# RESEARCH HIGHLIGHTS

*Selections from the scientific literature*

ORGANIC CHEMISTRY

## Alkanes to amines by bromine

Chemists have been seeking simple ways of inserting nitrogen or other elements into alkanes — simple hydrocarbons with just single bonds — to turn them into more useful molecules, such as drugs. Now Masahito Ochiai at the University of Tokushima in Japan and his colleagues show that a reactive bromine-based compound can be used for the addition of nitrogen without the traditional need for a metal catalyst or high temperature.

They used *N*-triflylimino-$\lambda^3$-bromane to insert nitrogen into a variety of alkanes at room temperature. Not only did this reaction achieve reasonable yields, in many cases it also selectively added nitrogen in just one of two possible positions.

***Science*** 332, **448–451 (2011)**

APPLIED PHYSICS

## Better X-ray vision

A new technique allows fainter features to be imaged by X-rays.

Conventional X-ray imaging relies on the absorption and scattering of X-ray photons by the object being imaged. But X-ray phase-contrast imaging instead detects changes in the photons' direction and velocity.

A. OLIVO *ET AL.*

Alessandro Olivo and his colleagues at University College London used a conventional X-ray source outfitted with grated masks — one in front of the object for imaging and one behind it. The masks were offset slightly from one another so that they filtered out some of the photons, reducing background noise. The detector measures by how much photons have deviated from their path, capturing different image data from conventional X-ray imaging and boosting the visibility of fine detail.

The team used its technique to image biological specimens such as a beetle (**pictured**), as well as samples of interest for medical imaging, materials science and security inspection.

***Appl. Optics*** 50, **1765–1769 (2011)**

C. A. SCHWEMM

ECOLOGY

## More rain, more virus

Precipitation levels and species biodiversity may affect humans' exposure to zoonotic diseases — those carried by other animals.

Hantavirus, which is carried by wild rodents, especially deer mice (*Peromyscus maniculatus*, **pictured**), causes severe lung disease in humans. The prevalence of the Sin Nombre variant of hantavirus, which is endemic in deer mice on California's Channel Islands, is affected by several ecological factors.

John Orrock at the University of Wisconsin, Madison, and his colleagues analysed data from the islands and found that increased viral prevalence was linked to greater precipitation and island area, and also to fewer predator species. Precipitation accounted for 79% of the variation in prevalence. Adding in island area upped this to 93%, and including predator richness took the total to 98%.

***Am. Nat.*** **doi:10.1086/659632 (2011)**

VIROLOGY

## The keys to hepatitis entry

The identification of two proteins that grant the hepatitis C virus (HCV) access to host cells may provide new targets for potential drugs. At present, treatments for the virus, which causes liver disease, are limited.

Thomas Baumert at the University of Strasbourg in France and his team screened human liver cells for proteins that regulate HCV entry. They focused on two cell-surface proteins, EGFR and EphA2, which are key players in a regulatory network linked to HCV entry and are abundant in liver cells. Blocking the two proteins with inhibitors reduced HCV infection of cells in culture. In mice with HCV and transplanted human liver cells, an EGFR inhibitor slowed the rate of infection.

***Nature Med.*** **doi:10.1038/nm.2341 (2011)**

PHARMACOLOGY

## Antibiotics aided by other drugs

Combining antibiotics with drugs that do not directly kill bacteria may be one option in fighting antibiotic resistance.

The antibiotic minocycline blocks bacterial protein synthesis, but resistance has emerged in several human pathogens. Eric Brown and Gerard Wright of McMaster