CONTENTS

EDITORIAL
17 Empowering Young Scientists
Tilman Brück et al.

NEWS OF THE WEEK
22 ‘Asilomar 2’ Takes Small Steps Toward Rules for Geoengineering
23 Madagascar’s Forests Get a Reprieve—But for How Long?
25 From Science’s Online Daily News Site
25 From the Science Policy Blog
26 Trade Trumps Science for Marine Species at International Meeting
Ivy Ban Upheld
27 Thought Experiment Torpedoes Variable-Speed-of-Light Theories
29 NOAA’s Tom Karl Takes On Task of Serving Up Climate to the Public

NEWS FOCUS
30 CHIMPANZEE RESEARCH TODAY
In the Shadow of Jane Goodall
>> Science Podcast
Long-Term Chimp and Bonobo Research Sites Chimps Read Lips
Makoku at 0°30’N 30°24’E: Chimping Via GPS
A Matter of Life and Limb
The Spread of Culture, Primitive as It Is
The Chimpanzee Genome Project’s Seedy Origins
36 Talking Chimp to Chimp
38 Boxed About the Ears, Ape Language Research Field Is Still Standing
40 The Inner Workings of the Chimpanzee Brain
41 Getting Intimate With the Chimp Mind, Japanese Style
43 Cutting to the Bone of Human Origins

LETTERS
45 Consent Contraindicated?
T. L. Yaksh et al.
Response
B. A. Liang and T. Mackey
Polystyrene Overestimated
D. J. Tonjes and R. L. Swanson
Suitability of Artificial Nests
J. Faaborg
Response
L. McKinnon et al.

CORRECTIONS AND CLARIFICATIONS

BOOKS ET AL.
48 An Entirely Synthetic Fish
A. Halverson, reviewed by J. Farmer

PERSPECTIVES
51 A Vaccine Monkey Wrench?
H. Hengel and U. H. Koszinowski
>> Report p. 102
52 Why Thick Can Be Slick
M. H. Müser and D. Shakhvorostov
>> Report p. 76
53 Ocean Chemistry and Early Animals
G. M. Narbonne
>> Report p. 80
54 What Lies Beneath
M. Tolstoy
>> Report p. 83
55 Fishing Antihypernuclei
Out of a Quark-Gluon Soup
T. D. Cohen
>> Research Article p. 58
56 Mixing or Not Mixing
D. Ray-Gallet and G. Almouzni
>> Report p. 94

CONTENTS continued >>

COVER
An array of alternating open and closed potassium channel pores. A Research Article on page 67 describes a mechanism by which cell membrane voltage, through the action of protein voltage sensors, controls ion channel opening and closing to produce electrical impulses in the nervous system.
Credit: Xiao Tao, Rockefeller University

DEPARTMENTS
13 This Week in Science
18 Editors’ Choice
20 Science Staff
21 Random Samples
110 New Products
111 Science Careers
RESEARCH ARTICLES

58 Observation of an Antimatter Hypernucleus
The STAR Collaboration
Nuclei composed of antimatter are found to form in the high-energy collisions of gold ions.
>> Perspective p. 55

62 Functional Hierarchy and Reversibility Within the Murine Spermatogenic Stem Cell Compartment
T. Nakagawa et al.
Developmental flexibility within a stem cell system underpins the robust maintenance of spermatogenesis.

67 A Gating Charge Transfer Center in Voltage Sensors
X. Tao et al.
An occluded site stabilizes charged amino acids as they cross the membrane field to achieve switchlike channel opening.

REPORTS

73 Evidence for Strong Extragalactic Magnetic Fields from Fermi Observations of TeV Blazars
A. Neronov and I. Vovk
An analysis of data from the Fermi Large Area Telescope sets a lower limit for the strength of intergalactic magnetic fields.

76 Frictional Characteristics of Atomically Thin Sheets
C. Lee et al.
A universal trend is observed for the friction properties of thin films on weakly adhering substrates.
>> Perspective p. 52

80 A Stratified Redox Model for the Ediacaran Ocean
C. Li et al.
Geological records in China indicate that ocean chemistry may explain the delay in life’s biggest diversification period.
>> Perspective p. 53

83 Mantle Flow Drives the Subsidence of Oceanic Plates
C. Adam and V. Vidal
Sea-floor depth varies as a function of convection of the underlying mantle, rather than the age of oceanic crust.
>> Perspective p. 54; Science Podcast

85 Orchestration of Floral Initiation by APETALA1
K. Kaufmann et al.
The master transcription factor APETALA1 dynamically regulates a complex genetic network to guide flower development.

89 Maize Tumors Caused by Ustilago maydis Require Organ-Specific Genes in Host and Pathogen
D. S. Skibbe et al.
Transcriptionally different expression occurs between infected maize tissues and the corn smut infecting these tissues.

92 Cryptic Sex-Ratio Bias Provides Indirect Genetic Benefits Despite Sexual Conflict
R. M. Cox and R. Calsbeek
Female lizards improve their fitness by biasing the sex ratio of their progeny on the basis of sire body size.

94 Dynamic Regulation of Archaeal Proteasome Gate Opening As Studied by TROSY NMR
T. L. Religa et al.
Enter of substrate into the proteasome is regulated by dynamic gates that move in and out of the entrance pores.

98 Partitioning of Histone H3-H4 Tetramers During DNA Replication–Dependent Chromatin Assembly
M. Xu et al.
Inheritance of histones H3 and H4 implies that epigenetic marks are copied between nucleosomes.
>> Perspective p. 56

102 Evasion of CD8+ T Cells Is Critical for Superinfection by Cytomegalovirus
S. G. Hansen et al.
Cytomegalovirus monkeys can reinfect an already-infected host by evading the CD8+ T cell–mediated immune response.
>> Perspective p. 51; Science Podcast

106 Synchrony of Thalamocortical Inputs Maximizes Cortical Reliability
H.-P. Wang et al.
Synchronous synaptic inputs from a very small number of thalamic neurons can be strong enough to activate cortical neurons.

CONTENTS continued >>
Onset of Convective Rainfall During Gradual Late Miocene Rise of the Central Andes
C. J. Poulsen et al.
Increased precipitation, rather than rapid uplift, drove isotopic changes in soil carbonates of the Andes in the Late Miocene. 10.1126/science.1185078

Systematic Analysis of Human Protein Complexes Identifies Chromosome Segregation Proteins
J. R. A. Hutchins et al.
A strategy designed to decipher the function of proteins identified in RNA interference screens reveals new insights into mitosis. 10.1126/science.1181348

RESEARCH ARTICLE: Differential Redox Regulation of ORAI Ion Channels—A Mechanism to Tune Cellular Calcium Signaling
I. Bogeskål et al.
Redox sensitivity of T cells decreases through ORAI Ca<sup>2+</sup> channel subunit switching during T cell differentiation.

RESEARCH ARTICLE: New Roles for the LKB1–NUAK Pathway in Controlling Myosin Phosphatase Complexes and Cell Adhesion
A. Zagórska et al.

PODCAST
D. R. Alessi and A. M. VanHook
The tumor suppressor LKB1 not only keeps cell proliferation in check but also modulates cell adhesion.

PERSPECTIVE: GPCR Dimers Fall Apart
N. A. Lambert
Oligomers of G protein–coupled receptors may be less stable than previously suspected.

REVIEW: The Role of the Kinases RIP1 and RIP3 in TNF–Induced Necrosis
P. Vandenabeele et al.
Programmed necrosis in response to TNF requires the activity of two serine-threonine kinases.

SCIENCE SIGNALING
www.sciencesignaling.org
Controlling cell adhesion.

RESEARCH ARTICLE: Plasmacytoid Dendritic Cells Delineate Immunogenicity of Influenza Vaccine Subtypes
S. Koyama et al.
Rare, circulating dendritic cells differentially shape the immunogenicity mechanisms for protection against H1N1 influenza.

RESEARCH ARTICLE: Microfluidic Isolation and Molecular Characterization of Circulating Tumor Cells from Patients with Localized and Metastatic Prostate Cancer
S. Stott et al.
Automated imaging of prostate-specific cancer cells from the blood provides a measure of circulating tumor cell half-life after tumor resection.

SCIENCE NEWS
www.sciencenow.org
Read about insights from chimpanzee research, how cytomegalovirus evades the immune system, sinking sea floors, and more.

SCIENCE PODCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 2 April Science Podcast to hear about insights from chimpanzee research, how cytomegalovirus evades the immune system, sinking sea floors, and more.

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

SPECIAL FEATURE: TECHNOLOGIES ASSISTING SCIENTISTS AND ENGINEERS
 Assistive Technologies Enable Discovery
S. Carpenter
Like a microscope, assistive technologies allow scientists and engineers to extend their capabilities.

Profiles in Technological Adaptation
S. Carpenter
With assists from technology, these scientists and engineers are getting their work done.

Taken for Granted: Trying to Account for Tastes
B. L. Benderly
Research finds that scientists’ career preferences are far wider than stereotypes suggest.

SCIENCE TRANSLATIONAL MEDICINE
www.sciencetranslationalmedicine.org
Integrating Medicine and Science

PERSPECTIVE: Toward an Oligonucleotide Therapy for Duchenne Muscular Dystrophy—A Complex Development Challenge
M. J. A. Wood
By correcting the reading frame in mutant DMD genes, antisense oligonucleotides can restore the production of missing dystrophin protein.

COMMENTARY: Complexity in Common Diseases—Big Biology for All
J. R. Lamb and N. Gibson
Discovery of diagnostic tools and treatments for common human diseases requires integrating research in academic and industrial institutions.
Science 328 (5974), 13-110.

http://science.sciencemag.org/content/328/5974

http://www.sciencemag.org/help/reprints-and-permissions