IN BRIEF

AGING

Gene expression changes in the course of normal brain aging are sexually dimorphic

Berchtold, N. C. *et al. Proc. Natl Acad. Sci. USA* **105**, 15605–15610 (2008)

The processes that underlie the cognitive decline that occurs during normal aging are unclear. This study shows that aging is associated with region- and sex-specific changes in gene expression. Male brains showed prominent downregulation of genes related to energy production and protein synthesis, whereas in female brains genes involved in neuronal morphogenesis and signal transduction were the most affected. Genes related to inflammation and immune function were upregulated in both sexes. These findings could inform us about the processes that regulate neurodegeneration and compensatory mechanisms during aging.

CIRCADIAN RHYTHMS

Hippocampal-dependent learning requires a functional circadian system

Ruby, N. F. *et al. Proc. Natl Acad. Sci. USA* **105**, 15593–15598 (2008)

The functional significance of circadian rhythmicity has not been firmly established. Here, the authors investigated its role in hippocampal function. They used light treatment to induce arrhythmicity in Siberian hamsters without destroying the suprachiasmatic nucleus (SCN). Arrhythmic animals did not show the normal circadian variations in memory performance, and this was independent of their altered sleep pattern. Daily injections of a GABA (γ-aminobutyric acid) antagonist for 10 days restored performance but not circadian rhythmicity, suggesting that cyclic GABA output from the SCN might influence cognitive function.

BEHAVIOUR

Social experience modifies pheromone expression and mating behavior in male *Drosophila melanogaster*

Krupp, J. J. *et al. Curr. Biol.* **18**, 1373–1383 (2008)

Social context influences chemical communication in *D. melanogaster* males

Kent, C. *et al. Curr. Biol.* **18**, 1384–1389 (2008)

Drosophila melanogaster is often used to investigate the genetics of mating behaviour. Two new studies by Joel Levine's group show that mating behaviour is also influenced by the flies' social environment — here consisting of either a homogeneous group of wild-type flies or a mixed group of wild-type and heterogeneous flies. The first study showed that cells producing pheromones express clock genes that regulate the transcription of *desaturase-1* (which encodes an enzyme involved in male pheromone production). The social environment influenced clock-gene transcription in male flies, affecting pheromone production and mating frequency. The second study showed that group composition, the light–dark cycle and interactions between the two also influence the composition of a male fly's pheromone blend. Moreover, the behavioural response of a male fly to another male was shown to be influenced by the genotype of the first male's previous social contacts. These studies show that, in *D. melanogaster*, chemical communication not only mediates social behaviour but also is influenced by it.