EDITORIAL
437  Redefining Science Education
Bruce Alberts

NEWS OF THE WEEK
446  Acquittals in CJD Trial Divide French Scientists
447  Western U.S. Forests Suffer Death by Degrees
>> Report p. 521
448  Debate Continues Over Rainforest Fate—With a Climate Twist
449  Confused Pelicans May Have Lingered Too Long Up North
449  Two Americans Win Japan Prize
450  European Pesticide Rules Promote Resistance, Researchers Warn
451  Scientists Puzzle Over Ebola-Reston Virus in Pigs
451  Educators Decry New Louisiana Policy
452  Proposed Regulatory Czar Has Long and Perplexing Track Record
452  U.S. Appellate Court Weighs 'Obvious' Patents
453  Photon Sieve Lights a Smooth Path to Entangled Quantum Weirdness
>> Report p. 483

NEWS FOCUS
454  Friendship as a Health Factor
With Isolation Comes Ill Health
>> Science Podcast
458  American Geophysical Union Meeting
Galloping Glaciers of Greenland Have Reined Themselves In
Tang Hints of a Watery Interior for Enceladus
The Many Dangers of Greenhouse Acid
Snapshots From the Meeting

LETTERS
460  Bailing Out Creatures Great and Small
J. Ghazoul
Proposed French Reforms Miss the Mark
D. Job
Ban Impact Factor Manipulation
C. Wallner
GOP Must Embrace Science Again
R. White
A Word of Caution on the Coca-Cola Way
G. Satchwell

BOOKS ET AL.
462  Dead Pool
J. L. Powell, reviewed by J. Farmer
463  Don’t Sleep, There Are Snakes
D. L. Everett, reviewed by A. S. Calude

POLICY FORUM
464  Could Access Requirements Stifle Your Research?
S. Jinnah and S. Jungcurt

PERSPECTIVES
466  Ex Uno Plura
S. Feau and S. P. Schoenberger
>> Reports pp. 502 and 505
467  Where Bacteria and Languages Concur
C. Renfrew
>> Research Article p. 479; Report p. 527; Science Podcast
469  Teleporting a Quantum State to Distant Matter
M. S. Kim and J. Cho
>> Report p. 486
470  Sources of Asian Haze
S. Szidat
>> Report p. 495
471  Life on an Anaerobic Planet
F. Westall
472  Protein Filaments Caught in the Act
G. J. Jensen
>> Report p. 509

REVIEW
474  Membrane Fusion: Grappling with SNARE and SM Proteins
T. C. Südhof and J. E. Rothman
>> Reports pp. 512 and 516

COVER
Human cells infected with the protozoan parasite Toxoplasma gondii visualized by scanning electron microscopy. In the foreground are parasites (yellow-green) rupturing out of a dying host cell (blue); in the background is an intact host cell containing a large parasite-filled vacuole. See page 530.

Image: Sasha Meshinchi, Michael Robinson, Bjorn Kafsack, and Vern Carruthers

www.sciencemag.org  SCIENCE  VOL 323  23 JANUARY 2009
Published by AAAS
BREVIA

478 Earth’s Degassing: A Missing Ethane and Propane Source
G. Etiope and P. Ciccioli
Natural gas seepage contributes far more methane, ethane, and propane to the atmosphere than formerly realized.

RESEARCH ARTICLE

479 Language Phylogenies Reveal Expansion Pulses and Pauses in Pacific Settlement
R. D. Gray et al.
Geographical distribution of Austronesian languages reveals the rate and direction of migrations from Taiwan 5200 years ago.
>> Perspective p. 467

REPORTS

483 An Entanglement Filter
R. Okamoto et al.
A useful tool for quantum information processing transmits entangled photons only when they have the same polarization.
>> News story p. 453

486 Quantum Teleportation Between Distant Matter Qubits
S. Olmschenk et al.
Transporting quantum states between trapped ions one meter apart may enable local storage of information in quantum memories.
>> Perspective p. 469

489 Femtosecond XANES Study of the Light-Induced Spin Crossover Dynamics in an Iron(II) Complex
Ch. Bressler et al.
X-ray absorption spectroscopy resolves the dynamics of spin-state interconversions, which take place in less than a picosecond, in a well-studied class of iron compounds.

492 Complementary Active Sites Cause Size-Selective Reactivity of Aluminum Cluster Anions with Water
P. J. Roach et al.
Water dissociates at similar active sites on anionic aluminum clusters that have different sizes and electronic structure.

495 Brown Clouds over South Asia: Biomass or Fossil Fuel Combustion?
O. Gustafsson et al.
Biomass burning accounts for at least one-half of carbon-rich aerosols in the Asian atmospheric brown cloud that forms each winter.
>> Perspective p. 470

498 Genetic Interactions Between Transcription Factors Cause Natural Variation in Yeast
J. Gerke et al.
Adaptive differences in yeast sporulation arise from single-nucleotide mutations in transcription factors regulating sex.

502 Different T Cell Receptor Signals Determine CD8+ Memory Versus Effector Development
E. Teixeira et al.
Point mutations in the T cell receptor decide the fate of killer T cells and the development of immunological memory.
>> Perspective p. 466

505 Secondary Replicative Function of CD8+ T Cells That Had Developed an Effector Phenotype
O. Bannard et al.
Killer T cells that developed during a primary antiviral response can become memory T cells in secondary infections.
>> Perspective p. 466

509 Electron Cryomicroscopy of E. coli Reveals Filament Bundles Involved in Plasmid DNA Segregation
J. Salje et al.
The actin-like filaments that power movement of DNA during bacterial cell division form small bundles of three to five filaments near the nucleoid.
>> Perspective p. 472

512 Alternative Zippering as an On-Off Switch for SNARE-Mediated Fusion
C. G. Giraudo et al.
A structural motif in the protein complexin may act as a switch during membrane fusion.
>> Review p. 474

516 Complexin Controls the Force Transfer from SNARE Complexes to Membranes in Fusion
A. Maximov et al.
The protein complexin may act as a force-transferring switch during membrane fusion.
>> Review p. 474

521 Widespread Increase of Tree Mortality Rates in the Western United States
P. J. van Mantgem et al.
Regional warming is contributing to the recent acceleration of tree deaths seen in undisturbed forests of the western U.S.
>> News story p. 447; Science Podcast

524 The Sphingolipid Transporter Spns2 Functions in Migration of Zebrafish Myocardial Precursors
A. Kawahara et al.
Normal heart development in zebrafish requires the function of a lipid transporter in a membrane surrounding the yolk, a tissue outside of the embryo proper.

527 The Peopling of the Pacific from a Bacterial Perspective
Y. Moodley et al.
The geographical distribution of strains of a specific human pathogen helps to define patterns of colonization out of Taiwan.
>> Perspective p. 467

530 Rapid Membrane Disruption by a Perforin-Like Protein Facilitates Parasite Exit from Host Cells
B. F. C. Kafsack et al.
The human and animal parasite that causes toxoplasmosis escapes from host cells by using a perforin-like protein to make holes in the intracellular vacuole in which it resides.

CONTENTS continued >>
PROTOCOL: Genome to Kinome—Species-Specific Peptide Arrays for Kinome Analysis
S. Jialal et al.
Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

CONNECTIONS MAP: Neuro2A Differentiation by Gαi/o Pathway
A. Ma’ayan et al.
Neurite outgrowth can be stimulated by G protein-coupled receptors that signal through Gαi and Gαo proteins.

GLOSSARY
Find out what IRAP, Spred, and DOPA mean in the world of cell signaling.

SCIENCE CAREERS
www.sciencecareers.org/career_magazine
Free Career Resources for Scientists

Mind Matters: Stress, an Uninvited Lab Visitor
I. Levine
Work-related stress is an insidious health hazard.

Lost in Translation
C. Rey
America needs more science writers of color, just as it needs more scientists of color.

Consulting Experience for Doctoral Students in France
E. Pain
A program launched by the French government allows Ph.D. students to sell their skills to nonacademic clients.

Analysis of the Drosophila Segmentation Network Identifies a JNK Pathway Factor Overexpressed in Kidney Cancer
J. Liu et al.
A developmental marker in fruit flies also acts as a marker of renal cell cancer in humans.

Axiom Regeneration Requires a Conserved MAP Kinase Pathway
M. Hammerlund et al.
Axiom regeneration in adult nematode worms has distinct signals that are independent of earlier developmental programs.

Axon regeneration in adult nematode worms has distinct signals that are independent of earlier developmental programs.

Injecting energy into a gold film can create a transient excited state with stronger bonds prior to melting.

The mechanisms by which kinases activate themselves are still emerging.

Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

Neurite outgrowth can be stimulated by G protein-coupled receptors that signal through Gαi and Gαo proteins.

An active kinase.
An hazard in the lab.
A history of beginnings.

Peptide Arrays for Kinome Analysis
S. Jalal et al.
Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

Identifies a JNK Pathway Factor Overexpressed in Kidney Cancer
J. Liu et al.
A developmental marker in fruit flies also acts as a marker of renal cell cancer in humans.

Not gone after all.

PROTOCOL: Genome to Kinome—Species-Specific Peptide Arrays for Kinome Analysis
S. Jialal et al.
Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

CONNECTIONS MAP: Neuro2A Differentiation by Gαi/o Pathway
A. Ma’ayan et al.
Neurite outgrowth can be stimulated by G protein-coupled receptors that signal through Gαi and Gαo proteins.

GLOSSARY
Find out what IRAP, Spred, and DOPA mean in the world of cell signaling.

SCIENCE CAREERS
www.sciencecareers.org/career_magazine
Free Career Resources for Scientists

Mind Matters: Stress, an Uninvited Lab Visitor
I. Levine
Work-related stress is an insidious health hazard.

Lost in Translation
C. Rey
America needs more science writers of color, just as it needs more scientists of color.

Consulting Experience for Doctoral Students in France
E. Pain
A program launched by the French government allows Ph.D. students to sell their skills to nonacademic clients.

Analysis of the Drosophila Segmentation Network Identifies a JNK Pathway Factor Overexpressed in Kidney Cancer
J. Liu et al.
A developmental marker in fruit flies also acts as a marker of renal cell cancer in humans.

Axiom Regeneration Requires a Conserved MAP Kinase Pathway
M. Hammerlund et al.
Axiom regeneration in adult nematode worms has distinct signals that are independent of earlier developmental programs.

Axon regeneration in adult nematode worms has distinct signals that are independent of earlier developmental programs.

Injecting energy into a gold film can create a transient excited state with stronger bonds prior to melting.

The mechanisms by which kinases activate themselves are still emerging.

Marrying bioinformatics and phosphorylation assays enables the empirical analysis of kinomes of multiple species.

Neurite outgrowth can be stimulated by G protein-coupled receptors that signal through Gαi and Gαo proteins.

An active kinase.
An hazard in the lab.
A history of beginnings.