RESEARCH HIGHLIGHTS

Selections from the scientific literature

CANCER

Liver cancer lifeline found

A survey of liver tumours has highlighted a gene that many such tumours depend on for survival.

Scott Lowe and Scott Powers at Cold Spring Harbor Laboratory in New York and their colleagues searched the genomes of 89 liver tumours and 12 liver-cancer cell lines. They identified 124 genes that were sometimes expressed in excess; overexpression of 18 of these caused liver cells transplanted into mice to become cancerous.

In particular, cells overexpressing the gene *FGF19* became dependent on this expression. An antibody that blocks the FGF19 protein inhibited the growth of these cells, suggesting that patients in whom this gene is overexpressed could benefit from therapies that block the protein.

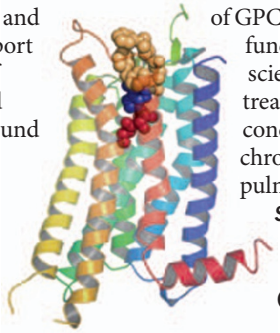
Cancer Cell **doi:10.1016/j.ccr.2011.01.040 (2011)**

CELL BIOLOGY

Plot twist for proteins

Cells interpret external chemical signals through membrane-spanning receptors that bind the chemicals and change shape to alter the cells' activities. Raymond Stevens at the Scripps Research Institute in La Jolla, California, and his colleagues now report the structure of one of the G-protein coupled receptors (GPCRs) bound to an activating drug.

The authors used X-ray crystallography to reveal the shape of the A_{2A} adenosine GPCR (**pictured**) bound to an agonist called UK-432097. This is the first time an agonist has been shown to bind to and stabilize the receptor without the aid of a G protein.



F. DEFLORIAN, NATL INST. HEALTH

Better understanding of GPCR structure and function could help scientists to develop treatments for conditions such as chronic obstructive pulmonary disease.

Science **doi: 10.1126/science.1202793 (2011)**

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ECOLOGY

Better fragmented than lost

Separating the effects of habitat loss and habitat fragmentation is difficult. To solve this problem, Mary Bonin and her colleagues at James Cook University in Townsville, Australia, arranged a series of experimental reefs off Papua New Guinea.

Few damselfish survived on reefs of *Acropora subglabra* (**pictured**) from which 75% of coral had been removed, whereas those on reefs that had been broken up but maintained in area actually did better than those on untouched control reefs. Species richness and abundance were also higher on fragmented reefs than on those that had lost habitat. Although the positive effect of fragmentation declined over a 16-week period, the impact of habitat loss worsened in this time, suggesting that reported declines in fish populations after habitat disruption are down to the latter and not the former.

Ecology **doi:10.1890/10-0627.1 (2011)**

PHYSICS

An 'electric' force for neutral atoms

Neutral atoms can be made to behave like charged particles by 'synthetic' electric and magnetic fields. These are created through the production of a synthetic gauge field in a state of matter known as a Bose–Einstein condensate (BEC), in which the atoms are all identical and behave collectively as if they were one 'superatom'.

Ian Spielman and his team at the National Institute of Standards and Technology in Gaithersburg, Maryland, have previously generated synthetic magnetic fields by spatial alteration of a time-independent electromagnetic vector potential — an entity that can be used to specify both the electric and the magnetic fields. Now they show that a synthetic electric field can be generated in a rubidium BEC in a parallel manner — by changing a spatially uniform vector potential over time.

The neutral atoms in the condensate were accelerated