

RESEARCH HIGHLIGHTS

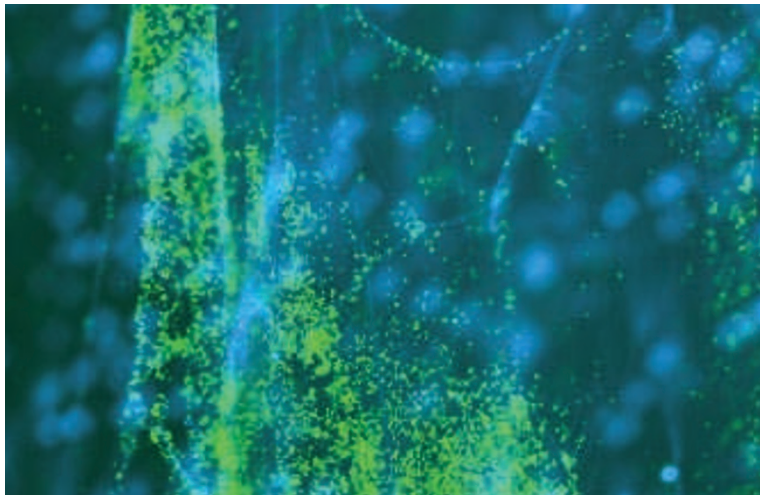
VASCULAR BIOLOGY

Clot catcher

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.1005743107 (2010)
Nets of DNA fibres and antimicrobial proteins in blood vessels ensnare and kill microbes during infection, and may also provide a scaffold for blood clots.

The immune system relies on these meshes, known as neutrophil extracellular traps, to fight infection. Denisa Wagner of the Immune Disease Institute in Boston, Massachusetts, and her colleagues found that the nets (pictured in blue) also catch platelets — cell fragments that aid in blood clotting (green).

The nets bound additional proteins known to stabilize clots, and DNA markers of the nets were found in the blood and clots of baboons with deep-vein thrombosis — a condition in which blood clots form in deep-seated veins. This finding could explain the link that has been made in humans between this condition and infection.



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ASTRONOMY

Dance of two planets

Science doi:10.1126/science.1195778 (2010)
Two planets roughly the size of Saturn have been discovered orbiting a star similar to the Sun 650 parsecs away. As they zip around their parent star in 19.2 and 38.9 days, respectively, the duo tug on each other gravitationally. As a result, the first planet is speeding up by 4 minutes per orbit, whereas the second is slowing by 39 minutes per orbit.

Using the Kepler satellite, Matthew Holman of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and his colleagues spotted telltale dips in the intensity of the host star's light, revealing each planet as it passed in front of the star. The team says that in the long term, the number of orbits for the pair will average out so that one planet circles almost exactly twice as often as the other.

CANCER BIOLOGY

Targeting skin tumours

N. Engl. J. Med. 363, 809–819 (2010)
A small clinical trial has shown promising results for a targeted therapy against one of the most aggressive and intractable forms of cancer: metastatic melanoma.

The drug, named PLX4032, inhibits a mutated form of a protein called B-RAF. Mutated B-RAF is found in up to 60% of all melanomas and drives cell proliferation.

Keith Flaherty of Massachusetts General Hospital in Boston and his colleagues tested the drug in 16 patients with a particular B-RAF

mutation and found that tumours shrank by at least 30% in 11 of the patients. In a follow-up study of 32 participants, tumours shrank in 24 and disappeared entirely in 2 patients. During the trial, five patients who did not have the mutation did not respond to the drug.

ANIMAL BEHAVIOUR

Lobster shock

J. Neurosci. 30, 11028–11031 (2010)
The sea slug *Aplysia californica* (pictured) has for years been the subject of learning studies, which have shown that the creature retracts its head, gills and tail defensively much more quickly in response to innocuous stimuli after receiving a strong electric shock. But there are no electric shocks in the lives of wild sea slugs, so why do they learn better when zapped with electricity?

William Wright and his colleagues at Chapman University in Orange, California, found that after an attack by a natural predator, the California spiny lobster (*Panulirus interruptus*), sea slugs showed a heightened

withdrawal reflex much like that of shocked slugs. So scientists have unwittingly been playing the part of the lobster all along.

TISSUE ENGINEERING

Vision restored

Sci. Transl. Med. 2, 46ra61 (2010)
Artificial corneal transplants improved the sight of more than 50% of patients with vision loss in a small two-year clinical trial.

The cornea is the eye's outermost lens, vital for controlling and focusing light into the eye. Corneal disease and damage are two of the main causes of vision loss and blindness, and affect millions worldwide. With a huge shortage of human donor corneas, May Griffith at Linköping University in Sweden and her colleagues created biosynthetic corneas from human collagen. Unlike plastic corneas, the biosynthetic ones mimic the cornea's protein scaffolding, triggering regeneration of the patient's own corneal cells and nerve growth in the eye.

In the study of ten patients who received the implant, visual acuity improved in six, remained the same in two and decreased in two. All ten could further correct their vision with contact lenses.

ECOLOGY

Tree death count

Geophys. Res. Lett.
doi:10.1029/2010GLO43733 (2010)
Severe storms that swept across Amazonia in January 2005 destroyed around half a billion trees, a loss estimated to equal 23% of the mean annual carbon



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