

IN BRIEF

NEUROIMMUNOLOGY**Pivotal role of cerebral interleukin-17-producing $\gamma\delta$ T cells in the delayed phase of ischemic brain injury**

Shichita, T. *et al. Nature Med.* **15**, 946–950 (2009)

Precisely how immune activation contributes to ischaemic damage is not known. Here, in a mouse model of stroke, pharmacological inhibition of T lymphocyte infiltration and genetic disruption of interleukin (IL)-23 or IL-17 expression reduced infarct volume. In wild-type mice, IL-17 was mainly produced by lymphocytes expressing the $\gamma\delta$ T cell receptor (TCR), and genetic ablation of the $\gamma\delta$ TCR or treatment with a $\gamma\delta$ TCR-specific antibody decreased infarct volume, suggesting that IL-17-producing $\gamma\delta$ T lymphocytes might be potential targets for stroke treatment.

STRESS**Chronic stress causes frontostriatal reorganization and affects decision-making**

Dias-Ferreira, E. *et al. Science* **325**, 621–625 (2009)

This study investigated the effects of stress on decision making. Rats exposed to chronic stress showed less flexible and more habitual responding in an action outcome task with changing contingencies. This was associated with atrophy in the associative corticostriatal circuits that mediate goal-directed behaviour, including the prelimbic and infralimbic cortex and the dorsomedial striatum, and with hypertrophy in sensorimotor circuits that underlie habitual behaviour, including the dorsolateral striatum. These findings might explain the link between stress and addiction in humans.

SYNAPTIC PLASTICITY**Regional differences in hippocampal calcium handling provide a cellular mechanism for limiting plasticity**

Simons, S. B. *et al. Proc. Natl Acad. Sci. USA* 31 Jul 2009
(doi:10.1073/pnas.0904775106)

Investigating why synaptic plasticity is absent from the hippocampal CA2, the authors showed that, compared with CA1 and CA3 neurons, CA2 neurons have an increased capacity to buffer Ca^{2+} and stronger Ca^{2+} extrusion. Artificially increasing the extracellular Ca^{2+} concentration (which promotes Ca^{2+} influx) or reducing Ca^{2+} extrusion in CA2 spines and dendrites allowed expression of long-term potentiation in CA2 neurons, whereas increasing Ca^{2+} extrusion in CA1 neurons prevented long-term potentiation in CA1. This indicates that strong Ca^{2+} extrusion prevents synaptic plasticity in CA2.

NEURODEGENERATIVE DISEASE**Amyloid deposition is associated with impaired default network function in older persons without dementia**

Sperling, R. A. *et al. Neuron* **63**, 178–188 (2009)

In patients with Alzheimer's disease (AD), amyloid deposition has been implicated in memory impairment. The authors combined *in vivo* imaging of amyloid deposition with measurements of neural activity in older subjects without dementia or obvious cognitive impairments. They demonstrated that amyloid deposition in key nodes of the default network was associated with abnormal default network activity, similar to findings reported in AD patients. These results suggest that this method might be used in presymptomatic diagnosis of AD.