# RESEARCH HIGHLIGHTS

*Selections from the scientific literature*

MICROBIAL GENOMICS

## Sequencing spots killer microbes

Sequencing the genome of an antibiotic-resistant microbe can identify the most dangerous isolates, reports a team led by Ruth Massey at the University of Bath, UK.

Her group studied 90 isolates of methicillin-resistant *Staphylococcus aureus* (MRSA) that had varying levels of ability to stick to and kill cultured human cells. The researchers sequenced the isolates, and conducted a genome-wide association study to identify 121 genetic changes, including additions or deletions of DNA, that were linked to this toxicity.

A set of 50 of these variants could predict the most and least toxic of 30 of the isolates, although it was unable to predict the medium-toxicity isolates with any accuracy.

***Genome Res.*** **http://dx.doi.org/10.1101/gr.165415.113 (2014)**

CLIVE LIMPKIN/ALAMY

EVOLUTION

## Hummingbird species on the rise

In just 22 million years or so, hummingbirds have rapidly diversified from a single ancestor into more than 300 species, and some lineages are still generating new species at an extraordinary rate.

Jimmy McGuire at the University of California, Berkeley, and his colleagues compared the DNA sequences of 284 hummingbird species, including *Selasphorus flammula* (pictured).

They found that the birds first diverged from their sister group, the swifts, around 42 million years ago and have diversified into 9 major lineages in South America over the past 22 million years. Speciation has been particularly dramatic in the Andes mountains, which have a wide range of habitats and climates and are home to 40% of hummingbird species.

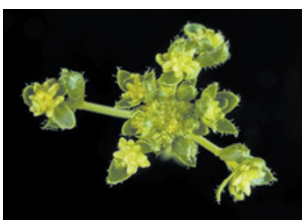
The researchers calculate that there could be as many as 767 species of hummingbird in the next several million years — more than twice the number that currently exist.

***Curr. Biol.*** **http://doi.org/r6v (2014)**

PLANT BIOLOGY

## How bacteria turn plants into zombies

Researchers have uncovered how certain bacterial pathogens that infect plants make them sterile and capable only of spreading disease.



JIC PHOTOGRAPHY

Phytoplasma pathogens are transmitted by sap-feeding insects that turn flowers (such as *Arabidopsis thaliana*, **pictured** top) into leaf-like structures (bottom) that do not produce seeds. Saskia Hogenhout at the John Innes Centre in Norwich, UK, and her colleagues studied *Arabidopsis* plants and found that a phytoplasma protein, SAP54, interacts with a class of plant proteins called RAD23 to degrade molecules that regulate floral development.

This interaction also seems to boost the attractiveness of infected plants to leafhopper insects, which spread phytoplasma from one plant to another.

***PLoS Biol.*** **12, e1001835 (2014)**

MOLECULAR BIOLOGY

## DNA regulator acts on RNA too

A DNA-binding protein that regulates several genes also attaches to RNA, revealing another way in which the protein acts as a 'master weaver' of the genome.

Félix Recillas-Targa of the National Autonomous University of Mexico in Mexico City, Danny Reinberg of New York University's Langone Medical Center and their colleagues discovered a region in the DNA-binding protein CTCF that binds to the RNA molecule Wrap53. This RNA regulates the tumour suppressor p53, a protein involved in DNA repair.

When the team mutated CTCF in human cells, CTCF could not bind to Wrap53 RNA and cells failed to trigger responses to damaged DNA, showing that CTCF controls p53 by binding to Wrap53. In a genome-wide screen, the team found CTCF attached to some 17,000 other RNAs.