CONTENTS

6 March 2014 / Vol 507 / Issue No 7490

THIS WEEK

EDITORIALS

7 HEALTH CARE

Careless.data

England must take its time and ensure that it gets its medical database right

8 POLICY

Full disclosure

US politicians should not fear transparency over conflicts of interest

8 PUBLISHING

Track and trace

Open ID project gears up to include tracking of grant money

WORLD VIEW

Scientific research must take gender into account

Londa Schiebinger Ignoring the differences between the sexes can be a matter of life and death



RESEARCH HIGHLIGHTS

10 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Serpin-promoted cancer / Magnetic biotechnology / Stretch the spectrum / Cheese past its best / L1 jumping gene in schizophrenia / Nematodes reach new heights

SEVEN DAYS

12 THE NEWS IN BRIEF

Switzerland loses Horizon 2020 status / Snow satellite launched / Publishers pull gibberish papers / Namibian bones sent home

CAREERS

129 CHINA

At a crossroads

Chinese institutions are keen to tempt expat researchers back home

131 COLUMN

A powerful narrative

Yoshimi Rii

What's good enough for communication between scientists is not good enough for presentation to a broader public

NEWS IN FOCUS

15 NUCLEAR POLICY

US seeks fresh ways to deal with radioactive waste

16 NUCLEAR ENERGY

Japan struggles to forge a future free from nuclear power



18 ENVIRONMENTAL HEALTH

Change to silica-exposure rules sparks conflict-of-interest debate in US Senate

19 DIAGNOSTICS

Non-invasive prenatal tests come of age

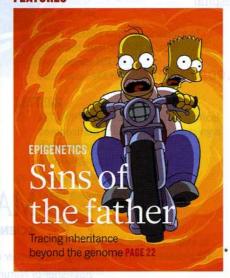
20 PALAEONTOLOGY

Brazil digs in over illegal fossil trade

21 CANCER DRUGS

Revamped US trial network falters under budget pressures

FEATURES



26 MATERIALS SCIENCE

A better battery

Chemists are powering their way towards cheaper rechargeable cells

COMMENT



29 PHYSICS

Broaden the search for dark matter

Mario Livio & Joe Silk
Particle physicists and astronomers
need to cooperate more in their quest

32 AGRICULTURE

Steps to sustainable livestock

Mark C Eisler et al.
With better husbandry and breeding, ruminants can be more effective at feeding the world

BOOKS & ARTS

36 FICTION

The cryptic mind Li Gong

37 BOOKS IN BRIEF

38 PALAEONTOLOGY

Migrant nation Ewen Callaway

39 Q&A

Concrete conservator

Andrea Hamilton on restoring dams, nuclear waste storage and Gaudí architecture

CORRESPONDENCE

40 Ivory trade unchecked / GDP and its rivals / Multiple causes of addiction



6 March 2014 / Vol 507 / Issue No 7490

RESEARCH

NEW ONLINE

Papers published this week at nature.com

NEWS & VIEWS

42 EARTH SCIENCE

Missing link in mantle dynamics Discovery of disclinations in the mantle mineral olivine

Greg Hirth SEE ARTICLE P.51

BIOLOGICAL TECHNIQUES

Wrapped around the heart

A three-dimensional membrane for multifunctional cardiac monitoring Colleen E Clancy & Yang K Xiang

PLANT SCIENCE

How to switch affinity

The structure of the nitrate transporter NRT1.1 Yi-Fang Tsay SEE ARTICLES P.68 & P.73

OPTOMECHANICS

Hardware for a quantum network

Converting radio-frequency electrical signals into laser light Mika A Sillanpää & Pertti J Hakonen SEE LETTER P.81

INFLUENZA

Prediction is worth a shot

Viral clade frequencies predicted from strain-fitness estimates Katia Koelle & David A Rasmussen

SEE ARTICLE P.57

Inflammation lights the way to metastasis

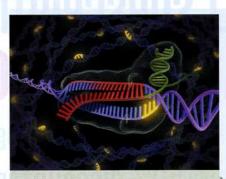
UV radiation promotes melanoma-cell angiotropism and metastasis Seth B Coffelt & Karin E de Visser SEE LETTER P.109

ARTICLES

- **EARTH SCIENCE Disclinations provide** the missing mechanism for deforming olivine-rich rocks in the mantle P Cordier et al. SEE N&V P.42
- VIROLOGY A predictive fitness model for influenza MŁuksza & M Lässig SEE N&V P.47

BIOPHYSICS DNA interrogation by the CRISPR RNA-guided endonuclease Cas9

> S H Sternberg, S Redding, M Jinek, E C Greene & J A Doudna



Make the cut

CRISPR/Cas9-based DNA targeting is a leading genome editing tool. Single-molecule and bulk biochemical experiments highlight the role of a trinucleotide protospacer adjacent motif (PAM; yellow in cover image) in recruiting Cas9-RNA complexes to potential DNA target sites, and in catalytically activating the Cas9 nuclease. PAGE 62

- PLANT SCIENCE Molecular basis of nitrate uptake by the plant nitrate transporter NRT1.1 J L Parker & S Newstead
 - SEE N&V P.44
- PLANT SCIENCE Crystal structure of the plant dual-affinity nitrate transporter NRT1.1 J Sun et al. SEE N&V P.44

LETTERS

- ASTROPHYSICS Change in the chemical composition of infalling gas forming a disk around a protostar N Sakai et al.
- 81 OPTOMECHANICS Optical detection of radio waves through a nanomechanical transducer T Bagci et al. SEE N&V P.45
- 86 MATERIALS SCIENCE Self-assembly of hydrogen-bonded two-dimensional quasicrystals N A Wasio et al.
- ECOLOGY Rate of tree carbon accumulation increases continuously with tree size

N L Stephenson et al.

- **NEUROSCIENCE Sensory-motor** transformations for speech occur bilaterally G B Cogan et al.
- **STEM CELLS Cell-autonomous** correction of ring chromosomes in human induced pluripotent stem cells M Bershteyn et al.
- 104 STEM CELLS Citrullination regulates pluripotency and histone H1 binding to chromatin M A Christophorou et al.
- 109 CANCER Ultraviolet-radiation-induced inflammation promotes angiotropism and metastasis in melanoma T Bald et al. SEE N&V P.48
- MICROBIOLOGY Sulphoglycolysis in Escherichia coli K-12 closes a gap in the biogeochemical sulphur cycle K Denger et al.
- 118 IMMUNOLOGY Polarized release of T-cell-receptor-enriched microvesicles at the immunological synapse K Choudhuri et al.
- 124 PLANT SCIENCE SRA- and SET-domaincontaining proteins link RNA polymerase V occupancy to DNA methylation L M Johnson et al.

MATERIALS SCIENCE

Shaping up

Novel cyclic pentamers, a new type of quasicrystal made from a ferrocene carboxylic acid monolayer. PAGE 86

