IN BRIEF

AXON GUIDANCE

Draxin, a repulsive guidance protein for spinal cord and forebrain commissures

Islam, S. M. *et al. Science* **323**, 388–393 (2009)

Axon-guidance proteins are essential for the development of the nervous system. Here, the authors screened a chick cDNA library and identified draxin as a novel protein that is transiently expressed during chick and mouse development and bears no homology to other known axon-guidance cues. In cultured spinal cord explants draxin acted as an inhibitor of neurite outgrowth. Overexpression of draxin in chick embryos and knockout of draxin in mice impaired commissural axonal growth. Further studies will determine the function of draxin in commissure formation.

CHEMICAL SENSES

Variant ionotropic glutamate receptors as chemosensory receptors in *Drosophila*

Benton, R. *et al. Cell* **136**, 149–162 (2009)

Ionotropic glutamate receptors have a central role in neurotransmission. The authors identified a family of receptors in the sensory neurons of *Drosophila melanogaster*, which they termed ionotropic receptors (IRs) as they are related to ionotropic glutamate receptors but lack the characteristic amino acids of the glutamate-binding site. Individual IRs are expressed in subpopulations of sensory neurons that do not express odorant or gustatory receptors and localize to their dendrites. The authors propose that IRs may act as peripheral chemosensors.

LEARNING AND MEMORY

Transgenerational rescue of a genetic defect in long-term potentiation and memory formation by juvenile enrichment

Arai, J. A. *et al. J. Neurosci.* **29**, 1496–1502 (2009)

Exposure to an enriched environment enhances learning and memory in mice. This new study shows that these effects can be transmitted to the next generation, as long-term potentiation (LTP) was enhanced in the offspring of enriched mothers. Moreover, the characteristic defects in LTP and contextual fear conditioning of *ras–Gfr*-knockout mice were masked in the offspring of knockout mice exposed to an enriched environment. These data raise the intriguing possibility that a mother's experience can induce epigenetic changes that influence her offspring's memory performance.

REPAIR

Axon regeneration requires a conserved MAP kinase pathway

Hammarlund, M. *et al. Science* **323**, 802–806 (2009)

The authors showed that DLK-1, a component of a mitogen-activated protein kinase pathway, is essential for axon regeneration after spontaneous or laser-induced damage. Worms with no or low levels of DLK-1 did not show growth cone formation and axon regeneration after laser axotomy, whereas increasing DLK-1 levels enhanced the initiation of regeneration. Eliminating other steps in the DLK-1 signalling pathway also blocked regeneration, suggesting that the final component of this pathway, PMK-3, might ultimately stimulate regeneration. These findings could be used to develop treatments that encourage neuron regeneration.