



Knot exactly

Tying knots in surgical sutures requires precise amounts of force — too little force and the sutured wound will gape and leak, too much and the wound will bloat and blood flow becomes restricted. Robots can help, but their complex sensing systems are hampered in operations with limited space, such as minimally invasive surgeries. In this week's issue, Tiejiao Li and colleagues analyse the force mechanics of the simple slipknot and reveal that it can be used to transmit force mechanically to close wounds consistently without the need for electronics. The researchers — [show all](#)

Cover image: Chaoyang Zhao/Kaihang Zhang/Tiejiao Li

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This Week

Editorial

Editorial

25 Nov 2025

World leaders must find the courage to end the fossil-fuel age

Despite the weak agreement seen at the COP30 climate conference, Brazil was right to prioritize discussing the eventual phase-out of fossil fuels. Others must now help to find a way forward.

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World View

World View

26 Nov 2025

Why the world must wake up to China's science leadership

The nation's next generation of scientists and technologists will shape the coming decades.

Kerry Brown

World View

25 Nov 2025

Don't scrap climate COPs, reform them

The world needs a more agile framework for climate action, but that shouldn't mean abandoning a system that has worked for 30 years.

Knappe Ramakrishna

Research Highlights

Research Highlight

20 Nov 2025

Neanderthal DNA reveals how human faces form

Subtle genomic variations between humans and Neanderthals provide clues to how DNA shapes our facial features.

Research Highlight

24 Nov 2025

Hydrogen fuel isn't always the green choice

Using hydrogen to power road transportation and heat homes doesn't save more carbon emissions than direct electrification.

Research Highlight

20 Nov 2025

The origin of male seahorses' brood pouch

Similarities to the womb and placenta of female mammals indicate a response to common evolutionary challenges in pregnancy.

Research Highlight

20 Nov 2025

Bacterial cooperative weaves sustainable rainbow materials

Several microbial strains working together in a 'one pot' production process could provide an environmentally friendly route to clothing.

News in Focus

News

News

21 Nov 2025

Psychedelics and immortality: Nature went to a health summit starring RFK and JD Vance

The Make America Healthy Again summit, attended by health secretary Robert F. Kennedy Jr and vice-president JD Vance, gave a sense of what's driving US health policy.

Max Kozlov

News

17 Nov 2025

How obesity drugs quiet 'food noise' in the brain

Researchers have identified a neural biomarker of compulsive food cravings, and showed that it is suppressed by the weight-loss drug Mounjaro.

Mariana Lenharc

News

13 Nov 2025

How ancient humans bred and traded the first domestic dogs

Analysis of fossils and ancient genomics revealed how early human populations bred less wolf-like companions, and how they might have traded them around the world.

Evean Callaway

News

12 Nov 2025

First new type of malaria treatment in decades shows promise against drug resistance

If approved, Gantlum could be available within a year and a half, according to maker.

Mariana Lenharc

News

12 Nov 2025

Global greenhouse-gas emissions are still rising: when will they peak?

Scientists say emissions could begin to decline in the next several years. What happens in China could determine when.

Jeff Tollefson

News

13 Nov 2025

CRISPR vs cholesterol: can gene editing prevent heart disease?

Promising results from a small clinical trial highlight a growing interest in designing gene-editing treatments for common diseases.

Heidi Ledford

News

19 Nov 2025

Women seem to retract fewer papers than men — but why?

In an analysis of nearly 900 retracted medical-research studies, the number of female authors is disproportionately low.

Jenna Ahart

News

13 Nov 2025

'Tiny' AI model beats massive LLMs at logic test

Technique could be used as a cheap way to boost ability of other AI models.

Elizabeth Gibney

Features

News Feature

26 Nov 2025

ADHD diagnoses are growing. What's going on?

More children and adults are being diagnosed with ADHD in some countries. Science is helping to understand why — and how best to provide support.

Helen Pearson

News Feature

25 Nov 2025

This AI combo could unlock human-level intelligence

Blending 'old-fashioned' logic systems with the neural networks that power large language models is one of the hottest trends in artificial intelligence.

Nicola Jones

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Innovations in lymphangiography

Clinicians share imaging and interventional techniques to help identify and repair lymphatic leaks

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Books & Arts

Essay

Essay

24 Nov 2025

What is the future of intelligence? The answer could lie in the story of its evolution

The advent of artificial intelligence might be just the latest stage in a guiding biological process that has produced ever more complex, mutually dependent organisms over the history of life.

Blaise Agüera y Arcas

Book Review

Book Review

24 Nov 2025

Putting nature on the balance sheet: how to account for the ecological costs of our actions

Economists should consider forests and wetlands as well as factories and farms.

Jacobs Hochard

Book Review

24 Nov 2025

The Internet is broken and the inventor of the World Wide Web wants to fix it

Tim Berners-Lee is calling for a return to a decentralized Internet and stronger data privacy, but his arguments could be more inspiring.

Chris Stoker-Walker

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Opinion

Obituary

Obituary

17 Nov 2025

George Smoot obituary: Charismatic cosmologist who revealed ripples in the Big Bang's afterglow

Nobel laureate who mapped temperature variations in the cosmic microwave background.

Douglas Scott, Joseph Silk & Tom Broadhurst

Correspondence

Correspondence

25 Nov 2025

International environmental treaties cannot be reformed through rational design

Vito De Lucia & Jan Solski

Correspondence

25 Nov 2025

Chile must preserve international science in Antarctica

Cristóbal Gabán Malagón, Marcelo Lepepe & Paulina Balthamonde

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Universities must help students faced with the death of a supervisor

Laura Zárraga-Vergas

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Lack of funding is pushing research in Romania to extinction

Lucian Priftile

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Work

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03 Nov 2025

My funding applications are taking up too much time. How can I stay focused on my research?

A young academic in China worries that the grant-application routine is wasted effort.

Xiaoying You

Collection

[An agency aint' for working scientists](#)

Q&A

Career Q&A

06 Nov 2025

Shadow scholars: inside Kenya's multibillion-dollar fake-essay industry

Speliotagist Patricia Kingori is helping to expose content cheating by scholars in high-income countries.

Anna Moko

Where I Work

Where I Work

24 Nov 2025

Chasing crayfish and the leeches that live on them

Maria Shestina works to understand the evolutionary history of crayfish symbionts — and how they might be indicators of trouble.

Star Dimitropoulos

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Research

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26 Nov 2025

Is there lightning on Mars?

The Perseverance rover on Mars has serendipitously recorded sounds and electromagnetic signals that are characteristic of lightning in dust storms.

Daniel Mitchell

News & Views

15 Oct 2025

First known fossil hand of the hominin *Paranthropus boisei*

Hand bones from a human relative, found in Kenya, reveal features similar to those of living gorillas, complicating the evolutionary history of hand and tool manipulation.

Nicky L. Knyff & Samar M. Sydes

News & Views

25 Nov 2025

Thirty years of Bose–Einstein condensation

In 1995, two papers reported long-sought proof of an exotic state of matter — with applications in fields as diverse as quantum computing and cosmology.

Zoran Hadzibabic & Ulrich Schneider

News & Views

22 Oct 2025

Gene implicated in the heart defects associated with Down's syndrome

A search for the genes responsible for the high incidence of heart defects in children with Down's syndrome casts a light on potentially affected developmental processes.

Beverly A. Rothmel

News & Views

01 Oct 2025

Bacteria use a decoy defence molecule to set a trap for viruses

Some bacterial-infecting viruses use 'sponges' to mop up defence molecules, but bacteria can fight back by responding when a sponge captures decoy molecules.

Malcolm F. White

Articles

Article

26 Nov 2025

Detection of riboelectric discharges during dust events on Mars

The SuperCam microphone aboard the Perseverance rover captured 55 riboelectric discharges during dust events on Mars over two Martian years, providing implications for examining the planet's surface chemistry, habitability and human exploration.

Baptiste Chide, Ralph D. Lorenz & Roger C. Wiens

Article

Open Access

26 Nov 2025

Operating two exchange-only qubits in parallel

Parallel operation of two exchange-only qubits consisting of six quantum dots arranged linearly is shown to be achievable and maintaining qubit control quality compared with sequential operation, with potential for use in scaled quantum computing.

Mateusz T. Majzik, Florian Lüthi & James S. Clarke

Article

26 Nov 2025

Multi-qubit nanoscale sensing with entanglement as a resource

Controlling pairs of nitrogen vacancy centres enables the measurement of magnetic correlations below the optical diffraction limit, and the use of entangled pairs shows a linear scaling of the measurement sensitivity with readout noise, as opposed to the quadratic scaling that would be obtained with unentangled spins.

Jared Rovny, Shimon Kolkowitz & Nathalie P. de Leon

Article

26 Nov 2025

Entanglement-enhanced nanoscale single-spin sensing

An entanglement-enhanced sensing strategy making use of entangled nitrogen-vacancy pairs is described, demonstrating a 3.4-fold improvement in sensitivity and a 1.5-fold improvement in spatial resolution relative to single nitrogen-vacancy centres using optical readout.

Xu Zhou, Mengqi Wang & Jiangfeng Du

Article

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26 Nov 2025

Slipknot-gauged mechanical transmission and robotic operation

A mechanism-intelligent transmission mechanism based on the slipknot delivers precise force signals for clinical practice and robotic operations such as minimally invasive surgery and tendon-driven robotics.

Yaoxing Xue, Jiasheng Cao & Xijun Cai

Article

12 Nov 2025

Controlling pyramidal nitrogen chirality by asymmetric organocatalysis

An asymmetric organocatalytic strategy is used to control pyramidal nitrogen chirality and to synthesize the enantioselective N-chloroaziridines with a configurationally stable nitrogen stereogenic centre.

Sen Wu, Pengquan Chen & Bin Tan

Article

15 Oct 2025

Photocatalytic oxygen-atom transmutation of oxetanes

A general photocatalytic strategy is described to convert oxetanes into other useful molecules by selectively substituting the oxygen atom with a nitrogen-, sulfur- or carbon-based moiety, simplifying the synthesis of pharmaceuticals and complex drug analogues.

Ying-Qi Zhang, Shuo-Han Li & Ming Joo Koh

Article

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15 Oct 2025

Deaminative cross-coupling of amines by boron radical β -scission

A strategy is described making use of in situ activation of radical boron chemistry to convert amines to handles for cross-coupling, enabling a range of useful transformations to make and modify drug-like molecules.

Zhenhua Zhang, Giovanni Lorandi & Daniele Leonori

Article

12 Nov 2025

The contribution of rock strength to soil production

Findings from a tectonically active mountain range show that soil production is driven by bottom-up rock weakening rather than by soil thickness, challenging long-held top-down models.

Emily C. Geyman, David A. Paige & Michael P. Lamb

Article

18 Sept 2025

Global warming amplifies wildfire health burden and reshapes inequality

Global warming will intensify wildfires, boosting emissions and increasing the number of premature deaths by about sixfold globally by 2100—shifting the health burden more evenly across regions, demanding stronger international policy responses.

Junri Zhao, Bo Zheng & Qiang Zhang

Article

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18 Sept 2025

Wildfire smoke exposure and mortality burden in the USA under climate change

Smoke PM_{2.5} could result in 71,420 excess deaths per year in the USA by 2060 under the SSP3-7.0 high-warming scenario.

Minghao Qiu, Jessica Li & Marshall Burke

Article

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15 Oct 2025

New fossils reveal the hand of *Paranthropus boisei*

Analysis of newly discovered hand and foot bones of a *Paranthropus boisei* specimen provide insight into possible tool use and other palaeobiology characteristics among Plio-Pleistocene hominin species.

Carme S. Monge, Casey M. Orr & Louise N. Leakey

Article

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24 Sept 2025

The formation and propagation of human Robertsonian chromosomes

Analysis of human Robertsonian chromosomes originating from 13, 14 and 21 reveal that they result from breaks at the SST1 microsatellite DNA array and recombination between homologous sequences surrounding SST1.

Leonardo Gomes de Lima, Andra Gueiracino & Jennifer L. Gerpe

Article

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