*Nature Reviews Neuroscience* | AOP, published online 16 July 2014;

# IN BRIEF

## NEUROGENESIS

### Adult neurogenesis gets a boost

The orphan nuclear receptor TLX promotes neural stem cell self-renewal, but its role in hippocampal neurogenesis is not known. Murai *et al.* generated transgenic (Tg) mice in which TLX expression was placed under the control of the promoter for nestin, a marker of neural precursors. Adult Tg mice exhibited increased numbers of proliferating neural progenitors and 5-bromodeoxyuridine-labelled newborn neurons in the dentate gyrus compared with wild-type mice, and performed better in the Morris water maze, a test of spatial learning and memory. Thus, TLX expression in neural progenitors cells is important for adult hippocampal neurogenesis and memory.

**ORIGINAL RESEARCH PAPER** Murai, K. *et al.* Nuclear receptor TLX stimulates hippocampal neurogenesis and enhances learning and memory in a transgenic mouse model. *Proc. Natl Acad. Sci. USA* **111**, 9115–9120 (2014)

## NEUROTRANSMITTERS

### Dopamine tone depends on DAT

The extracellular concentration of dopamine ($[DA]_e$) exhibits circadian oscillations, although the mechanisms underlying this phenomenon are unclear. Through the use of voltammetry in rat brain slices, Ferris *et al.* showed that, over a 24-hour cycle, the rate of DA reuptake by the DA transporter (DAT) was inversely related to $[DA]_e$. Slices from *Dat*-knockout mice showed no oscillation in $[DA]_e$, indicating that diurnal variation in $[DA]_e$ is governed by the DAT.

**ORIGINAL RESEARCH PAPER** Ferris, M. J. *et al.* Dopamine transporters govern diurnal variation in extracellular dopamine tone. *Proc. Natl Acad. Sci. USA* **111**, E2751–E2759 (2014)

## NEURODEVELOPMENTAL DISORDERS

### Mind the SYNGAP

Haploinsufficiency of SYNGAP1 (synaptic RAS GTPase activating protein 1) in humans can lead to intellectual disability and epilepsy, and *Syngap1*$^{+/-}$ mice exhibit impaired cognition. Here, in mice, heterozygous knockout of *Syngap1* in developing forebrain pyramidal neurons, but not in GABAergic neurons, was sufficient to replicate the *Syngap1*$^{+/-}$ mouse phenotype. Reduction of SYNGAP1 levels in adult mice had no effect on cognition or pyramidal neuron excitability, indicating that the cognitive impairment in *Syngap1*$^{+/-}$ mice is due to altered development of forebrain excitatory neurons.

**ORIGINAL RESEARCH PAPER** Ozkan, E. D. *et al.* Reduced cognition in *Syngap1* mutants is caused by isolated damage within developing forebrain excitatory neurons. *Neuron* **82**, 1317–1333 (2014)

## PSYCHIATRIC DISORDERS

### miR-135: a marker of mood

Serotonergic activity is dysregulated in depression and anxiety disorders, but less is known about the role of microRNAs (miRNAs) in mood disorders. miR-135, which inhibits expression of the serotonin transporter and inhibitory serotonin autoreceptor, was upregulated in serotonin neurons of animals that were treated with antidepressants. Mice that overexpressed miR-135 showed less anxiety- and depression-like behaviour after social defeat than did controls. Moreover, patients with depression exhibited lower circulating levels of miR-135. This study indicates that circulating miR-135 could be a marker of serotonin dysregulation or of response to antidepressant therapy.

**ORIGINAL RESEARCH PAPER** Issler, O. *et al.* MicroRNA 135 is essential for chronic stress resiliency, antidepressant efficacy, and intact serotonergic activity. *Neuron* http://dx.doi.org/10.1016/j.neuron.2014.05.042 (2014)