

174  
N28/e

# nature

THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE

The  
macrophage  
in sickness  
and in health

PAGE 445

## A CELL FOR ALL SEASONS

**PUBLIC HEALTH**

### ARMED WITH THE FACTS

*A scientist takes aim at gun violence*

PAGE 412

**REVIEWS**

### SPRING BOOKS SPECIAL

*Biblical and culinary science, and the birth of geology*

PAGE 424

**DNA AT SIXTY**

### INTO THE UNKNOWN

*Evolutionary theory in the post-classical genetics era*

PAGE 419

**NATURE.COM/NATURE**

25 April 2013 £10

Vol. 496, No. 7446



# CONTENTS

25 April 2013 / Vol 496 / Issue No 7446

## THIS WEEK

### EDITORIALS

#### 397 PUBLIC HEALTH

##### The fight against bird flu

China's response to this year's outbreaks deserves praise.

#### 397 PSYCHIATRY

##### Across the divide

Artificial divisions between mental-illness diagnoses hamper treatment

#### 398 ANNOUNCEMENT

##### Reducing our irreproducibility

Nature announces measures to improve quality in life-sciences articles



### WORLD VIEW

#### 399 H7N9 is a virus worth worrying about

Peter Horby  
We should not downplay the risks of the latest influenza virus

### RESEARCH HIGHLIGHTS

#### 400 SELECTIONS FROM THE SCIENTIFIC LITERATURE

Electrode therapy in depression / Bugs in the family / Autism mutations / Big-brained *Homo floresiensis* / Golden glow for silica

### SEVEN DAYS

#### 402 THE NEWS IN BRIEF

Mississippi man charged for sending ricin to authorities / Ernest Moniz nears approval as new US energy secretary / Astronomers spot new type of  $\gamma$ -ray burst

## CAREERS

#### 537 INTERDISCIPLINARITY

##### Artistic merit

Art-science collaboration as a profession — and as recreation

#### 539 CAREER BRIEFS

### NATUREJOBS ADVERTISING FEATURE

Spotlight on immunology  
Spotlight on Norway

## NEWS IN FOCUS



#### 405 GLOBAL WARMING

Amazon experiment aims to measure CO<sub>2</sub> fertilization

#### 407 ASTRONOMY

Company challenges convention for naming new moons and planets

#### 408 ECOLOGY

Europe to vote on pesticide ban to protect bees

#### 409 ENERGY

Japan manages to extract methane from hydrates beneath the ocean floor

#### 410 GEOPHYSICS

Researchers calculate timing of Earth's recycling process

#### 411 ETHICS

US health department endorses guidance for Internet research

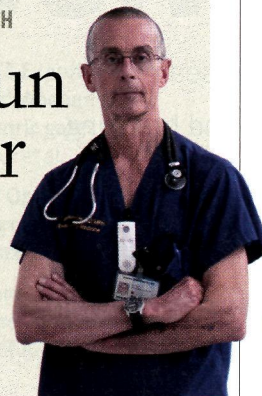
## FEATURES

### FIREARMS RESEARCH

## The gun fighter

Physician Garen Wintemute tries to pin down consequences of gun ownership

PAGE 412



#### 416 MENTAL HEALTH

##### On the spectrum

Unravelling the controversy behind diagnosis of mental illness

## COMMENT

#### 419 DNA AT SIXTY

##### Celebrate the unknowns

Philip Ball

Molecular and evolutionary biology are in a state of flux

#### 421 HURRICANE SANDY

##### After the deluge

Gordon Fishell

Rebuilding a mouse laboratory devastated by flood waters

## SPRING BOOKS



#### 424 COGNITIVE SCIENCE

##### Mind as mirror

Philip Ball

#### 426 GASTRONOMY

##### The kitchen revolution

Nathan Myhrvold

#### 427 BIOLOGY

##### Vive la différence

Suzanne Alonzo

#### 428 GEOLOGY

##### Written in stone

Ted Nield

#### 430 PHYSICS

##### Clockwork cosmos

Pedro Ferreira

#### 431 NEUROSCIENCE

##### Drugs to build a better brain

Anjan Chatterjee

#### 432 CULTURE

##### Of Genesis and genetics

Tim Radford

## CORRESPONDENCE

434 DNA at sixty: the story of the Nobel nominations

## FUTURES

#### 542 The epistolary history

Alex Shvartsman

# CONTENTS

25 April 2013 / Vol 496 / Issue No 7446

## RESEARCH

### NEW ONLINE

435 Papers published this week at nature.com

### NEWS & VIEWS

#### 436 FORUM: QUANTUM PHYSICS

##### A grip on misbehaviour

A tool to characterize and control the dynamics of a quantum system  
*Stefano Pironio, Dorit Aharonov*

SEE ARTICLE P.456

#### 437 AUTOIMMUNITY

##### Rubbing salt in the wound

A high-salt diet can enhance  $T_H17$ -cell differentiation and exacerbate EAE

*John J O'Shea & Russell G Jones*

SEE LETTERS P.513 & P.518

#### 439 PARTICLE PHYSICS

##### Minimalism triumphant

Focus on the Higgs boson

*Frank Wilczek*

#### 441 HIV

##### Roadmaps to a vaccine

The evolution of broadly neutralizing anti-HIV antibodies in a patient

*Hugo Mouquet & Michel C Nussenzweig*

SEE ARTICLE P.469

#### 442 IMAGING

##### Magnetic bacteria on a diamond plate

Optical magnetic imaging of magnetotactic bacteria

*Mihály Pósfai & Rafal E Dunin-Borkowski*

SEE LETTER P.486

#### 443 GENOMICS

##### Zebrafish earns its stripes

Using zebrafish to investigate the function of human genes

*Alexander F Schier*

SEE LETTERS P.494 & P.498

### REVIEW

#### 445 IMMUNOLOGY Macrophage biology in development, homeostasis and disease

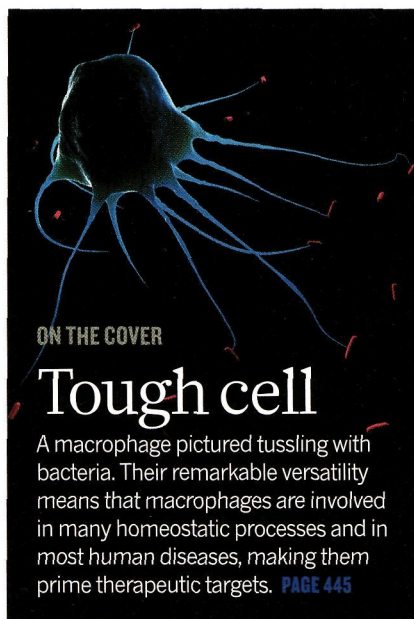
*T A Wynn, A Chawla & J W Pollard*

### ARTICLES

#### 456 QUANTUM PHYSICS Classical command of quantum systems

*B W Reichardt, F Unger & U Vazirani*

SEE N&V P.436



#### 461 SYSTEMS BIOLOGY Dynamic regulatory network controlling $T_H17$ cell differentiation

*N Yosef et al.*

#### 469 IMMUNOLOGY Co-evolution of a broadly neutralizing HIV-1 antibody and founder virus

*H-X Liao et al. SEE N&V P.441*

#### 477 STRUCTURAL BIOLOGY Accurate assessment of mass, models and resolution by small-angle scattering

*R P Rambo & J A Tainer*

### LETTERS

#### 482 QUANTUM PHYSICS Experimental realization of non-Abelian non-adiabatic geometric gates

*A A Abdumalikov Jr et al.*

#### 486 APPLIED PHYSICS Optical magnetic imaging of living cells

*D Le Sage et al. SEE N&V P.442*

#### 490 EARTH SCIENCE Anomalous sulphur isotopes in plume lavas reveal deep mantle storage of Archaean crust

*R A Cabral et al.*

#### 494 GENETICS A systematic genome-wide analysis of zebrafish protein-coding gene function

*R N W Kettleborough et al.*

SEE N&V P.443

#### 498 GENETICS The zebrafish reference genome sequence and its relationship to the human genome

*K Howe et al. SEE N&V P.443*

#### 504 HEALTH SCIENCES The global distribution and burden of dengue

*S Bhatt et al.*

#### 508 BIOCHEMISTRY Diverse type VI secretion phospholipases are functionally plastic antibacterial effectors

*A B Russell et al.*

#### 513 IMMUNOLOGY Induction of pathogenic $T_H17$ cells by inducible salt-sensing kinase SGK1

*C Wu et al. SEE N&V P.437*

#### 518 IMMUNOLOGY Sodium chloride drives autoimmune disease by the induction of pathogenic $T_H17$ cells

*M Kleinnietfeld et al. SEE N&V P.437*

#### 523 IMMUNOLOGY Follicular T-helper cell recruitment governed by bystander B cells and ICOS-driven motility

*H Xu et al.*

#### 528 BIOTECHNOLOGY High-level semi-synthetic production of the potent antimalarial artemisinin

*C J Paddon et al.*

#### 533 STRUCTURAL BIOLOGY Crystal structure of a eukaryotic phosphate transporter

*B P Pedersen et al.*

### APPLIED PHYSICS

## Field trip

Magnetic minerals in live bacteria on the map, thanks to diamonds. PAGE 486

