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IN BRIEF

ION CHANNELS

A warm response

How warmth is detected is not fully understood at the molecular level. Here, the authors identified neuronal subpopulations in dorsal root ganglion (DRG) and sympathetic neuron cultures that responded to non-painful heat but not to agonists of transient receptor potential (TRP) ion channels that are implicated in thermosensation. In cell lines that share properties with sympathetic neurons, they determined that TRPM2 could mediate such responses. Knocking out *Trpm2* in mice decreased the proportion of warmth-sensitive DRG neurons, and such mice had deficits in sensing warm temperatures, indicating that TRPM2 is needed for detecting non-painful heat.

ORIGINAL ARTICLE Tan, C.-H. & McNaughton, P. A. The TRPM2 ion channel is required for sensitivity to warmth. *Nature* **536**, 460–463 (2016)

NEUROPHYSIOLOGY

Inhibitory consumption

Orexin neurons have been suggested to stimulate eating; however, loss of these cells in mice leads to obesity. Here, the authors used fibre photometry to measure calcium signalling in orexin neurons in freely behaving fasted and fed mice and found that the activity of these cells decreased quickly after eating onset and remained low during the period of feeding. Moreover, conditional inactivation of orexin neurons in adult mice led to an overeating phenotype. Thus, these data suggest an inhibitory relationship between these neurons and eating.

ORIGINAL ARTICLE González, J. A. *et al.* Inhibitory interplay between orexin neurons and eating. *Curr. Biol.* http://dx.doi.org/10.1016/j.cub.2016.07.013 (2016)

CEREBRAL CORTEX

Cortical connections

Dum *et al.* explored which cortical areas may be involved in cognitive control of the stress response by injecting rabies virus into the adrenal medulla — which secretes hormones as part of this response — of non-human primates and assessing its retrograde transport. Two main cortical networks were linked via multisynaptic connections to the adrenal medulla: one comprised cortical motor areas in the frontal lobe and some somatosensory cortical areas, and the other comprised medial prefrontal cortex areas, including some involved in higher cognition and affect. Thus, various cortical regions may influence adrenal medulla function.

ORIGINAL ARTICLE Dum, R. P., Levinthal, D. J. & Strick, P. L. Motor, cognitive, and affective areas of the cerebral cortex influence the adrenal medulla. *Proc. Natl Acad. Sci. USA* **113**, 9922–9927 (2016)

TECHNIQUES

Neuronal barcoding

Mapping long-range neuronal projections with high resolution and high throughput has proved difficult. In an attempt to achieve this goal, Kebschull *et al.* developed a method termed multiplex analysis of projections by sequencing (MAP-seq). In mice, they injected the locus coeruleus (LC) with a viral library encoding a large pool of diverse mRNA 'barcodes', so that most infected neurons expressed only one such barcode. As the virus expressed a protein that promoted barcode transport to axon terminals, the authors could extract mRNA from the LC and distal sites and, through barcode sequencing, quickly determine the projection sites of many individual LC neurons.

ORIGINAL ARTICLE Kebschull, J. M. *et al.* High-throughput mapping of single-neuron projections by sequencing of barcoded RNA. *Neuron* http://dx.doi.org/10.1016/j.neuron.2016.07.036 (2016)