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Nature Geosci. <http://dx.doi.org/10.1038/ngeo2373>;
<http://dx.doi.org/10.1038/ngeo2351> (2015)

EPIDEMIOLOGY

Plague came to Europe in waves

The bacterium that causes the plague, which killed millions of Europeans over four centuries from the 1350s, was repeatedly reintroduced from Asia and did not establish itself in European rodents as was thought.

Yersinia pestis bacteria live in wild rodents and can infect humans when climate changes cause rodent populations to collapse, triggering plague-carrying fleas to find alternative hosts. To locate plague reservoirs in Europe, Nils Christian Stenseth at the University of Oslo and his colleagues analysed historical outbreaks along with tree-ring-based records of climate. They found no connection between fluctuations in European climate and plague outbreaks, but did find links between Asian climate changes and outbreaks at European trade harbours.

The authors conclude that the plague took about 15 years to travel overland to Europe. *Proc. Natl Acad. Sci. USA* <http://dx.doi.org/10.1073/pnas.1412887112> (2015)

BIOCHEMISTRY

Sunlight damages DNA in the dark

Sunlight can cause cancer-related DNA damage hours after light exposure, owing to a skin pigment that was largely thought to be protective.

Douglas Brash at Yale University School of Medicine in New Haven, Connecticut, and his team studied how the pigment melanin in mouse skin cells responds to ultraviolet (UV) light. They found that UVA radiation, the main type of UV light that comes from the Sun and from tanning beds,

creates melanin by-products that damage DNA, generating DNA derivatives called cyclobutane pyrimidine dimers (CPDs) for up to three hours after light exposure.

CPDs are associated with the skin cancer melanoma, so blocking their formation could be a way to develop sunscreens that can be used after exposure to sunlight, the team says. *Science* 347, 842–847 (2015)

CANCER

Bacteria protect tumours

Bacteria hiding out in tumours can shield them from attack by the immune system.

The oral bacterium *Fusobacterium nucleatum* has been linked to premature birth, rheumatoid arthritis and colon cancer. Gilad Bachrach and Ofer Mandelboim at the Hebrew University of Jerusalem and their colleagues studied the impact of the bacterium on cancer cells. They found that *F. nucleatum* sticks to tumour cells grown in culture and inhibits immune cells by activating an immune-cell receptor called TIGIT. Many immune-cell types found in human colon cancer and melanoma samples also expressed TIGIT, and were inhibited by *F. nucleatum*.

The results could explain why certain tumours, especially intestinal ones, seem to have high levels of bacteria. *Immunity* 42, 344–355 (2015)

PLANT SCIENCE

Nectar fends off bee parasites

Floral nectar helps to control parasites in bumblebees.

Plants produce molecules called secondary metabolites that are harmful to herbivores but in some cases can also protect animals from parasites. To see whether such metabolites in nectar similarly affect pollinators, Leif Richardson at Dartmouth College in Hanover, New Hampshire, and his team

SOCIAL SELECTION

Popular articles on social media

Scientists cautious about outreach

Scientists think that they should actively participate in public debates about science and technology — but many have misgivings about doing so, according to a survey of nearly 4,000 US researchers. The results of the poll, by the Pew Research Center, inspired a fresh online conversation about the use of social media in public engagement. “Been saying for years scientists need to come down from ‘ivory tower’ and engage public,” tweeted Caleph Wilson, a cancer researcher at the University of Pennsylvania in Philadelphia. Ajinkya Kamat, a physics PhD student at the University of Virginia in Charlottesville, tweeted: “We need more avenues, better incentive structure to get scientists in all career stages involved in science outreach.”

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infected eastern bumblebees (*Bombus impatiens*) with an intestinal parasite and gave the bees one of eight different nectar compounds. Four of the metabolites reduced the load of parasites by 60–80%.

The compound with the strongest effect on parasites, anabasine, did not seem to boost bumblebee survival, but the team says that these chemicals in nectar could benefit the bee colony as a whole by reducing parasite spread.

Proc. R. Soc. B 282, 20142471 (2015)

PALAEOECOLOGY

Coral growth shut down for millennia

Coral reefs in the eastern Pacific Ocean stopped growing for 2,500 years, probably because of a change in climate four millennia ago.

Lauren Toth at the Florida Institute of Technology

in Melbourne and her colleagues extracted a 2.68-metre core from a reef in the Gulf of Panama (pictured), representing 6,750 years of growth. They analysed the chemical composition of 133 skeletons of *Pocillopora* corals in the sample to assess coral health, local temperature, ocean currents and rainfall. They found that roughly 4,100 years ago, cooler temperatures and greater rainfall — similar to today's La Niña weather systems — were associated with the beginning of a 2,500-year pause in coral growth. The health of the corals seems to have declined at the start of this hiatus.

The samples also suggest that temperature is a key factor affecting coral growth. *Nature Clim. Change* <http://dx.doi.org/10.1038/nclimate2541> (2015)

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