

## IN BRIEF

**NEURODEGENERATIVE DISEASE****A pathogenic role for ARC?**

Amyloid- $\beta$ , which is implicated in the pathogenesis of Alzheimer's disease, is generated from the sequential cleavage of the amyloid precursor protein (APP) by  $\beta$ - and  $\gamma$ -secretase, a process that is believed to occur in endosomes. Neuronal activity can increase amyloid- $\beta$  generation but the underlying mechanism is unclear. Here, the authors show that depletion of activity-regulated cytoskeleton-associated protein (ARC) in Alzheimer's disease mice prevents activity-induced amyloid- $\beta$  production. Moreover, ARC causes increased colocalization of APP and  $\gamma$ -secretase in postsynaptic endosomes, potentially facilitating APP cleavage and hence amyloid- $\beta$  production.

**ORIGINAL RESEARCH PAPER** Wu, J. *et al.* Arc/Arg3.1 regulates an endosomal pathway essential for activity-dependent  $\beta$ -amyloid generation. *Cell* **147**, 615–628 (2011)

**METABOLISM****Another path to prostaglandins**

Prostaglandins have various physiological effects, including activation of inflammatory pathways. They are derived from arachidonic acid, the synthesis of which is believed to be mainly regulated by phospholipase A2. Nomura *et al.* show that monoacylglycerol lipase (MAGL) mediates an alternative prostaglandin biosynthetic pathway. Moreover, they show that inactivation of MAGL is neuroprotective in Parkinson's disease mice, and that this effect is probably mediated through a decrease in neuroinflammation. Thus, MAGL may be an anti-inflammatory target in neurodegenerative disease therapy.

**ORIGINAL RESEARCH PAPER** Nomura, D. K. *et al.* Endocannabinoid hydrolysis generates brain prostaglandins that promote neuroinflammation. *Science* 20 Oct 2011 (doi:10.1126/science.1209200)

**SLEEP****Visualizing dreams**

In lucid dreaming, individuals become aware that they are dreaming and are able to control their dreamed actions. Here, lucid dreamers were instructed to perform a hand clenching task while undergoing functional MRI or near-infrared spectroscopy. Hand clenching during dreaming was associated with neural activity in areas of the sensorimotor cortex. Interestingly, similar brain areas were activated in these individuals when they performed the task during wakefulness. This study provides preliminary evidence that a dream's content may be visualized through neuroimaging.

**ORIGINAL RESEARCH PAPER** Dresler, M. *et al.* Dreamed movement elicits activation in the sensorimotor cortex. *Curr. Biol.* **21**, 1833–1837 (2011)

**NEUROIMMUNOLOGY****Does multiple sclerosis originate in the gut?**

Autoreactive T and B cells may have important roles in multiple sclerosis, but what triggers autoreactivity is unclear. Here, the authors examined a relapsing–remitting variant of spontaneously developing murine experimental autoimmune encephalomyelitis (EAE). In this multiple sclerosis model, disease is driven by T cells that recognize a myelin autoantigen, and by recruited B cells that produce autoantibodies. Interestingly, relapsing–remitting mice that had been brought up in a germ-free environment, and hence had no commensal gut microbes, did not develop EAE and had impaired B-cell recruitment, suggesting that such microbes may have a role in multiple sclerosis.

**ORIGINAL RESEARCH PAPER** Berer, K. *et al.* Commensal microbiota and myelin autoantigen cooperate to trigger autoimmune demyelination. *Nature* 26 Oct 2011 (doi:10.1038/nature10554)