

RESEARCH HIGHLIGHTS

Selections from the scientific literature

CANCER

Predictor pairs images and genes

Automated image processing can be integrated with molecular profiling to provide a fuller portrait of cancer.

Pathologists routinely use visual examinations of cell types in tumour biopsies to direct patient care. However, it is hard to integrate these visual analyses with data from gene-expression studies.

Florian Markowitz and Yinyin Yuan at the University of Cambridge, UK, and their team came up with software that can analyse images of stained tissue sections to determine the identity and arrangement of cells in tumours. For some cell types, certain spatial patterns were associated with longer patient survival. However, an algorithm that combined image-based and gene-expression data predicted survival more accurately than algorithms that used either type of information alone.

Sci. Transl. Med. 4, 157ra143 (2012)

MICROBIOLOGY

Bacteria beaten by bacteria

Infections caused by a strain of *Clostridium difficile* responsible for recent epidemics might be treatable using a mix of gut bacteria.

A team led by Trevor Lawley of the Wellcome Trust Sanger Institute near Cambridge, UK, infected mice with the *C. difficile* strain and then treated them with an antibiotic commonly used in humans. Instead of killing the pathogen, the antibiotic displaced other gut bacteria and permitted a persistent *C. difficile* infection. Treating the infected mice with faeces from healthy

animals restored their intestinal flora and resolved their infections. A mixture of six different bacterial species isolated from the faeces had the same effect, promising a treatment more palatable to patients than faecal transplantation.

PLoS Path. 8, e1002995 (2012)

CLIMATE-CHANGE ECOLOGY

Plankton diversity loss looms

They are responsible for about half of all photosynthesis on Earth — and plankton could be drastically affected by climate change.

Mridul Thomas and his team

at Michigan State University in East Lansing considered 194 phytoplankton strains. Using the existing literature, the authors estimated the maximum growth rate, optimum temperature for growth and the temperature range over which growth can occur, for each of the strains. Many strains seem to be tightly adapted to the average temperature at their location. Tropical strains, in particular, tend to have optimal growth temperatures at or just below the mean temperature in their environment. The authors' models indicate that an average temperature rise of just 2°C in the tropics by 2100 could reduce the diversity of

phytoplankton in the region by a third — unless, that is, the plankton can evolve greater heat tolerance.

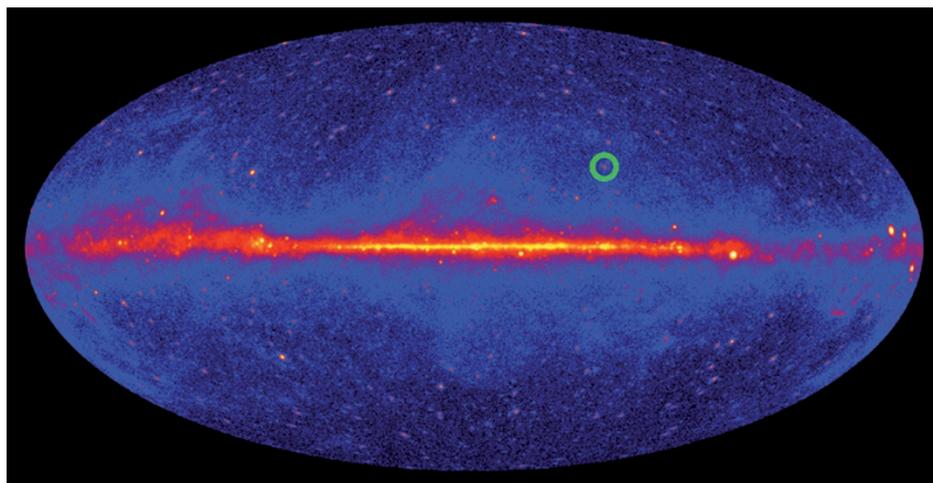
Science <http://dx.doi.org/10.1126/science.1224836> (2012)

BIOSENSORS

Naked-eye ELISA developed

Researchers have developed a sensitive bioassay that can be read with the naked eye.

The assay is based on a laboratory technique known as an ELISA (enzyme-linked immunosorbent assay), in which an enzyme generates a coloured compound whenever



ASTRONOMY

Picking out a predatory pulsar

Researchers have used raw computing power to hunt down a 'black widow' pulsar that is evaporating its companion star.

Pulsars are stellar remnants that emit lighthouse-like beams of radiation. They often emit gamma rays, but can usually be spotted only if they also emit easier-to-detect radio waves. However, Holger Pletsch of the Max Planck Institute for Gravitational Physics in Hannover, Germany, and his colleagues found

the current pulsar (pictured; circled) through a blind search of data from the Fermi Gamma-ray Space Telescope.

Using computers to analyse huge swathes of raw data, the team picked out the pulsar, which takes 93 minutes to orbit its companion star. This orbital period is the shortest of any binary pulsar of this type yet found.

Science <http://dx.doi.org/10.1126/science.1229054> (2012)