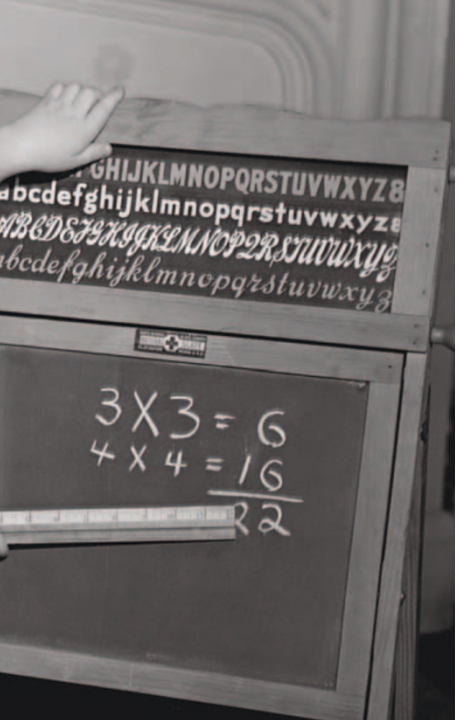


that originated in the rostral rhombic lip, and identified some further groups of migratory cells, including cochlear granule cells and non-granule ventral cochlear neurons, which emerged from a more caudal portion of the rhombic lip. Intriguingly, cerebellar and cochlear neurons that arose from the adjacent ventromedial neuroepithelium lacked *Math1*.

On the basis of these patterns of *Math1* expression, Wang and co-workers proposed that *Math1* defines the spatial limits of the rhombic lip, the anatomical boundaries of which have, so far, been difficult to distinguish from the ventricular epithelium.

These results indicate that a specific transcription factor influences the integration of diverse cell types into common pathways that are involved in proprioception, balance and audition. Moreover, they reveal the importance of temporal dynamics, in addition to spatial origin, in the specification of cell types in the hindbrain. It is hoped that future work will unravel the molecular mechanisms that coordinate this precise temporal regulation in the developing neural tube.

Alison Rowan

References and links

ORIGINAL RESEARCH PAPERS Machold, R. & Fishell, G. Math1 is expressed in temporally discrete pools of cerebellar rhombic-lip neural progenitors. *Neuron* **48**, 17–24 (2005) | Wang, V. Y., Rose, M. F. & Zoghbi, H. Y. *Math1* expression redefines the rhombic lip derivatives and reveals novel lineages within the brainstem and cerebellum. *Neuron* **48**, 31–43 (2005)

FURTHER READING Zervas, M. *et al.* Cell behaviors and genetic lineages of the mesencephalon and rhombomere 1. *Neuron* **43**, 345–357 (2004)

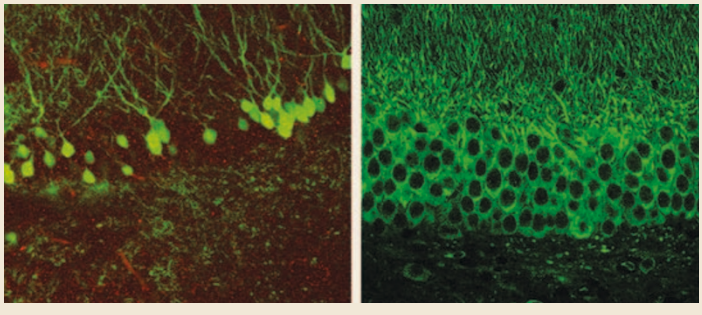
In addition, there was a marked reduction in neurodegeneration in the hippocampus of lenti-siBACE1-injected transgenic mice that was not observed in the neocortex where lenti-siBACE1 constructs had not been injected. Deficits in spatial learning and memory observed in transgenic mice in the Morris water maze were also reversed by siRNA treatment.

Although there are still questions surrounding the accuracy of delivery and long-term expression potential, RNAi is a promising viable therapeutic strategy for the treatment of Alzheimer's disease and other neurodegenerative disorders.

Daniel McGowan

References and links

ORIGINAL RESEARCH PAPER Singer, O. & Marr, R. A. *et al.* Targeting BACE1 with siRNAs ameliorates Alzheimer disease neuropathology in a transgenic model. *Nature Neurosci.* **8**, 1343–1349 (2005)



Lenti-GFP (green fluorescent protein) image showing the expression of the siRNA (left) and a microtubule-associated protein 2 (MAP2) immunolabelling illustration (right) showing that the neuronal dendritic structure is preserved after treatment. Image courtesy of E. Masliah, University of California, Davis, USA.

IN BRIEF

ION CHANNELS

Regulation of Kv7 (KCNQ) K^+ channel open probability by phosphatidylinositol 4,5-bisphosphate.

Li, Y. *et al. J. Neurosci.* **25**, 9825–9835 (2005)

Voltage-gated Kv7 (KCNQ) channels regulate K^+ currents, such as the M current. Li *et al.* used single-cell and whole-cell patch clamp techniques and biochemical analysis to show that Kv7 channel gating is highly sensitive to phosphatidylinositol-4,5-bisphosphate ($PtdIns(4,5)P_2$) concentrations, with low levels being associated with M current suppression. Moreover, distinct Kv7 channels had differential affinities for $PtdIns(4,5)P_2$, which was thought to reflect their different maximal opening probabilities.

DEVELOPMENT

Wnt signalling regulates adult hippocampal neurogenesis.

Lie, D.-C. *et al. Nature* **437**, 1370–1375 (2005)

In the adult mammalian CNS, new hippocampal neurons can be generated from neural stem cells in the subgranular zone of the hippocampal dentate gyrus. Lie and colleagues investigated the signals that regulate the proliferation and commitment to neuronal fate of adult hippocampal stem/progenitor cells. They found that inhibition of WNT signalling decreased neurogenesis from hippocampal stem/progenitor cells *in vitro* and abolished it *in vivo*. Moreover, overexpression of WNT3 enhanced neurogenesis *in vitro* and *in vivo*. Their data therefore indicate that WNT has a pivotal role in neurogenesis in the adult hippocampus.

NEUROIMMUNOLOGY

Thinning of the cerebral cortex visualized in HIV/AIDS reflects $CD4^+$ T lymphocyte decline.

Thompson, P. M. *et al. Proc. Natl Acad. Sci. USA* **102**, 15647–15652 (2005)

At least 40% of patients with AIDS suffer from neurological symptoms, but the profile of brain damage caused by HIV is poorly understood. Using high-resolution MRI brain scans, Thompson and colleagues created three-dimensional maps and showed that the primary sensory, motor and premotor cortices were 15% thinner in patients with AIDS. Cortical thinning was associated with the degree of immune suppression, as measured by blood levels of $CD4^+$ T lymphocytes, and cognitive and motor deficits.

NEURODEGENERATION

Retinal ganglion cell degeneration is topological but not cell type specific in DBA/2J mice.

Jakobs, T. C. *et al. J. Cell Biol.* **171**, 313–325 (2005)

Glaucoma is usually associated with increased intraocular pressure and results in slow, progressive cell loss in the retina. Jakobs and colleagues studied the neural changes that occurred during elevated intraocular pressure using a mouse model of inherited glaucoma (strain DBA/2J). They found that cell loss was not restricted to a particular type of ganglion cell, and regions of cell death have characteristic topological neuronal atrophy radiating from the optic nerve head in fan-shaped sectors.