

IN BRIEF

GLIA

Astrocytes are endogenous regulators of basal transmission at central synapses

Panatier, A. *et al. Cell* 18 Aug 2011 (doi:10.1016/j.cell.2011.07.022)

Astrocytes are known to modulate the activity of neural networks, but their contribution to basal neurotransmission was unclear. Here, the authors show that in the CA1 region of the hippocampus, astrocytes detect single action potentials in a calcium- and metabotropic glutamate subtype 5 receptor-dependent manner. In response, they release purines that activate presynaptic A2A receptors, leading to an increase in basal synaptic transmission. These findings show that astrocytes regulate neurotransmission at the level of single synapses.

NEURODEGENERATIVE DISEASE

Mutations in *UBQLN2* cause dominant X-linked juvenile and adult-onset ALS and ALS/dementia

Deng, H.-X. *et al. Nature* 21 Aug 2011 (doi:10.1038/nature10353)

Mutations in genes such as superoxide dismutase 1 and TAR DNA-binding protein 43 (TDP43) have been associated with familial amyotrophic lateral sclerosis (ALS), however, they only account for a small percentage of cases. This study identifies a novel disease-associated gene, ubiquilin 2 (*UBQLN2*), which encodes a protein that is involved in proteasome-mediated protein degradation. Mutations in *UBQLN2* cause dominantly inherited, chromosome X-linked ALS and ALS with dementia, suggesting that defects in protein degradation could represent a pathogenic mechanism that may be amenable to therapeutic intervention.

MicroRNAs

miR-124a is required for hippocampal axogenesis and retinal cone survival through *Lhx2* suppression

Sanuki, R. *et al. Nature Neurosci.* 21 Aug 2011 (doi:10.1038/nn.2897)

Despite being one of the most abundant microRNAs in the vertebrate CNS, the *in vivo* role of miR-124a remains ambiguous. In this study, the authors showed that retinal non-coding RNA 3 (*Rncr3*) knockout mice, in which miR-124a expression is mostly eliminated, exhibit axonal mis-sprouting in the dentate gyrus and have significantly fewer cone photoreceptors than wild-type mice. In addition, they found that the mRNA encoding LIM-homeobox protein 2 (*LHX2*) is an important target of miR-124a, and that inhibition of *Lhx2* translation by miR-124a is essential for the maturation and survival of dentate gyrus neurons and retinal cones.

DEVELOPMENT

Fas-associated factor 1 as a regulator of olfactory axon guidance

Cheng, K., Bai, L. & Belluscio, L. J. *Neurosci.* **31**, 11905–11913 (2011)

Apoptotic molecules have previously been implicated in the regulation of growth cone dynamics. Here, the authors report a role for the apoptotic signalling regulator FAS-associated factor 1 (FAF1) in guiding olfactory sensory neurons (OSNs) to the appropriate glomeruli in the glomerular layer of the olfactory bulb. Moreover, the mutant phenotypes that were generated by overexpressing FAF1 could be restored by inhibiting FAF1 expression postnatally, highlighting the possibility of restoring OSN organization even after broad disruption.