# IN BRIEF

## LEARNING AND MEMORY

### Falsifying memory

How false memories form is unclear. To begin to address this, Ramirez *et al.* aimed to create a false hippocampal memory in mice using optogenetics. They placed mice in a novel environment and labelled activated neurons in the dentate gyrus by the targeted expression of channelrhodopsin 2. The mice were then placed in a different environment and underwent fear conditioning while the neurons activated in the first environment were optogenetically reactivated. Subsequent placement of the mice into the first environment elicited a fear response, indicating that a false fear memory had been created.

**ORIGINAL RESEARCH PAPER** Ramirez, S. *et al.* Creating a false memory in the hippocampus. *Science* **341**, 387–391 (2013)

## MOTOR SYSTEMS

### Practice drives efficiency

Development of a high level of motor skill performance requires practice. Interestingly, human functional MRI studies show that motor skill training can lead to decreased functional activation in the primary motor cortex (M1), suggesting that practice increases motor system efficiency. To examine this, Picard *et al.* measured functional activity and neuronal firing in M1 of monkeys while they performed sequential reaching tasks that were designed to engage newly learnt or highly practised motor skills. Neuronal firing rates were similar in both types of tasks, but functional activation was decreased in the tasks engaging well-practised movements, indicating that practice increases the efficiency of M1 neuronal activity.

**ORIGINAL RESEARCH PAPER** Picard, N., Matsuzaka, Y. & Strick, P. L. Extended practice of a motor skill is associated with reduced metabolic activity in M1. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3477 (2013)

## LEARNING AND MEMORY

### Recognizing WNT signalling in memory

Fortress *et al.* examined whether WNT signalling, which regulates hippocampal synaptic function, is involved in hippocampal memory formation. Mice were trained in a hippocampus-dependent object recognition task. After training, they received an infusion of vehicle or dickkopf-related protein 1 (DKK1), a canonical WNT signalling inhibitor, into the dorsal hippocampus. The next day, DKK1-treated mice did not recognize the object from the task, indicating that object recognition memory consolidation involves canonical WNT signalling.

**ORIGINAL RESEARCH PAPER** Fortress, A. M. *et al.* Canonical Wnt signaling is necessary for object recognition memory consolidation. *J. Neurosci.* **33**, 12619–12626 (2013)

## NEUROTROPHIC FACTORS

### Deciphering fly neurotrophism

The identity of the receptors for the fly neurotrophins Nt1 and Nt2 has been unclear. This study identifies two members of the Toll receptor superfamily, which is implicated in innate immunity, as the likely candidates. The authors found that, during development in *Drosophila melanogaster*, Toll6 and Toll7 regulated motor axon targeting and neuron survival and exhibited overlapping or complementary expression patterns to those of Nt1 and Nt2. They also found genetic interactions between the *Toll* and *NT* genes, and showed that Nt1 can bind Toll7, whereas Nt2 can bind both Toll6 and Toll7.

**ORIGINAL RESEARCH PAPER** McIlroy, G. *et al.* Toll-6 and Toll-7 function as neurotrophin receptors in the *Drosophila melanogaster* CNS. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3474 (2013)