Drosophila have periods of rest that are remarkably similar to mammalian sleep—including increased arousal thresholds and increased rest after prolonged waking. Using genetic tools in Drosophila, Hendricks and colleagues report that manipulating CREB levels changed the duration of rest and rest rebound in predictable ways without affecting the circadian clock. The results help to sort out the molecular relationship between homeostatic mechanisms, which track sleep debt and determine the probability of falling asleep, from circadian mechanisms, which help to organize sleep into characteristic bouts (usually night versus day). See page 1108.

AMPA receptor function at single dendritic spines. Pages 1051 and 1086.
brief communications

A candidate gene for human neurodegenerative disorders: a rat PKCγ mutation causes a Parkinsonian syndrome ..............................................................1061
N J Craig, M B D Alonso, K L Hawker, P Shiels, T A Glencorse, J M Campbell,
N K Bennett, M Canham, D Donald, M Gardiner, D P Gilmore, R J Macdonald,
K M alland, A S M Caliion, D Russell, A P Payne, R G Sutcliffe and R W Davies

Adaptation to three-dimensional distortions in human vision. .........................1063
W J Adams, M S Banks and R van Els

articles

Interactions with identified muscle cells break motoneuron equivalence in embryonic zebrafish ..........................................................1065
J S Eisen and E Melançon

GDNF acutely modulates excitability and A-type K⁺ channels in midbrain dopaminergic neurons .................................................................1071
F Yang, L Feng, F Zheng, S W Johnson, J Du, L Shen, C Wu and B Lu

Internalization of ionotropic glutamate receptors in response to mGluR activation .................................................................1079
E M Snyder, B D Philpot, K M Huber, X Dong, J R Fallon and M F Bear

Dendritic spine geometry is critical for AMPA receptor expression in hippocampal CA1 pyramidal neurons ..............................................1086
M Matsuoka, G C R Ellis-Davies, T Nemoto, Y Miyashita, M Iino and H Kasai

Visualizing synapse formation in arborizing optic axons in vivo: dynamics and modulation by BDNF ......................................................1093
B Alsina, T Vu and S Cohen-Cory

NMDA receptor activation limits the number of synaptic connections during hippocampal development ......................................................1102
A Lüthi, L Schwyzer, J M Mateos, B H Gähwiler and R A McKinney

A non-circadian role for cAMP signaling and CREB activity in Drosophila rest homeostasis .............................................................1108
J C Hendricks, J A Williams, K Pandkeri, D Kirk, M Tello, J C P Yin and A Sehgal

TNFα promotes proliferation of oligodendrocyte progenitors and remyelination .................................................................1116
H A Arnett, J Mason, M M arino, K Suzuki, G K Matsuoka and J P Y Ting

Persistent and specific influences of early acoustic environments on primary auditory cortex .................................................1123
L I Zhang, S Bao and M M erzenich

Temporal and rate representations of time-varying signals in the auditory cortex of awake primates ......................................................1131
T Lu, L Liang and X Wang

Consolidation of human memory over decades revealed by functional magnetic resonance imaging ................................................1139
F Haist, J B Gare and H Mao

Disentangling signal from noise in visual contrast discrimination ....................1146
A Gorea and D Sagi

classifieds

see back pages