

CONTENTS

16 April 2015 / Vol 520 / Issue No 7547

THIS WEEK

EDITORIALS

263 POLICY

Close the deal

The chance of a nuclear agreement with Iran should not be missed

263 MEDICAL RESEARCH

Numbers matter

Quality control is key to ensuring that animal experiments suit their purpose

264 ANNOUNCEMENT

Time to tackle cells' mistaken identity

The veracity of cell lines used in experiments needs to be assured



WORLD VIEW

265 Scientists must speak up on fossil-fuel divestment

Alan Rusbridger

It is time for philanthropic organizations to act on carbon emissions

RESEARCH HIGHLIGHTS

266 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Two 'hot' neutrinos / Skin microbes pictured / Fishing exacerbates population decline / Hashtag happy / Asia's dirty air / Keeping spacecraft cool / San Andreas faults linked

SEVEN DAYS

268 THE NEWS IN BRIEF

Ebola drug trials restart / California launches precision-medicine initiative / Brazil approves GM eucalyptus / Lifeline for endangered voles

CAREERS

395 GLACIOLOGY

Climatology on thin ice

To do research on ice cores, first you must find your ice

397 TURNING POINT

With US funding squeezed, now is a good time to head for India, says Arun Shukla

NATURE JOBS ADVERTISING FEATURE

Spotlight on cancer research

NEWS IN FOCUS



271 MEDICAL RESEARCH

UK funders act to increase statistical power of animal experiments

272 POLICY

Reforms to health agency worry Canadian scientists

273 3D PRINTING

Printed body parts come of age

274 IRAN NEGOTIATIONS

Nuclear deal promises bonus for Iranian physicists

275 CAREERS

Female scientists find favour in tenure-track hiring experiment

276 REPRODUCIBILITY

Publishers put computational code under scrutiny

FEATURES

278 CANCER

The Ras renaissance

Drug developers make progress in a bid to target a notorious family of cancer-causing proteins

HUBBLE AT 25

Voices of Hubble

The story behind the highs and lows of the venerable space telescope

PAGE 282

TECHNOLOGY

389 CANCER

A most exceptional response

Patients responding unexpectedly well to antitumour therapy could point the way towards novel therapies

COMMENT

287 HUBBLE AT 25

Hubble's legacy

Mario Livio

Space exploration must be bold in the face of tight budgets



CANCER

Tight focus

Harness the power of precision medicine in the fight against cancer, says Mark A Rubin [PAGE 290](#)

BOOKS & ARTS

292 DATA VISUALIZATION

Mapping the topical space

Rikke Schmidt Kjærgaard

293 BOOKS IN BRIEF

294 Q&A

Geological historian

Geologist John Henry celebrates William Smith's famous 1815 map 'England and Wales with part of Scotland'



CORRESPONDENCE

295 ELI looms large in Romanian budget / Antibody validation / Keep to the facts on GM / The zero-carbon lab / Modern botany

FUTURES

400 The buyout

Ananyo Bhattacharya

CONTENTS

16 April 2015 / Vol 520 / Issue No 7547

RESEARCH

NEW ONLINE

- 297 Papers published this week at nature.com

NEWS & VIEWS

298 CANCER

The complex seeds of metastasis
Unravelling the dynamic evolution of prostate-cancer metastasis
Michael M Shen **SEE LETTER P.353**

299 PLANETARY SCIENCE

A new recipe for Earth formation
Effects of adding highly chemically reduced material to the early Earth
Richard W Carlson **SEE LETTER P.337**

300 CANCER

An extravascular route for tumour cells
Two anticoagulants promote vascular mimicry in breast-cancer cells
Mary J C Hendrix **SEE LETTER P.358**

302 ORGANIC CHEMISTRY

Streamlining drug synthesis
Fully continuous, multistep flow synthesis of an anti-inflammatory drug
Joel M Hawkins **SEE LETTER P.329**

303 PARTICLE PHYSICS

A weighty mass difference
Neutron-proton mass difference calculated from fundamental theories
Frank Wilczek

304 ECOLOGY

Recovering the potential of coral reefs
Fish declines in coral reefs can be reversed by managing fishing
Nicholas K Dulvy & Holly K Kindsvater
SEE LETTER P.341

ANALYSIS

- 307 **CELL BIOLOGY** A resource for cell line authentication, annotation and quality control
M Yu et al.

ARTICLES

- 312 **STRUCTURAL BIOLOGY** Crystal structures of the human adiponectin receptors
H Tanabe et al.
- 317 **STRUCTURAL BIOLOGY** Two disparate ligand-binding sites in the human P2Y₁ receptor
D Zhang et al.

ON THE COVER

Positive ID

Many cultured cell lines, cancer cells included, are contaminated, wrongly annotated or mislabelled. Richard Neve and colleagues present authentication and annotation data for over 3,500 cell lines as a reference point for genetic methods of cell annotation. In parallel, we outline a new publication policy designed to increase the scrutiny around cell line identity problems. **PAGES 307 & 264**



LETTERS

- 322 **ASTROPHYSICS** Nuclear ashes and outflow in the eruptive star Nova Vul 1670
T Kamiński et al.
- 325 **ELECTROCHEMISTRY** An ultrafast rechargeable aluminium-ion battery
M-C Lin et al.
- 329 **ORGANIC CHEMISTRY** Multistep continuous-flow synthesis of (R)- and (S)-rolipram using heterogeneous catalysts
T Tsubogo, H Oyamada & S Kobayashi
SEE N&V P.302
- 333 **PALAEOCLIMATE** Icebergs not the trigger for North Atlantic cold events
S Barker et al.
- 337 **GEOCHEMISTRY** A Mercury-like component of early Earth yields uranium in the core and high mantle ¹⁴²Nd
A Wohlers & B J Wood **SEE N&V P.299**
- 341 **ECOLOGY** Recovery potential of the world's coral reef fishes
M A MacNeil et al. **SEE N&V P.304**
- 345 **HUMAN BEHAVIOUR** Emotional learning selectively and retroactively strengthens memories for related events
J E Dunsmoor, V P Murty, L Davachi & E A Phelps
- 349 **NEUROSCIENCE** Thirst driving and suppressing signals encoded by distinct neural populations in the brain
Y Oka, M Ye & C S Zuker
- 353 **CANCER GENOMICS** The evolutionary history of lethal metastatic prostate cancer
G Gundem et al. **SEE N&V P.298**
- 358 **BREAST CANCER** A model of breast cancer heterogeneity reveals vascular mimicry as a driver of metastasis
E Wagenblast et al. **SEE N&V P.300**
- 363 **CANCER METABOLISM** SHMT2 drives glioma cell survival in ischaemia but imposes a dependence on glycine clearance
D Kim et al.
- 368 **CANCER THERAPY** Therapy-induced tumour secretomes promote resistance and tumour progression
A C Obenaus et al.
- 373 **TUMOUR IMMUNOLOGY** Radiation and dual checkpoint blockade activate non-redundant immune mechanisms in cancer
C Twyman-Saint Victor et al.
- 378 **CANCER MODELS** *Theileria* parasites secrete a prolyl isomerase to maintain host leukocyte transformation
J Marsolier et al.
- 383 **ANTIBIOTICS** β -Lactam formation by a non-ribosomal peptide synthetase during antibiotic biosynthesis
N M Gaudelli, D H Long & C A Townsend
- 388 **ERRATUM** A new antibiotic kills pathogens without detectable resistance
L L Ling et al.
- 388 **CORRIGENDUM** Endocrinization of FGF1 produces a neomorphic and potent insulin sensitizer
J M Suh et al.
- 388 **CORRIGENDUM** Human gut Bacteroidetes can utilize yeast mannan through a selfish mechanism
F Cuskin et al.

