

CANCER

Metabolic link to breast cancer

A protein that senses a cell's metabolic state may serve as a 'switch' to allow breast cancer to develop. This could be a molecular reason for why a high intake of calories and weight gain are strong risk factors for breast cancer.

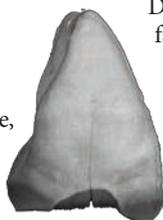
Kevin Gardner of the National Cancer Institute in Bethesda, Maryland, and his colleagues looked at the protein CtBP, which acts as a metabolic sensor. The protein is activated when it binds to NADH, an important indicator of a cell's metabolic activity. The researchers found that silencing CtBP expression increased expression of *BRCA1*, a tumour-suppressor gene associated with breast cancer. This suggests that greater activation of CtBP lowers the protective effects of *BRCA1*. *Nature Struct. Mol. Biol.* doi:10.1038/nsmb.1941 (2010)

EVOLUTION

Neanderthals matured fast

Analysis of fossil teeth from ancient humans and Neanderthals suggests that Neanderthals grew and matured more rapidly than *Homo sapiens*. This finding helps to pin down an evolutionary origin for humans' prolonged childhood and adolescence, which may have provided an evolutionary advantage.

Tanya Smith at Harvard University in Cambridge, Massachusetts, with Paul Tafforeau at the European Synchrotron Radiation Facility in Grenoble, France, and their colleagues used X-ray imaging to reveal microscopic growth



tracks inside fossil teeth from juvenile *H. sapiens* and Neanderthals (pictured). The tracks indicate developmental features such as daily growth rate.

Dental maturation was faster in the Neanderthals than in both ancient and modern-day humans. *Proc. Natl Acad. Sci. USA* doi:10.1073/pnas.1010906107 (2010)



GENOMICS

Similar bodies, different genomes

A species of marine zooplankton looks like some of its relatives but has a drastically different genomic structure. This suggests, contrary to conventional thinking, that conserved genomic architecture is not needed to maintain morphological features between species.

Daniel Chourrout at the University of Bergen in Norway and Patrick Wincker at Genoscope in Evry, France, and their co-workers analysed the genome of the tunicate *Oikopleura dioica*

(pictured), a rapidly evolving organism that is one of the closest relatives to the vertebrates. They found several unusual features, including an order of genes on the chromosomes that was very different from that of related species.

The authors conclude that some genome features are not necessarily adaptive even if they are shared by many animals, and such features can disappear when evolution accelerates. *Science* doi:10.1126/science.1194167 (2010)

STRUCTURAL BIOLOGY

Dopamine receptor revealed

The neurotransmitter dopamine, which is involved in drug addiction and certain psychiatric disorders, binds to five subtypes of receptor in the brain. Some psychiatric drugs block two of these receptors, the similar D2R and D3R, but often have side

effects. Researchers have now elucidated the crystal structure of D3R, which is a potential target for new drugs to treat substance abuse. The structure may help drug developers to tailor their compounds to this and related receptors.

Raymond Stevens at the Scripps Research Institute in La Jolla, California, and his colleagues crystallized D3R in complex with a drug, eticlopride, that binds both