IN BRIEF

GLIA

Glia are essential for sensory organ function in *C. elegans*

Bacaj, T., Tevlin, M. & Shaham, S. *Science* **322**, 744–747 (2008)

Sensory organs contain glia, but whether these glia contribute to sensory function is unknown. Here the authors ablated the 'sheath' glial cells that surround neurons in the amphid, a sensory organ in *Caenorhabditis elegans*. This resulted in impairments in sensory behaviour and dye-filling (a characteristic of specific amphid neurons) and in abnormal ciliary morphology of some sensory neurons. The authors also identified 298 mRNA transcripts that were enriched in sheath glia. This study provides evidence for an important role for glia in sensory function.

MEMORY

Integrating memories in the human brain: hippocampal-midbrain encoding of overlapping events

Shohamy, D. & Wagner, A. D. *Neuron* **60**, 378–389 (2008)

How do we generalize information gained from discrete experiences? The authors tested the hypothesis that an event that overlaps with a previous experience triggers retrieval of that experience, which in turn results in a new, integrated memory of the overlap. Subjects learned to associate photograph pairs (A–X, A–Y and B–X) and, in the test phase, had to infer that B is also associated with Y (generalization). Hippocampus and midbrain activations correlated and increased as the learning phase progressed. The magnitude of the increase correlated with the accuracy in the test phase. These findings suggest that generalization results from integrative encoding of discrete events through hippocampus–midbrain interactions.

LEARNING AND MEMORY

Neurofibromin regulation of ERK signaling modulates GABA release and learning

Cui, Y. *et al. Cell* **135**, 549–560 (2008)

Mutations in neurofibromin 1 (NF1) impair ERK signalling and disrupt cognitive function. Here the authors reveal a role for NF1 in the modulation of GABA release from interneurons, through ERK-dependent phosphorylation of synapsin 1. Deletion of NF1 from neurons resulted in learning deficits and an impairment of hippocampal LTP. These effects were alleviated by treatment with a GABA receptor antagonist, establishing a link between GABA release and learning and demonstrating a role for ERK signalling in the modulation of GABA activity.

CIRCADIAN RHYTHMS

An autonomous circadian clock in the inner mouse retina regulated by dopamine and GABA

Ruan, G.-X. *et al. PLoS Biol.* **6**, e249 (2008)

The retina contains an endogenous circadian clock; however, little is known about the cells and mechanisms that are involved in retinal pacemaking. The authors cultured intact adult mouse retinas expressing luciferase under the control of the *Per1* gene to report circadian activity. They localized the source of retinal pacemaking to the inner nuclear layer and showed that the pacemaking is probably cell-autonomous, with dopaminergic and GABAergic neurotransmission setting the phase and amplitude, respectively.