# CONTENTS

7 February 2013 / Vol 494 / Issue No 7435

#### THIS WEEK

#### **EDITORIALS**

HEALTH

#### Unknown territory

Japan should beware loopholes as it begins to regulate stem-cell therapies

#### **NUCLEAR WASTE**

#### In a hole

Going underground is the only viable choice for storing nuclear waste

#### ARCHAEOLOGY

#### Body of evidence

Those who discovered the remains of Richard III deserve their time in the sun



#### **WORLD VIEW**

7 Genetic privacy needs a more nuanced approach Misha Angrist There are advantages to having your genomic details in the public domain

#### RESEARCH HIGHLIGHTS

SELECTIONS FROM THE SCIENTIFIC LITERATURE Bacterial gold / Mosquito rivalry / Risk

factors for malnutrition / Jet stream on the move / Clock-watching ribosomes / Cats on the prowl / Handy neutrons

#### SEVEN DAYS

#### 10 THE NEWS IN BRIEF

US seeks to ease immigration laws / Antisense drug wins approval / US collider marked for possible closure / Pfizer spins out animal-health business / Steven Chu steps down / TB vaccine fails clinical trial

#### CAREERS

#### 137 COMMUNICATION

#### Two minutes to impress

Researchers need a pitch short enough to deliver in an elevator ride

#### 139 TURNING POINT

Even high-school students can do worthwhile research, says theoretical physicist Yogesh Joglekar

139 CAREER BRIEFS

### NEWS IN FOCUS

## EARTH SCIENCE

Landsat 8 prepares for liftoff

#### **NUCLEAR ENERGY**

Evidence of geological faults rattle Japan's plans to restart reactors

#### CHEMICAL SAFETY

Hydrogen fluoride leaks raise questions about safety in South Korean industry

#### PARTICLE PHYSICS

Researchers face busy schedule as LHC shuts down for maintenance

#### UNIVERSITIES

UCSF's Mission Bay campus seeks ways to combat lean financial climate

#### DRUG DEVELOPMENT

Public-private consortium aims to re-energize Europe's drug industry

#### **FEATURES**

22 ECOLOGY

#### Survival of the flexible

Extremes of heat and cold could spell the end for tropical species that have had little exposure to either



#### TRANSLATIONAL SCIENCE

## Medicine man

Christopher Austin's bid to jump-start drug discovery PAGE 24

#### TECHNOLOGY

131 CANCER

## Tracking metastasis and tricking

New technologies are being used to predict the movement of metastatic cells - and to destroy them

#### COMMENT



## Ten cool questions

Ice is central to the workings of the planet yet it still has too many mysteries, says Thorsten Bartels-Rausch PAGE 27

#### 29 ENERGY

#### Build a biomass energy market

Heinz Kopetz

Incentives from government are crucial for making the most of biofuels

#### **BOOKS & ARTS**

32 IN RETROSPECT

On Growth and Form

Philip Ball

33 BOOKS IN BRIEF

Chronicler of conflict

Richard Rhodes in conversation about nuclear weapons and the Spanish Civil War

#### CORRESPONDENCE

The Royal Institution matters / Vital statistics / Bogus species / We've got enough colliders

Brigitte Askonas (1923-2013) Anne O'Garra

### **FUTURES**

142 Local 623

Donald S Crankshaw

# CONTENTS

7 February 2013 / Vol 494 / Issue No 7435

#### RESEARCH

#### **NEW ONLINE**

39 Papers published this week at nature.com

#### **NEWS & VIEWS**

40 FORUM: MICROBIOLOGY
The life beneath our feet
Comparing approaches to identify and characterize soil microorganisms
Janet K Jansson; James I Prosser

#### 43 SOLID-STATE PHYSICS

A new spin on spintronics Reconfigurable computing blocks based on semiconductor junctions Sayeef Salahuddin SEE LETTER P.72

#### 44 NEUROSCIENCE

Salty sensations Identification of TMC proteins as salt sensors in C. elegans Bertrand Coste & Ardem Patapoutian

SEE LETTER P.95

45 FUNGAL BIOLOGY
Multiple mating strategies
Isolation of haploid strains of the
pathogen C. albicans
Neil A R Gow SEE ARTICLE P.55

#### 46 ASTROPHYSICS

Going supernova

Outburst from a massive star 40 days before it exploded as a supernova Alexander Heger SEE LETTER P.65

#### REVIEW

49 PHYSICS Spin-orbit coupling in quantum gases V Galitski & I B Spielman

#### ARTICLES

- 55 FUNGAL GENETICS The 'obligate diploid' Candida albicans forms matingcompetent haploids MA Hickman et al. SEE N&V P.45
- 60 IMMUNOLOGY Structural basis for viral 5'-PPP-RNA recognition by human IFIT proteins
  Y M Abbas, A Pichlmair, M W Górna, G Superti-Furga & B Nagar

#### **LETTERS**

65 ASTRONOMY An outburst from a massive star 40 days before a supernova explosion E O Ofek et al. SEE N&V P.46

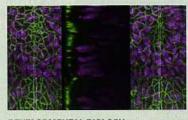


- 68 APPLIED PHYSICS Reconstructing state mixtures from diffraction measurements P Thibault & A Menzel
- 72 APPLIED PHYSICS Magneticfield-controlled reconfigurable semiconductor logic S Joo et al. SEE N&V P.43
- 77 INFORMATION TECHNOLOGY Towards practical, high-capacity, low-maintenance information storage in synthesized DNA N Goldman et al.
- 81 CLIMATE SCIENCE Northern Hemisphere forcing of Southern Hemisphere climate during the last deglaciation F He et al.
- 86 ECOLOGY Diversity loss with persistent human disturbance increases vulnerability to ecosystem collapse A S MacDougall, K S McCann, G Gellner & R Turkington
- 95 NEUROBIOLOGY tmc-1 encodes a sodium-sensitive channel required for salt chemosensation in C. elegans M Chatzigeorgiou, S Bang, S W Hwang & W R Schafer SEE N&V P.44

- 100 STEM CELLS Negligible immunogenicity of terminally differentiated cells derived from induced pluripotent or embryonic stem cells R Araki et al.
- 105 CARDIOVASCULAR BIOLOGY Studying arrhythmogenic right ventricular dysplasia with patient-specific iPSCs C Kim et al.

GRASS FIRE (DARIUSH M/SHUTTERST

- 111 DISEASE Obesity-induced overexpression of miR-802 impairs glucose metabolism through silencing of Hnf1b J-W Kornfeld et al.
- 116 IMMUNDLOGY Microbiota restricts trafficking of bacteria to mesenteric lymph nodes by CX<sub>3</sub>CR1<sup>hi</sup> cells G E Diehl et al.
- 121 BIOCHEMISTRY ATP-directed capture of bioactive herbal-based medicine on human tRNA synthetase H Zhou, L Sun, X-L Yang & P Schimmel
- 125 DEVELOPMENT Mitotic cell rounding accelerates epithelial invagination T Kondo & S Hayashi
- 130 CORRIGENDUM The zebrafish dorsal axis is apparent at the four-cell stage A V Gore et al.
- is tuned for proliferation and vulnerable to disruption
  A Schulze & A L Harris
- 130 ERRATUM Making sense of palaeoclimate sensitivity PALAEOSENS Project Members



DEVELOPMENTAL BIOLOGY

# Round trip

Cell shape is a key factor in mitotic cells in the early embryo. PAGE 125