RESEARCH HIGHLIGHTS

Selections from the scientific literature

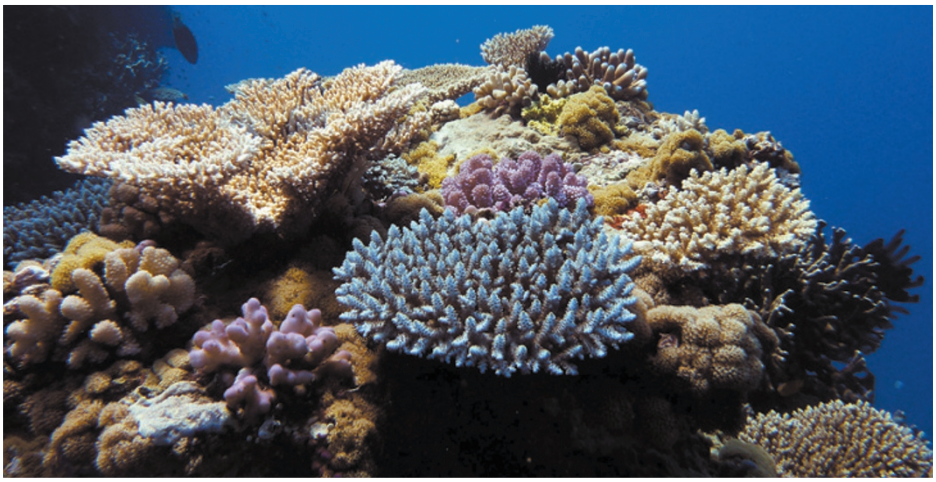
IMMUNOLOGY

How fat spurs inflammation

Obesity increases the risk of metabolic conditions such as insulin resistance by triggering inflammation. Lan Wu and Luc Van Kaer at Vanderbilt University in Nashville, Tennessee, and their colleagues have established that a subset of immune cells called invariant natural killer T (iNKT) cells links fat build-up with inflammation.

The authors fed mice a high-fat diet, which activated their iNKT cells, triggering the release of inflammatory proteins. When the animals' iNKT cells were stimulated with an injected molecule for eight weeks, the mice developed insulin resistance and fatty livers. By contrast, mice that were engineered to lack iNKT cells did not develop excess inflammation or metabolic conditions on a high-fat diet, despite becoming obese.

Proc. Natl Acad. Sci. USA **http://dx.doi.org/10.1073/pnas.1200498109 (2012)**



AURELIE MOYA

ECOLOGY

Can coral cope with climate change?

Climate change is likely to alter the species composition of coral reefs, rather than wipe out entire reef ecosystems.

Terry Hughes at James Cook University in Townsville, Australia, and his team sampled 132 sites along the full length of the Great Barrier Reef (pictured), spanning 13° of latitude and a range of sea surface temperatures. Of the 12 coral taxa sampled, 11 showed significant differences in abundance across the reef, regardless of how susceptible they were to thermal stress and bleaching. These differences in abundance did not follow changes in latitude or temperature.

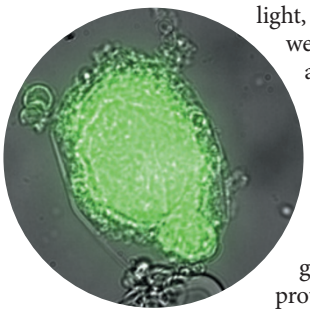
This flexibility may enable coral reefs to continue functioning as the environment alters with climate change.

Curr. Biol. **http://dx.doi.org/10.1016/j.cub.2012.02.068 (2012)**

NANOTECHNOLOGY

Injectable protein nanofactories

Tiny injectable particles containing protein 'factories' can be remotely activated by ultraviolet light. The technique could ultimately be used for drug delivery.



AM. CHEM. SOC.

Daniel Anderson and his group at the Massachusetts Institute of Technology in Cambridge created lipid spheres more than 100 nanometres in diameter that contained DNA and all the cellular ingredients and machinery needed to make proteins. By tagging the DNA with a chemical group that prevents it from being transcribed into RNA but can be removed using ultraviolet light, the researchers were able to control activation of RNA and protein production.

The authors developed nanoparticles that produce green fluorescent protein (**pictured**) and luciferase, an enzyme often used for *in vivo* molecular imaging. They showed that they could switch on luciferase production remotely after injecting the nanoparticles into mice.

Nano Lett. **http://dx.doi.org/10.1021/nl2036047 (2012)**

STEM CELLS

Recipes for making lung cells

The development of methods to transform embryonic stem cells into lung tissue paves the way for models of lung diseases such as cystic fibrosis.

Darrell Kotton at Boston University in Massachusetts and his team used a series of proteins to turn mouse embryonic stem cells into lung progenitor cells. When implanted into a mouse lung that had been removed from the animal and stripped of its cells, the progenitors formed structures similar to alveoli, sacs in the lungs where gas exchange occurs. The cells also expressed proteins characteristic of specialized lung cells.

Jayaraj Rajagopal at Massachusetts General Hospital in Boston and his group took the work a step further, reprogramming skin cells from a patient with cystic fibrosis into stem cells and then converting these into lung progenitors. When implanted underneath the skin of mice, the progenitors formed different kinds of specialized lung cells, including those lining the