RESEARCH HIGHLIGHTS

GENETICS

Gene guards

Genes Dev. doi:10.1101/gad.1893210 (2010)

Transposons, or 'jumping genes', move around genomes and can disrupt normal gene function. As a result, many organisms add methyl groups to their transposons to silence them. But how does a cell determine where a transposon ends and a protein-coding gene begins?

Eric Selker at the University of Oregon in Eugene and his team tackled this question in the fungus *Neurospora crassa*. When they disrupted a gene called *dmm1*, methylation spread beyond transposon borders and into neighbouring genes. The resulting mutants grew more slowly.

The DMM1 protein interacts with another protein, DMM2, and *dmm2* mutants also had excess methylation. The results suggest that DMM1 and DMM2 act together in a complex that protects genes residing near transposons.

NANOTECHNOLOGY

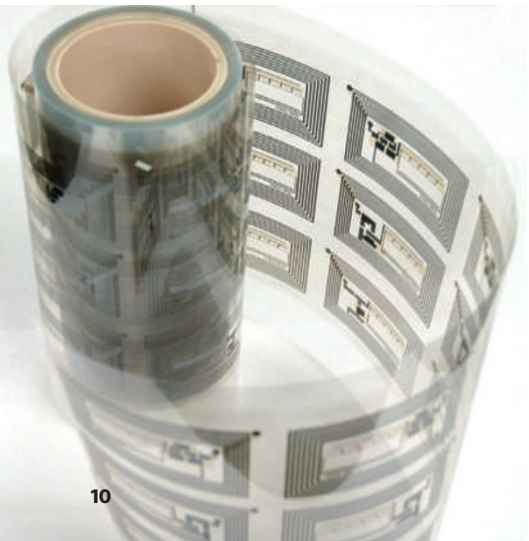
Light DNA machine

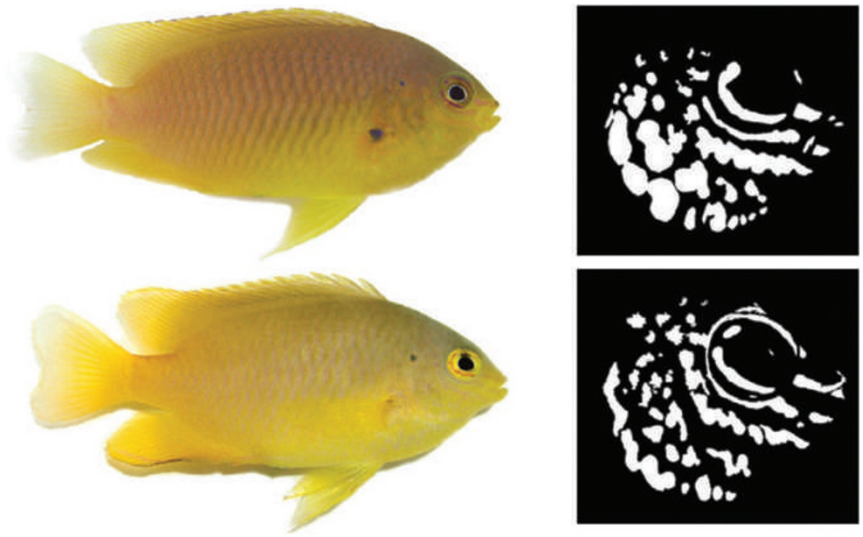
Angew. Chem. Int. Edn doi:10.1002/anie.200907082 (2010)

DNA structures can be created to manipulate other molecules, but controlling their activity has been a challenge. Xingguo Liang, Hiroyuki Asanuma and their colleagues at Nagoya University in Japan have now constructed one such single-molecule DNA 'nanomachine' that cleaves RNA and is controlled by light. This avoids the need to add small DNA or other 'fuel' molecules that would accumulate and interfere with the reactions.

The 'DNAzyme' is hairpin-shaped, with two parallel arms connected by a loop at one end, and both arms bind to the RNA. When illuminated with ultraviolet light, the hairpin opens, cleaving the RNA. It could be used to regulate gene expression, the authors suggest.

M. JUNG





U. SIEBECK/ELSEVIER

Secret code

Curr. Biol. doi:10.1016/j.cub.2009.12.047 (2010)

Some fish are thought to communicate using covert signals: ultraviolet (UV) coloration that is invisible to their predators. The idea is supported by the finding that Ambon damselfish (*Pomacentrus amboinensis*, pictured, top) can differentiate between their own species and the near-identical lemon damselfish (*P. moluccensis*, pictured, bottom) using tiny differences in UV facial patterning.

Ulrike Siebeck at the University of Queensland in Brisbane, Australia, and her colleagues found that, in general, territorial *P. amboinensis* attacked members of their own species more than they did *P. moluccensis*, but that this correlation broke down when the potential rivals were presented to one another in UV-opaque tubes.

The authors went on to show that trained fish could differentiate between species using images of facial patterns (pictured, right) that reflected either UV or visible light.

ELECTRONICS

Caught on film

IEEE Trans. Electron Dev. **57,** 571–580 (2010)

Radio-frequency identification (RFID) tags are microchips with tiny radio antennas that could replace barcodes on consumer goods if they become cheap enough to mass-produce. Gyoujin Cho of South Korea's Sunchon National University and his colleagues have developed a low-cost process that prints RFID tags onto rolls of plastic film (pictured left).

The film passes through three types of printer, which lay down the electrodes, antenna and other necessary electronic components. The key advance is the ability to print a tag that is powerful enough to be quickly activated and read by a standard RFID reader. The team estimates its per-unit production cost to be about US$0.03.

BIOLOGY

Stayin' alive

Am. Nat. doi:10.1086/650725 (2010)

Sexual reproduction weeds out harmful genetic mutations. How, then, have the asexual soil fungi Glomeromycota managed to survive for 400 million years?

The answer may lie in the way that Glomeromycota reproduce, by releasing spores packed with hundreds of nuclei. By contrast, typical eukaryotic cells, including the spores of many other asexual fungi, contain only one nucleus. Teresa Pawlowska of Cornell University in Ithaca, New York, and Jean-Luc Jany, now at the European University of Brittany, Rennes, France, used three-dimensional imaging to watch *Glomus etunicatum* reproduce on carrot roots.

They found that a stream of nuclei pour into the spores from the fungus's thread-like vegetative branches. They also observed that some nuclei are eliminated and thus never passed on to spores, suggesting a method the fungus uses to screen out mutated nuclei.

ASTROPHYSICS

Old stars call out

Astrophys. J. **711,** 517–531 (2010)

Mysterious radio signals could be coming from a large but quiet population in the Milky Way: old, slow-spinning neutron stars.

As many as one billion ancient neutron stars — the remnants of exploded stars — are