

## IN BRIEF

## ➤ AUTISM

## Disrupted neural synchronization in toddlers with autism

Dinstein I. *et al. Neuron* **70**, 218–1225 (2011)

Reduced inter-hemispheric synchronization is characteristic of people with autism, but how early these deficits emerge is not known. Using functional MRI in sleeping toddlers, Dinstein *et al.* found that in children with autism, there was weaker inter-hemispheric synchronization between brain areas involved in language processing and comprehension. This disruption of synchrony was correlated with severity of autism and language deficits, but importantly, was not found in non-autistic toddlers with language delay, suggesting that this reduced synchronization could be a selective early diagnostic marker for autism.

## ➤ PSYCHIATRIC DISORDERS

## NMDA receptor blockade at rest triggers rapid behavioural antidepressant responses

Autry E. *et al. Nature* **475**, 91–95 (2011)

A disadvantage of traditional antidepressants is that they take weeks to reach efficacy. A number of studies have shown that low-dose, intravenous ketamine can reduce depression in a matter of hours, with the effect lasting for up to a fortnight; however, the mechanism underlying this effect is not well understood. In this study, ketamine was shown to be similarly efficacious in a number of mouse models of depression. The mechanism of action seems to involve blockade of NMDA receptors, activation of eukaryotic elongation factor 2 and subsequent de-suppression of translation of brain-derived neurotrophic factor mRNA. This might represent a novel target for future fast-acting antidepressants.

## ➤ SYNAPTIC HOMEOSTASIS

## MicroRNA regulation of homeostatic synaptic plasticity

Cohen J. E. *et al. Proc. Natl Acad. Sci. USA* 11 Jun 2011 (doi: 10.1073/pnas.1017576108)

Homeostatic plasticity is an important regulatory mechanism that maintains neuronal activity within an optimal range. How the molecular–genetic mechanisms underlying this phenomenon are orchestrated is unknown, but Cohen *et al.* now show that the microRNA miR-485 plays a crucial part. One of the targets of miR-485 is the protein synaptic vesicle glycoprotein 2A (SV2A), which is involved in presynaptic neurotransmitter release. Regulation of translation of this protein in the presynaptic terminal during chronic excitation — resulting in reduced vesicle release — might participate in the homeostatic response.

## ➤ BEHAVIOURAL NEUROSCIENCE

## Nicotine decreases food intake through activation of POMC neurons

Mineur, Y. S. *et al. Science* **332**, 1330–1332 (2011)

Smokers often gain weight when they quit smoking, and a new study has identified the neuronal pathway that is responsible for this effect. Using mouse feeding models and selective pharmacological agents, the authors identified the centrally located  $\alpha 3\beta 4$  nAChR nicotinic acetylcholine receptor as essential for the anorexic effect of nicotine. They found that enhanced activation by nicotine of  $\alpha 3\beta 4$  nAChR on pro-opiomelanocortin neurons in the arcuate nucleus resulted in increased activity in the projections of these neurons to the paraventricular nucleus of the hypothalamus, and that this mediated the decrease in appetite.