

IN BRIEF

NEUROIMAGING**Stimulus-induced changes in blood flow and 2-deoxyglucose uptake dissociate in ipsilateral somatosensory cortex**Devor, A. *et al. J. Neurosci.* **28**, 14347–14357 (2008)

Functional MRI studies assume that blood oxygenation level-dependent (BOLD) signals correlate with neural activity. Here, stimulation of a rat forepaw increased the BOLD response, blood flow, neuronal activity and 2-deoxyglucose (2-DG) uptake in the contralateral somatosensory cortex, but the ipsilateral cortex showed decreased blood oxygenation and blood flow together with increased 2-DG uptake and neuronal activity. This implies that energy consumption does not determine blood flow and thus that BOLD signals do not necessarily indicate neural activity.

SOCIAL NEUROSCIENCE**The neural correlates of third-party punishment**Buckholz, J. W. *et al. Neuron* **60**, 930–940 (2008)

Legal decision making involves assessing the defendant's responsibility for the crime and choosing an appropriate punishment. To determine the neural correlates of these processes, the authors used functional MRI to scan volunteers who made legal decisions based on written scenarios. The level of activity in the right dorsolateral prefrontal cortex correlated with the level of responsibility that the volunteers assigned to the defendant, whereas activity in the amygdala, the medial prefrontal cortex and the posterior cingulate cortex predicted punishment magnitude, indicating that distinct neural systems underlie the two processes in legal decision making.

LEARNING AND MEMORY**Picomolar amyloid- β positively modulates synaptic plasticity and memory in hippocampus**Puzzo, D. *et al. J. Neurosci.* **28**, 14537–14545 (2008)

High levels of amyloid- β (A β) peptides are thought to contribute to synaptic dysfunction in Alzheimer's disease. A β peptides are expressed at low levels in the healthy brain; however, their function is unknown. The authors show that picomolar concentrations of A β peptides — similar to physiological levels — enhance synaptic plasticity in hippocampal slices and boost hippocampus-dependent learning and memory in mice through $\alpha 7$ nicotinic acetylcholine receptor activation. These findings add to our understanding of the functional roles of A β peptides in the nervous system.

CORTICAL PLASTICITY**Developmentally degraded cortical temporal processing restored by training**Zhou, X. & Merzenich, M. M. *Nature Neurosci.* **12**, 26–28 (2009)

Exposing rats to particular environmental noises during early postnatal life can disrupt auditory processing throughout adult life. For example, exposure to structured noise with low temporal modulation rates disrupts responses to sounds with higher modulation rates. The authors showed that intensive training during juvenile or young-adult stages on a perceptual task that requires the animals to identify and respond to trains of auditory pulses of specific rates could restore auditory processing in the temporal cortex in such noise-reared animals. This work provides another demonstration of the extent of postnatal cortical plasticity.