

RESEARCH HIGHLIGHTS

Selections from the scientific literature

EXOPLANETS

Earth-sized, not Earth-like

NASA's Kepler mission to find habitable planets orbiting Sun-like stars has turned up its first rocky planet. The project uses the Kepler space telescope to identify extrasolar planets by watching for dips in the intensity of light from up to 170,000 target stars.

Natalie Batalha of San Jose State University in California and her group spotted Kepler 10b, which is about 4.56 times the mass of Earth. Although similar in size to Earth, its orbit lasts just 0.84 days, making it likely that the planet is a scorched, waterless world with a sea of lava on its starlit side.

Astrophys. J. 729, 27 (2011)

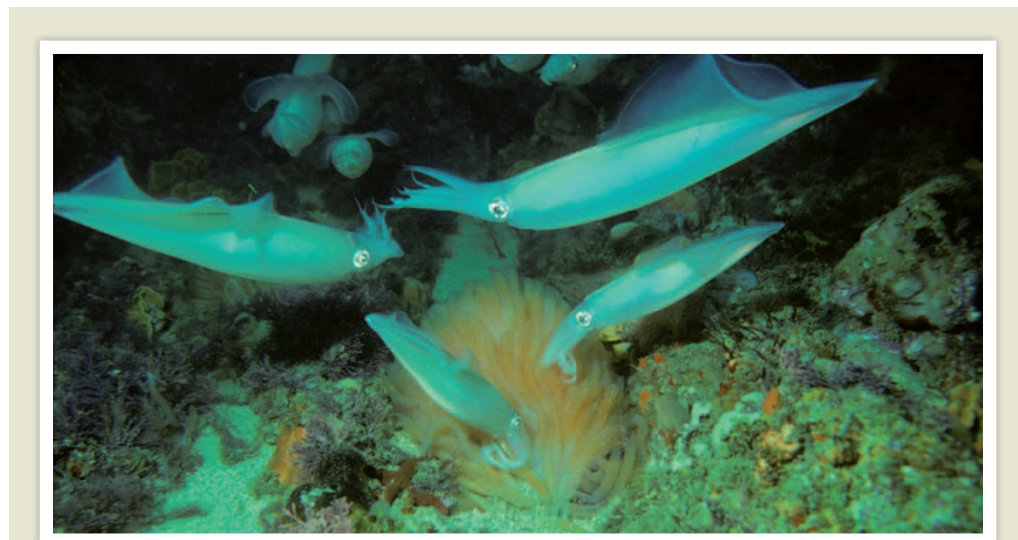
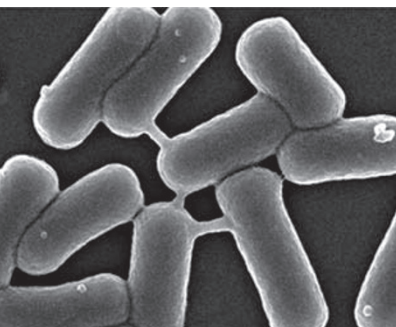
MICROBIOLOGY

Molecular mail by nanotube

Bacteria can communicate by sending molecules to each other along nanotube bridges. Researchers previously thought that bacteria exchanged molecules primarily by secreting and sensing them.

Gyanendra Dubey and Sigal Ben-Yehuda at the Hebrew University of Jerusalem in Israel observed tubular protrusions between neighbouring *Bacillus subtilis* cells (**pictured**) and showed that they are used to exchange

ELSEVIER



R. HANLON

ZOOLOGY

Fighters egged on by pheromones

Male squid are propelled into an immediate fighting frenzy by contact with squid eggs — a response, researchers say, to a pheromone identified on the eggs' surface. The protein, *Loligo* β -MSP, is the first aggression pheromone from a marine animal to be characterized at the molecular level. Its similarity to proteins found in mammalian seminal fluids suggests that these may also have a role in sexual competition. Roger Hanlon at the Marine Biological Laboratory in Woods Hole, Massachusetts,

and his team isolated the protein and applied it to the surface of a clear glass flask containing eggs. They found that male squid (*Loligo pealeii*, **pictured**) began to push and bite each other violently within seconds of touching the glass, competing for females as they do after contact with natural eggs. The pheromone, which is made by female reproductive glands, may help to focus males' competitive aggression when mature, receptive females are nearby.

Curr. Biol. doi:10.1016/j.cub.2011.01.038 (2011)

molecules and proteins. The nanotubes, which are typical of multicellular organisms, also form between *B. subtilis* and other bacterial species.

The bridging mechanism can transfer features such as antibiotic resistance between cells, the authors say.

Cell 144, 590–600 (2011)

CANCER

Cyclin through drug resistance

Breast-cancer tumours can become resistant to therapy if they express abnormally high levels of the gene for a protein called cyclin E. The finding

suggests that a combination of drugs targeted at specific molecules may one day be appropriate for such tumours.

The therapeutic antibody trastuzumab is designed for breast cancers that overexpress the gene *HER2*, but patients frequently become resistant to the treatment. José Baselga, now at Massachusetts General Hospital in Boston, and his colleagues analysed tumour cells from 34 patients treated with trastuzumab. They found that the median time it took for tumour progression to recommence was cut by more than half in those whose tumours overexpressed cyclin E.

Cyclin E acts with another protein called CDK2 to usher cells through a specific phase in the cell cycle. A compound that inhibits CDK2 slowed the growth of trastuzumab-resistant tumour cells transplanted into mice.

Proc. Natl Acad. Sci. USA doi:10.1073/pnas.1014835108 (2011)

CHEMISTRY

One catalyst, two products

Many chemical reactions produce two enantiomers — molecules that are mirror images of each other — but