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Winging it

Hiding from sight or using camouflage are excellent ways to try to avoid being caught while remaining still, but everything has to move at some point and evading predators while in motion is a trickier proposition. It has long been suggested that markings, such as a zebra's stripes, can help to confuse would-be predators, but clear evidence for this is surprisingly lacking. In this week's issue, Jolyon Troscianko and colleagues attempt to address this problem courtesy of butterflies. The team wanted to see if wing markings worked in combination with flight — show all

Cover image: George R. A. Hancock & Emmanuelle S. Briolat.

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This Week

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How a new wave of science philanthropists can have the greatest impact

Tech entrepreneurs are bringing an engineer's eye to research funding. They must be open about their findings to reap maximum benefit.

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***Nature*'s job-satisfaction survey highlights the changing geography of science**

A higher proportion of scientists in China and India report feeling optimistic about the future than in the United States and several European countries.

World View

World View
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How to compare and strengthen research systems

Analysing national research systems by using open-access data and new methods can help countries to learn from each other.

Lin Zhang

World View
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IceCube just won a Nobel prize. Protect astroparticle physics projects with the same potential

Building the Nobel-prizewinning neutrino experiment was a big risk. To continue its success, scientists — and funders — need to stay bold.

Lindley Winslow

Research Highlights

Research Highlight
19 Oct 2026

Light and mirrors move large quantum computers closer to reality

Scientists improve photon-collecting device that could be used to connect multiple quantum-computing arrays.

Research Highlight
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Lead-tainted teeth reveal medieval mines' unequal toll

Burials in the United Kingdom's Peak District, one of Europe's largest lead-production regions in centuries past, hint at social inequality.

Research Highlight
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Orangutan mothers arrange play dates for their babies

Solitary primates spend energy and time travelling to patches of forest for get-togethers.

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Growing plane and ship traffic degrade the air of western North America

Pollution from transport across the Pacific Ocean is raising ozone levels above a region whose own emissions have dropped.

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News in Focus

News

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Can GLP-1s heal the brain? Obesity drugs get a makeover for addiction and depression

Compounds inspired by the blockbuster weight-loss drugs are also being trialled for schizophrenia and Parkinson's disease, among other conditions.

Mariana Lenharo

News
08 Oct 2026

UAE completes Arab world's first solo space probe – and sets course for an asteroid

Device will be launched on a craft built jointly by the United Arab Emirates and the United States. Some researchers say it could be the last mission constructed with outside help.

Elizabeth Gibney

News
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'Incredible': bleached corals thrive within days when touching healthy neighbour

A coral fragment can form a tissue bridge with a dying counterpart — and provide it with crucial microalgae.

Sarah Wild

News
12 Oct 2026

What does a PhD pay? Data reveal huge gaps across Europe

Earnings come in a combination of scholarships and salaries and vary widely between countries, an analysis by international federation Eurodoc reveals.

Chris Simms

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US proposes $100,000 charge for international students to do postgraduate work

Suggested change to immigration rules would choke off a crucial STEM talent pipeline, policy specialists say.

Dan Garisto

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Big dogs age faster than little ones – rogue 'jumping genes' might be to blame

Study of almost 900 dogs from roughly 120 breeds finds that rapid ageing of large canines is linked to changes in the epigenome.

Heidi Ledford

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Overlooked brown fat in our bodies linked to wide range of health benefits

Massive study of more than 100,000 people finds surprising connection between 'good' body fat and improved mental health.

Mariana Lenharo

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ArXiv versus AI slop: will capping preprint submissions work?

Major preprint platform tightens its rules to curb a surge of submissions, including those generated by artificial-intelligence tools.

Dalmeet Singh Chawla

Features

News Feature
20 Oct 2026

Will this sleep-disorder drug be the next big blockbuster?

Orexin agonists have been approved for the treatment of a type of narcolepsy, yet they could also treat conditions across the health spectrum.

Amanda Heidt

News Feature
21 Oct 2026

How tech billionaires are disrupting biomedical science

Money from the world's increasingly prosperous technology entrepreneurs has been flooding into biomedical research. Is it changing how science is done?

Heidi Ledford

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Books & Arts

Book Review

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19 Oct 2026

How pregnancy reshapes the brain throughout life

Neuroscience is mapping changes in the brain during pregnancy. What they mean for future health is yet to be pinned down.

Liisa Galea

Book Review
09 Oct 2026

The life of Darwin and the science of clouds: Books in brief

Andrew Robinson reviews five of the best science picks.

Andrew Robinson

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Margaret Hamilton obituary: computer scientist who pioneered software engineering and helped us get to the Moon

Programmer whose forward-thinking and reliable code helped to save the Apollo 11 mission.

Maia Weinstock

Comment

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19 Oct 2026

Three reasons why AI is not conscious and perhaps never will be

Large language models can mimic thought and feeling with uncanny skill. But evidence from neuroscience suggests that intelligence alone is not enough for subjective experience.

Anil K. Seth, Ned Block & Giulio Tononi

Comment
20 Oct 2026

Nepal's disaster is an urgent wake-up call

Record-breaking avalanches and floods are signs of things to come. Scientists must evaluate and respond to growing risks in mountain regions.

Christian Huggel, Simon K. Allen ... Kavita Upadhyay

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Nobel-prizewinning breakthroughs can emerge from neglected organisms

Zora Zhang, Kang Lou & Zhenlong Wang

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Europe and the rest of the world must come up with an answer to US science strategy

André Loesekrug-Pietri

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Bundle water safeguards into critical-mineral licences

Junpeng Guo & Xingtao Xu

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Conservation planning should follow animal clocks

Peter Mikula

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Feature

Career Feature
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'Fiercely stubborn': the US scientists continuing their research amid funding cuts

Researchers working on climate change, diversity, transgender health and international aid have turned to lawsuits, private donors and alternative topics to keep their projects going.

Virginia Gewin

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Research

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Nuclear clocks tick for the first time

Ultraprecise clocks that use transitions in atomic nuclei to keep time show promise as a next-generation time standard and for probing fundamental physics.

Akio Kawasaki

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Harmful tau spreads like self-propagating prion proteins

Structural studies support the idea that fibrillized tau protein, a feature of neurodegenerative disorders, acts as a prion-like template to induce misfolding in healthy tau.

Kayleigh Mason-Chalmers & Jose A. Rodriguez

News & Views
07 Oct 2026

Retrofitted LLM can count the letter 'i's in 'artificial intelligence'

Most LLMs cannot reliably evaluate text on the level of individual letters. A technique called byteification retrofits existing models to enable it.

Zhao Zhang & Yingfei Xiong

News & Views
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Gut microbes that trace ancient human journeys

The Indigenous African Hadza and South American Tsimane share gut microorganisms that shed light on human dispersals and microbial losses in industrialized societies.

Carina M. Schlebusch & Maja Vukovikj

News & Views
20 Oct 2026

Butterfly wing patterns make motion hard to read

Movement can expose camouflaged prey, yet whether colour patterns help moving prey to avoid capture is a long-standing puzzle. Butterfly wings might offer an answer.

Gopal Murali

News & Views
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Pipework problems when cancer spreads to an area bordering the brain

Analysis of cancer growing adjacent to the brain reveals that bone-eroding cells interfere with lymphatic drainage vessels and hinder anti-tumour immune responses.

Jang Hyun Park & Jonathan Kipnis

Collection: Cancer at Nature Portfolio

Reviews

Review Article
21 Oct 2026

Multimodal precision diagnostics in clinical xenotransplantation

Now that hyperacute rejection of pig xenografts can be reliably prevented, subtler immune-mediated graft injuries have emerged that conventional diagnostics often miss; a multimodal precision diagnostic framework is proposed to detect these injuries earlier, guide personalized immunosuppression and inform future gene editing strategies.

Raphael P. H. Meier, Erwan Morgand ... Alexandre Loupy

Articles

Article
Open Access
07 Oct 2026

A thorium-229 optical nuclear clock with feedback loop

A thorium-229 nuclear clock is realized by stabilizing a continuous-wave laser to the 148-nm nuclear excitation with a rapid feedback loop based on absorption spectroscopy.

L. Toscani De Col, T. Riebner ... T. Schumm

Article
Open Access
07 Oct 2026

A nuclear clock synchronized to ^{229}Th

A nuclear clock synchronized to ^{229}Th establishes laser-addressed nuclei as operational clock references and ^{229}Th:CaF$_2$ as a stable, reproducible solid-state platform for compact nuclear clocks and nuclear quantum sensors.

Beichen Huang, Gaowei Yan ... Shiqian Ding

Article
14 Oct 2026

Wave coarsening drives time crystallization in mechatronic metamaterials

Wave coarsening in active elastic media is a phenomenon in which vibrations spontaneously increase in wavelength, period and amplitude before forming a globally synchronized time crystal.

Jonas Veenstra, Jack Binysh ... Corentin Coulais

Article
Open Access
07 Oct 2026

Retrofitting language models to operate over bytes

Byteification is a general method for retrofitting large language models to operate over bytes such that they approach the capabilities of subword-based systems and may be better for scientific data.

Benjamin Minixhofer, Tyler Murray ... Valentin Hofmann

Article
Open Access
14 Oct 2026

Competing mechanisms toughen bcc binary and medium-entropy alloys at 20 K

The mechanical properties of medium-entropy alloys at 20 K show a plateau in tensile yield strength and fracture toughness as a function of temperature, with no apparent ductile-to-brittle transition.

David H. Cook, Xiaoyu Chen ... Robert O. Ritchie

Article
07 Oct 2026

Hydrogen bonding in water under extreme confinement

A new technique allows direct nanoscale observations of the vibrational response of water confined inside carbon nanotubes, revealing that high degrees of confinement disrupt the hydrogen bond network through a fluctuating and highly-dispersed molecular state.

Xintong Xu, Matthias Kuehne ... Arun Majumdar

Article
14 Oct 2026

Rh^{3+} stabilized in KRh@MFI catalyses regioselective hydroformylation

DFT investigations combined with spectroscopic and catalytic studies of disrupted subnanometric Rh_2O_3 clusters show that Rh^+ centres in a zeolite-based catalyst are blocked with N-containing molecules, whereas Rh^{3+} sites are stabilized, allowing hydroformylation reactions with enhanced regioselectivity and efficiency.

Minjie Zhao, Reisel Millán ... Avelino Corma

Article
14 Oct 2026

Interhemispheric monsoon dynamics over the past 450,000 years

A 450 ka Andean speleothem record shows Southern and Northern Hemisphere monsoons generally vary out of phase, but occasionally synchronize during rapid climate change and glacial terminations.

E. J. Olson, D. P. Gillikin ... D. T. Rodbell

Article
Open Access
14 Oct 2026

Advancing subseasonal forecasting with machine learning

The AI framework probabilistic bias correction is shown to correct weather forecast errors 2 to 6 weeks ahead and boost forecast skill, making it promising for improved extreme-weather prediction.

Hannah Guan, Soukayna Mouatadid ... Lester Mackey

Article
Open Access
30 Sept 2026

Butterfly wing patterns in flight create powerful illusory motion cues

Butterfly wing patterns and flight dynamics work in tandem to create powerful visual illusions that confuse predators, potentially representing one of the most successful visual defence strategies in moving animals.

George R. A. Hancock, Emmanuelle S. Briolat ... Jolyon Troscianko

Article
30 Jul 2026

Somatic mutations reveal the ontogeny of microglia in human ageing

A widespread influx of myeloid cells into the healthy human brain contributes to the pool of human microglia and becomes common with ageing.

Julia A. Belk, Yaowen Zhang ... Siddhartha Jaiswal

Article
Open Access
30 Sept 2026

Prion-like transmission of human tau strains in the mouse brain

Mouse experiments show that Alzheimer's disease and corticobasal degeneration tau filaments retain their distinct structures during templated seeding, supporting strain-specific tau propagation and disease modelling.

Sofia Lövestam, Aki Shimozawa ... Sjors H. W. Scheres

Article
26 Aug 2026

Granule cells reorient cortical trajectories to separate contexts

Simultaneous imaging of premotor cortex and cerebellar granule cells in mice learning two skills in parallel shows that trajectories generalize in cortex but coherently reorient apart in granule cells, supporting generalization and separation between contexts.

Martha G. Garcia-Garcia, Michał J. Wójcik ... Mark J. Wagner

Article
Open Access
19 Aug 2026

Wake-activated neuronal populations that regulate sleep drive

Whole-brain activity mapping, targeted cell manipulations and electrophysiology in mice identify wake-activated neuronal populations that are crucial for sleep drive and can persistently reduce daily sleep amount.

William Joo, Clare Diester ... Alexander F. Schier

Article
Open Access
16 Sept 2026

Mutational constraints on RSV F and its neutralization by antibodies

How respiratory syncytial virus mutations affect antibody neutralization is defined, and a biophysical model of the mechanism is provided, to show how Fab potency and epitope specificity combine to determine the effects of viral mutations on antibody neutralization.

Cassandra A. L. Simonich, Teagan E. McMahon ... Jesse D. Bloom

Article
Open Access
07 Oct 2026

Prehistoric global migration of vanishing gut microbes with humans

Microbial species disappearing from industrialized populations have evolved with humans over millennia and migrated worldwide with them—this may have consequences for human health.

Matthew M. Carter, Zhiru Liu ... Justin L. Sonnenburg

Article
Open Access
02 Sept 2026

Functional chimeric mRNAs encode proteins in mammalian immunity

Inflammation induces interchromosomal DNA interactions that bring parent genes into close proximity, facilitating the formation of chimeric mRNAs that encode physiologically relevant, functional proteins.

Olivia Venezia, Harry Kane ... Ruaidhrí Jackson

Article
30 Sept 2026

Osteoclasts intercept meningeal lymphatic paths for dural metastasis

Osteoclast-derived angiopoietin-2 in the dura mater impairs lymphatic vessel function and weakens anti-tumour immunity against dural metastases, which offers new therapeutic approaches to restore meningeal lymphatic function through selective osteoclast targeting.

Rui Zeng, Jiaxu Zhao ... Yudan Chi

Collection: Cancer at Nature Portfolio

Article
16 Sept 2026

Mitochondrial fission factor senses and governs ferroptosis

The mitochondrial–peroxisomal fission adaptor MFF is identified as a selective pro-ferroptotic mediator, and the newly developed MFF–SPARK sensor enables high-content screening of ferroptosis-sensitizing compounds and the discovery of upstream regulators of MFF.

Songjun Dai, Xiaoyan Dai ... Qiang Zhang

Article
23 Sept 2026

A methanogen hydrolase reveals the structure of archaeal peptidoglycan

ArmA from *Methanobrevibacter smithii*, a dominant member of the human gut microbiome, is identified and characterized as a glycosyl hydrolase specific for cleaving the cell wall of methanogens, revealing an unsuspected chemical structure of archaeal peptidoglycan that includes a previously unidentified sugar.

Robert Smith, Nika Pende ... Simonetta Gribaldo

Article
Open Access
16 Sept 2026

Cohesin reshapes replication fork contacts to aid fork slowing and reversal

Cohesin-mediated loop extrusion limits sister-fork coupling and tethers nearby replication forks under replication stress, promoting fork reversal and slowing fork progression to safeguard genome stability.

Daniel González-Acosta, Daniel Giménez-Llorente ... Massimo Lopes

Article
09 Sept 2026

An operational perturbation proteomics-based virtual cell model

Temporal protein-abundance measurements from systematically perturbed breast cancer cell lines were generated to develop ProteinTalks, a virtual cell model that functions as an operational tool for diverse drug discovery tasks.

Rui Sun, Liujia Qian ... Tiannan Guo

Article
10 Aug 2026

Learning millisecond protein dynamics from what is missing in NMR spectra

Dyna-1 was trained on missing data from nuclear magnetic resonance depositions and predicts μs–ms dynamics, often linked to biological function, including enzyme catalysis and ligand binding.

Hannah K. Wayment-Steele, Gina El Nesr ... Dorothee Kern

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Amendments & Corrections

Author Correction
06 Oct 2026

Author Correction: Anodic Pd membrane H_2 extraction enhances thermochemical dehydrogenation

Rui Zeng, Julian Ufert ... Yogesh Surendranath

Editorial Expression of Concern
08 Oct 2026

Editorial Expression of Concern: Maternal gut bacteria promote neurodevelopmental abnormalities in mouse offspring

Sangdoo Kim, Hyunju Kim ... Jun R. Huh

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