RESEARCH HIGHLIGHTS

Selections from the scientific literature

MICROBIOLOGY

Cigarette smoke boosts biofilms

Components of cigarette smoke can cause bacteria in the nose to increase their production of biofilms — sticky structures that help the microorganisms to establish an infection.

Cigarette smoke is known to impair the immune system and to irritate the lining of the lungs. Adam Ratner and his team at Columbia University, New York, exposed *Staphylococcus aureus* to cigarette smoke and found that some of the toxic molecules in smoke switched on biofilm-forming signalling pathways. The smoke also boosted bacterial adherence to cultures of the cells that line the lungs.

The findings offer another explanation for why smokers and those exposed to second-hand smoke are prone to respiratory infections.

Infect. Immun. **http://dx.doi.org/10.1128/IAI.00689-12 (2012)**

B. SCHEER/ZOO WUPPERTAL

ANIMAL HEALTH

The spread of herpes in zoos

The death in 2010 of Jerka, a polar bear at a zoo in Germany, has been blamed on a herpes virus that originated in zebras.

By sequencing and analysing viral genetic material from Jerka (pictured) and other polar bears, Alex Greenwood at the Leibniz Institute for Zoo and Wildlife Research in Berlin and his team identified the polar bear virus as being similar to the zebra EHV1 herpes strain. However, the virus that was found in the polar bears was a recombinant strain, which could explain how it was able to jump between species. Rodents moving freely between enclosures containing zebras and polar bears might have acted as vehicles for the recombinant viruses.

Because not all the infected polar bears showed symptoms, the team warns that disease outbreaks in zoos ought to be monitored more carefully to track pathogen spread and to prevent other animals from suffering Jerka's fate.

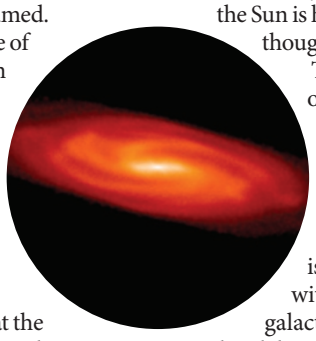
Curr. Biol. **http://dx.doi.org/10.1016/j.cub.2012.07.035 (2012)**

ASTRONOMY

Dark matter hugs the Sun

Dark matter constitutes roughly 85% of all matter in the Universe, and there may be more of it near the Sun than previously assumed.

The presence of dark matter can be inferred from its gravitational effect on the rotation of the Milky Way and other groups of stars. Silvia Garbari at the University of Zurich in Switzerland and her team have developed a dynamic model of the Milky Way (**pictured**) that focuses on the motion of about 2,000 stars local to the Sun. Their model suggests that the density of dark matter near the Sun is higher than had been thought.



A. HOBBS

This result is at odds with the prevailing view that a spherical halo of dark matter surrounds the Galaxy. The result is instead consistent with a less spherical galactic halo or with a local disc of dark matter.

Mon. Not. R. Astron. Soc. **http://dx.doi.org/10.1111/j.1365-2966.2012.21608.x (2012)**

REPRODUCTIVE BIOLOGY

Molecule blocks sperm production

A small molecule that reversibly lowered sperm count and rendered sperm immobile in male mice has potential as a male contraceptive.

Martin Matzuk at Baylor College of Medicine in Houston, Texas, James Bradner at the Dana-Farber Cancer Institute in Boston, Massachusetts, and their colleagues show that the molecule, JQ1, binds to a protein called BRDT. This protein is found only in the testes, where it is required for sperm generation. Male mice injected with JQ1 continued to mate normally with females, but they showed shrunken testes and decreased sperm count, and sired no offspring. Within four months of the treatment being stopped, the male mice could impregnate females.

The molecule could be part of a new class of contraceptive drugs that specifically target male sex cells, the authors suggest.

Cell 150, **673–684 (2012)**

For a longer story on this research, see http://go.nature.com/sd4sko