

IN BRIEF

SLEEP**Notch signaling modulates sleep homeostasis and learning after sleep deprivation in *Drosophila***Seugnet, L. *et al. Curr. Biol.* **21**, 1–6 (2011)

The authors showed that sleep deprivation impaired learning in mutant flies with loss of Notch signalling, but not in mutants with increased Notch signalling, which also displayed no homeostatic sleep response. Notch and its ligand Delta were expressed in glia and neurons, respectively. Flies expressing the intracellular, active Notch domain in glia had a similar phenotype to Notch gain-of-function mutants, whereas expressing the domain in neurons had no effect. These findings reveal a role for glial Notch signalling in regulating the effects of sleep deprivation.

AGEING**Deficit in switching between functional brain networks underlies the impact of multitasking on working memory in older adults**Clapp, W. C. *et al. Proc. Natl Acad. Sci. USA* **108**, 7212–7217 (2011)

Why older individuals are more susceptible to the interfering influence of external stimuli on working memory than younger people is a topic of debate. In this functional MRI study, young and old individuals performed a working memory task. When a secondary task was introduced, both groups moved attention away from the memory maintenance network towards the secondary stimuli. However, only older individuals continued to process the interrupting stimuli and failed to reactivate the memory network, suggesting a reduced ability for older individuals to dynamically switch between networks.

ADDICTION**A *Drosophila* model for alcohol reward**Kaun, K. R. *et al. Nature Neurosci.* **14**, 612–619 (2011)

Using a new conditioned place preference assay, the authors showed that *Drosophila melanogaster* perceive high levels of ethanol as rewarding. Ethanol preference expression required dopamine neuron activation. Subsequent sequential activation of specific neuronal subsets in the mushroom body mediated the acquisition, consolidation and retrieval of ethanol reward memory. The authors also demonstrated that *scabrous* — the protein product of which regulates Notch signalling — was required for ethanol reward memory. These results show that *D. melanogaster* can be used to model aspects of alcohol intoxication.

NEURODEVELOPMENTAL DISORDERS**GIT1 is associated with ADHD in humans and ADHD-like behaviors in mice**Won, H. *et al. Nature Med.* **17**, 556–572 (2011)

The mechanisms underlying attention deficit hyperactivity disorder (ADHD) are poorly understood. The authors identified a single-nucleotide polymorphism in the gene encoding G protein-coupled receptor kinase interacting protein 1 (*GIT1*) that was associated with ADHD susceptibility in humans. Mice lacking *Git1* showed ADHD-like hyperactivity and impaired learning and memory, which could be reversed with methylphenidate, a psychostimulant used to treat ADHD. The hippocampus of *Git1*^{-/-} mice had reduced inhibitory synaptic transmission, which was due to reduced input at inhibitory synapses and resulted in increased excitation of postsynaptic neurons.