

IN BRIEF

➤ SENSORY PROCESSING**Mixed-up mitral cells**

In this study, whole-cell recordings of mitral/tufted cells (M/TCs) in the olfactory bulb of awake mice revealed greater heterogeneity of activity compared with that in mice in an anaesthetized state, including in a subpopulation of cells with high spontaneous baseline activity and a subpopulation with very low levels of spontaneous activity. Interestingly, the silent and active subpopulations responded to odour exposure with depolarization and strongly increased firing rates or weak responses, respectively. These findings suggest a previously unrecognized level of complexity for odour processing.

ORIGINAL RESEARCH PAPER Kollo, M. et al. 'Silent' mitral cells dominate odor responses in the olfactory bulb of awake mice. *Nature Neurosci.* <http://dx.doi.org/10.1038/nn.3768> (2014)

➤ PAIN**Finding motivation in pain**

People with chronic pain can experience reduced motivation to complete goal-directed tasks, but the mechanism is poorly understood. In this study, the decreased motivation that occurred in two mouse models of chronic pain was associated with reduced activity in medium spiny neurons of the nucleus accumbens, which was mediated by activation of galanin receptor 1. These findings reveal a previously unrecognized consequence of chronic pain on motivational circuitry in the brain.

ORIGINAL RESEARCH PAPER Schwartz, N. et al. Chronic pain. Decreased motivation during chronic pain requires long-term depression in the nucleus accumbens. *Science* **345**, 535–542 (2014)

➤ AGEING**Synaptic slide into old age**

Synapses in the outer retina undergo age-related functional decline, but the molecular mechanisms are unknown. The authors showed that synaptic changes in ageing mouse retinas are linked to reduced activity of the serine/threonine kinase LKB1, which in turn reduced phosphorylation of its substrate AMPK. Mice lacking AMPK or LKB1 had synaptic alterations similar to those found in aged mice, including loss of rod photoreceptors and axonal retraction. These defects could be reversed by pharmacological activation of AMPK, which might have therapeutic potential in the treatment of age-related alterations in retinal physiology.

ORIGINAL RESEARCH PAPER Samuel, M. A. et al. LKB1 and AMPK regulate synaptic remodeling in old age. *Nature Neurosci.* <http://dx.doi.org/10.1038/nn.3772> (2014)

➤ DECISION MAKING**Off the hook**

It has been suggested that the state of mind of the perpetrator of a crime plays a strong part in people's judgement of what constitutes an appropriate punishment. This functional MRI study showed that when people are shown an intentionally harmful act, activity in their amygdala and its connectivity with lateral prefrontal regions was increased. Observers also voted for a stronger punishment for the perpetrator. However, when the same harmful act was perpetrated unintentionally, activity in the observer's amygdala was suppressed by a circuit involving temporoparietal–medial prefrontal regions; views on appropriate punishment severity were also reduced. These findings provide insight into the neural mechanisms underlying emotion-driven punishment.

ORIGINAL RESEARCH PAPER Treadway, M. T. et al. Corticolimbic gating of emotion-driven punishment. *Nature Neurosci.* <http://dx.doi.org/10.1038/nn.3781> (2014)