

Nature Publishing Group
The Macmillan Building,
4 Crinan St, London N1 9XW, UK
e-mail: nature@nature.com



NATURE'S MISSION, 1869:

'The objective which it is proposed to attain by this periodical may be broadly stated as follows. It is intended, first, to place before the general public the grand results of scientific work and scientific discovery; and to urge the claims of science to move to a more general recognition in education and in daily life... Secondly, to aid scientific men [sic] themselves, by giving early information of all advances made in any branch of natural knowledge throughout the world, and by affording them an opportunity of discussing the various scientific questions which arise from time to time.'

Nature's mission statement was updated in 2000:

► www.nature.com/nature/about

Submissions and Guide to Authors:

► www.nature.com/nature/authors

Author and referee policies and services:

► www.nature.com/authors

Nature® (ISSN 0028-0836) is published by Nature Publishing Group, a division of Macmillan Publishers Ltd (The Macmillan Building, 4 Crinan Street, London N1 9XW). Registered as a newspaper at the British Post Office.

North and South American orders to subscriptions@nature.com (Tel: +1 866 363 7860). Other orders to subscriptions@nature.com (Tel: +44 (0)1256 329242; Fax +44 (0)1256 812358).

Authorization to photocopy material for internal or personal use, or internal or personal use of specific clients, is granted by Nature to libraries and others registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided the relevant copyright fee is paid direct to CCC, 222 Rosewood Drive, Danvers MA 01923, USA. Identification code for Nature: 0028-0836/03. CPC PUB AGREEMENT #40032744.

In the US Nature (ISSN 0028-0836) is published weekly on Thursday, except the last week in December by Nature Publishing Group, 75 Varick St, 9th Fl, New York NY 10013-1917, USA. US Periodicals postage paid at New York NY, and additional mailing post offices. US POSTMASTER: send address changes to Nature, Subscription Dept, 342 Broadway PMB 301, New York NY 10013-3910, USA. Published in Japan by NPG Nature Asia-Pacific, Chiyoda Building, 2-37 Ichigayatamachi, Shinjuku-ku, Tokyo 162-0843, Japan. © 2010 Macmillan Publishers Limited. All rights reserved.



nature publishing group

nature

EDITORIALS

- 1245 **How Nature deals with allegations of fraud | The changing face of clinical trials | Lab data in peril**

RESEARCH HIGHLIGHTS

- 1248 'Ouroborand' molecule as nanoscale flask | *Salmonella* and HIV | A diet of ants | Wetland methane | Ice caves on Mars | Life on a chip
- 1249 **JOURNAL CLUB** The role of microRNAs in tumour growth
Jean-Christophe Marine

NEWS

- 1250 **NEWS BRIEFING**
- 1252 Last-minute magnet swap in space antimatter detector delays launch
- 1253 Volcanic ash dispersal models under the microscope following flights chaos
- 1254 **SPECIAL REPORT** What UK politicians are saying about science on the election trail
- 1257 Russian government funding to target neglected university sector
- 1258 Cancer researchers contemplate 'adaptive' clinical trials
- 1259 Study of multiple sclerosis twins breaks new ground in disease genomics

NEWS FEATURES

- 1260 Cybersecurity: How safe are your data?
Jeffrey Perkel
- 1262 Hydrogen vehicles: Fuel of the future?
Jeff Tollefson

CORRESPONDENCE

- 1266 Online comments on science metrics | Making forensics scientific | French research in need of boost

OPINION

- 1268 Dorothy Hodgkin: The making of an exceptional scientist
Georgina Ferry
- 1271 Forecasts needed for retreating forests
Csaba Mátyás

SPRING BOOKS

- 1273 **Whole Earth Discipline** by Stewart Brand;
Eaarth by Bill McKibben
Reviewed by David Orr



Woman at work: celebrating Dorothy Hodgkin, p. 1268.



Driving ambition: hydrogen-fuelled cars are on the way, p. 1262.

- 1275 **The Politics of Happiness** by Derek Bok
Reviewed by Felicia Huppert
- 1276 **How to Find a Habitable Planet**
by James Kasting
Reviewed by Debra Fischer
- 1277 **The Great Brain Race** by Ben Wildavsky
Reviewed by Adam R Nelson
- 1280 **The Calculus of Selfishness**
by Karl Sigmund
Reviewed by Mike Mesterton-Gibbons
- 1281 **The Unwanted Sound of Everything We Want** by Garret Keizer
Reviewed by Jascha Hoffman
- 1281 **Anthill: A Novel** by E O Wilson
Reviewed by Robert Dunn
- 1283 **Solar** by Ian McEwan
Reviewed by Hans von Storch

NEWS & VIEWS

- 1285 **Immunology: Close encounters of the second type**
Gérard Eberl **See Letters pp. 1362, 1367**
- 1286 **Asteroids: A frosty finding**
Henry Hsieh **See Letters pp. 1320, 1322**
- 1287 **Metabolism: Host and microbes in a pickle**
Ping Li & Gökhan S Hotamisligil
- 1289 **Quantum physics: Atoms in chequerboard order**
Cheng Chin & Nathan Gemelke
See Article p. 1301
- 1290 **Geochemistry: The mystery of Don Juan Pond**
Andrew Mitchinson
- 1290 **Neuroscience: Each synapse to its own**
Nicholas J Priebe & David Ferster
See Article p. 1307
- 1292 **OBITUARY James Black (1924-2010)**
Robin Ganellin & William Duncan

NATUREJOBS

- 1393 **Q&A Nadine Gassner on mentoring**
- 1394 **CAREERS Getting better at biotech**
Paul Smaglik

FUTURES

- 1398 **Grandfather paradox**
Ian Stewart

REVIEWS

- 1293 **Genetics, pathogenesis and clinical interventions in type 1 diabetes**
J A Bluestone, K Herold & G Eisenbarth

ARTICLES

- 1301 **Dicke quantum phase transition with a superfluid gas in an optical cavity**
K Baumann, C Guerlin, F Brennecke & T Esslinger [See N&V p. 1289](#)
- 1307 **Dendritic organization of sensory input to cortical neurons in vivo**
H Jia, N L Rochefort, X Chen & A Konnerth [See N&V p. 1290](#)
- 1313 **Adiponectin and AdipoR1 regulate PGC-1 α and mitochondria by Ca²⁺ and AMPK/SIRT1**
M Iwabu, T Yamauchi, M Okada-Iwabu, K Sato, T Nakagawa, M Funata, M Yamaguchi, S Namiki, R Nakayama, M Tabata, H Ogata, N Kubota, I Takamoto, Y K Hayashi, N Yamauchi, H Waki, M Fukayama, I Nishino, K Tokuyama, K Ueki, Y Oike, S Ishii, K Hirose, T Shimizu, K Touhara & T Kadowaki

LETTERS

- 1320 **Water ice and organics on the surface of the asteroid 24 Themis**
H Campins, K Hargrove, N Pinilla-Alonso, E S Howell, M S Kelley, J Licandro, T Mothé-Diniz, Y Fernández & J Ziffer [See N&V p. 1286](#)
- 1322 **Detection of ice and organics on an asteroidal surface**
A S Rivkin & J P Emery [See N&V p. 1286](#)
- 1324 **Dipolar collisions of polar molecules in the quantum regime**
K.-K Ni, S Ospelkaus, D Wang, G Quémener, B Neyenhuis, M H G de Miranda, J L Bohn, J Ye & D S Jin
- 1329 **A molecular molybdenum-oxo catalyst for generating hydrogen from water**
H I Karunadasa, C J Chang & J R Long
- 1334 **The central role of diminishing sea ice in recent Arctic temperature amplification**
J A Screen & I Simmonds
- 1338 **Exceptional dinosaur fossils show ontogenetic development of early feathers**
X Xu, X Zheng & H You
- 1342 **Evolution of self-compatibility in *Arabidopsis* by a mutation in the male specificity gene**
T Tsuchimatsu, K Suwabe, R Shimizu-Inatsugi, S Isokawa, P Pavlidis, T Städler, G Suzuki, S Takayama, M Watanabe & K K Shimizu
- 1347 **A role for host-parasite interactions in the horizontal transfer of transposons across phyla**
C Gilbert, S Schaack, J K Pace II, P J Brindley & C Feschotte

- 1351 **Genome, epigenome and RNA sequences of monozygotic twins discordant for multiple sclerosis**
S E Baranzini, J Mudge, J C van Velkinburgh, P Khankhanian, I Khrebukova, N A Miller, L Zhang, A D Farmer, C J Bell, R W Kim, G D May, J E Woodward, S J Caillier, J P McElroy, R Gomez, M J Pando, L E Clendenen, E E Ganusova, F D Schilkey, T Ramaraj, O A Khan, J J Huntley, S Luo, P-y Kwok, T D Wu, G P Schroth, J R Oksenberg, S L Hauser & S F Kingsmore [See News p. 1259](#)
- 1357 **NLRP3 inflammasomes are required for atherogenesis and activated by cholesterol crystals**
P Duewell, H Kono, K J Rayner, C M Sirois, G Vladimer, F G Bauernfeind, G S Abela, L Franchi, G Nuñez, M Schnurr, T Espevik, E Lien, K A Fitzgerald, K L Rock, K J Moore, S D Wright, V Hornung & E Latz
- 1362 **IL25 elicits a multipotent progenitor cell population that promotes T_H2 cytokine responses**
S A Saenz, M C Siracusa, J G Perrigoue, S P Spencer, J F Urban Jr, J E Tocker, A L Budelsky, M A Kleinschek, R A Kastelein, T Kambayashi, A Bhandoola & D Artis [See N&V p. 1285](#)
- 1367 **Nuocytes represent a new innate effector leukocyte that mediates type-2 immunity**
D R Neill, S H Wong, A Bellosi, R J Flynn, M Daly, T K A Langford, C Bucks, C M Kane, P G Fallon, R Pannell, H E Jolin & A N J McKenzie [See N&V p. 1285](#)
- 1371 **Innate lymphoid cells drive interleukin-23-dependent innate intestinal pathology**
S Buonocore, P P Ahern, H H Uhlig, I I Ivanov, D R Littman, K J Maloy & F Powrie
- 1376 **Control of cortical GABA circuitry development by Nrg1 and ErbB4 signalling**
P Fazzari, A V Paternain, M Valiente, R Pla, R Luján, K Lloyd, J Lerma, O Marín & B Rico
- 1381 **I κ B ζ regulates T_H17 development by cooperating with ROR nuclear receptors**
K Okamoto, Y Iwai, M Oh-hora, M Yamamoto, T Morio, K Aoki, K Ohya, A M Jetten, S Akira, T Muta & H Takayanagi
- 1386 **Tracking G-protein-coupled receptor activation using genetically encoded infrared probes**
S Ye, E Zaitseva, G Caltabiano, G F X Schertler, T P Sakmar, X Deupi & R Vogel
- 1390 **Lessons on longevity from budding yeast (Erratum)**
M Kaeblerlein
- 1390 **Enzyme-inhibitor-like tuning of Ca²⁺ channel connectivity with calmodulin (Corrigendum)**
X Liu, P S Yang, W Yang & D T Yue

NATURE ONLINE

ADVANCE ONLINE PUBLICATION

PUBLISHED ON 25 APRIL 2010

Cis-interactions between Notch and Delta generate mutually exclusive signalling states

D Sprinzak *et al.* [doi:10.1038/nature08959](#)Stepwise [FeFe]-hydrogenase H-cluster assembly revealed in the structure of HydA^{AEFG}D W Mulder *et al.* [doi:10.1038/nature08993](#)

Aberrant silencing of imprinted genes on chromosome 12qF1 in mouse induced pluripotent stem cells

M Stadtfeld *et al.* [doi:10.1038/nature09017](#)

PUBLISHED ON 27 APRIL 2010

A dicer-independent miRNA biogenesis pathway that requires Ago catalysis

S Cheloufi, C O Dos Santos, M M W Chong & G J Hannon

[doi:10.1038/nature09092](#)

PUBLISHED ON 28 APRIL 2010

Structural basis of oligomerization in the stalk region of dynamin-like MxA

S Gao *et al.* [doi:10.1038/nature08972](#)

G domain dimerization controls dynamin's assembly-stimulated GTPase activity

J S Chappie, S Acharya, M Leonard, S L Schmid & F Dyda

[doi:10.1038/nature09032](#)

Mutations of optineurin in amyotrophic lateral sclerosis

H Maruyama *et al.*[doi:10.1038/nature08971](#)

ONLINE LISTENING AND VIEWING

On the podcast, more on this week's cover story, a study of twins discordant for multiple sclerosis. This work includes the first published female human genome sequences. Also on the podcast this week, background on feather development in dinosaurs and the discovery of ice on a main-belt asteroid.

[www.nature.com/podcast](#)

For the latest videos from Nature, go to:

[www.youtube.com/NatureVideoChannel](#)