into hair cells. When applied to the ears of mice deafened by loud sounds, the molecule triggered the generation of new hair cells. By three months after this treatment, the rodents' hearing had been partly restored.

LY411575 would probably need to be delivered locally to the ear in humans to avoid side effects, the authors say.

Neuron 77, **58–69 (2013)**

ANIMAL BEHAVIOUR

Mothers call for parenting help

Male laboratory mice do not spontaneously care for their offspring, but they can exhibit some paternal behaviour in response to signals from their mates.

Haruhiro Higashida at Kanazawa University in Japan and his colleagues found that when female mice were separated from their young, they could encourage their male partners to adopt parental behaviour — such as carrying wandering pups back to the nest (**pictured**) — using high-pitched vocalizations and pheromones.

About 60% of the males tested retrieved pups after hearing a recording of 38-kilohertz distress calls of females removed from their pups. The team found similar results when males were placed in cages that had previously held females separated from their young. Paternal behaviour disappeared when the researchers simultaneously blocked hearing and olfaction in the males.

Nature Commun. 4, **1346 (2013)**

ARCO IMAGES GMBH/ALAMY

MATERIALS

Spinning strong, conductive carbon

Fibres spun from carbon nanotubes can be as electrically conductive as metal wires, yet as strong as conventional carbon fibres.

Individual carbon nanotubes are strong, stiff and exceptionally conductive — but spinning them into larger filaments adds defects, impurities and misalignments that compromise the fibres' physical properties. Matteo Pasquali at Rice University in Houston, Texas, and his colleagues have improved the spinning process by adapting techniques used to make industrial fibres such as Kevlar. The authors extruded filaments from nanotubes dissolved in an acid and wound them into fibres of dense, well-aligned tubes that are stronger than copper and almost as conductive.

The fibres could be manufactured on a large scale and have a variety of applications in electronics, the authors say.

Science 339, **182–186 (2013)**

CELL FATE

Impede a protein to reprogram

Blockade of just one protein is sufficient to change skin cells into neurons.

Several research groups have already converted one cell type to another by adding, for example, specific genes. Now researchers led by Xiang-Dong Fu at the University of California, San Diego, have found another approach. They used small RNA molecules to repress an RNA-binding protein called PTB. Decreased levels of this protein led to the activation of genes that can convert skin cells to neurons. PTB influences the stability of RNA molecules and coordinates molecules called microRNAs that regulate gene expression.

The approach is a convenient way to reprogram other cell types to neurons, and provides a glimpse of the complex mechanisms involved in the control of gene expression.

Cell **http://dx.doi.org/10.1016/j.cell.2012.11.045 (2013)**

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CLIMATE SCIENCE

Warming matches predictions

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Temperature data collected since 1990 are in good agreement with model-based estimates of global warming made by the Intergovernmental Panel on Climate Change (IPCC).

Stefan Rahmstorf of the Potsdam Institute for Climate Impact Research in Germany and his colleagues removed short-term temperature fluctuations or 'noise', which result from events such as volcanic eruptions, from a 1980–2011 time-series of annual global temperatures. The adjusted warming trend of 0.16 °C per decade closely matches the projections made by the IPCC in its reports in 2001 and 2007.

The global sea level, however, has since 1993 been rising 60% faster than anticipated. Future sea-level rise could exceed even the highest value — some 60 centimetres by the end of the century — projected by the IPCC in its 2007 report, the team cautions.

Environ. Res. Lett. 7, **044035 (2012)**

GUDRUN HERZNER/*PROC. NATL ACAD. SCI.*

ANIMAL BEHAVIOUR

Wasp parasites keep hosts clean

By peering into the bodies of American cockroaches, researchers have found that a parasitic larva disinfects its host with antibacterial secretions.

Larvae of the emerald cockroach wasp (*Ampulex compressa*; **pictured**) feed on the innards of the American cockroach (*Periplaneta americana*), but also have to contend with bacteria that live in their host's tissues. Gudrun Herzner at the University of Regensburg in Germany and her colleagues installed transparent panels into the sides of parasitized roaches and observed that the wasp larvae secrete large amounts of a clear liquid from their mouthparts onto their hosts' tissues.

Analysis of the liquid revealed the presence of the chemicals mellein and micromolide. These substances slow the growth of certain microorganisms, including the bacterium *Serratia marcescens*, which can kill insect larvae and was also isolated from the cockroaches.

Proc. Natl Acad. Sci. USA **http://dx.doi.org/10.1073/pnas.1213384110 (2013)**

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