IN BRIEF

DEVELOPMENT

Wnt–Ryk signalling mediates medial–lateral retinotectal topographic mapping.

Schmitt A. M. *et al. Nature* **439**, 31–37 (2006)

The complex connections of the vertebrate nervous system are topographically highly organized. Order is achieved by establishing an appropriate balance of opposing morphogens that guide axons to their targets. A new study of the cues that establish the topographic map for retinotectal projections in the chick and mouse reveals WNT3 as a lateral mapping force that acts in opposition to the medial-directed cue provided by ephrins. Contributing a further degree of spatial 'awareness' to axons, the strength of the WNT3 effect varies along the dorsoventral axis depending on the particular receptor that it binds: an axon-repulsive WNT–RYK axis competes with an attractive WNT–frizzled interaction, which, together with ephrins determine the topographical connections of axons.

SYNAPTIC PHYSIOLOGY

A single vesicular glutamate transporter is sufficient to fill a synaptic vesicle.

Daniels, R. W. *et al. Neuron* **49**, 11–16 (2006)

Neurotransmitter is released as packets, or quanta, which correspond to one synaptic vesicle. Vesicles are filled with neurotransmitter by vesicular neurotransmitter transporters, and the postsynaptic response to the release of a synaptic vesicle, known as the quantal size, depends on the amount of transmitter within a particular vesicle. However, the minimum number of transporters needed to fill a vesicle has so far not been documented. Daniels *et al.* created a series of *Drosophila* mutants in which there was graded expression of the vesicular glutamate transporter (VGLUT) at the neuromuscular junction. They found that, in the mutant flies, there was a reduction in the frequency of spontaneous quantal release that varied according to the level of VGLUT. Importantly, quantal size remained normal, and, according to probabalistic calculations, even when the number of transporters was restricted so that each synaptic vesicle was thought to contain only one functional unit of VGLUT, all synaptic vesicles were still filled to the same level as they were in wild-type flies. These findings were taken to indicate that a single vesicular glutamate transporter is sufficient to fill each synaptic vesicle.

NEUROIMAGING

Declarative memory consolidation in humans: a prospective functional magnetic resonance imaging study.

Takashima, A. *et al. Proc. Natl Acad. Sci. USA* **103**, 756–761 (2006)

In a prospective study, Takashima *et al.* used functional MRI over the course of 3 months to monitor the effects of memory consolidation on brain activity. Hippocampal activity declined, whereas activation in the ventral medial prefrontal cortex increased over repeated testing. Moreover, the duration of slow-wave sleep was positively correlated with recognition memory performance and negatively correlated with the strength of changes in hippocampal activity. These findings support a model in which memory consolidation is facilitated by slow-wave sleep and a gradual shift of retrieval processes to the neocortex.