

## IN BRIEF

**▶ CHEMOSENSATION**

Structural requirements for the activation of vomeronasal sensory neurons by MHC peptides

Leinders-Zufall, T. *et al. Nature Neurosci.* **12**, 1551–1558 (2009)

Major histocompatibility complex (MHC) molecules present peptides that can be detected by vomerosensory neurons (VSNs) in the mammalian nose, but it was not understood how particular VSNs recognize specific peptides. The authors showed that VSNs expressing *V2r1b*, a member of the pheromone 2 receptor (*V2R*) gene family, could detect different MHC peptide ligands with high specificity and sensitivity, even recognizing peptides that differ by one amino acid residue. Knockout studies showed that *V2r1b* is required for VSN activation by MHC peptide ligands. This paper indicates that *V2r1b* gene products function as chemosensory receptors.

**▶ GAP JUNCTIONS**

Dopamine-stimulated dephosphorylation of connexin 36 mediates All amacrine cell uncoupling

Kothmann, W. W. *et al. J. Neurosci.* **29**, 14903–14911 (2009)

Connexin 36 (Cx36)-containing gap junctions couple retinal amacrine All cells, but the mechanisms that regulate the strength of these electrical synapses are unknown. The authors showed that gap junction uncoupling is associated with Cx36 dephosphorylation mediated by activation of the dopamine 1 receptor–protein kinase A–protein phosphatase 2b signalling pathway. Cx36 gap junctions in a single cell had varying dephosphorylation states, suggesting that they are individually regulated; this might permit precise control of neuronal coupling.

**▶ FEAR**

The amygdala is a chemosensor that detects carbon dioxide and acidosis to elicit fear behavior

Ziemann, A. E. *et al. Cell* **139**, 1012–1021 (2009)

The amygdala is important for the regulation of fear responses. Amygdala neurons express acid-sensing ion channel 1a (ASIC1a), which *in vitro* is activated by falling pH and is required for fear responses. The authors showed that, in mice, CO<sub>2</sub> inhalation reduced the brain pH, which was detected by amygdala ASIC1a channels and evoked a fear response. This shows that the amygdala can directly detect fear-inducing stimuli and explains how CO<sub>2</sub> inhalation can trigger panic attacks in humans.

**▶ VISUAL SYSTEM**

Neural “ignition”: enhanced activation linked to perceptual awareness in human ventral stream visual cortex

Fisch, L. *et al. Neuron* **64**, 562–574 (2009)

When do we become aware of what we see? Here, the authors used electrocorticography to measure neural activity in a picture categorization task. They used a backward masking paradigm so that pictures were recognized (and thus entered the subject’s awareness) in only around half of the trials. Gamma power and evoked potential activations over higher-level visual areas increased in ‘recognition’ trials. This increase outlasted stimulus presentation, which might point to reverberatory network activity. The authors suggest that the increased neural activity has a crucial role in the emergence of a conscious percept.