CONTENTS

1 August 2013 / Vol 500 / Issue No 7460

EDITORIALS

5 JAPAN
The test for Abenomics
Japan's Prime Minister should listen to researchers in his science policy-making

5 FORENSIC SCIENCE
Forensics fiasco
Guidance is sorely needed to restore responsibility to forensic science

WORLD VIEW

7 Pakistan must seize the chance to revive its science
Ehsan Masood
The nation's science-for-growth strategy needs a heavy-hitting science minister

RESEARCH HIGHLIGHTS

8 SELECTIONS FROM THE SCIENTIFIC LITERATURE
Hive of infection / Carbon stocks captured / Deformable metamaterials / Turtles saved / 'Unknown gene' knockouts / Neanderthal sex test / Subatomic images

SEVEN DAYS

10 THE NEWS IN BRIEF
Sex researcher Virginia Johnson dies / First images from NASA's solar observatory / Massive telecommunications satellite launches / US plan to keep Asian carp out / Drug industry moves to open data stores

FEATURES

13 PHYSICS
Two labs jostle for position as race to host next US X-ray source heats up

14 BIOBIOLOGY
NIH explores ways to check reproducibility of research results

16 MICROBIOLOGY
Downsized Human Microbiome Project looks for new home

18 CLIMATE
Hard rock is the medium of choice for locking up carbon dioxide

ARCHAEOLOGY

The milk revolution
How a single genetic mutation led to an ancient European invasion

CAREERS

111 RELOCATING
Middle Eastern promise
Qatar and other Arab states aspire to science hub status — but test the waters before taking the plunge

113 COLUMN
Too much hype
Monika Mańczewska
Scientists need to understand self-promotion and how far to take it

113 CAREER BRIEFS

BOOKS & ARTS

23 BIOLOGY
Cell sex matters
Elizabeth Polizzi
Researchers, funders and journals must acknowledge that cells from males and females can behave differently

ORNITHOLOGY

Soar point
Nicky Clayton finds much to enjoy in the story of our dealings with birds

PAGE 25

ENVIRONMENT

25 Blanketing out the mess
Edward Humes

27 BOOKS IN BRIEF

28 GENOMICS
The big blueprint
Gene Russo

CORRESPONDENCE

29 Communication fails Japan / Too much reliance on bibliometrics / Time lapse in awards for excellence / Tigers edged out / Music is not a science

OBITUARY

30 Kenneth Geddes Wilson (1936–2013)
Leo P Kadanoff

FUTURES

116 The best of us
Lee Hlafson

1 AUGUST 2013 | VOL 500 | NATURE | 1
NEW ONLINE
31 Papers published this week at nature.com

NEWS & VIEWS
32 REGENERATIVE BIOLOGY
On with their heads
Altered Wnt/β-catenin signalling in regeneration-deficient flatworms
Andrés Simon
SEE LETTERS P.73, P.77 & P.81

33 CLIMATE SCIENCE
Unequal equinoxes
Ocean turbulence and the equatorial Pacific climate
Shang-Ping Xie
SEE LETTER P.64

34 ALZHEIMER'S DISEASE
From big data to mechanism
Identification of APOE4 effectors through integrative analysis
Vivek Swarup & Daniel H Geschwind
SEE ARTICLE P.45

36 NANOTECHNOLOGY
Tiny thermometers used in living cells
Temperature changes measured using nanodiamonds
Konstantin Sokolov
SEE LETTER P.54

APPLIED PHYSICS
Think small
A nanothermometer that zeroes in on a single cell could be big in the world of nanotechnology
PAGE 54

ON THE COVER
Battle lines
Differences in Myc dose between neighbouring cells in the developing mouse embryo determine which survives and which suffers cell death. The cover shows fluorescence-based detection of a cell population shift in embryos undergoing increasing levels of cell competition from left to right.

37 CANCER
Angiogenic awakening
Angiogenesis induces the exit of metastasized tumour cells from dormancy
Neta Erez

ARTICLES
39 DEVELOPMENTAL BIOLOGY
Myc-driven endogenous cell competition in the early mammalian embryo
C Clavert, G Giovinazzo, R Sierra & M Torres

45 NEUROSCIENCE
Integrative genomics identifies APOE4 effectors in Alzheimer's disease
H Rhim et al.
SEE N&V P.34

LETTERS
51 ASTRONOMY
An age difference of two billion years between a metal-rich and a metal-poor globular cluster
B M S Hansen et al.

54 APPLIED PHYSICS
Nanometre-scale thermometry in a living cell
G Kucsko et al.
SEE N&V P.36

59 MATERIALS SCIENCE
Stretchable nanoparticle conductors with self-organized conductive pathways
Y Kim et al.

64 OCEANOGRAPHY
Seasonal sea surface cooling in the equatorial Pacific cold tongue controlled by ocean mixing
J N Moum, A Perlin, J D Nesb & M J McPhaden
SEE N&V P.33

68 VOLCANOLOGY
Feeding andesitic eruptions with a high-speed connection from the mantle
P Ruprecht & T Plank

73 DEVELOPMENTAL BIOLOGY
The molecular logic for planarian regeneration along the anterior-posterior axis
Y Umescu et al.
SEE N&V P.32

77 DEVELOPMENTAL BIOLOGY
Restoration of anterior regeneration in a planarian with limited regenerative ability
J M Skiles & P A Newmark
SEE N&V P.32

81 DEVELOPMENTAL BIOLOGY
Reactivating head regrowth in a regeneration-deficient planarian species
S-Y Liu et al.
SEE N&V P.32

85 NEUROSCIENCE
Dual-mode operation of neuronal networks involved in left-right alternation
A E Tapalar et al.

89 STEM CELLS
AID stabilizes stem-cell phenotype by removing epigenetic memory of pluripotency genes
R Kumar et al.

93 MOLECULAR BIOLOGY
A stable transcription factor complex nucleated by oligomeric AML1-ETO controls leukaemogenesis
X-J Sun et al.

98 BIOPHYSICS
Roshaping of the conformational search of a protein by the chaperon trigger factor
A Mashaghi et al.

102 STRUCTURAL BIOLOGY
Structural basis for the inhibition of bacterial multidrug exporters
R Nakashima et al.

107 STRUCTURAL BIOLOGY
Unusual base pairing during the decoding of a stop codon by the ribosome
I S Fernández et al.