Nature Reviews Neuroscience | AOP, published online 30 April 2014

IN BRIEF

EPIGENETICS

Early trauma alters sperm RNA

The effects of traumatic early life experiences on adult behaviour can be transmitted to the next generation through unknown mechanisms. The authors show that male mice exposed to early life stress exhibit altered behavioural responses, as do their offspring. The sperm of the traumatized mice exhibited changes in the levels of small non-coding RNAs. Injection of RNAs purified from this sperm into wild-type oocytes produced offspring with behavioural alterations similar to those observed in traumatized mice, indicating that sperm RNAs contribute to the transgenerational inheritance of the effects of early life trauma.

ORIGINAL RESEARCH PAPER Gapp, K. *et al.* Implication of sperm RNAs in transgenerational inheritance of the effects of early trauma in mice. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3695 (2014)

TECHNIQUES

A colourful concept

Sophisticated genetic methods for cell type identification have increased our understanding of cell fate acquisition during development. The authors describe a technique that enables the simultaneous identification of all major retinal cell subtypes in zebrafish. In this approach, three different fluorescent proteins are expressed under the control of the promoters of transcription factors that are present in different combinations in differentiating retinal neurons. This approach may aid the study of various aspects of retinal development.

ORIGINAL RESEARCH PAPER Almeida, A. D. *et al.* Spectrum of Fates: a new approach to the study of the developing zebrafish retina. *Development* http://dx.doi.org/10.1242/dev.104760 (2014)

ADDICTION

Dopamine dips as drug use increases

Altered striatal dopamine signalling is linked to drug abuse; however, the precise nature of any changes in dopamine release in addiction are unclear. The authors here show that phasic dopamine release in the striatum is decreased during the escalation of cocaine self-administration in rats. In the ventromedial striatum, this decrease was correlated with the increased drug taking. Increasing striatal extracellular dopamine levels by administering L-DOPA was able to reverse the escalation of cocaine self-administration. Thus, decreased phasic dopamine release may contribute to the onset of drug abuse.

ORIGINAL RESEARCH PAPER Willuhn, I. *et al.* Excessive cocaine use results from decreased phasic dopamine signaling in the striatum. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3694 (2014)

NEUROIMAGING

Potential mechanisms

Event-related potentials (ERPs), transient stereotypical changes in the electroencephalogram in response to particular stimuli, are widely used to measure cognitive function, but the mechanisms that generate ERPs are unclear. This study showed that the amplitude and timing of the frontal ERP response to the presentation of an 'oddball' auditory tone was coupled to neuronal activity in the basal forebrain (BF) of rats. Furthermore, BF stimulation triggered local field potentials similar to those associated with the ERP. Thus, subcortical inputs may have an important role in the generation of ERPs.

ORIGINAL RESEARCH PAPER Nguyen, D. P. & Lin, S.-C. A frontal cortex event-related potential driven by the basal forebrain. *eLife* **3**, e02148 (2014)