

CLIMATE MODELLING

Wetter, drier with warming

Trends in tropical rainfall over land could provide a signal of global warming, with very wet and very dry months both projected to become more frequent as temperatures rise.

Benjamin Lintner at Rutgers University in New Brunswick, New Jersey, and his colleagues compared the results from climate models simulating rainfall for 1975–99 and 2075–99. The researchers found that dry areas will tend to become drier by the end of this century as Earth warms, whereas rainfall will increase in wet areas.

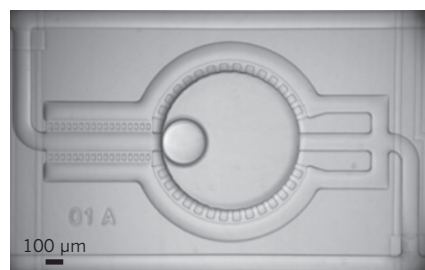
The team also compared rainfall simulations with measurements obtained between 1979 and 2008. However, there was no clear link between changes in tropical precipitation and recent temperature increases. This suggests that natural climate variability, in addition to global warming, is important in influencing tropical rainfall trends.

J. Geophys. Res. <http://dx.doi.org/10.1029/2012JD017499> (2012)

BIOENGINEERING

Shunting bacteria on a chip

A device that moves chemical reagents through a network of tiny chambers and channels on



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a chip has been used to analyse the genomes of individual bacterial cells.

Carl Hansen at the University of British Columbia in Vancouver, Canada, and his team developed the microfluidic device, which uses computer-controlled valves

to pump reagents and cells as discrete droplets suspended in a stream of oil. By programming the valves, the authors directed single droplets to 95 different 30-nanolitre reaction wells (pictured, with

droplet), in which the droplets can be isolated or mixed with others. The authors used their device to sort, culture and sequence the genomes of individual bacterial cells sampled from the human mouth and from marine sediment.

Proc. Natl Acad. Sci. USA <http://dx.doi.org/10.1073/pnas.1106752109> (2012)

CANCER

A tumour's Kras behaviour

Growing cancer cells divert glucose and other nutrients

away from energy-producing pathways towards those that make complex molecules that can be used as building blocks. The cancer gene *Kras* promotes this diversion in pancreatic cancer.

Using a mouse model of the most common type of pancreatic cancer, Alec Kimmelman at the Dana-Farber Cancer Institute in Boston, Massachusetts, Ronald DePinho, now at the MD Anderson Cancer Center in Houston, Texas, and their colleagues show that the pancreatic tumours need mutant *Kras* to survive. The mutant protein shunts



MATERIALS

Butterfly-inspired reflectors

A synthetic material mimics the complex microscopic structure of brilliant butterfly wings to achieve a bright blue colour.

Butterflies of the genus *Morpho* are known for their dazzling blue wings (pictured right). The colour arises from densely packed layers of ridges that cover the scales on the wing surface. The ridges are structured such that light waves reflecting off the ridges interfere with each other, creating the blue colour. The tight, semi-random packing of the ridges makes the wings appear bright across a wide range of viewing angles.

To recreate these features in a reflective material, Jung Shin at the Korea Advanced Institute of Science and Technology in Daejeon, South Korea, and his colleagues deposited silica microspheres onto a surface and then sprayed layers of titanium dioxide and silicon dioxide over them. The resulting film (pictured left) had just the right mix of regularity and disorder to create the even blue colouring.

Adv. Mater. <http://dx.doi.org/10.1002/adma.201200521> (2012)