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Cover

Bags of rice await export from India to Europe. As the global population climbs to a projected peak of some 9 billion in 2050, concerns about food security are growing. A special section beginning on page 797 examines the causes of food insecurity and some solutions, and the implications of climate change and energy use for feeding the world.

Photo: Simon Rawles/Alamy
Sustainability and Global Seafood

M. D. Smith et al.

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Propelling Progeny

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Ultracold Chemistry

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Radical Ligands Confer Nobility

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PRDM9 Is a Major Determinant

of Meiotic Recombination Hotspots

E. D. Parvanov et al.

A chromatin-modifying enzyme is implicated in the determination of recombination loci within the genome.

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PRDM9 Controls Activation of Mammalian Recombination Hotspots

E. D. Parvanov et al.

Genome recombination during meiosis is likely controlled by a chromatin-modifying enzyme.

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PRDM9 Is a Major Determinant

of Meiotic Recombination Hotspots

in Humans and Mice

F. Baudat et al.

A chromatin-modifying enzyme is implicated in the determination of recombination loci within the genome.

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Repulsion of Superinfecting Virions:
A Mechanism for Rapid Virus Spread

V. Doceul et al.

Early in infection, vaccinia virus exploits the actin cytoskeleton to promote rapid cell-to-cell spread.

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Drive Against Hotspot Motifs in Primates Implicates the PRDM9 Gene in Meiotic Recombination

S. Myers et al.

Bioinformatics identifies a chromatin-modifying enzyme as a factor in determining recombination hotspots.

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The Lmo2 Oncogene Initiates Leukemia in Mice by Inducing Thymocyte Self-Renewal

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Expression of an oncogene confers self-renewal activity to committed T cells in the thymus long before disease onset.

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A Composite of Multiple Signals Distinguishes Causal Variants in Regions of Positive Selection

S. R. Grossman et al.

Combining statistical methods detects signals of selection with increased sensitivity and a lower false-positive rate.

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Reactions mediated by quantum mechanical tunneling are observed, even in a sample of molecules cooled almost to a standstill.

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Spin-Dependent Quantum Interference Within a Single Magnetic Nanostructure

H. Oka et al.

Magnetization modulation is observed on a cobalt nanosiland using spin-polarized scanning tunneling microscopy.

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Multiple Functional Groups of Varying Ratios in Metal-Organic Frameworks

H. Deng et al.

The adsorption characteristics for mixed linkers can exceed that expected from just combining the single-linker compounds.

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An optical scattering technique is used to map the weak bonding interaction between water and dissolved halide ions.

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Sea-Level Highstand 81,000 Years Ago in Mallorca

J. A. Dorale et al.

Measurements from the island of Mallorca indicate that past sea levels were much higher than had been assumed.

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Vibrio cholerae VpsT Regulates Matrix Production and Motility by Directly Sensing Cyclic di-GMP

P. V. Krasteva et al.

A bacterial signaling molecule induces the dimerization and activation of a biofilm-promoting transcription factor.

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Darwinian Evolution of Prions in Cell Culture

J. Li et al.

When propagated in vitro, prion strains demonstrate adaptability and selection.
**Possible discovery about reaction speed.**

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**The CDMS II Collaboration**

Details of possible, but unlikely, detection events produced by dark matter are reported. 10.1126/science.1186112

**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. 10.1126/science.1182369

**Light-Controlled Self-Assembly of Semiconductor Nanoparticles into Twisted Ribbons S. Srivastava et al.**

The photooxidation of CdS nanoparticles within CdTe nanoparticle ribbons causes surface stresses that lead to twisting. 10.1126/science.1177218

**Doc2b Is a High-Affinity Ca2+ Sensor for Spontaneous Neurotransmitter Release A. J. Groffen et al.**

Spontaneous synaptic vesicle fusion is triggered by soluble proteins that compete with synaptotagmins to induce membrane curvature. 10.1126/science.1183765

**Significant Acidification in Major Chinese Croplands J. H. Guo et al.**

Intensifying agriculture in China in the past 30 years is the major contributor to soil acidification at the regional scale. 10.1126/science.1182570

**Fixing the Legal Framework for Pharmaceutical Research S. M. Knowles 10.1126/science.1184188**

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Acetylation by ARD1 of an inhibitor of mammalian target of rapamycin may inhibit cancer growth. 10.1126/science.1183765

**RESEARCH ARTICLE: SUMOylation Mediates the Nuclear Translocation and Signaling of the IGF-1 Receptor B. S. Mob et al.**

Attachment of SUMO lets insulin-like growth factor receptors act as transcriptional regulators in the nucleus. 10.1126/science.1183765

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By mimicking a DNA response element, a noncoding RNA inhibits glucocorticoid receptor activity. 10.1126/science.1183765

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Understanding common genetic variation can serve to explain individual behaviors. 10.1126/science.1184188

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Electronic health record systems represent important new strategies to improve health care. 10.1126/science.1183765

**RESEARCH ARTICLE: The Origins of Sexually Transmitted HIV Among Men Who Have Sex with Men D. M. Butler et al.**

A cell-free virus in semen is the origin of sexually transmitted HIV among men who have sex with men. 10.1126/science.1183765

**RESEARCH ARTICLE: A Monoclonal Antibody Against αvβ3 Integrin Inhibits Development of Atherosclerotic Lesions in Diabetic Pigs L. A. Maile et al.**

An antibody directed at the C terminal of an integrin subunit can prevent atherosclerosis in diabetic pigs. 10.1126/science.1183765

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