

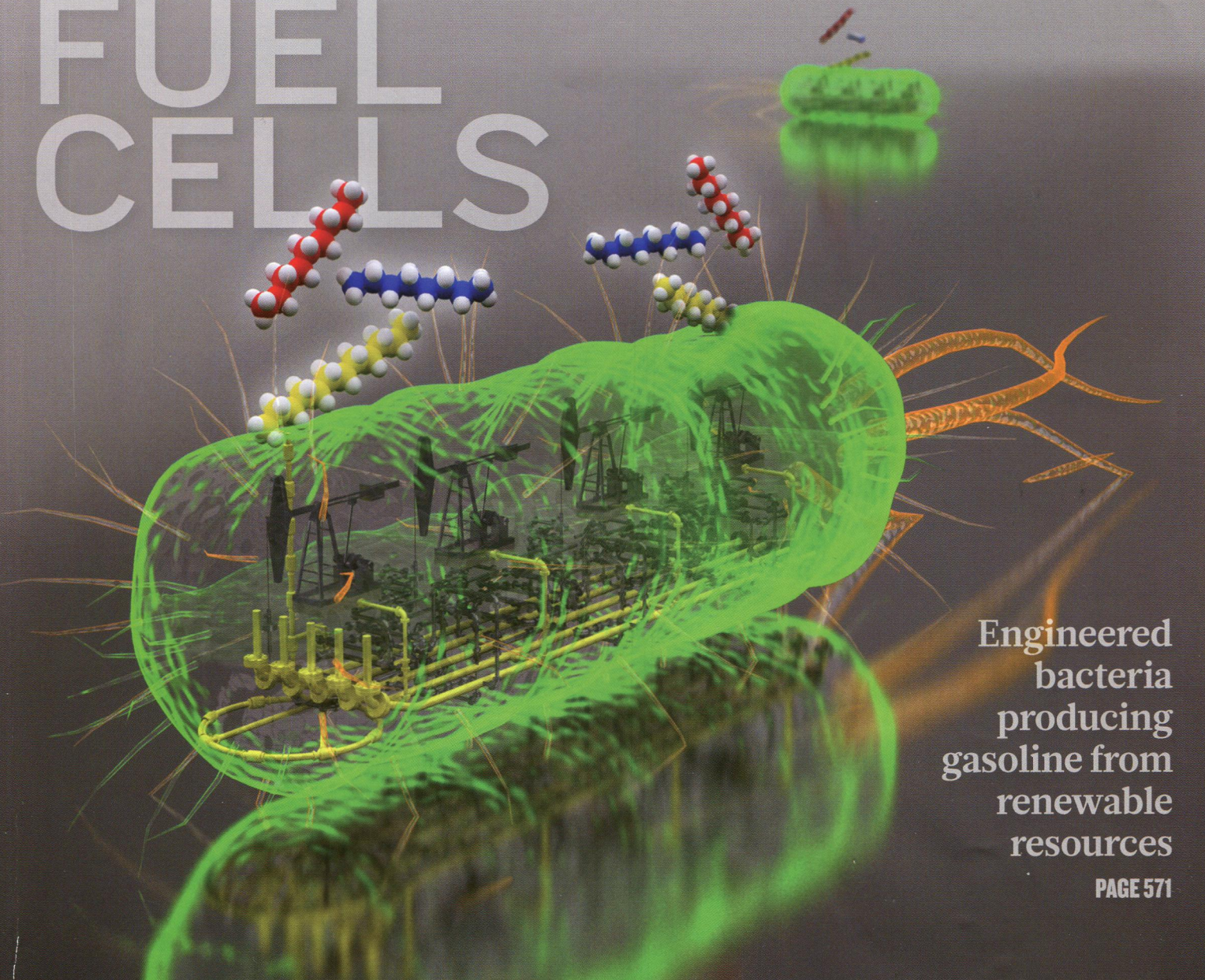
FU
N28/e

INSIGHT
Transcription and
epigenetics

nature

THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE

FUEL CELLS



Engineered
bacteria
producing
gasoline from
renewable
resources

PAGE 571

PALAEONTOLOGY

T. REX — THE TRUTH

Where the myths end and the science begins

PAGE 424

US POLICY

SHUTDOWN MELTDOWN

Antarctic research may never recover

PAGE 431

REVIEWS SPECIAL

AUTUMN BOOKS

Venter gears up, disaster physics and the joy of snakes

PAGE 436

NATURE.COM/NATURE

24 October 2013 £10

Vol. 502, No. 7472



CONTENTS

24 October 2013 / Vol 502 / Issue No 7472

THIS WEEK

EDITORIALS

409 EUROPE

High maintenance

Success cannot be allowed to breed complacency for the European Research Council

409 RESEARCH

End harassment

We must drive sexual harassment out of science

410 CHEMISTRY

Magnetic map

NMR offers insight into the black box of industrial chemistry

WORLD VIEW

411 Universities must inspire as well as teach

Rana Dajani

There is more to education than textbooks

RESEARCH HIGHLIGHTS

412 SELECTIONS FROM THE SCIENTIFIC LITERATURE

The face of the Florida panther / Skin-cell rhythms / Ultra-hard nickel / A microbial corpse clock / Tying light up in knots

SEVEN DAYS

414 THE NEWS IN BRIEF

UN sets up science panel / GOCE mission comes to an end / Massive meteorite fragment found in Russian lake / Declaration of Helsinki is revised

CAREERS

581 PROFESSIONAL SOCIETIES

Come together

Professional bodies can provide networking contacts for young researchers

583 COLUMN

A good investment

Self-knowledge is an important asset when working out what to do next

NATURE JOBS ADVERTISING FEATURE

Spotlight on postgraduate opportunities

NEWS IN FOCUS

417 DRUG REGULATION

US executions halted in row over use of common anaesthetic

418 PUBLISHING

South American open-access project celebrates 15th birthday

419 POLITICS

US researchers uneasy about funding future in wake of government shutdown

420 FISHERIES POLICY

Maritime battle erupts over European fisheries subsidies

421 PHYSICS

LUX experiment prepares to reveal results of hunt for dark matter

422 ATMOSPHERIC SCIENCE

Sensor for planes to detect volcanic ash is put through its paces

FEATURES

424 PALAEOLOGY

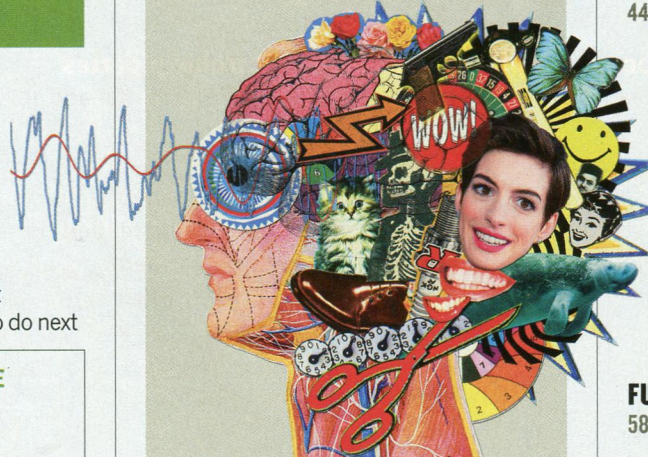
The truth about *T. rex*

Palaeontologists are getting to grips with the secrets of this formidable predator

BRAIN DECODING

Reading minds

Scanning the brain opens a window into thoughts and dreams **PAGE 428**



COMMENT

431 US POLITICS

The long shadow of the shutdown

Gretchen E Hofmann

When the US government faltered, young Antarctic researchers took a hit

433 FUNDING

Set research priorities in a time of recession

Patrick Cunningham

Governments must put first things first when money is tight, but how to choose?

AUTUMN BOOKS

436 GENETICS

The genetic watchmaker

Nathaniel Comfort

438 DISASTER MANAGEMENT

Preparing for the worst

Roger Bilham

439 RADIO ASTRONOMY

Finger on the pulsar

Bernie Fanaroff

441 PHYSICS

Science under the Nazis

Robert P Crease

442 BIOLOGY

The love of pit vipers

Stuart Pimm

444 ECONOMICS

Fixing the climate odds

Gail Whiteman

445 HISTORY OF SCIENCE

Science spun on the Silk Road

Christopher I Beckwith

446 PSYCHIATRY

America the traumatized

Andrea Tone

CORRESPONDENCE

448 In praise of the patent / Traditional cheese and conservation / Quality control for scientific software

OBITUARY

449 Ronald Harry Coase (1910–2013)

Robert Hahn

FUTURES

586 How cherry coke saved my life

Dawn Bonanno

CONTENTS

24 October 2013 / Vol 502 | Issue No 7472

RESEARCH

NEW ONLINE

451 Papers published this week at nature.com

NEWS & VIEWS

452 PALAEOANTHROPOLOGY

Small-brained and big-mouthed

A fifth, and complete, hominin cranium from Dmanisi
Fred Spoor

453 ASTROPHYSICS

Recipe for regularity

The far-infrared–radio correlation for galaxies actively forming stars
Ellen Zweibel

454 PHYSIOLOGY

A metabolic minuet

Circadian coordination of fat metabolism by a blood lipid
David D Moore [SEE LETTER P.550](#)

455 APPLIED PHYSICS

Materials scientists take control

A new way of controlling the Ruddlesden–Popper series of structures
Melanie W Cole [SEE LETTER P.532](#)

457 PALAEOONTOLOGY

Inside-out turned upside-down

Conodont elements may have evolved convergently to vertebrate teeth
Philippe Janvier [SEE LETTER P.546](#)

458 INORGANIC CHEMISTRY

A reducing role for boron

Carbon monoxide molecules coupled together by a non-metal
Polly L Arnold

459 ASTRONOMY

New distance record for galaxies

Discovery of a galaxy at a cosmic age of just 700 million years
Dominik A Riechers [SEE LETTER P.524](#)

ARTICLES

507 **NEUROSCIENCE** Odour receptors and neurons for DEET and new insect repellents
P Kain et al.

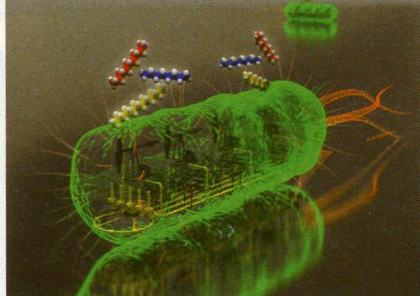
513 **STEM CELLS** Spatial organization within a niche as a determinant of stem-cell fate
P Rompolas, KR Mesa & V Greco

519 **MOLECULAR BIOLOGY** The structure of the box C/D enzyme reveals regulation of RNA methylation
A Lapinaite et al.

ON THE COVER

Fuel cells

Conventional fossil oil production contrasts with the metabolic route. Engineered *E. coli* can produce free fatty acids, esters and alcohols as well as the short-chain alkanes nonane and decane, ideal as fuels and for use in chemical synthesis. [PAGE 571](#)



LETTERS

524 **ASTRONOMY** A galaxy rapidly forming stars 700 million years after the Big Bang at redshift 7.51
S L Finkelstein et al. [SEE N&V P.459](#)

528 **SUPERCONDUCTIVITY** Interface superconductor with gap behaviour like a high-temperature superconductor
C Richter et al.

532 **ELECTRONIC MATERIALS** Exploiting dimensionality and defect mitigation to create tunable microwave dielectrics
C-H Lee et al. [SEE N&V P.455](#)

537 **CHEMISTRY** Thermal maps of gases in heterogeneous reactions
N N Jarenwattananon et al.

541 **CLIMATE SCIENCES** Robust twenty-first-century projections of El Niño and related precipitation variability
S Power, F Delage, C Chung, G Kociuba & K Keay

546 **PALAEOONTOLOGY** The origin of conodonts and of vertebrate mineralized skeletons
D J E Murdock et al. [SEE N&V P.457](#)

550 **PHYSIOLOGY** A diurnal serum lipid integrates hepatic lipogenesis and peripheral fatty acid use
S Liu et al. [SEE N&V P.454](#)

555 **PLANT DEVELOPMENT** The maize *Ga* gene *COMPACT PLANT2* functions in *CLAVATA* signalling to control shoot meristem size

P Bommert, B I Je, A Goldshmidt & D Jackson

559 **VIROLOGY** Human MX2 is an interferon-induced post-entry inhibitor of HIV-1 infection

C Goujon et al.

563 **VIROLOGY** MX2 is an interferon-induced inhibitor of HIV-1 infection

M Kane et al.

567 **CELL BIOLOGY** α TAT1 catalyses microtubule acetylation at clathrin-coated pits

G Montagnac et al.

571 **METABOLIC ENGINEERING** Microbial production of short-chain alkanes

Y J Choi & S Y Lee

575 **STRUCTURAL BIOLOGY** Adrenaline-activated structure of β_2 -adrenoceptor stabilized by an engineered nanobody

A M Ring et al.

580 **CORRIGENDUM** APOBEC3B is an enzymatic source of mutation in breast cancer

M B Burns et al.

580 **CORRIGENDUM** Calving fluxes and basal melt rates of Antarctic ice shelves

M A Depoorter et al.

580 **CORRIGENDUM** Dietary intervention impact on gut microbial gene richness

A Cotillard et al.

PLANT DEVELOPMENT

Shoot now

The signals that govern shoot meristem activity in maize. [PAGE 555](#)

