



## COVER

The mirror-like surface of Anish Kapoor's sculpture "Cloud Gate" reflects the cityscape of Chicago. The theme of the AAAS Annual Meeting in Chicago, 12 to 16 February 2009, acknowledges the 150th anniversary of Charles Darwin's *On the Origin of Species*, and the meeting starts on his 200th birthday. See the preliminary program beginning on page 762.

Image: Paul Sampson

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[www.sciencexpress.org](http://www.sciencexpress.org)

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**Time-Resolved Dynamics in N<sub>2</sub>O<sub>4</sub> Probed Using High Harmonic Generation**  
W. Li et al.

Electrons can be ejected from multiple orbitals of N<sub>2</sub>O<sub>4</sub> by exploiting different stages in its excited vibrations, yielding an attosecond light probe of molecular dynamics.  
10.1126/science.1163077

## BIOCHEMISTRY

**Structural Evidence for Common Ancestry of the Nuclear Pore Complex and Vesicle Coats**

S. G. Brohawn et al.

The protein complex that controls entry and exit from the cell nucleus shares a structural element with vesicle coat proteins, suggesting that it is built around a lattice-like scaffold.  
10.1126/science.1165886

**LETTER: European Union and NIH Collaborate**

E. A. Zerhouni and J. Potočnik

10.1126/science.1167667

## MICROBIOLOGY

**BREVIA: Bat White-Nose Syndrome: An Emerging Fungal Pathogen?**

D. S. Blehert et al.

Bats that died en masse in New York state while they were hibernating were infected with a cold-tolerant fungus.

10.1126/science.1163874

## CHEMISTRY

**High Harmonic Generation from Multiple Orbitals in N<sub>2</sub>**

B. K. McFarland, J. P. Farrell, P. H. Bucksbaum, M. Gühr

Electron ejection from multiple N<sub>2</sub> orbitals, controlled by the molecule's orientation relative to a laser, produces attosecond light spectra that can reveal molecular dynamics.

10.1126/science.1162780

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P. M. Fuller, J. Lu, C. B. Saper

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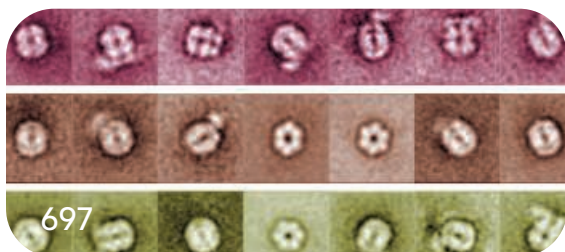
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An endosymbiotic bacterium survives and spreads in populations of *Drosophila* because it protects its insect hosts from death caused by certain RNA viruses. >> *Science Podcast*



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B. R. Williams et al.

Mouse cell lines carrying extra copies of one of four chromosomes all show less cell proliferation and higher gene expression, but vary in how fast they become cancer-like cells. >> *Perspective p. 692*

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**Structure and Molecular Mechanism of a Nucleobase-Cation-Symport-1 Family Transporter** 709

S. Weyand et al.

The structure of a membrane transporter in an open state suggests that in- and out-facing cavities reciprocally open and close coordinated by two transmembrane segments.

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A type of primitive meteorite from the earliest small bodies in the solar system preserves remnant magnetism, implying that these planetesimals had a convecting metallic core.

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**The Role of Impulse on the Initiation of Particle Movement Under Turbulent Flow Conditions** 717

P. Diplas et al.

Entrainment of sediment grains from, say, a stream bed, by turbulent flow depends not just on the magnitude of the applied fluid forces but also on their duration.

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H. D. Rowland et al.

When polymers are squeezed at nanometer scales, the longest chains unexpectedly flow more easily, even though in theory they should be the most entangled. >> *Perspective p. 689*

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*S. Aoi, T. Kunugi, H. Fujiwara*

Upward ground acceleration in a recent earthquake in Japan reached about four times that of gravity, as if the upper soil layer were bouncing on a trampoline in the ground below.

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**Tracing the Origin and Fate of NO<sub>x</sub> in the Arctic Atmosphere Using Stable Isotopes in Nitrate** 730

*S. Morin et al.*

Measurements of N and O isotopes show that nitrate in the high Arctic is produced when spring sunlight oxidizes pollutants brought from lower latitudes since the past summer.

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**Ages for the Middle Stone Age of Southern Africa: Implications for Human Behavior and Dispersal** 733

*Z. Jacobs et al.*

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### ECOLOGY

**Experimental Evidence for Spatial Self-Organization and Its Emergent Effects in Mussel Bed Ecosystems** 739

*J. van de Koppel et al.*

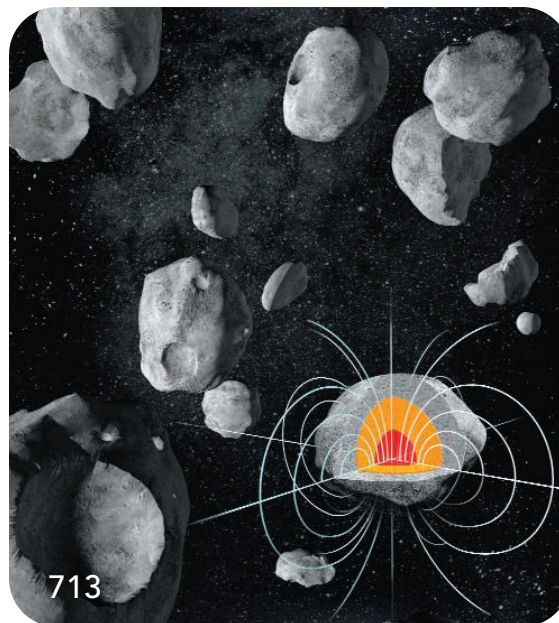
Interactions among individual mussels result in large-scale spatial patterns in mussel beds that are beneficial to the population—by promoting secondary production, for example.

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*T. Bacaj, M. Tevlin, Y. Lu, S. Shaham*

Nonneural glial cells are required for the normal operation of the main sensory organ of a nematode, influencing neuronal shape and function, as well as behavior. >> *Perspective p. 693*

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**HARP Is an ATP-Driven Annealing Helicase** 748

*T. Yusufzai and J. T. Kadonaga*

The gene deleted in a complex genetic disease is a reverse helicase, a motor-like enzyme that uses adenosine triphosphate to zip up separated strands of DNA.

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**Polycomb Proteins Targeted by a Short Repeat RNA to the Mouse X Chromosome** 750

*J. Zhao, B. K. Sun, J. A. Erwin, J.-J. Song, J. T. Lee*

A small RNA cleaved from a larger precursor recruits silencing proteins to the X chromosome to inactivate it in female mammals, which have an extra copy.

### IMMUNOLOGY

**Deletion of *Trpm7* Disrupts Embryonic Development and Thymopoiesis Without Altering Mg<sup>2+</sup> Homeostasis** 756

*J. Jin et al.*

A cation channel that conducts both Ca<sup>2+</sup> and Mg<sup>2+</sup> is unexpectedly required for normal mouse development, specifically for proper maturation of the thymus and T cells.



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HIGHLIGHTS FROM OUR DAILY NEWS COVERAGE

### Viagra Stands Firm Against Muscular Dystrophy

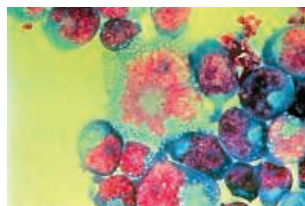
Famous anti-impotence pill might compensate for muscle-weakening enzyme deficiency.

### Thanks for Erasing the Memories

Combination of genetic engineering and drugs wipes out specific memories in mice.

### Not Your Garden-Variety Tomato

Researchers engineer cancer-fighting purple tomatoes.



Enthusiasm for virology.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_development](http://www.sciencereers.org/career_development)

FREE CAREER RESOURCES FOR SCIENTISTS

### The Pathways to Independence Award: Early Returns

*S. Carpenter*

NIH's new transition awards program seems to be achieving its goal.

### The Other Life Sciences Industry

*C. Mintz*

The medical devices and diagnostics industry is underappreciated as a life sciences career destination.

### A Virologist With a Contagious Enthusiasm

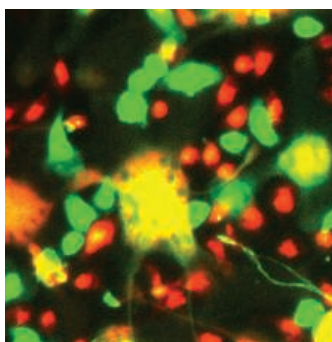
*E. Pain*

French virologist Ali Saib is praised for his research achievements and efforts to attract a diversity of people to science.

### From the Archives: Lab Dynamics—Science at the Balcony

*C. M. Cohen and S. L. Cohen*

How you discuss content or data can be as important as the content or data itself.



Programming macrophages to fuse.

## SCIENCE SIGNALING

[www.sciencesignaling.org](http://www.sciencesignaling.org)

THE SIGNAL TRANSDUCTION KNOWLEDGE ENVIRONMENT

### RESEARCH ARTICLE: Essential Role of DAP12 Signaling in Macrophage Programming into a Fusion-Competent State

*L. Helming, E. Tomasello, T. R. Kyriakides, F. O. Martinez, T. Takai, S. Gordon, E. Vivier*

Signaling through the DAP12 adaptor triggers a gene expression profile that makes macrophages competent to fuse and form multinucleated giant cells.

### PROTOCOL: High-Resolution Imaging of Redox Signaling in Live Cells Through an Oxidation-Sensitive Yellow Fluorescent Protein

*G. Maulucci, V. Labate, M. Mele, E. Panieri, G. Arcovito, T. Galeotti, H. Østergaard, J. R. Winther, M. De Spirito, G. Pani*

Measure and visualize intracellular changes in the redox state.

### JOURNAL CLUB: The HIF-1 $\alpha$ -C/EBP $\alpha$ Axis

*H. P. Janardhan*

Interactions between HIF-1 $\alpha$  and C/EBP $\alpha$  may mediate reciprocal functional effects.

### PODCAST

*R. Linding and A. M. VanHook*

Rune Linding explains how combining NetPhorest with a genetic screen enables researchers to gain insight into the relationships among the identified players.

## SCIENCE PODCAST

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