

Science

12 June 2009 | \$10

Programa de
Biotecnología
004



AAAS

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Discovered in 1852 and used for polarizing light, the crystal structure of iodoquinine sulfate has been solved.

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COVER

The flight path of a maple seed visualized in a composite multiframe photograph. Autorotating seeds slow their descent by exploiting the low pressure generated by a vortex that forms at the leading edge of their spinning wing. A similar leading-edge vortex also elevates the lift of insect, bat, and hummingbird wings. See page 1438.

Photo: David Lentink

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Observations of polarized dust emission show that the magnetic field controls the dynamical evolution of a massive star-forming region.

1411 A Radio Pulsar/X-ray Binary Link

A. M. Archibald et al.

Radio observations reveal a system undergoing the transition from a low-mass x-ray binary star to a millisecond radio pulsar.

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1414 Determining the Dynamics of Entanglement

O. Jiménez Fariás et al.

The evolution of quantum mechanically entangled photon pairs can now be measured as they interact with their environment.

1417 Colloidal Nanocrystals with Molecular Metal Chalcogenide Surface Ligands

M. V. Kovalenko et al.

Chalcogenide-based ligands are used to link colloidal nanocrystals together and can be converted into semiconducting complexes.

1421 Polarization Control of Electron Tunneling into Ferroelectric Surfaces

P. Maksymovych et al.

High electric fields delivered with an atomic force microscope tip pattern polarization domains in ferroelectric thin films.

1425 Isotopic Homojunction Band Engineering from Diamond

H. Watanabe et al.

Nanoscale multilayers of diamond that alternate in isotopic composition create quantum wells that confine electrons.

1428 Measuring the Charge State of an Adatom with Noncontact Atomic Force Microscopy

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Charging of gold and silver atoms on salt films changes the force detected by the tip of a scanning probe microscope.

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1431 Oxygen-18 of O₂ Records the Impact of Abrupt Climate Change on the Terrestrial Biosphere

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Ice core studies show that changes in low-latitude rainfall accompanied abrupt climate change over the past 100,000 years.

1435 Boom-and-Bust Development Patterns Across the Amazon Deforestation Frontier

A. S. L. Rodrigues et al.

Rainforest loss in the Amazon is associated with ephemeral increase in people's relative prosperity.

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1438 Leading-Edge Vortices Elevate Lift of Autorotating Plant Seeds

D. Lentink et al.

Winged plant seeds use leading-edge vortices to create lift, in the same way that flying animals do.

1441 Fluorescent False Neurotransmitters Visualize Dopamine Release from Individual Presynaptic Terminals

N. G. Gubernator et al.

Optical tracking of neurotransmitter release in the brain reveals multiple synaptic populations that depend on brain activity.

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S. T. Aoki et al.

Binding of neutralizing antibodies to rotavirus stabilizes coat-protein trimers and blocks cell entry.

1447 Extensive Demethylation of Repetitive Elements During Seed Development Underlies Gene Imprinting

M. Gehring et al.

Gene function in *Arabidopsis* endosperm depends on whether a gene is maternally or paternally inherited.

1451 Genome-Wide Demethylation of *Arabidopsis* Endosperm

T.-F. Hsieh et al.

The endosperm genome of *Arabidopsis* shows extensive gene imprinting.

1454 Hyper-Recombination, Diversity, and Antibiotic Resistance in *Pneumococcus*

W. P. Hanage et al.

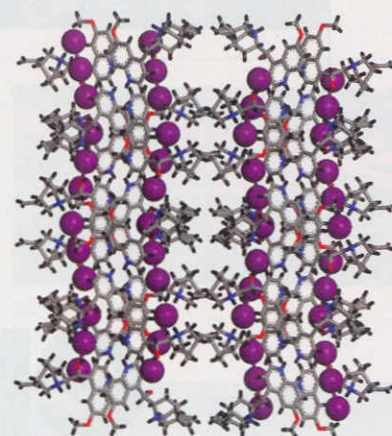
Promiscuity not only leads to diversity in streptococcal bacteria, but also to an increased likelihood of acquiring drug resistance.

1457 Inhibition of Hedgehog Signaling Enhances Delivery of Chemotherapy in a Mouse Model of Pancreatic Cancer

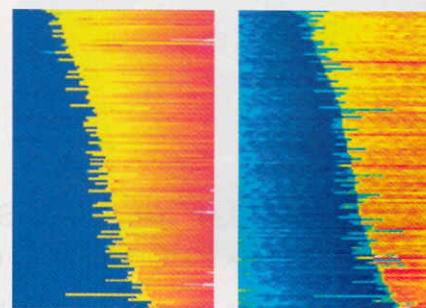
K. P. Olive et al.

Pancreatic tumors are unresponsive to chemotherapy because their limited vasculature precludes efficient drug delivery.

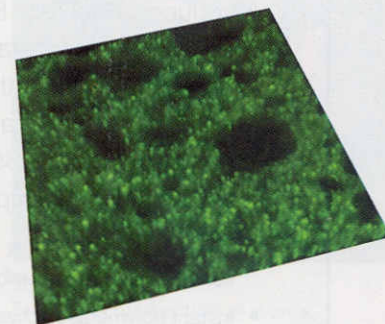
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www.sciencexpress.org

Genome-Wide RNAi Screen Identifies Genes Involved in Intestinal Pathogenic Bacterial Infection

S. J. F. Cronin et al.

In vivo RNA interference screen reveals regulators of innate immunity in *Drosophila*.

10.1126/science.1173164

Meningococcal Type IV Pili Recruit the Polarity Complex to Cross the Brain Endothelium

M. Coureuil et al.

Adhesion of bacteria to cells lining blood vessels in the brain induces them to part and allows pathogen invasion.

10.1126/science.1173196

LXR Regulates Cholesterol Uptake Through Idol-Dependent Ubiquitination of the LDL Receptor

N. Zelcer et al.

Cholesterol metabolism is regulated by a signaling pathway that targets the LDL receptor for degradation.

10.1126/science.1168974

Self-Assembling Sequence-Adaptive Peptide Nucleic Acids

Y. Ura et al.

A synthetic DNA analog can dynamically adapt its sequence in response to changing templates.

10.1126/science.1174577

Experimental Realization of a Three-Dimensional Topological Insulator, Bi_2Te_3

Y. L. Chen et al.

Bi_2Te_3 is identified as a three-dimensional topological insulator with a single metallic surface state.

10.1126/science.1173034

TECHNICALCOMMENTS

Comment on "Tail Reconnection Triggering Substorm Onset"

A. T. Y. Lui

full text at www.sciencemag.org/cgi/content/full/324/5933/1391-b

Response to Comment on "Tail Reconnection Triggering Substorm Onset"

V. Angelopoulos et al.

full text at www.sciencemag.org/cgi/content/full/324/5933/1391-c

SCIENCENOW

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Highlights From Our Daily News Coverage

Snakes on a Pane

Researchers figure out how snakes move over flat surfaces.

Physicists Put the Quantum Into Mechanics

Experiment demonstrates weird quantum connection between tiny "machines."

Case Closed: Scientists Nab Birds That Brought Down Airplane

Forensic analysis of feathers fingers culprit in Hudson River crash.

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The Signal Transduction Knowledge Environment

RESEARCH ARTICLE: PI3K γ Adaptor Subunits Define Coupling to Degranulation and Cell Motility by Distinct PtdIns(3,4,5) P_3 Pools in Mast Cells

T. Bohnacker et al.

PERSPECTIVE: Finding Partners for PI3K γ —When 84 Is Better Than 101

T. Balla

PODCAST

M. P. Wymann and A. M. VanHook

Adaptor subunits of phosphoinositide 3-kinase γ specify different cellular responses.

PERSPECTIVE: Insulin Signaling in Sporadic Alzheimer's Disease

F.-F. Liao and H. Xu

Amyloid- β and its oligomers disrupt insulin signaling by targeting the insulin receptor or downstream kinases.

SCIENCECAREERS

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Free Career Resources for Scientists

Speed Networking for Scientists

L. Holmes and K. Travis

Speed networking can be an effective way to promote new research collaborations.

Reaching for the Stars

C. Thomas

Maggie Aderin-Pocock's passion for science drives her career and public outreach.

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A History of Beginnings

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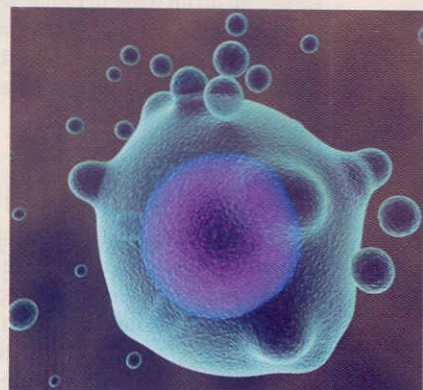
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Science Policy News and Analysis



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How dost thou slither?



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Mast cell degranulation.

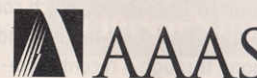


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