RESEARCH HIGHLIGHTS

Selections from the scientific literature

MICROBIOLOGY

Bacterial weapon: inflammation

Inflammation is normally bad news for pathogens, but one bacterium seems to have turned the process to its own advantage.

Alan Hauser and his team at Northwestern University in Chicago, Illinois, studied a particularly virulent strain of the pneumonia-causing *Pseudomonas aeruginosa* that had been isolated from a patient. The bacterium produces a protein known as RhsT, and the authors determined that *P. aeruginosa* injects this protein into host cells called phagocytes — white blood cells that normally engulf and destroy pathogens. Once inside them, RhsT activates an immune-signalling complex called the inflammasome, killing infected cells.

The authors found that the RhsT protein is linked to increased production of inflammatory proteins in cell culture and in the lungs of infected mice. The mice died within two days of infection. Conversely, mice infected with *P. aeruginosa* in which the *rhsT* gene had been deleted survived.

Many bacterial pathogens contain genes similar to *rhsT*, which may be important for infection.

Proc. Natl Acad. Sci. USA **http://dx.doi.org/10.1073/pnas.1109285109 (2012)**

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EVOLUTION

Social life shapes primate faces

Facial patterns such as skin and hair colour may have evolved to help primates recognize and communicate with others of their species.

Sharlene Santana and her colleagues at the University of California, Los Angeles, analysed skin and hair colour patterns in the faces of adult males of 129 species of primate from the Americas (a sampling pictured). The authors found that species living in smaller groups have more complex facial features. This suggests that these animals, which interact with each other less frequently than those living in larger groups, are more dependent on facial patterns to recognize members of their own species. Living near a greater number of related species also contributes to facial diversity, regardless of group size.

However, ecological factors also play a part — species range, for example, seems to drive the evolution of hair length and the pigmentation of certain facial features.

Proc. R. Soc. B **http://dx.doi.org/10.1098/rspb.2011.2326 (2012)**

PHYSICS

Not so ice-free materials

Surfaces engineered to repel water and ice can lose their ice resistance if environmental conditions shift.

'Superhydrophobic' surfaces may prevent ice build-up and have applications in aerospace and power transmission, among others. Dimos Poulikakos at the Swiss Federal Institute of Technology in Zurich and his colleagues ran water droplets down four different hydrophobic surfaces at –15 °C, in an experimental chamber in which humidity and nitrogen gas flow rate could be controlled. Although the droplets did not freeze at the water–surface boundary, at certain levels of humidity and gas flow they did freeze at the water–gas boundary. This occurred because of evaporation at this interface that further cooled the water, and resulted in much higher adhesion of ice to the surface under particular conditions.

Nature Commun. **http://dx.doi.org/10.1038/ncomms1630 (2012)**

BIOCHEMISTRY

Fungi munch on lead

Two species of fungus can transform metallic lead, a toxic pollutant, into a stable lead mineral called chloropyromorphite. The formation of this mineral has been proposed as a way to sequester lead contaminants in soil.

Geoffrey Gadd at the University of Dundee, UK, and his colleagues incubated small spheres of lead with either *Metarhizium anisopliae* or *Paecilomyces javanicus*, fungal species isolated from a former lead-mining area. They found mineral deposits on the surface of the spheres, and X-ray analysis of these