

IN BRIEF

NEURODEGENERATIVE DISEASE**Amyloid- β protein oligomerization and the importance of tetramers and dodecamers in the aetiology of Alzheimer's disease**Bernstein, S. L. *et al. Nature Chem.* **1**, 326–331 (2009)

There has been increasing focus on the contribution of small oligomers of amyloid β (A β) in the pathology of Alzheimer's disease. The authors used ion mobility mass spectroscopy to analyse the aggregates formed by A β 40 and A β 42. Only the A β 42 solution contained hexamers and dodecamers. Further analysis showed that the structure of the tetrameric form of the protein determines whether higher-order aggregates form and suggested that the formation of dodecamers by A β 42 underlies its toxicity.

FEEDING BEHAVIOUR**Loss of GABAergic signaling by AgRP neurons to the parabrachial nucleus leads to starvation**Wu, Q. *et al. Cell* **137**, 1225–1234 (2009)

Ablation of agouti-related peptide (AgRP)-expressing neurons in the arcuate nucleus of the hypothalamus causes starvation, but how these neurons regulate feeding is unknown. Here, the authors showed that anorexia caused by AgRP neuron ablation can be suppressed by administering a GABA_A (γ -aminobutyric acid type A) receptor agonist into the parabrachial nucleus (PBN), a target of AgRP neurons. Conversely, delivering a GABA_A receptor antagonist into the PBN or blocking GABA synthesis in AgRP neurons caused anorexia. This suggests that AgRP neurons regulate feeding by inhibiting PBN neurons.

LEARNING AND MEMORY**The formation of recent and remote memory is associated with time-dependent formation of dendritic spines in the hippocampus and anterior cingulate cortex**Restivo, L. *et al. J. Neurosci.* **29**, 8206–8214 (2009)

It is thought that recent and remote memories are stored in the hippocampus and the neocortex, respectively. Mice that had been shocked in a cage and re-exposed 24 h later exhibited increased spine density in the hippocampal CA1; however, when mice were re-exposed after 36 h there was increased spine density in the anterior cingulate cortex. This indicates a shift in structural synaptic changes from the hippocampus to the cortex as recent memories become remote.

COGNITIVE NEUROSCIENCE**Recruitment of an area involved in eye movements during mental arithmetic**Knop, A. *et al. Science* **324**, 1583–1585 (2009)

Behavioural studies suggest that numbers are represented on a 'mental number line', with small numbers on the left and large numbers on the right; moreover, numerical and spatial representations overlap in the parietal cortex. Here, functional MRI data revealed that performing additions and subtractions induces activation patterns in the posterior parietal cortex that are similar to those induced by eye movements to the right and left, respectively. These data support the idea that mental calculation involves a 'spatial shift' along the mental number line.