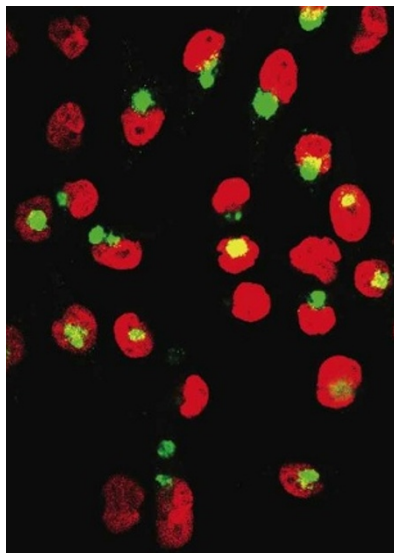


## RESEARCH HIGHLIGHTS



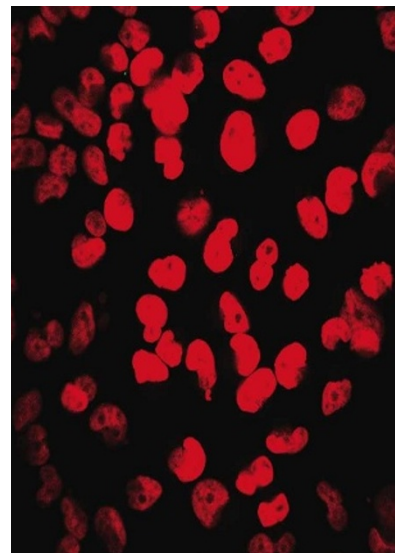
### Casting anchor

*Science* **320**, 520–523 (2008)

A potential drug target for Alzheimer's disease may be more tractable now that scientists in Germany have discovered how to tether compounds that block a crucial enzyme to the cellular compartment in which the enzyme does its deadly work.

This enzyme,  $\beta$ -secretase, cleaves the protein APP (labelled green, left) to make amyloid- $\beta$  peptide, which causes the plaques that contribute to neurodegeneration, in a compartment called the endosome. But soluble inhibitors do not reach this area when tested in cell cultures.

Kai Simons from the Max Planck Institute of Molecular Cell Biology and Genetics in Dresden and his colleagues chemically modified one inhibitor by linking it to a fat-soluble sterol group. The resulting compound could anchor itself inside an endosome and efficiently block amyloid- $\beta$  generation there (pictured right). It also stopped the development of plaques when injected into a mouse model of Alzheimer's disease.



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### NEUROBIOLOGY

#### Pecking order

*Neuron* **58**, 273–283 (2008)

Social hierarchy is a major determinant of health and mortality, yet how the brain processes group position has been shrouded in mystery. By monitoring blood flow in gamers' brains, Caroline Zink, Andreas Meyer-Lindenberg and their colleagues at the US National Institute of Mental Health in Bethesda, Maryland, have revealed distinct brain activity patterns that form in response to status cues.

The researchers set artificial hierarchies by assigning 72 volunteers a skill rank in a computer game that flagged onscreen opponents as superior or inferior players. But the opponents were really computers, and the games and ranks were rigged so that status was only perceived. One of the authors' discoveries is that brain regions associated with emotion or pain become busier when gamers are losing to inferior opponents.

### HUMAN BIOLOGY

#### Boy appétit

*Proc. R. Soc. B.* doi:10.1098/rspb.2008.0105 (2008)

Pregnant women who munch through a lot of calories around the time they conceive may be more likely to bear boys than girls.

Fiona Mathews of the University of Exeter, UK, and her colleagues divided 740 British women into three groups according to what they remembered eating in early pregnancy and around the time they conceived. Only 45% of those in the group with the lowest energy intake carried boys, compared with 56% of women in the highest-calorie group.

These data support the Trivers–Willard hypothesis, say the authors, which predicts that females in good condition will have more male offspring.

### CHEMICAL BIOLOGY

#### Dope hope

*Nature Chem. Biol.* doi:10.1038/nchembio.86 (2008)

Marijuana calms people down and relieves pain, but also has the negative effect of promoting memory loss. By blocking the breakdown of two naturally occurring compounds that bind to the same brain receptor as cannabis, scientists in California have found a way to boost the positive effects associated with cannabis use.

THC, the marijuana plant's psychoactive component, binds to a receptor called CB<sub>1</sub>, as do the brain's own cannabinoids 2-AG and

anandamide. John Casida of the University of California, Berkeley, and his colleagues used organophosphorus nerve agents to inhibit the enzymes that catalyse the destruction of these two compounds. Adding one particular nerve agent caused a more than tenfold increase in the levels of these chemicals in the brain. The finding could help pharmacologists design new drugs that relieve pain.

### ASTRONOMY

#### Galactic beginnings

*Astronom. J.* **135**, 1968–1981 (2008)

It is the ultimate chicken and egg problem: Which came first, galaxies' stars or the black holes at their centres? David Alexander from Durham University, UK, and his collaborators are putting their money on the stars.

The group surveyed six young galaxies more than 10 billion light years away and found that their black holes were between sixty million and one hundred million times more massive than our Sun.

That may be huge, but given the number of stars in each galaxy and current models of how galaxies grow, the findings suggest that these black holes appeared after the stars started multiplying. The stars probably helped the black holes grow by feeding them gases leftover from the stars' own birth.

### ANIMAL BEHAVIOUR

#### A reassuring tune

*Curr. Biol.* **18**, 576–579 (2008)

Zoologists have debated whether birds that look out for predators while the rest of their flock feeds are behaving selfishly or cooperatively. But few have asked why these



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