IN BRIEF

SYNAPTOGENESIS

The language of synaptogenesis

The expression of the language-associated gene sushi repeat-containing X-linked 2 (*SRPX2*) is repressed by the transcription factor FOXP2. Here, SRPX2 knockdown led to a decrease in excitatory cortical synaptic density and impaired ultrasonic vocalizations in mouse pups. Modulating FOXP2 levels also regulated synaptic density by controlling SRPX2 expression. Thus, these data reveal that FOXP2 regulates synaptogenesis through SRPX2 and suggest that dysregulation of SRPX2 function might be linked to language disorders.

ORIGINAL RESEARCH PAPER Sia, G. M., Clem, R. L. & Huganir, R. L. The human language-associated gene SRPX2 regulates synapse formation and vocalization in mice. *Science* **342**, 987–991 (2013)

NEURAL DEVELOPMENT

Programming memory through milk

Conflicting data exist for a role for tumour necrosis factor (TNF) in memory. Here, the offspring of female mice deficient in haematopoietic TNF showed enhanced postnatal hippocampal proliferation and spatial memory in adulthood. These effects were independent of the offspring's TNF status, suggesting a maternal effect on the developing young. Indeed, TNF-deficient mothers showed low levels of various milk chemokines, and administering these chemokines to their pups restored normal hippocampal development and spatial memory. Thus, maternal TNF, through regulating milk chemokine levels, regulates hippocampal development in postnatal offspring in mice.

ORIGINAL RESEARCH PAPER Liu, B. *et al.* Maternal hematopoietic TNF, via milk chemokines, programs hippocampal development and memory. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3596 (2013)

NEUROTRANSMISSION

The second sensor

Synaptotagmin 1 (SYT1) acts as a calcium sensor to mediate synchronous calcium-triggered synaptic vesicle exocytosis in neurons. *Syt1* deletion in forebrain neurons prevents such transmission and reveals a slower form of neurotransmitter release — asynchronous release — for which the calcium sensor has been unclear. Bacaj *et al.* show that hippocampal neurons express two calcium-binding SYTs — SYT1 and SYT7 — and that loss of SYT7 in SYT1-deficient neurons suppresses asynchronous release. This could be rescued by SYT7 expression, indicating that SYT7 may act as the second calcium sensor in these neurons.

ORIGINAL RESEARCH PAPER Bacaj, T. *et al.* Synaptotagmin-1 and synaptotagmin-7 trigger synchronous and asynchronous phases of neurotransmitter release. *Neuron* **80**, 947–959 (2013)

NEUROLOGICAL DISORDERS

Differential methylation in multiple sclerosis

Changes in DNA methylation — one form of epigenetic regulation — are linked to a number of brain disorders. Here, Huynh *et al.* found differences in DNA methylation in pathology-free tissue from multiple sclerosis (MS)-affected and control brains. In the MS samples, several genes involved in oligodendrocyte survival were hypermethylated and their transcripts were downregulated. By contrast, several genes involved in proteolytic cleavage were hypomethylated and their transcripts were upregulated. These data suggest that DNA methylation may have a role in MS disease mechanisms.

ORIGINAL RESEARCH PAPER Huynh, J. L. *et al.* Epigenome-wide differences in pathology-free regions of multiple sclerosis-affected brains. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3588 (2013)