RESEARCH HIGHLIGHTS

Selections from the scientific literature

CANCER

Immune-cell block halts brain tumour

A drug that targets the white blood cells fostering brain tumours — rather than the cancer cells themselves — shrinks tumours in mice.

The aggressive brain cancer known as glioblastoma is notoriously difficult to treat. Johanna Joyce at the Memorial Sloan-Kettering Cancer Center in New York and her colleagues gave mice with glioblastomas a drug that inhibits a cell-surface protein called colony-stimulating factor-1 receptor. This protein is expressed mainly on the white blood cells, or macrophages, that surround the tumour.

The 22 mice that did not receive the drug all died within 8 weeks. By contrast, 64% of the mice given the drug were still alive after 26 weeks. Surprisingly, the drug did not kill the macrophages but instead altered their gene expression, presumably turning off tumour-promoting functions.

Nature Med. 19, **1264–1272 (2013)**

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ENVIRONMENTAL SCIENCE

Why bee colonies collapse

Environmental stresses can cause bee colonies to fail — even if the stress levels are not high enough to kill individual insects.

Habitat decline, parasites and insecticides have all been blamed for bee colony collapses, but finding the individual causes of collapse has been problematic.

John Bryden of Royal Holloway University of London and his colleagues modelled stresses on bees and found that colonies began to decline when the number of functionally impaired bees reaches a critical threshold. The model accurately predicted the fate of 16 experimental colonies of bumblebees (*Bombus terrestris*), of which half were exposed to a neonicotinoid pesticide at levels that do not kill bees but do reduce their ability to learn and gather food.

Multiple stresses can put colonies on a knife edge between growth and failure, the authors say, which makes it hard to pin declines on one factor.

Ecol. Lett. **http://dx.doi.org/10.1111/ele.12188 (2013)**

ZOOLOGY

Shining light on cold turtles

Freshwater turtles can survive the winter at the bottom of frozen lakes despite a complete lack of oxygen. But they do not, as some have suggested, fall into a coma when hibernating, according to Jesper Madsen of Aarhus University in Denmark and his colleagues.

Madsen and his team submerged *Trachemys scripta* turtles (**pictured**) in cold, oxygen-depleted water to put them into false hibernation. The animals still responded to light and increased temperatures, but not to vibrations or increased oxygen levels. The results suggest that hibernating turtles are in a low-energy but vigilant state.

The brains of chemically anaesthetized turtles also responded to light, indicating that these animals have adapted to remain responsive to this stimulus even when other body systems are shut down.

Biol. Lett. 9, **20130602 (2013)**

DRUG MANUFACTURING

From synthesis to pill without pause

A factory that produces a continuous stream of drug tablets from the raw ingredients could save time and money over traditional stop–start methods, which spread manufacture over many locations. Bernhardt Trout and his colleagues at the Massachusetts Institute of Technology in Cambridge report the first example of such a plant, an 18-square-metre factory that produces the hypertension drug aliskiren (developed by Novartis, which funded the project).

Chemical building blocks flow in at one end, followed by a series of reactions and separations in which the drug is synthesized, crystallized, dried and coated to produce tablets at the other.

Angew. Chem. Int. Edn **http://dx.doi.org/10.1002/anie.201305429 (2013)**

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