the generation of immune cells called dendritic cells that were less able to trigger allergic inflammation in the lungs.

The results provide a possible link between the rising incidence of asthma in developed countries and decreasing dietary-fibre intake.
Nature Med. **http://dx.doi.org/10.1038/nm.3444 (2014)**

ZOOLOGY

Tobacco breath aids defence

The tobacco hornworm, which feeds on tobacco plants, exhales some of the ingested nicotine to repel predators.

Ian Baldwin and his colleagues at the Max Planck Institute for Chemical Ecology in Jena, Germany, glued tiny sensors to the mouths of tobacco hornworm larvae (*Manduca sexta*; **pictured**) to measure the levels of nicotine in their breath. They found that larvae that fed on engineered, nicotine-free tobacco plants (*Nicotiana attenuata*) exhaled less nicotine than larvae fed on normal plants, as did larvae in which an enzyme that transfers nicotine from the gut into the circulation was silenced. Wolf spiders (*Camptocosa parallela*) preferred to prey on larvae with less nicotine on their breath.

The study shows how ingested toxic chemicals can be used for predator defence.
Proc. Natl Acad. Sci. USA **http://doi.org/qq3 (2013)**

PAVAN KUMAR

GENOMICS

CRISPR screen identifies genes

Two teams show how a genome-editing system can be used to screen human cells for genes of interest.

The CRISPR system allows biologists to edit specific genes using 'guide' RNA molecules that target them. Feng Zhang at the Broad Institute in Cambridge, Massachusetts, and his colleagues created a library of 64,751 guide RNA sequences that target 18,080 genes in human cells. Using this library, the researchers pinpointed genes that are required by cancer and stem cells to survive. They also teased out genes that, when lost, allow cancer cells to fend off the melanoma drug vemurafenib.

A separate team led by Eric Lander at the Broad Institute and David Sabatini at the Whitehead Institute for Biomedical Research in Cambridge, Massachusetts, used a library of 73,000 guide RNAs to screen for several genes, including those involved in resistance to the chemotherapy drug etoposide.
Science 343, **80–84; 84–87 (2014)**

STRUCTURAL BIOLOGY

Better pictures of protein structures

A modified method for determining the three-dimensional structure of large proteins seems to show them in a more natural pose than conventional techniques do.

Proteins called G protein-coupled receptors (GPCRs) are important drug targets, but researchers struggle to figure out their structures. Vadim Cherezov of the Scripps Research Institute in La Jolla, California, and his colleagues modified the standard X-ray crystallography technique by using an X-ray free-electron laser to capture serial images of the structure of a GPCR for the neurotransmitter serotonin.

The team used the technique on tiny serotonin-receptor crystals kept at room temperature, and obtained structures that differed from those determined using conventional approaches with larger crystals kept at cool temperatures. The results suggest that the room-temperature free-electron-laser approach may better capture the protein's conformation in its native environment.
Science 342, **1521–1524 (2013)**

COMMUNITY CHOICE

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CANCER

How drugs boost resistance

HIGHLY READ on jem.rupress.org in December.

Chemotherapy kills cancer cells, but in colorectal cancer it can also stimulate their growth by activating cells called fibroblasts in the connective tissue.

Matthew Kalady and Jeremy Rich at the Cleveland Clinic in Ohio and their colleagues analysed tumours from patients with colorectal cancer before and after chemotherapy. The researchers found that the abundance of cancer-associated fibroblasts increased after treatment, and that these cells enhanced the ability of a subset of cancer cells to initiate tumour growth. The fibroblasts seem to do this by secreting signalling proteins, including one called IL-17A.

The findings suggest that chemotherapy can trigger drug resistance by changing the tumour's microenvironment. Disrupting this mechanism could be a way of improving cancer therapies, the authors say.
J. Exp. Med. 210, **2851–2872 (2013)**

HEATHER MCCLELLAND/AP/PA

GEOLOGY

Radar signals sinkhole to come

Radar measurements taken more than a month before a giant sinkhole (**pictured**) opened up in 2012 in Bayou Corne, Louisiana, reveal that nearby ground shifted horizontally towards the pit's location.

Cathleen Jones and Ronald Blom of NASA's Jet Propulsion Laboratory in Pasadena, California, looked at radar data gathered by an unmanned aircraft as part of a Mississippi River delta study. By comparing data from flight passes in June 2011 and July 2012, the team saw that surface material had moved by as much as 26 centimetres towards where the 110-metre-wide sinkhole appeared in August 2012.

Radar remote sensing could be a way of predicting the formation of these potentially catastrophic sinkholes and their growth rate, the authors say.
Geology **http://doi.org/qnr (2013)**

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