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## COVER
Scanning electron micrograph of a female *Anopheles stephensi* mosquito, a transmitter of malaria (proboscis length: ~0.6 millimeters). To drive malaria eradication, new medicines that target all stages of the malaria life cycle are needed. In their study, Meister et al. used thousands of *A. stephensi* mosquitoes to identify chemical classes with activity against the silent malaria liver stage. See page 1372.

*Image: David Scharf/Getty Images*
RESEARCH ARTICLES

1367 Calibrating the End-Permian Mass Extinction
S. Shen et al.
High-precision geochronologic dating constrains probable causes of Earth’s largest mass extinction.

1372 Imaging of Plasmodium Liver Stages to Drive Next-Generation Antimalarial Drug Discovery
S. Meister et al.
Imidazolopiperazine compounds inhibit liver-stage malaria parasites with one oral dose in mice.

REPORTS

1377 Carving at the Nanoscale: Sequential Galvanic Exchange and Kirkendall Growth at Room Temperature
E. González et al.
Processes used in colloidal chemistry can be jointly exploited to make complex metal alloy nanoparticles.
>> Perspective p. 1359

1380 The Origin of OB Runaway Stars
M. S. Fujii and S. Portegies Zwart
Most of the unusually fast, young stars in our galaxy are produced in three-body encounters within dense clusters of stars.

1383 A Perovskite Oxide Optimized for Oxygen Evolution Catalysis from Molecular Orbital Principles
J. Suntivich et al.
An electronic property of metal oxides was used to guide development of a catalyst for prospective use in energy applications.
>> Perspective p. 1355

1385 Climate Sensitivity Estimated from Temperature Reconstructions of the Last Glacial Maximum
A. Schmittner et al.
Last Glacial Maximum temperature reconstructions and model simulations can constrain the equilibrium climate sensitivity.
>> Perspective p. 1360

1388 Middle Stone Age Bedding Construction and Settlement Patterns at Sibudu, South Africa
L. Wadley et al.
Early humans constructed sleeping mats from local plants, including some with insecticidal properties.

1392 Context Modularity of Human Altruism
M. Alexander and F. Christia
Ethnic integration enhances cooperative behavior and sanctioning of free-riders.
>> Perspective p. 1356

1394 Capacity Building Helps Pastoral Women Transform Impoverished Communities in Ethiopia
D. L. Coppock et al.
Diversification of income-producing activities provides greater resilience to drought.

1398 Perceived Predation Risk Reduces the Number of Offspring Songbirds Produce per Year
L. Y. Zanette et al.
Fear itself reduces reproductive success in song sparrows.
>> Perspective p. 1353

1401 Arabidopsis EDS1 Connects Pathogen Effector Recognition to Cell Compartment–Specific Immune Responses
K. Heidrich et al.
Coordination of different defense pathways across cell compartments produces a fully effective innate immune response.
>> Perspective p. 1354

1405 Pathogen Effectors Target Arabidopsis EDS1 and Alter Its Interactions with Immune Regulators
S. Bhattacharjee et al.
Coordination of different defense pathways across cell compartments produces a fully effective innate immune response.

1408 The Competitive Advantage of a Dual-Transporter System
S. Levy et al.
Low-affinity nutrient transporters sense depletion earlier than high-affinity transporters, thus preparing cells for starvation.

1413 Perceptual Learning Incepted by Decoded fMRI Neurofeedback Without Stimulus Presentation
K. Shibata et al.
Even the adult primary visual cortex is sufficiently plastic to allow performance enhancement.

1415 Entorhinal Cortex Layer III Input to the Hippocampus Is Crucial for Temporal Association Memory
J. Suh et al.
A specific neural circuit integrates temporally dispersed stimuli into a coherent memory episode.

1420 Interconversion Between Intestinal Stem Cell Populations in Distinct Niches
N. Takeda et al.
Two niches with distinct characteristics work in tandem.

1424 Explaining Seasonal Fluctuations of Measles in Niger Using Nighttime Lights Imagery
N. Bharti et al.
Changes in human population density as measured by satellite images of nighttime lights predict measles.
>> Science Podcast

1427 Empathy and Pro-Social Behavior in Rats
I. Ben-Ami Bartal et al.
Rats free companions from restraint, apparently motivated by empathy to end their mate’s distress.
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Stop Signals Provide Cross Inhibition in Collective Decision-Making by Honeybee Swarms
T. D. Seeley et al.
Scout bees bring about nest-site decisions by targeting stop signals at bees with other candidate sites.
10.1126/science.1210361
>> Science Podcast
How Honeybees Break a Decision-Making Deadlock
J. E. Niven
10.1126/science.1216563
A SUMoylation-Dependent Transcriptional Subprogram Is Required for Myc-Driven Tumorigenesis
J. D. Kessler et al.
An RNA interference screen identifies a “druggable” enzyme whose inhibition halts tumor cell growth.
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Cytoplasmic Dynemin Moves Through Uncoordinated Stepping of the AAA+ Ring Domains
M. A. DelVitt et al.
The molecular motor dynemin moves each of its two heads independently along the microtubule.
10.1126/science.1215804
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L.-Q. Chen et al.
Transporters hand off sucrose from production cell to transport cell.
10.1126/science.1213351
Capturing Ultrasmall EMT Zeolite from Template-Free Systems
E.-P. Ng et al.
Control of the early stages of nucleation favors the synthesis of large-pore zeolite crystals ~10 nanometers in size.
10.1126/science.1214798
Synthetic Partial Waves in Ultracold Atomic Collisions
R. A. Williams et al.
A pair of lasers is used to produce complex interactions between bosons in an ultracold gas.
10.1126/science.1212652
Suicide Efflux Mediated by SWEET Proteins as a Key Step for Phloem Transport
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FOCUS: ROCK in a Stiff Place
K. Deinhardt et al.
Whereas nerve growth factor promotes neurite outgrowth, the precursor form triggers retraction.
10.1126/science.1214798

RESEARCH ARTICLE: Protein Kinase C η Is Required for T Cell Activation and Homeostatic Proliferation
G. Fu et al.
T cells make specific use of different protein kinase C isoforms.

RESEARCH ARTICLE: PDLIM2 Inhibits T Helper 17 Cell Development and Granulomatous Inflammation Through Degradation of STAT3
I. Tanaka et al.
An E3 ubiquitin ligase inhibits the development of inflammatory T cells involved in autoimmune diseases.

ST NETWATCH: Expression2Kinases (X2K)
Identify the signaling components that may mediate changes in genome-wide expression profiles.

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Explore the human side of science.

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The Signal Transduction Knowledge Environment
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EDITORIAL GUIDE: The Complex Art of Telling It Simply
M. B. Yaffe
Computational biology studies are complex; papers describing the results should not be.

RESEARCH ARTICLE: Neuronal Growth Cone Retraction Relies on Proneurotrophin Receptor Signaling Through RAC
K. Denhardt et al.
Whereas nerve growth factor promotes neurite outgrowth, the precursor form triggers retraction.

RESEARCH ARTICLE: The SH2 Domain–Containing Proteins in 21 Species Establish the Provenance and Scope of Phosphotyrosine Signaling in Eukaryotes
B. A. Liu et al.
The evolution of modular protein domains corresponds with organismal complexity.

RESEARCH ARTICLE: Protein Kinase C η Is Required for T Cell Activation and Homeostatic Proliferation
G. Fu et al.
T cells make specific use of different protein kinase C isoforms.

RESEARCH ARTICLE: PDLIM2 Inhibits T Helper 17 Cell Development and Granulomatous Inflammation Through Degradation of STAT3
I. Tanaka et al.
An E3 ubiquitin ligase inhibits the development of inflammatory T cells involved in autoimmune diseases.

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Explore the human side of science.

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Integrating Medicine and Science
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FOCUS: Three Rs of Animal Testing for Regenerative Medicine Products
R. Robinson
Considerations of animal welfare have spurred the design of “smarter” preclinical studies intended to ultimately benefit patients.

FOCUS: ROCK in a Stiff Place
D. A. Louffenburg

RESEARCH ARTICLE: Age-Related Intimal Stiffening Enhances Endothelial Permeability and Leukocyte Transmigration
J. Hyunh et al.
Inhibiting endothelial cell contractility reverses the deleterious effects of age-related matrix stiffening on normal cell function.

REPORT: Penetration of Tenofovir and Emtricitabine in Mucosal Tissues: Implications for Prevention of HIV-1 Transmission
K. B. Patterson et al.
Antiretroviral drugs are found at different concentrations in human mucosal tissues with implications for pre-exposure prophylaxis trials to prevent HIV transmission.

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A Pharma Industry in Crisis
E. Pain
Scientists seeking pharma careers must adapt to sweeping changes in the industry.
http://sciinem.ag/PharmaCrisis
Future Pharma Scientists: Start Small
M. Price
As the industry moves away from the big-pharma model, young drug-development scientists are likely to find more and better opportunities at smaller companies.
http://sciinem.ag/PharmaSearch
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Science Careers Staff
We present our best information and advice on working in the pharmaceuticals industry.
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