IN BRIEF

NEUROLOGICAL DISORDERS

Microglia — major players in Rett syndrome?

Recent studies have uncovered a role for astrocytes in the pathophysiology of Rett syndrome, most cases of which are linked to mutations in methyl-CpG-binding protein 2 (*MECP2*). A new study shows that microglial dysfunction may also have an important role in this disorder. Transplantation of wild-type murine bone marrow into male *Mecp2*$^{-/-}$ mice that had undergone postnatal irradiation led to engraftment of MECP2-expressing microglia-like cells in the brain parenchyma and a cessation of disease progression. Moreover, mice in which MECP2 expression was restricted to myeloid cells, including microglia, showed a similar phenotype. Finally, pharmacological blockade of microglial phagocytic activity in these animals attenuated disease improvement.

ORIGINAL RESEARCH PAPER Derecki, N. C. *et al.* Wild-type microglia arrest pathology in a mouse model of Rett syndrome. *Nature* 18 Mar 2012 (doi:10.1038/nature10907)

NEURTROPHIC FACTORS

Locating BDNF

The low levels of endogenous brain-derived neurotrophic factor (BDNF) in the mature nervous system have hindered attempts to determine the subcellular localization of this peptide. Through use of confocal and immunogold electron microscopy, Dieni *et al.* now show that in the adult mouse hippocampus, BDNF and its pro-peptide are located in presynaptic dense core vesicles but are absent in postsynaptic compartments. According to the authors, these findings challenge the dendritic release–retrograde signalling model of BDNF action in the CNS.

ORIGINAL RESEARCH PAPER Dieni, S. *et al.* BDNF and its pro-peptide are stored in presynaptic dense core vesicles in brain neurons. *J. Cell Biol.* **196**, 775–788 (2012)

ION CHANNELS

The anionic influence

A new study shows that the shift in intracellular chloride concentration ($[Cl^-]_i$) that occurs in the early postnatal period of mammalian neuronal development may regulate $GABA_A$ receptor ($GABA_AR$) subunit composition. In immature murine cerebellar granule cells, overexpression of K^+–Cl^- cotransporter (KCC2) — which promotes a low $[Cl^-]_i$ — was associated with a shift in α3 to α1 $GABA_AR$ subunit expression and an increase in δ subunit levels. Conversely, KCC2 downregulation increased α3 and lowered δ subunit levels. Thus, the $[Cl^-]_i$ may provide a GABA-independent means of tuning phasic and tonic inhibition, mediated by α- and δ-containing $GABA_ARs$, respectively.

ORIGINAL RESEARCH PAPER Succol, F. *et al.* Intracellular chloride concentration influences the $GABA_A$ receptor subunit composition. *Nature Commun.* **3**, 738 (2012)

DENDRITES

Staying out of touch

Despite the complex nature of dendritic aborizations, the dendrites of a single neuron rarely touch. Cell surface proteins have been implicated in this self-avoidance phenomenon, but other molecular determinants have remained unclear. Here, the authors showed that in *Caenorhabditis elegans*, disruption of netrin (UNC-6) signalling led to a failure of touch withdrawal in dendrites of PVD nociceptive neurons, as revealed by time-lapse imaging. As netrin is a diffusible factor that is involved in axon guidance, this study shows that dendrite self-avoidance may be achieved through various strategies.

ORIGINAL RESEARCH PAPER Smith, C. J. *et al.* Netrin (UNC-6) mediates dendritic self-avoidance. *Nature Neurosci.* 18 Mar 2012 (doi:10.1038/nn.3065)