

## SPECIAL SECTION

# Human Conflict

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**COVER**

We are all too familiar with human conflict, such as this bombing on 13 August 2006 in Beirut, Lebanon, by the Israel Defense Forces. In the special section on Human Conflict (see page 818), we examine the origins of conflict, trace its path through history, and consider its modern manifestations. We also analyze our innate ability to foster peace and look at societies that eschew war. This cover was chosen for visual imagery and not for any political message or endorsement.

*Image: Sang-Hoon KISH Kim/Sipa Press/Newscom*

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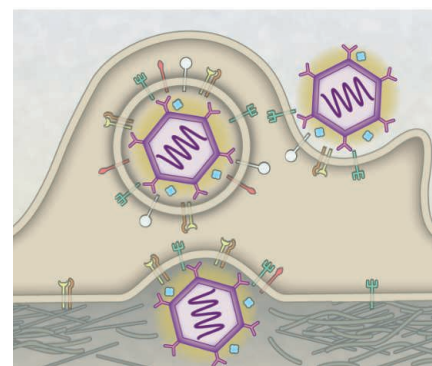
## BREVIA

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*A. G. Bick et al.*  
Phylogenetic analysis of the mitochondrial calcium transporter shows that it was a feature of early eukaryotes.

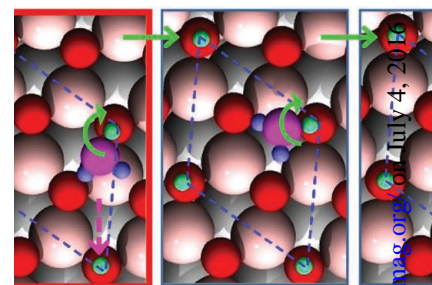
## REPORTS

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Illumination of an ensemble of cold rubidium atoms ultimately leads to high-level excitation of just a single atom.  
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*L. R. Merte et al.*  
The presence of adsorbed water enhances proton diffusion, likely through a hydronium ion transition state.
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*M. Behrens et al.*  
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- 901 Observation of <sup>239</sup>Pu Nuclear Magnetic Resonance  
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*D. J. Johnson et al.*  
Tree seedlings have a harder time establishing themselves in forests containing many adults of the same species.
- 907 Randomized Government Safety Inspections Reduce Worker Injuries with No Detectable Job Loss  
*D. I. Levine et al.*  
It may be feasible to achieve employee safety while keeping businesses viable.
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A close look at a paradigmatic system accounts for the costs due to protein activity versus expression and folding.
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*Y. S. Polikanov et al.*  
Three crystal structures show why bacteria stop making proteins when they enter the stationary phase.
- 918 The Ancient Drug Salicylate Directly Activates AMP-Activated Protein Kinase  
*S. A. Hawley et al.*  
A possible molecular mechanism of action for a metabolite of aspirin is described.  
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*H. Røy et al.*  
Microbes in Pacific sediments grow very, very slowly.
- 925 Multiple Spectral Inputs Improve Motion Discrimination in the *Drosophila* Visual System  
*T. J. Wardill et al.*  
Fly photoreceptors that detect colors also contribute information to the processing of motion.
- 931 AID-Driven Deletion Causes Immunoglobulin Heavy Chain Locus Suicide Recombination in B Cells  
*S. Péron et al.*  
Recombination-induced deletion of the immunoglobulin heavy chain gene in activated B cells may influence B cell homeostasis.



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- 934 Quantitative Sequencing of 5-Methylcytosine and 5-Hydroxymethylcytosine at Single-Base Resolution  
*M. J. Booth et al.*  
A sequencing method can discriminate epigenetically modified cytosine nucleotides within embryonic stem cell DNA.

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## SCIENCEONLINE

## SCIENCEEXPRESS

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

### Evolution and Functional Impact of Rare Coding Variation from Deep Sequencing of Human Exomes

*J. A. Tennesen et al.*

Most functionally consequential variants in protein-coding genes are rare and, thus, difficult to find.

10.1126/science.1219240

### An Abundance of Rare Functional Variants in 202 Drug Target Genes Sequenced in 14,002 People

*M. R. Nelson et al.*

A pharmacogenomics analysis shows how challenging it will be to associate rare variants with phenotypes.

10.1126/science.1217876

### Oscillatory Dynamics of Cdc42 GTPase in the Control of Polarized Growth

*M. Das et al.*

The regulation of a yeast cell-growth enzyme is dynamic rather than on-off.

10.1126/science.1218377

### Graphene Barristor, a Triode Device with a Gate-Controlled Schottky Barrier

*H. Yang et al.*

The absence of defects and surface oxides at a graphene/silicon interface enables voltage control of graphene devices.

10.1126/science.1220527

### Direct Detection of Projectile Relics from the End of the Lunar Basin—Forming Epoch

*K. H. Joy et al.*

Analysis of lunar rocks from the Apollo missions reveals fragments from meteorites that hit the Moon in the ancient past.

10.1126/science.1219633

### Fragments of the Lunar Cataclysm

*A. E. Rubin*

10.1126/science.1224184

### Roton-Type Mode Softening in a Quantum Gas with Cavity-Mediated Long-Range Interactions

*R. Mottl et al.*

Low-energy excitations of the type present in superfluid helium are observed in a cold gas of rubidium atoms.

10.1126/science.1220314

## SCIENCENOW

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

Highlights From Our Daily News Coverage

### Electronics Go Viral

Researchers create an electrical generator out of viruses.

[http://scim.ag/Electronics\\_Viral](http://scim.ag/Electronics_Viral)

### Engravings of Female Genitalia May Be World's Oldest Cave Art

Images found on the ceiling of a collapsed shelter may predate those of France's famed Chauvet Cave.

<http://scim.ag/Cave-Art>

### Heat Trickery Paves Way for Thermal Computers

Devices harness heat currents instead of electrical ones.

<http://scim.ag/Thermal-Computers>

## SCIENCE SIGNALING

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

The Signal Transduction Knowledge Environment

**15 May issue:** <http://scim.ag/ss051512>

### RESEARCH RESOURCE: MicroSCALE Screening Reveals Genetic Modifiers of Therapeutic Response in Melanoma

*K. C. Wood et al.*

Miniaturized functional genomics uncovers potentially useful combination therapies and drug targets for melanoma.

### PERSPECTIVE: The Structure of the Full-Length Tetrameric PKA Regulatory R $\beta$ Complex Reveals the Mechanism of Allosteric PKA Activation

*J. M. Elkins and S. Knapp*

The conformational changes caused by cAMP binding to the regulatory subunit in the PKA holoenzyme are shown.

### PERSPECTIVE: The Structural Basis of DKK-Mediated Inhibition of Wnt/LRP Signaling

*J. Bao et al.*

Structural analysis indicates that the binding sites on a receptor for ligand and inhibitor partially overlap.

### PRESENTATION: Roles of GRK2 in Cell Signaling Beyond GPCR Desensitization—GRK2-HDAC6 Interaction Modulates Cell Spreading and Motility

*P. Penela et al.*

GRK2 modulates tubulin acetylation dynamics in an HDAC6-dependent manner to affect epithelial cell spreading and motility.

## SCIENCE TRANSLATIONAL MEDICINE

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

Integrating Medicine and Science

**16 May issue:** <http://scim.ag/stm051612>

### EDITORIAL: APO $\epsilon$ 4 Status and Traumatic Brain Injury on the Gridiron or the Battlefield

*S. Gandy and S. T. DeKosky*

Should APO $\epsilon$ 4 genotyping be required for high school or college athletes and military personnel?

### RESEARCH ARTICLE: Chronic Traumatic Encephalopathy in Blast-Exposed Military Veterans and a Blast Neurotrauma Mouse Model

*L. E. Goldstein et al.*

Blast exposure is associated with chronic traumatic encephalopathy and persistent cognitive deficits in veterans and athletes.

>> *News story p. 790*

### RESEARCH ARTICLE: Gene Therapy for Aromatic L-Amino Acid Decarboxylase Deficiency

*W.-L. Hwu et al.*

Gene therapy can restore some motor function in patients with aromatic L-amino acid decarboxylase deficiency.

### RESEARCH ARTICLE: CD25 Blockade Depletes and Selectively Reprograms Regulatory T Cells in Concert with Immunotherapy in Cancer Patients

*A. J. Rech et al.*

CD25 monoclonal antibody therapy rapidly and durably depletes T<sub>regs</sub> in cancer patients through a mechanism consistent with reprogramming.

### RESEARCH ARTICLE: High-Throughput Sequencing Detects Minimal Residual Disease in Acute T Lymphoblastic Leukemia

*D. Wu et al.*

High-throughput sequencing can detect minimal residual disease comparable to multiparametric flow cytometry in T-ALL patients.

### PERSPECTIVE: Drug-Based Optical Agents—Infiltrating Clinics at Lower Risk

*W. Scheuer et al.*

Using drugs as optical imaging agents and “microdosing” amounts reduces risk or clinical translation of fluorescence molecular imaging.

## SCIENCE CAREERS

[www.sciencereers.org/career\\_magazine](http://www.sciencereers.org/career_magazine)

Free Career Resources for Scientists

### Winning Over Hearts Means Understanding Minds

*M. Price*

For scientists who study conflict's motivations and consequences, the brain is the battlefield that matters.

<http://scim.ag/HeartsandMinds>

>> *Human Conflict section p. 818*

### Tooling Up: How to Swim With Sharks

*D. Jensen*

Here's what you need to know about third-party services that offer to help with your job search.

[http://scim.ag/TU\\_Sharks](http://scim.ag/TU_Sharks)

### In Person: Family-Friendly Science Careers

*T. Ainsworth*

We need to let young women know that it is possible to have a science career and a family.

<http://scim.ag/InPersonAinsworth>

## SCIENCE PODCAST

[www.sciencemag.org/multimedia/podcast](http://www.sciencemag.org/multimedia/podcast)

Free Weekly Show

On the 18 May Science Podcast: a special show exploring human conflict, including strife among our primate ancestors, the biological underpinnings of racism, and the fundamentals of “peace systems.”

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Editor's Summary

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