

RESEARCH HIGHLIGHTS

IN BRIEF

CIRCADIAN RHYTHM

Circadian rhythm generation and entrainment in astrocytes.

Prolo, E. D. *et al. J. Neurosci.* **25**, 404–408 (2005)

The suprachiasmatic nucleus of the hypothalamus — the master circadian pace maker in mammals — consists of a heterogeneous population of neurons and glia. Most studies have focused on the role of neurons in regulating circadian rhythm, and the importance of glia is not known. This study shows that astrocytes can also function as circadian oscillators and express rhythms that are regulated by physiologically relevant signals.

COGNITIVE NEUROSCIENCE

A representation of the hazard rate of elapsed time in macaque area LIP.

Janssen, P. & Shadlen, M. N. *Nature Neurosci.* 16 January 2005 (10.1038/nn1386)

A sense of elapsed time is important for humans and animals to plan actions, anticipate salient events and learn associations. To identify the brain regions that encode this information, Janssen and Shadlen trained monkey to anticipate the appearance of test targets after random periods of time. They found that the lateral intraparietal area contains circuitry that represents the time structure of environmental cues over a range of seconds.

BRAIN IMAGING

Functional imaging with cellular resolution reveals precise micro-architecture in visual cortex.

Ohki, K. *et al. Nature*, 19 January 2005 (10.1038/nature03274)

In the cortex, neurons with similar functional properties are organized into anatomical columns. So far it has not been possible to study the fine-scale organization of the cortex over a large area, or to resolve the purity of functional domains and the precision of the borders between them. In this study, Ohki and colleagues labelled neurons in the visual cortex with a calcium-sensitive indicator and imaged neuronal activity at single-cell resolution with two-photon microscopy, thereby building up a fine map of the cortical micro-architecture.

OBESITY

The hypothalamic arcuate nucleus: a key site for mediating leptin's effects on glucose homeostasis and locomotor activity.

Coppari, R. *et al. Cell Metab.* **1**, 63–72 (2005)

Leptin is secreted by adipocytes and signals the status of the body's energy content to the brain. Although it is thought that the arcuate nucleus (ARH) in the hypothalamus might be an important site for leptin action, direct evidence has been lacking. In this study, Coppari and colleagues show that restoring the expression of leptin in the ARH in leptin-deficient mice leads to a decrease in body weight and normalizes the level of blood glucose and locomotor activity.