

Science

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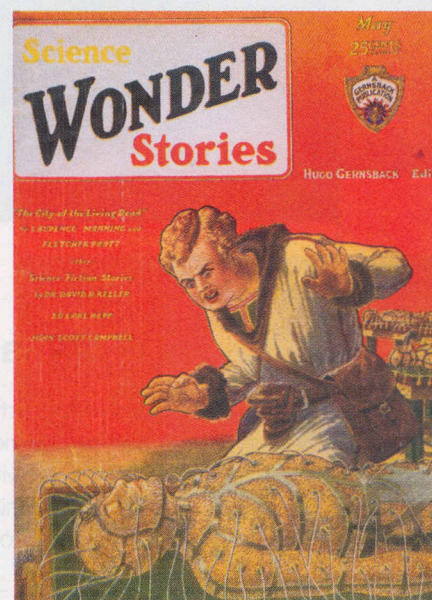
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COVER

Scanning electron microscope image of a strand of hair (about 80 micrometers wide) from the Aboriginal Australian whose genome was sequenced. The genomic sequence provides evidence for multiple dispersals into Asia of modern humans. See page 94.

Courtesy of Timothy P. Topper, Natural History Museum of Denmark

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M. J. Walter et al.

Tiny minerals trapped inside Brazilian diamonds show that Earth's carbon cycle extends down to the lower mantle.

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57 Universal Digital Quantum Simulation with Trapped Ions

B. P. Lanyon et al.

A series of trapped calcium ions was used to simulate the complex dynamics of an interacting spin system.

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61 Implementing the Quantum von Neumann Architecture with Superconducting Circuits

M. Mariantoni et al.

A quantum version of a central processing unit was created with superconducting circuits and elements.

66 Three-Dimensional Anderson Localization of Ultracold Matter

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A localized and a propagating component appear when an ultracold atomic gas expands in a disordered optical potential.

69 Detection of Pulsed Gamma Rays Above 100 GeV from the Crab Pulsar

The VERITAS Collaboration

This detection constrains the mechanism and emission region of gamma-ray radiation in the pulsar's magnetosphere.

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72 Dispersible Exfoliated Zeolite Nanosheets and Their Application as a Selective Membrane

K. Varoon et al.

Thin zeolite films prepared through a polymer exfoliation method were used as selective membranes.

75 A Major Constituent of Brown Algae for Use in High-Capacity Li-Ion Batteries

I. Kovalenko et al.

Alginate extracts help stabilize silicon nanoparticles used in a high-capacity lithium-silicon battery.

79 A Self-Quenched Defect Glass in a Colloid-Nematic Liquid Crystal Composite

T. A. Wood et al.

A high concentration of colloidal particles stabilizes a defect network in a liquid crystal and creates a gel-like material.

83 Adaptation to Climate Across the *Arabidopsis thaliana* Genome

A. M. Hancock et al.

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L. Abi-Rached et al.

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94 An Aboriginal Australian Genome Reveals Separate Human Dispersals into Asia

M. Rasmussen et al.

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M. Rosas-Ballina et al.

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101 Functional Innervation of Hepatic iNKT Cells Is Immunosuppressive Following Stroke

C. H. Y. Wong et al.

Neurotransmitters relay immunosuppressive signals to natural killer T cells after stroke.

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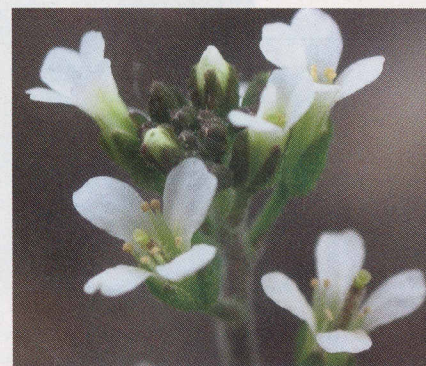
105 Linking Long-Term Dietary Patterns with Gut Microbial Enterotypes

G. D. Wu et al.

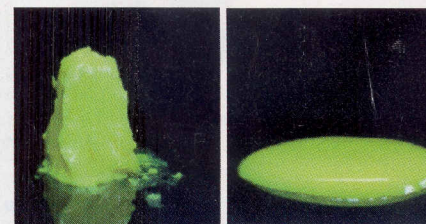
The basic composition of the human gut microbiome is influenced by long-term diet: high fat and protein versus high fiber.

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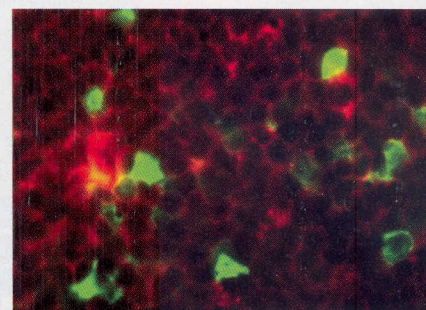
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SCIENCEONLINE

SCIENCEEXPRESS

www.sciencexpres.org

An Activating Mutation of AKT2 and Human Hypoglycemia

K. Hussain et al.

A key kinase in the insulin signaling pathway is constitutively activated in humans with a severe form of hypoglycemia.

10.1126/science.1210878

Stochastic Pulse Regulation in Bacterial Stress Response

J. C. W. Locke et al.

Energy stress activates an alternative sigma factor in stochastic pulses and modulates pulse frequency to control activity.

10.1126/science.1208144

The Influence of Late Quaternary Climate-Change Velocity on Species Endemism

B. Sandel et al.

Regions with low glacial-interglacial climate-change velocity were essential refuges for many small-ranged species.

10.1126/science.1210173

>> *Science Podcast*

Hot Carrier-Assisted Intrinsic Photoresponse in Graphene

N. M. Gabor et al.

Photoexcited electrons in graphene remain thermally excited because they cannot transfer this energy to lattice vibrations.

10.1126/science.1211384

Lithospheric Thinning Beneath Rifted Regions of Southern California

V. Lekic et al.

Seismic imaging reveals the degree to which extensional forces can pull apart the lithosphere.

10.1126/science.1208898

Editorial Expression of Concern on Puneet et al. Report

B. Alberts

10.1126/science.1214735

SCIENCENOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Ig Nobels Honor Bladder Control,

Beer Bottle Mating

Annual awards recognize the humorous side of science.

<http://scim.ag/IgNobels>

Got War? Blame the Weather

Study argues that climate shifts are behind most of humankind's maladies.

<http://scim.ag/war-weather>

Beam Me Up, Ratty

'Teleportation' study shows that spatial memories are stored in 125-millisecond packages.

<http://scim.ag/rat-beams>

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

4 October issue: <http://scim.ag/ss100411>

RESEARCH ARTICLE: Genome-Wide Analysis of a Wnt1-Regulated Transcriptional Network Implicates Neurodegenerative Pathways

E. M. Wexler et al.

A systems biology approach identifies connections between Wnt1 signaling and neurodegenerative diseases.

RESEARCH ARTICLE: Itk Controls the Spatiotemporal Organization of T Cell Activation

K. L. Singleton et al.

Loss of the kinase Itk in activated T cells disrupts actin accumulation at the immunological synapse, compromising T cell activation.

PERSPECTIVE: A WNTer Revisit: New Faces of β -Catenin and TCFs in Pluripotency

K. Watanabe and X. Dai

Wnt-stabilized β -catenin may enable embryonic stem cells to resist differentiation by balancing transcriptional repression and activation.

PODCAST: *Science Signaling* Podcast: 4 October 2011

A. Levchenko and A. M. VanHook

By working together, cells can overcome the loss of information as it flows through a signaling network.

ST NETWORK: E-RNAi

Get online help designing and evaluating RNAi reagents.

ST NETWORK: Proteomics Identifications Database (PRIDE)

Access published proteomics data sets and contribute your own mass spectrometry data to an online public repository.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

5 October issue: <http://scim.ag/stm100511>

COMMENTARY: The Changing Burden of Infectious Disease in Europe

R. Fears et al.

Opportunities and challenges are described for improving disease surveillance and healthcare innovation to tackle the growing threats of infection.

PERSPECTIVE: Striking a Balance Between Feasible and Realistic Biological Models

A. Califano

A simple yet elegant quantitative modeling of oncogene addiction advances our predictive understanding of this physiological phenomenon.

RESEARCH ARTICLE: Increased Gene Dosage of *Ube3a* Results in Autism Traits and Decreased Glutamate Synaptic Transmission in Mice

S. E. P. Smith et al.

Tripling the dosage of an autism- and Angelman syndrome-related gene in mice results in reduced glutamatergic synaptic transmission and autism behavioral traits.

RESEARCH ARTICLE: Neutrophil-Derived Cathelicidin Protects from Neointimal Hyperplasia

O. Soehnlein et al.

Cathelicidin-coated stents limit neointima formation.

RESEARCH ARTICLE: Survival and Death Signals Can Predict Tumor Response to Therapy After Oncogene Inactivation

P. T. Tran et al.

Modeling survival and death signaling in tumors by combining quantitative imaging and in situ biomarker analysis can be used to predict responses to therapy after oncogene inactivation.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Scientists as Competitive-Intelligence Analysts

S. Louët

Scientific training gives applicants most of the skills companies need to keep track of the competition.

http://scim.ag/Competitive_Intelligence

Taken for Granted: A Way to Improve Lab-Safety Culture?

B. L. Benderly

A former lab manager argues that modern information systems hold the key to safer academic labs.

<http://scim.ag/rbuDBI>

Content Collection: Science Writing and Editing

J. Austin

A collection of the best *Science* Careers articles on this popular career path for scientists.

http://scim.ag/CC_Writing

SCIENCEPODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

On the 7 October *Science* Podcast: climate change and species distributions, pulsar gamma ray emissions, the case for 'the Anthropocene,' and more.

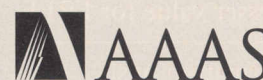
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Science Policy News and Analysis

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