slowed. Another polyglutamine protein, the androgen receptor (expansions in which are associated with spinobulbar muscular atrophy), had the same effect. The authors also found that the mutant androgen receptor inhibited neurite outgrowth in neuronal cell lines, further supporting the idea that the protein interfered with axonal transport.

In Huntington's disease and other polyglutamine disorders, the mutated proteins accumulate in both the nucleus and the cytoplasm. It is unclear which of these contributes to the pathology, or even whether aggregates are necessary for neurodegeneration. These studies add another piece to the puzzle, but we are clearly still a long way from a full understanding of how polyglutamine expansions cause neurodegeneration.

Rachel Jones

References and links

ORIGINAL RESEARCH PAPERS Gunawardena, S. *et al.* Disruption of axonal transport by loss of huntingtin or expression of pathogenic polyQ mutants in *Drosophila*. *Neuron* **40**, 25–40 (2003) | Szebenyi, G. *et al*. Neuropathogenic forms of huntingtin and androgen receptor inhibit fast axonal transport. *Neuron* **40**, 41–52 (2003)

FURTHER READING Muqit, M. M. K. & Feany, M. B. Modelling neurodegenerative disorders in *Drosophila*: a fruitful approach? *Nature Rev. Neurosci.* **3**, 237–243 (2002)

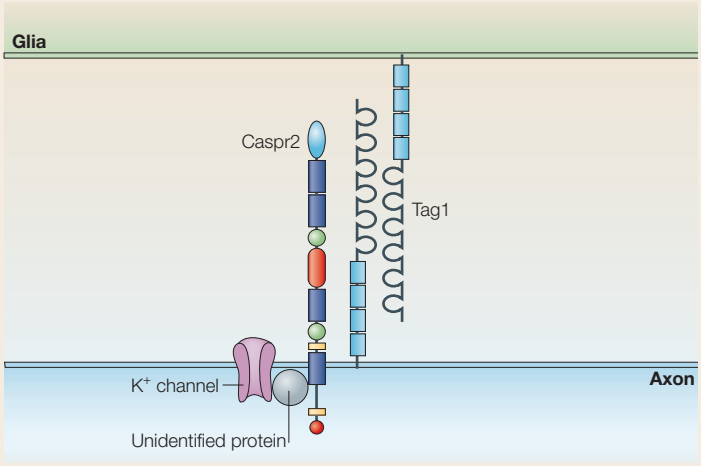
In the second study, Szebenyi *et al.* used isolated axoplasm from squid giant axons to investigate fast axonal transport. When the axoplasm was perfused with a mutant huntingtin fragment, both anterograde and retrograde fast axonal transport were

Second, as this adhesion molecule forms homophilic interactions between opposing membranes (in this case, between axon and glia), Tag1 participates in maintaining the structural integrity of this region of the myelin sheath.

Juan Carlos López

References and links

ORIGINAL RESEARCH PAPERS Poliak, S. *et al.* Juxtaparanodal clustering of *Shaker*-like K^+ channels in myelinated axons depends on Caspr2 and TAG-1. *J. Cell Biol.* **162**, 1149–1160 (2003) | Traka, M. *et al*. Association of TAG-1 with Caspr2 is essential for the molecular organization of juxtaparanodal regions of myelinated fibers. *J. Cell Biol.* **162**, 1161–1172 (2003)



IN BRIEF

ION CHANNELS

Structural basis for modulation and agonist specificity of HCN pacemaker channels.

Zagotta, W. N. *et al*. *Nature* **425**, 200–205 (2003)

HCN channels have pacemaking activity in heart and brain cells, are activated by hyperpolarization, and are modulated by cyclic nucleotides. On the basis of crystallographic and equilibrium sedimentation analyses of the carboxy-terminal domain of HCN2, Zagotta and colleagues define the mechanism of cyclic nucleotide specificity and identify a domain that mediates the tetramerization of this channel region. They also propose a possible mechanism for the allosteric modulation of gating. These results might be relevant to other cyclic nucleotide-binding channels.

SENSORY SYSTEMS

Multiple actions of systemic artemin in experimental neuropathy.

Gardell, R. L. *et al*. *Nature Med.* 5 October 2003 (doi: 10.1038/nm944)

Neuropathic pain — pain caused by functional disturbances of peripheral nerves — can be successfully treated with systemic artemin in rats, according to this study. Artemin is a member of the glial-derived neurotrophic factor family, and the peripheral expression of its receptor — GFRα3 — is restricted to nociceptive neurons. The authors found that artemin reversed several behavioural, morphological and biochemical correlates of experimental neuropathy with no obvious side effects, pointing to its possible therapeutic use.

COGNITIVE NEUROSCIENCE

Sounds and silence: an optical topography study of language recognition at birth.

Peña, M. *et al. Proc. Natl Acad. Sci. USA* **100**, 11702–11705 (2003)

Newborn infants can organize the auditory world.

Winkler, I. *et al. Proc. Natl Acad. Sci. USA* **100**, 11812–11815 (2003)

Our understanding of the cognitive abilities and organization of newborn infants suffers from difficulties in applying traditional techniques of study to babies. In these two papers, different techniques are applied to show that the responses of newborn infants to auditory stimuli are similar to those of adults. In the first, Peña *et al.* use optical topography — an optical technique for imaging changes in blood flow in the cortex below the scalp — to show that, even in babies that are just two or three days old, the left hemisphere responds preferentially to speech, but not to backward speech. In the second study, Winkler and colleagues use the mismatch negativity — an electroencephalogram signal that is a signature for the detection of an 'oddball' stimulus — to show that similarly young infants can also segregate concurrent streams of sound according to their source. As in adults, the segregation of the sounds depends on a difference in spatial pitch between the two streams.