IN BRIEF

NEURAL REPAIR

Bionic rats?

Paralysis following spinal cord injury (SCI) continues to be an intractable problem. Here, the authors studied SCI in rats that induced complete hindlimb paralysis but left a small 'bridge' of undamaged tissue. A combination of electrical stimulation and monoaminergic agonists was applied to spinal circuits downstream of the lesion. The rats were then placed in a supportive robotic postural interface that allowed bipedal locomotion and presented with a food reward that was just out of reach. Within 6 weeks of training, rats with neurochemical prostheses were able voluntarily to initiate locomotion towards the food. This supports previous studies that suggest that active training, combined with motivational sensory cues, has potential as a rehabilitation approach in humans with paralysing SCI.

ORIGINAL RESEARCH PAPER van den Brand, R. *et al.* Restoring voluntary control of locomotion after paralyzing spinal cord injury. *Science* **336**, 1182–1185 (2012)

GLIA

Microglia eat synapses for breakfast

Although recent research has indicated an involvement of microglia in synapse remodelling in the normal brain, their precise role in this process is unknown. The synapses of the retinogeniculate system undergo extensive pruning postnatally, and Schafer *et al.* now find that microglia contribute to this pruning by engulfing and remodelling presynaptic inputs. Interestingly, they show that this process is dependent on upstream neuronal activity and signalling via the phagocytic complement receptor 3 pathway.

ORIGINAL RESEARCH PAPER Schafer, D. P. *et al.* Microglia sculpt postnatal neural circuits in an activity and complement-dependent manner. *Neuron* **74**, 691–705 (2012)

SENSORY SYSTEMS

Human olfaction is not neurogenesis-dependent

Neurogenesis in the olfactory bulb of rodents continues into maturity and has been implicated in olfactory memory. The extent to which adult neurogenesis contributes to olfactory bulb function in humans is unclear, however. The number of neuroblasts migrating to the human olfactory bulb decreases sharply after birth, and here the authors used carbon dating to show that levels remain extremely low throughout life. This work highlights an important difference between humans and rodents in the role of neurogenesis in olfactory bulb function.

ORIGINAL RESEARCH PAPER Bergmann, O. *et al.* The age of olfactory bulb neurons in humans. *Neuron* **74**, 634–639 (2012)

GLIA

Astrocytes make synapses noisy

It has previously been shown that astrocytes can secrete factors that result in the formation of silent synapses, but whether they can induce formation of functional synapses was unknown. Exposure of purified retinal ganglion cell neurons to the astrocyte-secreted molecules glypican 4 (GPC4) and GPC6 was sufficient to induce functional synapses. Indeed, application of GPC4 to these neurons was sufficient to increase the postsynaptic surface expression of AMPA receptors and increase the amplitude and frequency of firing — all of which where attenuated in GPC4-deficient mice. These findings indicate that GPC4 and GPC6 have key roles in synapse development.

ORIGINAL RESEARCH PAPER Allen, N. J. *et al.* Astrocyte glypicans 4 and 6 promote formation of excitatory synapses via GluA1 AMPA receptors. *Nature* 27 May 2012 (doi:10.1038/nature11059)