

## IN BRIEF

 METABOLISM**Lactate mobilization**

A new study reveals how low blood sugar levels or high neural activity can induce lactate mobilization from glycogen stores in astrocytes and delivery to neurons for use as fuel. Choi *et al.* showed that in astrocytes, an increase in extracellular K<sup>+</sup> levels (as occurs with a rise in neural activity) or intracellular alkalization (resulting from aglycaemic conditions) activates soluble adenylyl cyclase (sAC), leading to cyclic AMP (cAMP) generation. This sAC-derived cAMP could induce lactate production from astrocytic glycogen stores, and lactate generated in this manner was taken up by neurons.

**ORIGINAL RESEARCH PAPER** Choi, H. B. *et al.* Metabolic communication between astrocytes and neurons via bicarbonate-responsive soluble adenylyl cyclase. *Neuron* **75**, 1094–1104 (2012)

 NEURODEVELOPMENTAL DISORDERS**Fragile signalling**

Fragile X syndrome, the most common genetic cause of autism, arises from the loss of fragile X mental retardation protein (FMRP). Jung *et al.* found that FMRP-null mice are deficient in a form of metabotropic glutamate receptor 5 (mGluR5)-dependent long-term depression that occurs in the ventral striatum and prefrontal cortex. Loss of FMRP in these regions disrupted a protein complex that couples the production of the endocannabinoid 2-arachidonoylglycerol (2-AG) to mGluR5 activation. Enhancing 2-AG signalling reversed certain behavioural deficits in FMRP-null mice, indicating that this complex may be a candidate drug target.

**ORIGINAL RESEARCH PAPER** Jung, K.-M. *et al.* Uncoupling of the endocannabinoid signalling complex in a mouse model of fragile X syndrome. *Nature Commun.* **3**, 1080 (2012)

 GLIA**Internodally speeding up**

The velocity of nerve conduction in myelinated axons is predicted to rise (up to a certain limit) with increasing distance between nodes of Ranvier, but little experimental data exist to support this prediction. Here, Wu *et al.* showed that young mice expressing mutant periaxin, which impairs Schwann cell elongation, exhibited abnormally short internodal lengths and a reduced axonal conduction velocity compared with wild-type mice. As the mutant mice aged, nerve conduction velocities increased — up to a maximum — with internodal length, confirming the prediction.

**ORIGINAL RESEARCH PAPER** Wu, L. M. N. *et al.* Increasing internodal distance in myelinated nerves accelerates nerve conduction to a flat maximum. *Curr. Biol.* **27** Sep 2012 (doi:10.1016/j.cub.2012.08.025)

 LEARNING AND MEMORY**Image storage**

Where the human brain stores content during visual short-term memory remains unresolved. Here, subjects undergoing functional MRI (fMRI) had to memorize two complex images and, after a delay, decide which one of two newly presented images most resembled the original stimuli. Using multivariate pattern classification, the authors showed that fMRI activity patterns in visual areas and an area in the posterior parietal cortex allowed decoding of the stimuli held in memory, indicating that these areas are involved in maintaining content-specific information in visual short-term memory.

**ORIGINAL RESEARCH PAPER** Christophel, T. B., Hebart, M. N. & Haynes, J.-D. Decoding the contents of visual short-term memory from human visual and parietal cortex. *J. Neurosci.* **32**, 12983–12989 (2012)