IN BRIEF

SYNAPTIC PLASTICITY

A role for SNAP25 in internalization of kainate receptors and synaptic plasticity

Selak, S. *et al. Neuron* **63**, 357–371 (2009)

The factors that regulate the trafficking of kainite receptors (KARs) at the postsynaptic membrane are largely unknown. Here the authors show that SNAP25, a protein best known for its role in presynaptic vesicle docking and fusion, interacts directly with the KAR subunit GluK5 (also known as KA2). Overexpression of SNAP25 in cultured hippocampal neurons increased the rate of endocytosis of GluK5-containing receptors. Furthermore, inhibition of SNAP25 in hippocampal slices increased KAR-mediated excitatory postsynaptic currents in CA3 neurons of wild-type but not of GluK5$^{-/-}$ mice. This study reveals an unexpected role of SNAP25 in KAR trafficking.

NEUROPROTECTION

Melatonin modulates visual function and cell viability in the mouse retina via the MT1 melatonin receptor

Baba, K. *et al. Proc. Natl Acad. Sci. USA* **106**, 15043–15058 (2009)

Melatonin is expressed in photoreceptors of the retina under the direct control of the circadian clock, but the role of melatonin receptors in retinal function is unknown. The authors showed that 3-month-old wild-type mice, but not mice lacking melatonin receptor 1 (*Mt1*$^{-/-}$ mice), exhibited a luminescence level-dependent retinal response that could be amplified by daytime melatonin injection. Moreover, 18-month-old *Mt1*$^{-/-}$ mice had significantly fewer photoreceptors and ganglion cells, suggesting that MT1 is required for the survival of certain retinal cell types as well as for the modulation of visual sensitivity.

NEUROTECHNIQUES

Direct activation of sparse, distributed populations of cortical neurons by electrical microstimulation

Histed, M. H. *et al. Neuron* **63**, 508–522 (2009)

Electrical microstimulation is used to study the functional roles of specific brain areas. However, the interpretation of these studies is complicated by a poor understanding of which neurons are activated. Here the authors used two-photon Ca^{2+} imaging to reveal that microstimulation activates neurons with cell bodies that are distributed sparsely up to hundreds of micrometres away from the electrode, owing to the stimulation of neural processes around the electrode tip. This has implications for the interpretation of both old and new microstimulation experiments.

NEURITOGENESIS

An essential role of the aPKC–Aurora A–NDEL1 pathway in neurite elongation by modulation of microtubule dynamics

Mori, D. *et al. Nature Cell Biol.* **11**, 1057–1069 (2009)

Neurite extension requires cytoskeleton remodelling; however, the signalling pathways involved are not fully characterized. The authors find that, as dorsal root ganglion neurons grow, atypical protein kinase C activates the kinase Aurora A. Aurora A in turn phosphorylates NDEL1. The authors show that this pathway is important for microtubule reorganization during neurite extension. As an Aurora A–NDEL1 pathway has also been linked to microtubule remodelling during mitosis, this study suggests similarities in the mechanisms underlying both processes.

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