Nature Reviews Neuroscience | AOP, published online 4 December 2013

IN BRIEF

REGENERATION AND REPAIR

Laws of attraction

Transplantation of neural precursor cells (NPCs) has promise as a cell-replacement therapy in neurodegenerative disorders; however, their efficacy is hampered by poor migration into, and population of, the host tissue. Here, the authors found that differentiating NPCs formed spherical clusters and secreted vascular endothelial growth factor and fibroblast growth factor 2, and that the secretion of these factors prevented the migration of the NPCs' neuronal progeny. Inhibition of these auto-attractive mechanisms enhanced the migration of grafted differentiating NPCs into rodent CNS tissue. Therefore, therapy based on these mechanisms might increase the effectiveness of neural transplants.

ORIGINAL RESEARCH PAPER Ladewig, J., Koch, P. & Brüstle, O. Auto-attraction of neural precursors and their neuronal progeny impairs neuronal migration. *Nature Neurosci.* http://dx.doi.org/10.1038/nn.3583 (2013)

MOTOR SYSTEMS

Bimanual bionics

Brain–machine interfaces (BMIs) have the potential to restore movement in paralysed limbs by monitoring the readout from motor areas and using these signals to control mechanical prosthetics. Although control of individual arms has been achieved, coordinated bimanual control has not been possible to date. In rhesus monkeys, cortical activity patterns related to bimanual movement were decoded and transmitted to a bimanual BMI. With practice, the monkeys' performance in manual tasks improved and was accompanied by widespread cortical plasticity, suggesting that cortical networks are able to adapt to the bimanual BMI. These findings could enable the development of more advanced BMIs.

ORIGINAL RESEARCH PAPER Ifft, P. J. *et al.* A brain-machine interface enables bimanual arm movements in monkeys. *Sci. Transl. Med.* **5**, 210ra154 (2013)

BEHAVIOURAL NEUROSCIENCE

Facets of fear

In mice, exposure to different threatening stimuli, such as a footshock, a predator or an aggressive mouse, results in the activation of different medial hypothalamic nuclei. The authors selectively inhibited neurons in different nuclei in the ventromedial hypothalamus and found that disruption of specific hypothalamic circuits disrupted threat-specific behavioural responses. These results suggest that selective pharmacological blockade of different types of fear might be possible.

ORIGINAL RESEARCH PAPER Silva, B. A. *et al.* Independent hypothalamic circuits for social and predator fear. *Nature Neurosci.* **16**, 1731–1733 (2013)

GENE EXPRESSION

Mixing it up

Somatic genome variation arising from copy-number variation (CNV) is thought to contribute to functional diversity in the human brain, but such variation has been difficult to measure. Here, the authors used two approaches that enable large-scale mapping of CNVs in single cells — namely, microarray analysis of multiple displacement amplification products and single-cell sequencing. They found that, in humans, the levels of CNVs are markedly higher in neurons than in non-neuronal cells such as fibroblasts.

ORIGINAL RESEARCH PAPER McConnell, M. J. *et al.* Mosaic copy number variation in human neurons. *Science* **342**, 632–637 (2013)