

CONTENTS

3 May 2018 / Vol 557 / Issue No 7703

THIS WEEK

EDITORIALS

5 DATA PROTECTION

Family connections

Ethics should lead decisions on how genetic data can be shared

5 HEALTH CARE

All that ails you

Consider all morbidities when tackling ill health

6 ANNOUNCEMENT

Human embryo and stem-cell research

Nature journals announce updates to policy

WORLD VIEW

7 To treat pain, study people in all their complexity

Beth Darnall

Clinical research must account for the psychology of pain

RESEARCH HIGHLIGHTS

8 SELECTIONS FROM THE SCIENTIFIC LITERATURE



Fit kids / Arctic plastic / Massacre clues / Milky Way measurement / Brotherly birds / California's whiplash weather

SEVEN DAYS

10 THE NEWS IN BRIEF

Antarctic glacier / AI in Europe / Australian reef rescue / Moon mission / Trump letter / Facebook data

CAREERS

129 SUPPORT

Why mental health matters

Personal accounts of the stresses of academia

131 TURNING POINT

Political expatriate

A theoretical chemist explains why he choose Canada over the United States

NEWS IN FOCUS

13 PLANETARY SCIENCE

NASA mission to hunt for Mars quakes



14 PUBLIC HEALTH

Antibiotics trial aids African children

15 ASTRONOMY

Teams rush to catch cosmic-dawn signal

16 SYNTHETIC BIOLOGY

Plan to synthesize human genome scaled back

17 ENVIRONMENT

Brazil lawmakers push to weaken environment rules

18 SPACE

European mission releases billion-star map

FEATURES

CONFLICT

After the violence

A bid to understand the impact of conflict in Colombia **PAGE 19**



TECHNOLOGY

127 TOOLBOX

Science goes virtual

How virtual and augmented reality are adding a dimension to research

COMMENT



EQUALITY

Close the gender gap

An analysis of grant changes in China from Ying Ma and colleagues **PAGE 25**

BOOKS & ARTS

28 NATURAL HISTORY

A prodigious namer of nature

Elizabeth Yale

29 BOOKS IN BRIEF

30 PHYSICS

Einstein said that — didn't he?

Andrew Robinson



CORRESPONDENCE

31 AI ethics / Poor meta-analyses / Sea-bed mining / Climate action / Blobel's Nobel

FUTURES

134 Piano concerto for new hands

Andrea Kriz



CONTENTS

3 May 2018 / Vol 557 / Issue No 7703

RESEARCH

NEW ONLINE

33 Papers published this week at nature.com

NEWS & VIEWS

34 MOLECULAR BIOLOGY

Faulty replication can sting

SAMHD1 prevents cytoplasmic DNA build-up and unwanted inflammation
Madzia P Crossley & Karlene A Cimprich
[SEE ARTICLE P.57](#)

35 ASTRONOMY

Helium discovered in the tail of an exoplanet

Observations of helium on the exoplanet WASP-107b
Drake Deming [SEE LETTER P.68](#)

36 PALAEOONTOLOGY

Evolutionary insights from an ancient bird

Reconstructed skull of a key extinct species illuminates bird evolution
Kevin Padian [SEE LETTER P.96](#)

38 SUPRAMOLECULAR CHEMISTRY

A perfect marriage of materials

A hyperexpandable composite of a protein and a hydrogel
François Baneyx [SEE LETTER P.86](#)

39 NANOTECHNOLOGY

Molecular machines swap rings

Multi-ring rotaxane molecules in which the rings change places
Steve Goldup

40 MEDICAL RESEARCH

Life of a liver awaiting transplantation

Clinical trial compares ways to store donated livers before transplantation
Stefan Schneeberger [SEE ARTICLE P.50](#)

ARTICLES

43 **AGRICULTURAL GENETICS** Genomic variation in 3,010 diverse accessions of Asian cultivated rice
W Wang et al.

50 **MEDICAL RESEARCH** A randomized trial of normothermic preservation in liver transplantation
D Nasralla et al. [SEE N&V P.40](#)

57 **MOLECULAR BIOLOGY** SAMHD1 acts at stalled replication forks to prevent interferon induction
F Coquel et al. [SEE N&V P.34](#)

62 **STRUCTURAL BIOLOGY** Cryo-EM structure



ON THE COVER

Lifeline for livers

A key limiting factor for successful liver transplants is the availability and quality of donor organs. A trial described in this issue shows that normothermic machine perfusion of donor livers — rather than the standard preservation on ice — allowed more donor livers to be transplanted, having been preserved for up to 54% longer, and reduced graft injury by 50%. [PAGES 40 & 50](#)

of the gasdermin A3 membrane pore

J Ruan, S Xia, X Liu, J Lieberman & H Wu

LETTERS

68 **ASTRONOMY** Helium in the eroding atmosphere of an exoplanet
J J Spake et al. [SEE N&V P.35](#)

71 **PARTICLE PHYSICS** Characterization of the 1S–2S transition in antihydrogen
M Ahmadi et al.

76 **MATERIALS SCIENCE** Lightwave valleytronics in a monolayer of tungsten diselenide
F Langer et al.

81 **OPTICAL PHYSICS** An optical-frequency synthesizer using integrated photonics
D T Spencer et al.

86 **SUPRAMOLECULAR CHEMISTRY** Hyperexpandable, self-healing macromolecular crystals with

integrated polymer networks

L Zhang, J B Bailey, R H Subramanian & F A Tezcan [SEE N&V P.38](#)

92 **ORGANOMETALLIC CHEMISTRY** Synthesis, structure and reaction chemistry of a nucleophilic aluminyl anion
J Hicks, P Vasko, J M Goicoechea & S Aldridge

96 **PALAEOONTOLOGY** Complete *Ichthyornis* skull illuminates mosaic assembly of the avian head
D J Field et al. [SEE N&V P.36](#)

101 **MICROBIOLOGY** Deep mitochondrial origin outside the sampled alphaproteobacteria
J Martijn, J Vosseberg, L Guy, P Offre & T J G Ettema

106 **DEVELOPMENTAL BIOLOGY** Blastocyst-like structures generated solely from stem cells
N C Rivron et al.

112 **CELL BIOLOGY** LUBAC is essential for embryogenesis by preventing cell death and enabling haematopoiesis
N Peltzer et al.

118 **STRUCTURAL BIOLOGY** Architecture of an HIV-1 reverse transcriptase initiation complex
K P Larsen et al.

123 **STRUCTURAL BIOLOGY** Structure of the alternative complex III in a supercomplex with cytochrome oxidase
C Sun et al.

PALAEOONTOLOGY

Bird brains

Fossils shed light on the evolution of avian skulls, brains and beaks. [PAGE 96](#)



COVER IMAGE: ANS STUDIO, INC.