CONTENTS

30 July 2015 / Vol 523 / Issue No 7562

THIS WEEK

EDITORIALS

501 ENVIRONMENTAL SCIENCE

Tropical protection

The palm-oil industry must start acting on environmental-protection pledges

501 BIOSECURITY

Secret service

US government labs need more transparent oversight

502 OUTBREAKS

Realistic risks

Infectious diseases will remain a threat until society assesses risks properly

WORLD VIEW

503 Faith and science can find common ground

David M Lodge

The Pope is well placed to bridge the gap between science and religion

RESEARCH HIGHLIGHTS

504 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Qubits controlled / Death by boa / Miniature stomachs / Reporting a null result / Origami goes large / The most distant galaxy yet



SEVEN DAYS

506 THE NEWS IN BRIEF

Japan space agency issues call for asteroid names / UK eases pesticide ban / Head of BGI steps down

CAREERS

627 EXTRAMURAL WORK

To serve or not to serve

The pitfalls and benefits of serving on committees

629 TURNING POINT

Working on a US-wide project is time consuming, but worth it, says postdoc ecologist Heather Schneider

NEWS IN FOCUS



509 DRUG DEVELOPMENT

Alzheimer's drugs start to show success

510 GLACIOLOGY

NASA launches six-year air-and-water project to study Greenland's fjords

511 PLANETARY SCIENCE

Kepler telescope finds world with conditions that could support life

512 ANTHROPOLOGY

Neanderthal genes shaped human biology

513 POLITICS

Deadline looms for US budget deal

514 COSMOLOGY

Observatory to spy on teenage Universe

FEATURES



EVIDENCE-BASED MEDICINE

Checklists in trouble

Pre-surgery checks have had mixed success in saving lives PAGE 516

520 STEM-CELL MEDICINE

Rise of the organoids

Mini kidneys, livers, brains and guts are teaching biologists about development

COMMENT

523 HISTORY

From blackboards to bombs

David Kaiser

The surprising legacy of the 'physicists' war'

526 POLICY

Define biomass sustainability

Roeland Bosch, Mattheüs van de Pol & Jim Philp

The world needs to agree on key criteria for prioritization in the bioeconomy

BOOKS & ARTS



528 HOLIDAY READING

Summer books

Nature regulars share their getaway picks — and there's more online

CORRESPONDENCE

531 Palaeo-tourism in South Africa / Tree rings and climate / Teaching evolution / Socially responsible universities

OBITUARY

532 Irwin Allan Rose (1926–2015) Keith Wilkinson & Avram Hershko

FUTURES

632 The shoulder of Orion

Eric Garside



CONTENTS

30 July 2015 / Vol 523 / Issue No 7562

RESEARCH

NEW ONLINE

533 Papers published this week at nature.com

NEWS & VIEWS

534 SUSTAINABILITY

Bypassing the methane cycle A high-starch, low-methane transgenic rice variety Paul L E Bodelier SEE LETTER P.602

535 INORGANIC CHEMISTRY

Movies of a growth mechanism Real-time observations of crystallizing metal-organic frameworks Krista S Walton

536 MATERIALS SCIENCE

Composite for energy storage takes the heat

A composite material acts as a high-temperature dielectric Harry J Ploehn SEE LETTER P.576

538 STRUCTURAL BIOLOGY

Arresting developments in receptor signalling

The structure of the GPCR rhodopsin in complex with arrestin-1 Jeffrey L Benovic SEE ARTICLE P.561

539 GENETICS OF DISEASE

Associations with depression Genetic associations with major depressive disorder in Chinese women Patrick F Sullivan SEE LETTER P.588

540 OPHTHALMOLOGY

Cataracts dissolved Lanosterol may offer a non-surgical

treatment for cataracts J Fielding Hejtmancik SEE LETTER P.607

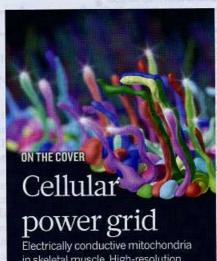
541 STRONG-FIELD PHYSICS

Harmonic radiation from crystals Tunnelling electrons in a crystal interfere and drive light emission Peter Hommelhoff & Takuya Higuchi

SEE LETTER P.572

ARTICLES

- 543 GEOCHEMISTRY Timing and climate forcing of volcanic eruptions for the past 2,500 years M Sigl et al.
- 550 MICROBIOLOGY Metabolic codependence gives rise to collective oscillations within biofilms J Liu et al.



in skeletal muscle. High-resolution microscopy shows that as well as generating energy, mitochondria have a role in its distribution, forming a conductive pathway throughout the cell in the form of a proton motive force. This network is potentially rapid enough to enable muscle to respond almost instantaneously to new energy demands, PAGE 617

- 555 STRUCTURAL BIOLOGY Biogenesis and structure of a type VI secretion membrane core complex E Durand et al.
- 561 STRUCTURAL BIOLOGY Crystal structure of rhodopsin bound to arrestin by femtosecond X-ray laser Y Kang et al. SEE N&V P.538

LETTERS

- 568 SPACE PHYSICS Magnetospherically driven optical and radio aurorae at the end of the stellar main sequence G Hallinan et al.
- 572 QUANTUM PHYSIS Real-time observation of interfering crystal electrons in high-harmonic generation M Hohenleutner et al. SEE N&V P.541
- 576 POLYMER CHEMISTRY Flexible hightemperature dielectric materials from polymer nanocomposites O Li et al. SEE N&V P.536
- 580 PALAEOCEANDGRAPHY Onset of Antarctic Circumpolar Current 30 million years

- ago as Tasmanian Gateway aligned with westerlies H D Scher et al.
- 584 PALAEONTOLOGY A Middle Triassic stem-turtle and the evolution of the turtle body plan R R Schoch & H-D Sues
- 588 GENETICS Sparse whole-genome sequencing identifies two loci for major depressive disorder CONVERGE consortium SEE N&V P.539
- 592 NEUROSCIENCE Impermanence of dendritic spines in live adult CA1 hippocampus A Attardo, J E Fitzgerald & M J Schnitzer
- 597 STEM CELLS Parent stem cells can serve as niches for their daughter cells A Pardo-Saganta et al.
- 602 PLANT BREEDING Expression of barley SUSIBA2 transcription factor yields high-starch low-methane rice J Su et al. SEE N&V P.534
- 607 VISION DISORDERS Lanosterol reverses protein aggregation in cataracts L Zhao et al. SEE N&V P.540
- 612 IMMUNOLOGY T-cell exhaustion, co-stimulation and clinical outcome in autoimmunity and infection E F McKinney, J C Lee, D R W Jayne, PA Lyons & KGC Smith
- 617 BIDCHEMISTRY Mitochondrial reticulum for cellular energy distribution in muscle B Glancy et al.
- MOLECULAR BIOLOGY Molecular basis for 5-carboxycytosine recognition by RNA polymerase II elongation complex L Wang et al.
- 626 RETRACTION Integrative genomics identifies APOE £4 effectors in Alzheimer's disease H Rhinn et al.
- 626 CORRIGENDUM Divergent reprogramming routes lead to alternative stem-cell states PD Tonge et al.
- 626 CORRIGENDUM Genome-wide characterization of the routes to pluripotency S M I Hussein et al.