

IN BRIEF

NEURODEGENERATIVE DISEASE**Probing prions**

It has been hypothesized that the spread of misfolded proteins underlies patterns of neurodegeneration. Using a highly sensitive detection method, Alibhai *et al.* observed widespread early distribution of prion protein 'seeds' in a mouse model of prion disease but no correlation between the regions affected and subsequent patterns of neurodegeneration. Transcriptional analysis indicated distinct microglial responses to disease in brain regions that undergo neurodegeneration versus those that do not, suggesting that the host response to misfolded protein seeds determines subsequent pathology.

ORIGINAL ARTICLE Alibhai, J. *et al.* Distribution of misfolded prion protein seeding activity alone does not predict regions of neurodegeneration. *PLoS Biol.* **14**, e1002579 (2016)

METABOLISM**A rapid satiety circuit**

Current models of hypothalamic function cannot account for the rapid induction of satiety: activation of arcuate nucleus pro-opiomelanocortin (POMC)-expressing neurons (ARC^{POMC} neurons) only reduces hunger after several hours. The authors showed that manipulation of a population of glutamatergic ARC neurons rapidly alters feeding in mice through a projection to the paraventricular hypothalamus, where their inputs converge with those of ARC^{POMC} neurons and agouti-related protein-expressing ARC neurons to mediate their effects.

ORIGINAL ARTICLE Fenselau, H. *et al.* A rapidly acting glutamatergic ARC→PVH satiety circuit postsynaptically regulated by α -MSH. *Nat. Neurosci.* <http://dx.doi.org/10.1038/nn.4442> (2016)

SYNAPTIC TRANSMISSION**Separating transmission modes**

The extent to which spontaneous and evoked neurotransmission are spatially segregated within a synapse is unclear. Using a fluorescent calcium indicator to visualize activity in individual synapses, the authors found that most synapses in dissociated hippocampal cultures exhibit both spontaneous and evoked neurotransmission; however, unique populations of postsynaptic NMDA receptors are activated by each mode of transmission.

ORIGINAL ARTICLE Reese, A. L. & Kavalali, E. T. Single synapse evaluation of the postsynaptic NMDA receptors targeted by evoked and spontaneous neurotransmission. *eLife* <http://dx.doi.org/10.7554/eLife.21170> (2016)

PERCEPTION**Coding for choice**

The mechanisms by which sensory representations are transformed to enable perception and decision making are unknown. Rossi-Pool *et al.* recorded from neurons in the cortex of monkeys performing a task that required them to decide whether pairs of vibrotactile stimulus patterns were the same or different. Neurons in somatosensory cortex were shown to code the temporal patterns presented but not to reflect the decisions made, whereas dorsal premotor cortex neurons coded the stimulus within abstract categories in a manner that predicted choice.

ORIGINAL ARTICLE Rossi-Pool, R. *et al.* Emergence of an abstract categorical code enabling the discrimination of temporally structured tactile stimuli. *Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1618196113> (2016)