

VISION

Dopamine loss hurts diabetic eye

A decrease in the amount of dopamine in the retina could explain why people with diabetes often have visual problems or even go blind.

Reduced levels of this brain-signalling molecule have been seen in diabetes before, so Mabelle Pardue at Emory University in Atlanta, Georgia, and her colleagues gave a dopamine precursor called L-DOPA to rat and mouse models of type 1 diabetes. They found that the molecule delayed the onset and slowed down the progression of early visual dysfunction, and improved the responses of the retina's light-sensing cells.

Treating dopamine deficiency could be a way to combat vision loss associated with type 1 diabetes, the authors say.

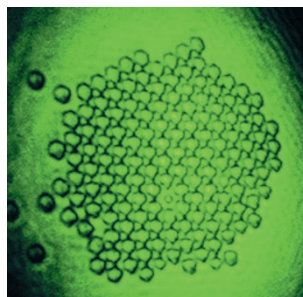
J. Neurosci. 34, 726–736 (2014)

OPTICS

Laser power makes a mirror

Physicists have created a mirror by using a laser to herd tiny particles into a continuous reflective surface.

Optical forces from laser beams have already been used to manipulate single particles. Now, Tomasz Grzegorzczuk at BAE Systems in Burlington, Massachusetts,



and his colleagues have used a green laser to organize about 150 polystyrene spheres suspended in water. The three-micrometre-wide beads interacted with each other to form a crystal-like membrane configuration (pictured), and a camera was used to capture an image reflected off the membrane surface.

The method gives the membrane self-healing properties, and one day could be used to build ultralight mirrors with a large surface area for space

telescopes, the authors suggest. *Phys. Rev. Lett.* 112, 023902 (2014)

MICROBIOLOGY

How antibiotics boost infection

Antibiotics alter the bacterial community in the mouse gut in ways that might make the animal more susceptible to infections from the dangerous, diarrhoea-causing bacterium *Clostridium difficile*.

Vincent Young and his team

at the University of Michigan in Ann Arbor analysed the molecules produced by gut microbes and found that antibiotics shifted the levels of carbohydrates and other metabolites.

Compounds that became more abundant with antibiotic treatment such as the sugar alcohols mannitol and sorbitol boosted the growth of *C. difficile* cells in culture. A bile acid that also increased in treated mice triggered spores of the bacterium to germinate. Moreover, the



OCEANOGRAPHY

Climate change spawns bigger waves

Taller ocean waves could slam coastal regions in the tropics and in parts of the Southern Hemisphere this century, thanks to faster surface winds.

Xiaolan Wang and her colleagues at Environment Canada in Toronto developed statistical models that use sea-level pressure data from multiple global climate model simulations to predict changes in the height of ocean waves. The authors found that the frequency of

extremely high waves that now occur roughly once a decade could double or triple by the end of this century in some coastal regions, including Chile (pictured) and Mexico's Baja peninsula. Surface wind speeds are affected by changing air temperature and sea-level pressure.

Rising sea levels could worsen the impacts of bigger waves, such as coastal flooding and erosion, the authors say.

Geophys. Res. Lett. <http://doi.org/q2c> (2014)