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### NEW ONLINE

465 Papers published this week at nature.com

### NEWS & VIEWS

#### 466 MATERIALS SCIENCE

##### Flexible self-powered biosensors

Integration of organic photovoltaic cells and electrochemical transistors  
*Shiming Zhang & Fabio Cicoira*  
[SEE LETTER P.516](#)

#### 467 CELL BIOLOGY

##### A core problem in nuclear assembly

Micronuclei are fragile because they lack some nuclear-envelope components  
*Matthias Samwer & Daniel W Gerlich*  
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#### 468 IMMUNOLOGY

##### Antibodies pose a double threat to HIV

Clinical trials test the use of two antibodies as a treatment for HIV  
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#### 470 ENGINEERING

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Self-guided pathways in shape-changing metamaterials  
*Larry L Howell* [SEE LETTER P.512](#)

#### 471 COMPUTATIONAL BIOCHEMISTRY

##### Designer proteins activate fluorescence

A method for designing  $\beta$ -barrels that bind to any small molecule  
*Roberto A Chica* [SEE ARTICLE P.485](#)

### ARTICLES

**473 GENOMICS** Population dynamics of normal human blood inferred from somatic mutations  
*H Lee-Six et al.*

**479 IMMUNOLOGY** Combination therapy with anti-HIV-1 antibodies maintains viral suppression  
*P Mendoza et al.* [SEE N&V P.468](#)

**485 BIOCHEMISTRY** De novo design of a fluorescence-activating  $\beta$ -barrel  
*J Dou et al.* [SEE N&V P.471](#)

**492 STRUCTURAL BIOLOGY** Cryo-EM structure of the active,  $G_s$ -protein complexed, human CGRP receptor  
*Y-L Liang et al.*

### LETTERS

**498 ASTRONOMY** Outbursts of luminous



ON THE COVER

## Stellar outburst

A visualization of the turbulent envelope of a luminous blue variable star surrounding the central high-density core. These massive, evolved stars vary widely in luminosity and size. In this week's issue, Yan-Fei Jiang and colleagues report 3D models that suggest that helium opacity plays an important part in triggering the outbursts and in setting their effective temperature. [PAGE 498](#)

blue variable stars from variations in the helium opacity  
*Y-F Jiang et al.*

**502 QUANTUM OPTICS** A topological source of quantum light  
*S Mittal, E A Goldschmidt & M Hafezi*

**507 ELECTRONIC DEVICES** Extremely efficient terahertz high-harmonic generation in graphene by hot Dirac fermions  
*H A Hafez et al.*

**512 MATERIALS SCIENCE** Multi-step self-guided pathways for shape-changing metamaterials  
*C Coullais, A Sabbadini, F Vink & M van Hecke* [SEE N&V P.470](#)

**516 OPTICAL MATERIALS** Self-powered ultra-flexible electronics via nano-grating-patterned organic photovoltaics  
*S Park et al.* [SEE N&V P.466](#)

**522 CHEMISTRY** Multicomponent synthesis of tertiary alkylamines by photocatalytic olefin-hydroaminoalkylation  
*A Trowbridge, D Reich & M J Gaunt*

**528 EARTH SCIENCES** Transience of the North American High Plains landscape and its impact on surface water  
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**533 PALAEONTOLOGY** The role of miniaturization in the evolution of the mammalian jaw and middle ear  
*S Lautenschlager, P G Gill, Z-X Luo, M J Fagan & E J Rayfield*

**538 CLIMATE-CHANGE ECOLOGY** Hydraulic diversity of forests regulates ecosystem resilience during drought  
*W R L Anderegg et al.*

**542 NEURAL CIRCUITS** Sensation, movement and learning in the absence of barrel cortex  
*Y K Hong, C O Lacefield, C C Rodgers & R M Bruno*

**547 NEUROSCIENCE** Touch and tactile neuropathic pain sensitivity are set by corticospinal projections  
*Y Liu et al.*

**551 CELL BIOLOGY** Nuclear envelope assembly defects link mitotic errors to chromothripsis  
*S Liu et al.* [SEE N&V P.467](#)

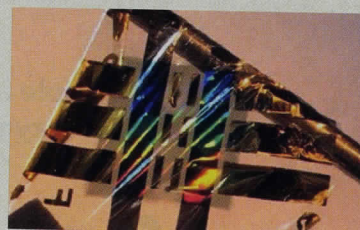
**556 BIOCHEMISTRY** mRNA circularization by METTL3-eIF3h enhances translation and promotes oncogenesis  
*J Choe et al.*

**561 STRUCTURAL BIOLOGY** Structure of the membrane-assembled retromer coat determined by cryo-electron tomography  
*O Kovtun et al.*

### OPTICAL MATERIALS

## Flex power

Ultra-flexible self-powered biometric devices. [PAGE 516](#)



COVER IMAGE: JOSEPH INSLEY/ALCF

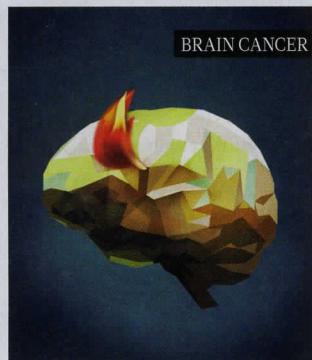


# OUTLOOK

Supplement to 27 September 2018 / Vol 561 / Issue No 7724

## BRAIN CANCER

natureOUTLOOK



BRAIN CANCER

Produced with support from:  
novocure

Defence of an  
essential organ

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### S39 EDITORIAL

**Brain cancer**

*Herb Brody*

### S40 BRAIN CANCER

**Breaking down brain cancer**

Tumour location and epidemiology

### S42 IMMUNOTHERAPY

**The battle for the brain**

Helping the immune system to attack glioma

### S45 PERSPECTIVE

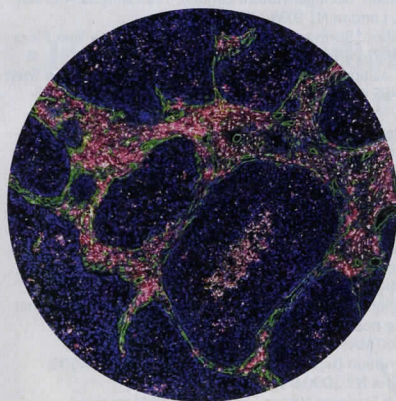
**See the whole picture**

*Terri S. Armstrong* on the importance of neurological symptoms

### S46 NEUROBIOLOGY

**Across the divide**

Ways to bypass the blood–brain barrier



Delivering photodynamic therapy to a patient with a brain tumour (see page S59).

### S48 DISEASE MODELS

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### S56 PAEDIATRICS

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### S59 MEDICAL DEVICES

**Lighting up the brain**

Electric fields and laser beams



**MORE  
ONLINE**

#### NATURE.COM

● To read about using T cells to target brain cancer, visit:

[go.nature.com/2op3eeg](http://go.nature.com/2op3eeg)

● For more on using 3D brain cultures in research, visit:

[go.nature.com/2p25xcl](http://go.nature.com/2p25xcl)

#### COLLECTION

● Visit our online edition, which includes an exclusive collection of the latest research papers on modelling, classifying and treating brain cancer:

[go.nature.com/2nawcua](http://go.nature.com/2nawcua)