which microglia might confer CNS immune privilege.

## SYNAPTIC PLASTICITY

Metaplastic control of the endocannabinoid system at inhibitory synapses in hippocampus

Edwards, D. A., Zhang, L. & Alger, B. E. *PNAS* **105**, 8142–8147 (2008)

Endocannabinoids (eCBs) can modulate synaptic plasticity, but how eCB mobilization is regulated has remained unclear. Here, the authors demonstrated that eCB mobilization in CA1 pyramidal cells by group I metabotropic glutamate receptors (mGluRs) required the cells to be primed by a transient increase in intracellular  $Ca^{2+}$  concentrations. Furthermore, prior mGluR activation potentiated  $Ca^{2+}$ -dependent eCB mobilization. These findings identify a mechanism for regulating eCB mobilization.

## PERCEPTION

Decision-making with multiple alternatives

Churchland, A. K., Kiani, R. & Shadlen, M. N. *Nature Neurosci.* **11**, 693–702 (2008)

In simple, two-choice perceptual-discrimination tasks, neuronal firing rates in the monkey lateral intraparietal area (LIP) gradually increase until a response is made, suggestive of an accumulation of evidence for the two choices. The authors showed that a similar process underlies four-choice discrimination tasks, although the neurons' initial firing rate was lower than in the two-choice task. In both tasks neuronal firing rates reflected choice accuracy and reaction time. The findings provide further support for the 'bounded accumulation of evidence' hypothesis of perceptual decision making.