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Better sequencing techniques offer a fresh take on personal genomics

#### 408 HEALTH

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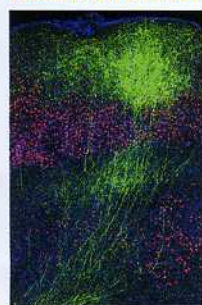
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We need more small, cheap spacecraft, says their designer, Riccardo Bevilacqua

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#### 417 INFECTIOUS DISEASE

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The story of controversial cell line WI-38, source of many vaccines

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Health and happiness of millions would improve if we knew more about sleep

#### 429 MARINE SCIENCE

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Sam Dupont & Hans Pörtner

We need to identify at-risk ecosystems in the oceans — and to protect them

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### HISTORY

## Leading light

The story of the Fresnel lens shows the power of invention, says Joanne Baker PAGE 430

#### 431 BOOKS IN BRIEF

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##### Broken brains and runaway technology

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##### Sound chaser

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### NEW ONLINE

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### NEWS & VIEWS

#### 438 QUANTUM PHYSICS

##### Spooky action gets collective

Entanglement between an atomic collective excitation and a photon  
*Matthias Weidemüller*

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#### 439 REGENERATIVE BIOLOGY

##### Heartbroken embryos heal

Atrial-cell-derived ventricular cells in zebrafish

*Kenneth R Chien* SEE LETTER P.497

#### 440 APPLIED PHYSICS

##### Cloaking of heat

A thermal cloaking device  
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#### 441 NEUROSCIENCE

##### Stem cells in multiple time zones

Transcription-factor cascades control temporal specification of neuroblasts  
*Stefan Thor*

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#### 443 ELECTRONICS

##### The road to carbon nanotube transistors

Advances in the purification and positioning of carbon nanotubes  
*Aaron D Franklin*

#### 444 CELL SIGNALLING

##### Nutrient sensing lost in cancer

Amino-acid levels affect mTORC1-mediated growth in cells  
*Suchithra Menon & Brendan D Manning*

#### 446 ANIMAL BEHAVIOUR

##### Brain food

Energetic stress impairs cognitive function in honeybees  
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#### 446 EPIDEMIOLOGY

##### Resistance mapping in malaria

Parasite sequencing reveals candidate artemisinin-resistance genes  
*A Taylor Bright & Elizabeth A Winzeler*

#### 447 PHOTONICS

##### An ultra-small silicon laser

A Raman silicon laser that operates at microwatt power levels  
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### ON THE COVER

## Throwback

Analysis of the biomechanics of collegiate baseball players' throwing motion shows that adaptations in the upper body allow us to store and release elastic energy in the shoulder in a catapult-like fashion. Evidence of key morphology shifts that make this possible — and differentiate humans from non-human primates — is preserved in the fossil record. **PAGE 483**

### ARTICLES

449 **DEVELOPMENTAL BIOLOGY** Combinatorial temporal patterning in progenitors expands neural diversity

*O A Bayraktar & C Q Doe* SEE N&V P.441

456 **DEVELOPMENTAL BIOLOGY** Temporal patterning of *Drosophila* medulla neuroblasts controls neural fates

*X Li et al.* SEE N&V P.441

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466 **PHYSICS** Entanglement between light and an optical atomic excitation

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470 **PHOTONICS** A micrometre-scale Raman silicon laser with a microwatt threshold  
*Y Takahashi et al.* SEE N&V P.447

475 **EARTH SCIENCES** Lifespan of mountain ranges scaled by feedbacks between landsliding and erosion by rivers

*D L Egholm, M F Knudsen & M Sandiford*

479 **GEODYNAMICS** Stability of active mantle upwelling revealed by net characteristics of plate tectonics

*C P Conrad, B Steinberger & T H Torsvik*

483 **EVOLUTION** Elastic energy storage in the shoulder and the evolution of high-speed throwing in *Homo*

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487 **NEUROBIOLOGY** *orco* mutant mosquitoes lose strong preference for humans and are not repelled by volatile DEET

*M DeGennaro et al.*

492 **CELL BIOLOGY** EndMT contributes to the onset and progression of cerebral cavernous malformations

*L Maddaluno et al.*

497 **DEVELOPMENTAL BIOLOGY** *In vivo* cardiac reprogramming contributes to zebrafish heart regeneration

*R Zhang et al.* SEE N&V P.439

502 **IMMUNE EVASION** Severe malaria is associated with parasite binding to endothelial protein C receptor

*L Turner et al.*

506 **IMMUNOLOGY** BACH2 represses effector programs to stabilize  $T_{reg}$ -mediated immune homeostasis

*R Roychoudhuri et al.*

511 **MOLECULAR BIOLOGY** Rev-Erbs repress macrophage gene expression by inhibiting enhancer-directed transcription

*M T Y Lam et al.*

516 **MOLECULAR BIOLOGY** Functional roles of enhancer RNAs for oestrogen-dependent transcriptional activation

*W Li et al.*

521 **STRUCTURAL BIOLOGY** Unusual architecture of the p7 channel from hepatitis C virus

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526 **CORRIGENDUM** Functional organization of human sensorimotor cortex for speech articulation  
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526 **CORRIGENDUM** Human contribution to more-intense precipitation extremes  
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