

SPECIAL SECTION

HIV/AIDS IN AMERICA

INTRODUCTION

167 HIV/AIDS in America

NEWS

- 168 The Many States of HIV in America
A TALE OF 10 CITIES
- 172 *Birmingham, Alabama*: A Southern HIV/AIDS Program With All the Fixins
- 173 *Jackson, Mississippi*: By the People, For the People
- 174 *Atlanta, Georgia*: And the Band Played On, Vol. 2
- 175 *San Francisco, California*: A Concerted Effort to Lighten the Load
- 176 *Los Angeles, California*: Life in the Fast Lane: HIV and Meth
- 177 *San Diego, California, and Tijuana, Mexico*: My Virus Is Your Virus
- 178 *New York, New York*: Miracle on 34th Street: Success With Injectors Pay Now, Benefits May Follow
- 180 *Providence, Rhode Island*: HIV and the Cell: The Prisoner's Dilemma
- 181 *Baltimore, Maryland*: Dancing the Night Away; Keeping HIV at Bay
- 182 *Washington, District of Columbia*: HIV/AIDS Response Renovated in Capital

REVIEW

- 183 Broadly Neutralizing Antibodies Present New Prospects to Counter Highly Antigenically Diverse Viruses
D. R. Burton et al.

>> *Editorial p. 133; News story p. 152; Science Express Policy Forum by S. Lynch et al.; Science Careers; Science Translational Medicine Research Article by C. Sundling et al.; Science Podcast and other features at <http://scim.ag/hiv2012>*

EDITORIAL

- 133 An AIDS-Free Generation?
Salim S. Abdool Karim
>> *HIV/AIDS in America section p. 167*

NEWS OF THE WEEK

- 138 A roundup of the week's top stories

NEWS & ANALYSIS

- 141 Higgs Boson Makes Its Debut After Decades-Long Search
- 143 Commission Spreads Blame for 'Manmade' Disaster
- 144 Genes Suggest Three Groups Peopled the New World
- 145 Earth and Planetary Scientists Search for Common Ground

NEWS FOCUS

- 146 Rising Acidity Brings an Ocean of Trouble
>> *Report p. 220*
- 149 Betting Big on Science: A Cautionary Tale
- 152 The View From the Top of the HIV/AIDS World
>> *HIV/AIDS in America section p. 167*

LETTERS

- 154 Canada's Weakening Aquatic Protection
B. Favaro et al.
Postmarketing Trials for Rare Diseases
V. A. Llera and E. J. A. Roldán
- 155 The BUZZ: NSF's Big Pitch
- 155 CORRECTIONS AND CLARIFICATIONS
- 155 TECHNICAL COMMENT ABSTRACTS



pages 146 & 220

BOOKS ET AL.

- 156 Infrastructure
B. M. Frischmann, reviewed by E. Schlager
- 157 Born Together—Reared Apart: The Landmark Minnesota Twin Study
N. L. Segal, reviewed by D. I. Boomsma

POLICY FORUM

- 158 Challenges to the Future Conservation of the Antarctic
S. L. Chown et al.

PERSPECTIVES

- 160 Fragile Delivery to the Genome
D. E. Gottschling
>> *Research Article p. 195; Report p. 243*
- 161 Driving Dislocations in Graphene
L. L. Bonilla and A. Carpio
>> *Report p. 209*
- 162 Amazonian Extinction Debts
T. F. Rangel
>> *Report p. 228*
- 164 Frameshifting to PA-X Influenza
J. W. Yewdell and W. L. Ince
>> *Research Article p. 199*
- 165 Nature's Intricate Clockwork
B. R. Crane
>> *Research Article p. 189*



COVER

The epicenter of the HIV/AIDS epidemic in the United States has shifted from the East and West Coasts to the Deep South, where young black men who have sex with men are now becoming infected at a high rate. One of these men is Joshua Alexander, 25, shown here sitting in front of his mother's house in Greenville, Mississippi. See the special section beginning on page 167. For the story behind the cover, go to <http://scim.ag/cov6091>.

Photo: Malcolm Linton

DEPARTMENTS

- 131 This Week in *Science*
- 134 Editors' Choice
- 136 *Science* Staff
- 246 New Products
- 247 *Science* Careers

Downloaded from <http://science.sciencemag.org/> on May 8, 2021

BREVIA

- 188 **Attenuated Vaccines Can Recombine to Form Virulent Field Viruses**
S.-W. Lee et al.
Problems can arise when vaccines and wild strains of a chicken herpesvirus recombine.
>> *Science Podcast*

RESEARCH ARTICLES

- 189 **Crystal Structure of the Heterodimeric CLOCK:BMAL1 Transcriptional Activator Complex**
N. Huang et al.
Structure-function analyses reveal details of the interaction between two proteins that regulate daily rhythms in mammals.
>> *Perspective p. 165*
- 195 **MMS19 Assembles Iron-Sulfur Proteins Required for DNA Metabolism and Genomic Integrity**
O. Stehling et al.
A protein thought to be involved in DNA repair is, in fact, responsible for inserting iron-sulfur clusters into enzymes.
>> *Perspective p. 160; Report p. 243*
- 199 **An Overlapping Protein-Coding Region in Influenza A Virus Segment 3 Modulates the Host Response**
B. W. Jagger et al.
A previously unidentified influenza protein, partly old and partly new, turns off the expression of host genes.
>> *Perspective p. 164*

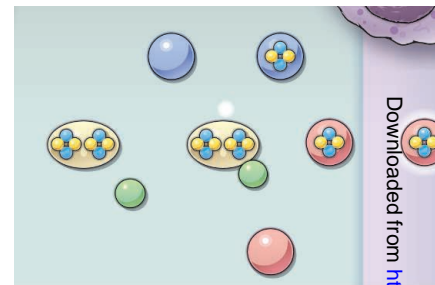
REPORTS

- 204 **Spin-Polarized Light-Emitting Diode Based on an Organic Bipolar Spin Valve**
T. D. Nguyen et al.
The light emission from an organic light-emitting diode depends on the spin polarization of the injected current.
- 209 **Dislocation-Driven Deformations in Graphene**
J. H. Warner et al.
Two-dimensional dislocation dynamics and the resulting strain fields are studied at high resolution in graphene.
>> *Perspective p. 161*
- 212 **A Reduced Organic Carbon Component in Martian Basalts**
A. Steele et al.
Analysis of 11 martian meteorites reveals complex hydrocarbons associated with magmatic minerals in 10 of them.
- 216 **Ice Volume and Sea Level During the Last Interglacial**
A. Dutton and K. Lambeck
Global average sea level during the last interglacial period was 6 to 10 meters higher than it is today.
- 220 **Rapid Progression of Ocean Acidification in the California Current System**
N. Gruber et al.
Rising concentrations of atmospheric carbon dioxide threaten to amplify the severity of ocean acidification in upwelling zones.
>> *News story p. 146*
- 223 **Clovis Age Western Stemmed Projectile Points and Human Coprolites at the Paisley Caves**
D. L. Jenkins et al.
The age of a Western Stemmed projectile point implies that this culture overlapped with the Clovis culture in North America.
>> *Science Podcast*
- 228 **Extinction Debt and Windows of Conservation Opportunity in the Brazilian Amazon**
O. R. Wearn et al.
Deforestation scenarios predict species extinction rates and identify targets of conservation efforts.
>> *Perspective p. 162*
- 232 **Structural Basis for Allosteric Regulation of GPCRs by Sodium Ions**
W. Liu et al.
A protein-engineering strategy yields a closer look at the receptor-bound water, sodium, and lipid molecules.
- 236 **Molecular Architecture and Assembly Principles of *Vibrio cholerae* Biofilms**
V. Berk et al.
When imaged in real time, biofilm development can be seen to rely on spatial and temporal intercellular contacts.
- 239 **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.
- 243 **MMS19 Links Cytoplasmic Iron-Sulfur Cluster Assembly to DNA Metabolism**
K. Gari et al.
A protein that associates with DNA metabolism enzymes serves as a platform for the integration of iron-sulfur clusters.
>> *Perspective p. 160; Research Article p. 195*

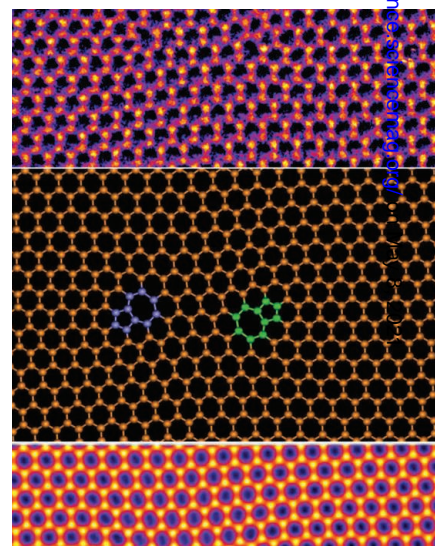
CONTENTS continued >>



page 157



pages 160, 195, & 243



pages 161 & 209

SCIENCEONLINE

SCIENCEEXPRESS

www.sciencexpress.org

Getting HIV Treatment to the Most People

S. Lynch et al.

10.1126/science.1225702

>> *HIV/AIDS in America* section p. 167

The Provenances of Asteroids, and Their Contributions to the Volatile Inventories of the Terrestrial Planets

C. M. O'D. Alexander et al.

Hydrogen isotopic analysis of primitive meteorites implicates asteroids as early sources of Earth's water.

10.1126/science.1223474

Long-Range Incommensurate Charge Fluctuations in $(Y,Nd)Ba_2Cu_3O_{6+x}$

G. Ghiringhelli et al.

Scattering experiments uncover an order competing with superconductivity in a cuprate family.

10.1126/science.1223532

Cartwheel Architecture of *Trichonympha* Basal Body

P. Guichard et al.

Electron microscopy provides a close-up view of the ninefold-symmetric stacked rings at the base of cilia and flagella.

10.1126/science.1222789

Identification of Small Molecule Activators of Cryptochrome

T. Hirota et al.

A small molecule binds to a core protein in the circadian clock and slows down time.

10.1126/science.1223710

Quantitative Modulation of Polycomb Silencing Underlies Natural Variation in Vernalization

V. Coutham et al.

Arabidopsis adjusts the onset of flowering to the length of winters via an epigenetic mechanism.

10.1126/science.1221881

GFAJ-1 Is an Arsenate-Resistant, Phosphate-Dependent Organism

T. J. Erb et al.

10.1126/science.1218455

Absence of Detectable Arsenate in DNA from Arsenate-Grown GFAJ-1 Cells

M. L. Reaves et al.

Claims of arsenic substitution for phosphorus in the biomolecules of a Mono Lake bacterium are not independently reproduced.

10.1126/science.1219861

TECHNICAL COMMENTS

Comment on "Plant Species Richness and Ecosystem Multifunctionality in Global Drylands"

T. Jucker and D. A. Coomes

Full text at www.sciencemag.org/cgi/content/ful/337/6091/155-c

Response to Comment on "Plant Species Richness and Ecosystem Multifunctionality in Global Drylands"

F. T. Maestre et al.

Full text at www.sciencemag.org/cgi/content/ful/337/6091/155-d

SCIENCENOW

www.sciencenow.org

Highlights From Our Daily News Coverage

A Big Magnet in a Small Fish

Scientists have isolated magnetic cells that give some fish their sense of direction.

http://scim.ag/Magnetic_Cells

Space Weather Forecasted by South Pole Neutron Detectors

A team proposes a new way to monitor solar storms.

http://scim.ag/Neutron_Detectors

A Shotgun for Blood Clots

Nanoparticles home in on and dissolve blockages in veins and arteries.

http://scim.ag/Blood_Clots

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

10 July issue: <http://scim.ag/ss071012>

RESEARCH ARTICLE: Differential Regulation by Cyclic Nucleotides of the CNGA4 and CNGB1b Subunits in Olfactory Cyclic Nucleotide-Gated Channels

V. Nache et al.

Different subunits of olfactory CNG channels enable specific regulation of channel activity by cAMP or cGMP.

RESEARCH ARTICLE: Complementary Phosphorylation Sites in the Adaptor Protein SLP-76 Promote Synergistic Activation of Natural Killer Cells

H. S. Kim and E. O. Long

SLP-76 acts as a molecular checkpoint in the activation of NK cells of the immune system.

LETTERS: Comment and Response on "A Dynamic Network Model of mTOR Signaling Reveals TSC-Independent mTORC2 Regulation": Building a Model of the mTOR Signaling Network with a Potentially Faulty Tool

Comment: B. D. Manning

Response: P. Dalle Pezze et al.

Manning and Dalle Pezze et al. discuss whether phosphorylation of Ser²⁴⁸¹ of mTOR can serve as a specific readout of mTORC2 activity.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

A Capitol Job for a Midwestern Transplant

J. Cohen

Tiffany West helped turn Washington, D.C.'s HIV/AIDS effort into a widely admired program.

<http://scim.ag/CapitolJob>

>> *HIV/AIDS in America* section p. 167

Out of India

J. Cohen

Moupali Das's roots led her to public health and caring for HIV/AIDS patients.

<http://scim.ag/OutOfIndia>

>> *HIV/AIDS in America* section p. 167

Career Q&A: Laurel Haak and the ORCID Project

J. Austin

The newly appointed executive director of ORCID discusses her career and her latest challenge.

http://scim.ag/QA_LaurelHaak

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

11 July issue: <http://scim.ag/stm071112>

REVIEW: Deep Brain Stimulation for Psychiatric Disease

C. Hamani and Y. Temel

Animal models can help to improve deep brain stimulation for neuropsychiatric disease.

RESEARCH ARTICLE: High-Resolution Definition of Vaccine-Elicited B Cell Responses Against the HIV Primary Receptor Binding Site

C. Sundling et al.

Vaccine-elicited mAbs are different from infection-elicited antibodies against the HIV-1 Env CD4bs.

>> *HIV/AIDS in America* section p. 167

RESEARCH ARTICLE: Matrix Metalloproteinase Induction of Rac1b, a Key Effector of Lung Cancer Progression

M. L. Stallings-Mann et al.

FOCUS: Got a Light? Illuminating Lung Cancer

S. S. McAllister

New mouse models shed light on mechanisms of lung cancer progression and pinpoint a potential therapeutic target.

RESEARCH ARTICLE: Reproducible Quantification of Cancer-Associated Proteins in Body Fluids Using Targeted Proteomics

R. Hüttenhain et al.

A compendium of SRM assays for cancer-associated proteins provides a resource for accelerating and planning biomarker verification studies.

RESEARCH ARTICLE: PGC-1 α Rescues Huntington's Disease Proteotoxicity

T. Tsunemi et al.

PGC-1 α rescues Huntington's disease neurodegeneration by inducing a master regulator of autophagy.

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

On the 13 July Science Podcast: a vaccine recombines in the wild, early North American inhabitants, HIV/AIDS in the U.S., and more.

SCIENCE (ISSN 0036-8075) is published weekly on Friday, except the last week in December, by the American Association for the Advancement of Science, 1200 New York Avenue, NW, Washington, DC 20005. Periodicals Mail postage (publication No. 484460) paid at Washington, DC, and additional mailing offices. Copyright © 2012 by the American Association for the Advancement of Science. The title SCIENCE is a registered trademark of the AAAS. Domestic individual membership and subscription (51 issues): \$149 (\$74 allocated to subscription). Domestic institutional subscription (51 issues): \$990; Foreign postage extra: Mexico, Caribbean (surface mail) \$55; other countries (air assist delivery) \$85. First class, airmail, student, and emeritus rates on request. Canadian rates with GST available upon request, GST #R1254 88122. Publications Mail Agreement Number 1069624. Printed in the U.S.A.

Change of address: Allow 4 weeks, giving old and new addresses and 8-digit account number. Postmaster: Send change of address to AAAS, P.O. Box 96178, Washington, DC 20090-6178. Single-copy sales: \$10.00 current issue, \$15.00 back issue prepaid includes surface postage; bulk rates on request. Authorization to photocopy material for internal or personal use under circumstances not falling within the fair use provisions of the Copyright Act is granted by AAAS to libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that \$30.00 per article is paid directly to CCC, 222 Rosewood Drive, Danvers, MA 01923. The identification code for Science is 0036-8075. Science is indexed in the Reader's Guide to Periodical Literature and in several specialized indexes.



ADVANCING SCIENCE, SERVING SOCIETY

Science

337 (6091)

Science **337** (6091), 125-246.

ARTICLE TOOLS

<http://science.sciencemag.org/content/337/6091>

PERMISSIONS

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

Use of this article is subject to the [Terms of Service](#)

Science (print ISSN 0036-8075; online ISSN 1095-9203) is published by the American Association for the Advancement of Science, 1200 New York Avenue NW, Washington, DC 20005. The title *Science* is a registered trademark of AAAS.

Copyright © 2012 The Authors, some rights reserved; exclusive licensee American Association for the Advancement of Science. No claim to original U.S. Government Works.