

# RESEARCH HIGHLIGHTS

Selections from the scientific literature

## MICROBIOLOGY

### Obesity link to jet-lagged microbes

Disrupted sleep patterns alter the composition of gut bacteria, leading to metabolic problems.

Eran Elinav at the Weizmann Institute of Science in Rehovot, Israel, and his team found that the abundance of gut microbes in mice fluctuates daily in sync with host feeding times. But when the team genetically disabled the animals' circadian clocks or shifted them by eight hours, the bacteria lost this rhythmicity and their composition changed.

Jet-lagged mice eating a high-fat diet gained more weight and showed an increased susceptibility to diabetes compared with normal mice that were fed the same food. Jet-lagged humans had more bacteria called Firmicutes — which have been linked to metabolic disease — in their guts than before their transatlantic trips.

The findings could explain why shift workers have a higher risk of obesity and diabetes.

*Cell* <http://doi.org/wfh> (2014)

## CONSERVATION

### Horn trade could save rhinos

Wild southern white rhinoceroses could go extinct in just nine years because of poaching, but could be saved if trade in their horns were to be carefully managed.

Poachers killed almost 1,000



southern white rhinoceroses (*Ceratotherium simum simum*; **pictured**) for their horns in 2013, some 5% of the total population. Enrico Di Minin of the University of Helsinki and his colleagues used population and economic models to estimate extinction risk and the cost of anti-poaching patrols.

The models suggest that the species could be saved by a carefully controlled trade in horn collected from rhinos that die naturally or harvested from live animals without killing them. Money from this would fund increased anti-poaching patrols and create an

income source for local people, deterring them from poaching. *Conserv. Biol.* <http://dx.doi.org/10.1111/cobi.12412> (2014)

## STEM CELLS

### Cell transplants enhance vision

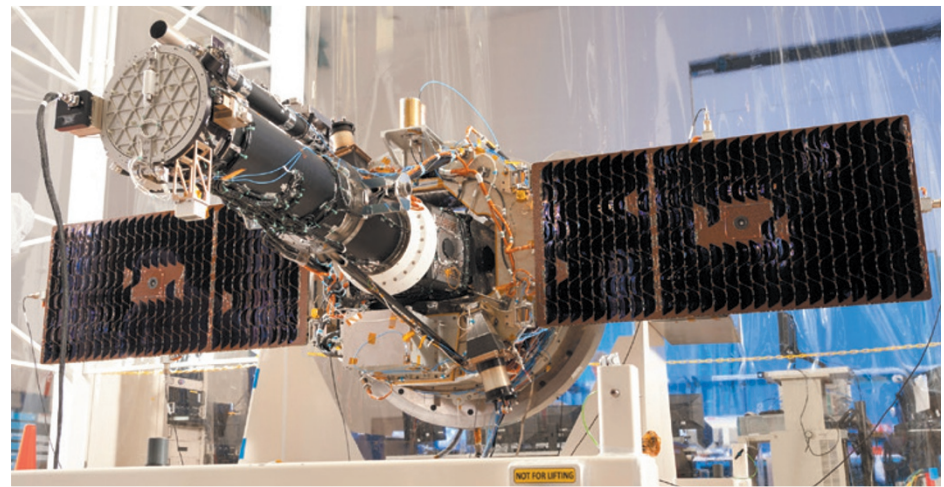
Implanted retinal cells derived from stem cells seem to be improving vision in some people in two early-stage clinical trials.

Steven Schwartz at the University of California, Los Angeles, Robert Lanza at Advanced Cell Technology in

Marlborough, Massachusetts, and their team grew retinal pigmented epithelial cells from human embryonic stem cells and transplanted them into the retinas of 18 people who have one of two forms of macular degeneration, which results in the loss of central vision.

After about two years, there have been no serious side effects from the cells, such as abnormal growth. Ten participants reported seeing more letters on an eye chart than before the treatment.

The transplanted cells are support cells that do not directly enable vision, so it is



## SOLAR PHYSICS

### Solar atmosphere is a hotbed of activity

Explosions of plasma in the Sun's atmosphere can reach temperatures of nearly 100,000°C, much hotter than scientists had expected.

The finding is one of several about the region between the solar surface and the uppermost edge of the Sun's atmosphere, or corona, revealed by NASA's Interface Region Imaging Spectrograph (IRIS) mission. The spacecraft (pictured before its launch) found that much of the energy from solar flares goes into heating and accelerating the plasma explosions, reports a team led by Hardi Peter of the Max Planck Institute for Solar System

Research in Göttingen, Germany.

Viggo Hansteen of the University of Oslo and his co-workers found short loops of magnetized plasma that flicker out within minutes and could help to explain how the corona gets so hot.

Jets of charged particles less than 300 kilometres wide also occasionally appear for up to 80 seconds, and may fuel the solar wind, say Hui Tian of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts, and his colleagues.

*Science* <http://doi.org/wfc>; <http://doi.org/wfd>; <http://doi.org/wff> (2014)

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