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IN BRIEF

NEURODEGENERATIVE DISEASE

FYN gives Aβ the green light

Protein complexes consisting of amyloid-β (Aβ) oligomers and cellular prion protein (PrP^C) contribute to synaptic dysfunction in Alzheimer's disease by an unknown mechanism. A new study shows that Aβ oligomers, PrP^C and the tyrosine protein kinase FYN are enriched in postsynaptic densities. Soluble Aβ assemblies from the brains of patients with Alzheimer's disease were found to interact with PrP^C. This complex activates FYN, which in turn phosphorylates the NR2B subunit of NMDA receptors and causes reduced NMDA receptor surface expression and loss of dendritic spines. This newly revealed signalling pathway might contribute to the cellular pathology of Alzheimer's disease.

ORIGINAL RESEARCH PAPER Um, J. W. *et al.* Alzheimer amyloid-β oligomer bound to postsynaptic prion protein activates Fyn to impair neurons. *Nature Neurosci.* 22 Jul 2012 (doi:10.1038/nn.3178)

NEURONAL CIRCUITS

Starving for AGRP

Activation of hypothalamic agouti-related protein (AGRP)-expressing neurons is known to increase food intake in rodents. Here, Atasoy *et al.*, using channel rhodopsin-assisted circuit mapping and pharmacogenetic techniques, showed that activation of inhibitory projections of AGRP neurons to a small population of oxytocin-expressing neurons in the paraventricular hypothalamus was sufficient to induce this effect. As this population of neurons is lost in Prader–Willi syndrome, these findings provide a mechanism for the insatiable hunger associated with this syndrome and perhaps for other eating disorders.

ORIGINAL RESEARCH PAPER Atasoy, D. *et al.* Deconstruction of a neural circuit for hunger. *Nature* 11 Jul 2012 (doi:10.1038/nature11270)

COGNITIVE NEUROSCIENCE

Grey matter shows its soft side

Why are some people more altruistic than others? Morishima *et al.* used voxel-based morphometry to demonstrate that stronger altruistic tendencies were associated with larger grey matter volume in the right temporoparietal junction (TPJ). Furthermore, the specific conditions under which an individual makes altruistic choices were associated with TPJ grey matter volume and with increases in activation in that area. These findings demonstrate a functional and structural correlate of individual differences in altruism.

ORIGINAL RESEARCH PAPER Morishima, Y. *et al.* Linking brain structure and activation in temporoparietal junction to explain the neurobiology of human altruism. *Neuron* **75**, 73–79 (2012)

LEARNING AND MEMORY

Hippocampus plays multiple choice

To assess the role of hippocampal NMDA receptors in spatial memory, Bannerman *et al.* tested mice lacking NR1 selectively in the hippocampal CA1 and dentate gyrus. The mice had memory impairments in the radial maze task but performed similar to controls in the spatial reference memory water maze task. However, further investigation using the water maze revealed that, although spatial memory regarding the platform location and decoy marker was intact, the mice were unable to use this knowledge to make the correct choice. This suggests that NMDA receptors on hippocampal principal cells are not necessary for spatial memory per se but are required for spatial discrimination.

ORIGINAL RESEARCH PAPER Bannerman, D. M. *et al.* Dissecting spatial knowledge from spatial choice by hippocampal NMDA receptor deletion. *Nature Neurosci.* 15 Jul 2012 (doi:10.1038/nn.3166)