## CONTENTS

11 July 2013 / Vol 499 / Issue No 7457

#### THIS WEEK

#### EDITORIALS

#### 125 MEDICAL RESEARCH

#### Trial and error

Italy's plans for a trial of an unproven stem-cell therapy must be shelved

#### 125 FUNDING

#### In the dark

Germany's DFG needs to clarify its new rules on confidentiality

#### 126 COMMUNICATION

#### Headline message

An evolving science media should not abandon investigative journalism

#### **WORLD VIEW**

#### 127 A slippery slope to human germline modification

Marcy Darnovsky
The UK government's move to
trial mitochondrial replacement is
extremely rash

#### **RESEARCH HIGHLIGHTS**

## 128 SELECTIONS FROM THE SCIENTIFIC LITERATURE



Crows join the mob /
Carbon-14 dates ivory /
Seeds of modern
agriculture / Heard
about the bionic ear? /
Broken quantum
entanglement gets fixed

#### **SEVEN DAYS**

#### 130 THE NEWS IN BRIEF

Pluto's moons get names / Peruvian pyramid is destroyed / Solar plane completes coast-to-coast flight / End of the line for Jason-1 satellite

#### CAREERS

#### 243 NETWORKING

#### Real connections

You can't beat the personal touch when it comes to making career-building relationships

#### 245 COLUMN

#### Music meets science

Stephane Detournay
Composers and scientists — two sides
of the same coin?

#### **NEWS IN FOCUS**



133 ASTRONOMY Large Binocular Telescope gets off to a slow start

# 134 PUBLISHING Copyright deal gives visually impaired improved access to scientific texts

#### 135 PHYSICS

Noise barrier suggests electron microscopy has reached its limit

### 136 BIOMEDICAL RESEARCH

Researchers question plans for a 'Japanese NIH'

#### 137 FUNDING

Push for commercialization threatens to starve US research firms of funds

#### **FEATURES**





### The forecast for 2018 is cloudy with record heat

The struggle to perfect accurate near-term forecasts



#### COMMENT



#### 145 ENERGY

#### The smart-grid solution

Massoud Amin

Expect power outages unless the US electricity grid becomes self-healing

#### 147 FUNDING

#### What would you cut?

David Garman & Armond Cohen; Benjamin Jones; David Goldston How to strengthen the US science base despite the budget sequester

#### **BOOKS & ARTS**



#### HOLIDAY READING

## Summer books

Nature regulars share their vacation picks — and there's more online PAGE 150

#### CORRESPONDENCE

154 Astronomical history / Shale-as pollution / Counting badgers

### **FUTURES**

248 All that remains Shane D Rhinewald

# CONTENTS

11 July 2013 / Vol 499 / Issue No 7457

#### RESEARCH

#### **NEW ONLINE**

155 Papers published this week at nature.com

#### **NEWS & VIEWS**

156 FORUM: MALARIA

Molecular secrets of a parasite

Regulation of P. falciparum var genes by histone modification Swaminathan Venkatesh & Jerry L Workman; Mats Wahlgren & Maria Teresa Bejarano **SEE LETTER P.223** 

157 GEOPHYSICS

A third way to rift continents

Rifting of continents can be caused by local effects W Roger Buck

159 OPTICAL PHYSICS

Trapping the light fantastic

A photonic-crystal system that acts as a perfect mirror A Douglas Stone SEE LETTER P.188

160 EARTH SCIENCE

A holistic approach to climate targets

Allowable carbon emissions under multiple climate objectives Joeri Rogelj SEE LETTER P.197

161 CELL BIOLOGY

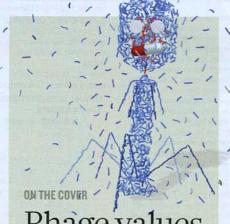
Lipid switches and traffic control

Role of PI(3,4)P2 in clathrin-mediated endocytosis Sandra L Schmid & Marcel Mettlen SEE LETTER P.233



Go digital

Digit regeneration begins with the nail stem cells PAGE 228



Antibiotic treatment in mice enriches phage-encoded genes related to antibiotic resistance in the gut microbiota, and phage from antibiotictreated mice enhance resistance in gut bacteria. These findings implicate the phageome in the emergence of multidrug resistance. PAGE 219

#### **ANALYSIS**

163 QUANTUM PHYSICS Oversimplifying quantum factoring J A Smolin, G Smith & A Vargo

#### ARTICLES

- 166 CELL BIOLOGY Temporal regulation of EGF signalling networks by the scaffold protein Shc1 Y Zheng et al.
- **BIOCHEMISTRY A compendium of** RNA-binding motifs for decoding gene regulation D Ray et al.
- DISEASE The Mycobacterium tuberculosis regulatory network and hypoxia J E Galagan et al.

- 184 ASTRONOMY Formation of sharp eccentric rings in debris disks with gas but without planets W Lyra & M Kuchner
- OPTICAL PHYSICS Observation of trapped light within the radiation continuum CW Hsu et al. SEE N&V P.159

- 192 CHEMISTRY Metal-free oxidation of aromatic carbon-hydrogen bonds through a reverse-rebound mechanism C Yuan et al.
- 197 CLIMATE SCIENCE Allowable carbon emissions lowered by multiple climate targets M Steinacher, F Joos & T F Stocker SEE N&V P.160
- 202 EARTH SCIENCE Characterization and implications of intradecadal variations in length of day R Holme & O de Viron
- 205 ECOLOGY Gene expression in the deep biosphere W D Orsi, V P Edgcomb, G D Christman & J F Biddle
- 209 GENETICS Pan genome of the phytoplankton Emiliania underpins its global distribution B A Read et al.
- 214 CANCER Mutational heterogeneity in cancer and the search for new cancer-associated genes MS Lawrence et al.
- 219 MICROBIOLOGY Antibiotic treatment expands the resistance reservoir and ecological network of the phage metagenome SR Modi, HH Lee, CS Spina & J J Collins
- 223 MOLECULAR BIOLOGY PSETVS methylation of histone H3K36 represses virulence genes in Plasmodium falciparum L Jiang et al. SEE N&V P.156
- STEM CELLS Wnt activation in nail epithelium couples nail growth to digit regeneration M Takeo et al.
- 233 CELL BIOLOGY Spatiotemporal control of endocytosis by phosphatidylinositol-3,4bisphosphate Y Posor et al. SEE N&V P.161
- 238 IMMUNOLOGY An siRNA screen for NFAT activation identifies septins as coordinators of store-operated Ca2+ entry S Sharma et al.