CONTENTS

Volume 337   Issue 6101
www.sciencemag.org

SCIENCE
VOL 337    21 SEPTEMBER 2012

1427

COVER
A vending machine filled with healthy substitutes for highly processed foods. Affluence paved the way for technology and medicines to combat infection, but even well-off nations have communities that are increasingly plagued by noncommunicable diseases, including cancer, type 2 diabetes, and Alzheimer’s disease. Addressing this huge prospective burden of long-term disease is a priority in the design of a new generation of preventative strategies, including healthier eating. See our special section beginning on page 1466.

Image: Mike Kemp/Getty Images

SPECIAL SECTION
Disease Prevention

INTRODUCTION
1466  It Takes More Than an Apple a Day

NEWS
1468  Task Force’s Prevention Advice Proves Hard to Swallow
Public Health Measures in Disease Prevention
>> Science Podcast
1471  Will an Aspirin a Day Keep Cancer Away?
Wondering How the Wonder Drug Works
1473  Tackling America’s Eating Habits, One Store at a Time
>> Science Podcast
1476  Uncertain Verdict as Vitamin D Goes on Trial
1479  Chronic Disease Vaccines Need Shot in the Arm

REVIEW
1482  Can Noncommunicable Diseases Be Prevented? Lessons from Studies of Populations and Individuals
M. Ezzati and E. Riboli

PERSPECTIVES
1488  Preventing Alzheimer’s Disease
D. J. Selkoe
>> Science Podcast
1492  Changing Human Behavior to Prevent Disease: The Importance of Targeting Automatic Processes
T. M. Marteau et al.
1495  Fetal and Early Childhood Undernutrition, Mortality, and Lifelong Health
C. K. Lutter and R. Lutter
1499  Double Burden of Noncommunicable and Infectious Diseases in Developing Countries
I. C. Bygbjerg
1501  Why a Macroeconomic Perspective Is Critical to the Prevention of Noncommunicable Disease
R. Smith
>> Science Podcast

>> Editorial p. 1433; Policy Forum p. 1456; Science Careers; and videos at www.sciencemag.org/special/prevention

BOOKS ET AL.
1454  Interop
J. Palfrey and U. Gasser, reviewed by L. DeNardis
1455  Wild Hope
A. Balmford, reviewed by D. McCauley

POLICY FORUM
1456  Global Indicators and Targets for Noncommunicable Diseases
S. Y. Angell et al.
>> Disease Prevention section p. 1466

PERSPECTIVES
1458  A Measurable Planetary Boundary for the Biosphere
S. W. Running
1459  Nanometer-Scale Printing
J. A. Rogers
>> Report p. 1517
1460  Versatility from Protein Disorder
M. M. Babu et al.
1462  Thermally Responsive Pulsating Nanotubules
W. Zhang and T. Aida
>> Report p. 1521
1463  Emerging Anatomy of the BAP1 Tumor Suppressor System
A. E. White and J. W. Harper
>> Report p. 1541
1464  Moving and the Neighborhood Glass Ceiling
R. J. Sampson
>> Research Article p. 1505

CONTENTS continued >>
RESEARCH ARTICLE
1505 Neighborhood Effects on the Long-Term Well-Being of Low-Income Adults
J. Ludwig et al.
Moving from a poor to a less poor residential environment makes people feel good for a long time.
>> Perspective p. 1464

REPORTS
1511 Kepler-47: A Transiting Circumbinary Multiplanet System
J. A. Orosz et al.
Data from the Kepler space telescope reveal two small planets orbiting a pair of two low-mass stars.
1514 Quantum-Enhanced Optical-Phase Tracking
H. Yonezawa et al.
A quantum mechanical technique is developed to enhance the phase tracking of photons.
1517 Subtractive Patterning via Chemical Lift-Off Lithography
W.-S. Liao et al.
Oxidized silicone-rubber stamps can pattern bare regions on gold surfaces by removing hydroxyl-terminated alkane thiols.
>> Perspective p. 1459
1521 Pulsating Tubules from Noncovalent Macrocycles
Z. Huang et al.
Nanoscale tubes expand and contract with temperature changes through loose association of their constituent building blocks.
>> Perspective p. 1462
1526 A Crystalline Singlet Phosphinonitrene: A Nitrogen Atom–Transfer Agent
F. Dielmann et al.
A phosphorus fragment supports an otherwise uncoordinated nitrogen atom in a stable motif previously seen only with metals.
1529 A Fully Size-Resolved Perspective on the Crystallization of Water Clusters
C. C. Pradzynski et al.
Infrared spectroscopy of water clusters of increasing size indicates the onset of an ice-like structure at around 275 molecules.
1532 Structural Basis for Microtubule Binding and Release by Dynein
W. B. Redwine et al.
The molecular motor dynein uses conformational changes within its microtubule-binding domain to modulate track affinity.
1536 Specifying and Sustaining Pigmentation Patterns in Domestic and Wild Cats
C. B. Kaelin et al.
The genes specifying tabby cat coat patterns also affect big cats, including king cheetahs.
1541 Loss of the Tumor Suppressor BAP1 Causes Myeloid Transformation
A. Dey et al.
The de-ubiquitinating enzyme BAP1 is implicated in myelodysplastic syndrome.
>> Perspective p. 1463
1546 Unicellular Cyanobacterium Symbiotic with a Single-Celled Eukaryotic Alga
A. W. Thompson et al.
A nitrogen-fixing cyanobacterium that lacks photosynthesis and the tricarboxylic acid cycle possesses a tiny phytoplankton symbiont.
1550 Disruption of Reconsolidation Erases a Fear Memory Trace in the Human Amygdala
T. Agren et al.
Interfering with memory formation at the right moment removes the signature of fear memories in human brain imaging studies.
1553 Acute Gastrointestinal Infection Induces Long-Lived Microbiota-Specific T Cell Responses
T. W. Hand et al.
Enteric infections induce lasting adaptive immunity against commensal bacteria that may play a role in intestinal problems.

CONTENTS continued
Early Isolation Impairs Brain Connections

M. Henry

American bees?

Plight of the Bumblebee

http://scim.ag/Crows-Question

New Caledonian crows, like humans, can reason

Whodunit? Crows Ask That Question, Too

Highlights From Our Daily News Coverage

www.sciencenow.org

SCIENCEwww.scienceexpress.org

Elemental Mapping by Dawn Reveals Exogenic H in Vesta’s Regolith

T. H. Prettyman et al.

10.1126/science.1225354

Pitted Terrain on Vesta and Implications for the Presence of Volatiles

B. W. Denevi et al.

Analysis of data from the Dawn spacecraft implies that asteroid Vesta is rich in volatiles.

10.1126/science.1225374

A Golden Spike for Planetary Science

R. P. Binzel

10.1126/science.1228328

Detecting Causality in Complex Ecosystems

G. Sugihara et al.

A new method, based on nonlinear state space reconstruction, can distinguish causality from correlation.

10.1126/science.1227079

Genomic Variation in Seven Khoe-San Groups Reveals Adaptation and Complex African History

C. M. Schlebusch et al.

Cutting-edge genomic approaches test hypotheses about the roots of human history in southern African indigenous populations.

10.1126/science.1227721

Germ Cell Migration Across Sertoli Cell Tight Junctions

B. E. Smith and R. E. Braun

Sertoli germ cell chains span a network of transient compartments to cross the blood-testis barrier in adult mice.

10.1126/science.1219969

TECHNICAL COMMENTS

Comment on “A Common Pesticide Decreases Foraging Success and Survival in Honey Bees”

J. E. Cresswell and H. M. Thompson

Full text at www.sciencemag.org/cgi/content/full/337/6101/1453-b

Response to Comment on “A Common Pesticide Decreases Foraging Success and Survival in Honey Bees”

M. Henry et al.

Full text at www.sciencemag.org/cgi/content/full/337/6101/1453-c

SCIENCENOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Wheedump? Crows Ask That Question, Too

New Caledonian crows, like humans, can reason about hidden causes.

http://scim.ag/Crows-Question

Plight of the Bumblebee

Did invader insects bring deadly disease to South American bees?

http://scim.ag/Plight-Bumblebee

Early Isolation Impairs Brain Connections

Childhood neglect stunts the brain’s “insulating” cells.

http://scim.ag/Insulating_Cells

SCIENTRANSITIONAL MEDICINE

www.scientranslationalmedicine.org

Integrating Medicine and Science

19 September issue: http://scim.ag/stm091912

RESEARCH ARTICLE: Effects of STX209 (Arbaclofen) on Neurobehavioral Function in Children and Adults with Fragile X Syndrome: A Randomized, Controlled, Phase 2 Trial

E. M. Berry-Krais et al.

Administration of a selective GABA_A agonist to individuals with fragile X syndrome improves their deficits in social avoidance, a core symptom of the disease.

RESEARCH ARTICLE: Reversal of Disease-Related Pathologies in the Fragile X Mouse Model by Selective Activation of GABA_A Receptors with Arbaclofen

C. Henderson et al.

Pharmacological activation of the GABA_A receptor with arbaclofen in a mouse model of fragile X syndrome corrects neuronal defects associated with the disease.

RESEARCH ARTICLE: A Paper-Based Multiplexed Transaminase Test for Low-Cost, Point-of-Care Liver Function Testing

N. R. Pollock et al.

A paper-based, multiplexed microfluidic assay allows rapid, semiquantitative, visual measurement of transaminases in clinical specimens.

PERSPECTIVE: Patient-Empowerment Interactive Technologies

C. S. Bruggers et al.

Health-promoting video games are emerging as nonpharmacological tools to help patients manage their diseases.
Editor's Summary

This copy is for your personal, non-commercial use only.

**Article Tools**  Visit the online version of this article to access the personalization and article tools:
http://science.sciencemag.org/content/337/6101

**Permissions**  Obtain information about reproducing this article:
http://www.sciencemag.org/about/permissions.dtl