COVER
A lined day gecko (Phelsuma lineata) from Andasibe, eastern Madagascar. This gecko is one of the 2315 species analyzed to identify optimal expansion sites for protected areas within Madagascar, as described on page 222.
Photo: Miroslav Honzák

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Molecular Biology
Endogenous siRNAs Derived from Transposons and mRNAs in Drosophila Somatic Cells
M. Ghildiyal et al.
Endogenous small interfering RNAs transcribed from both transposons and messenger RNAs are found in somatic cells of flies and may act to silence "selfish" genetic elements. 10.1126/science.1157396

Immunology
Innate Immune Activation Through Nalp3 Inflammasome Sensing of Asbestos and Silica
C. Dostert et al.
A large multiprotein complex detects particulate airborne pollutants that have been taken up by immune cells in the lung and initiates a potent inflammatory response. 10.1126/science.1156995

REVIEW
APPLIED PHYSICS
Magnetic Domain-Wall Racetrack Memory
S. S. P. Parkin, M. Hayashi, L. Thomas

BREVIA
PALEOClimATE
Amplification of Cretaceous Warmth by Biological Cloud Feedbacks
L. R. Kump and D. Pollard
The extreme warmth of the Cretaceous may have been a consequence of fewer clouds, caused by a low abundance of organic cloud nuclei from reduced ocean productivity.

Research Articles
Physics
Electronic Origin of the Inhomogeneous Pairing Interaction in the High-Tc Superconductor
Bi2Sr2CaCu2O8+δ
A. N. Pasupathy et al.
Scanning tunneling microscope measurements around the superconducting transition temperature imply that electron correlations, not a proposed boson glue, pair up electrons.

Neuroscience
Temperature Sensing by an Olfactory Neuron in a Circuit Controlling Behavior of C. elegans
A. Kuhara et al.
An olfactory neuron in Caenorhabditis elegans also senses the ambient temperature and is necessary for worms' propensity to seek out the temperature at which they were raised. 10.1126/science.1148922

Chemistry
Gate-Variable Optical Transitions in Graphene
F. Wang et al.
Application of electrical biases to single or double layers of graphene changes its infrared reflectivity, mimicking aspects of transistors and opening up optoelectronic applications.

Applied Physics
Current-Controlled Magnetic Domain-Wall Nanowire Shift Register
M. Hayashi, L. Thomas, R. Moriya, C. Rettner, S. S. P. Parkin
Brief, polarized current pulses can create and shift magnetic domain walls along a magnetic nanowire, demonstrating the basis for a racetrack memory. >> News story p. 166

Climate Change
Impact of Artificial Reservoir Water Impoundment on Global Sea Level
B. F. Chao, Y. H. Wu, Y. S. Li
Accounting for water impounded globally in artificial lakes that were filled during the past 80 years raises estimates of natural contributions to recent sea level.
REPORTS CONTINUED...

GEOCHEMISTRY
Determining Chondritic Impactor Size from the Marine Osmium Isotope Record
The difference in osmium concentrations and isotopes between seawater and asteroids allows reconstruction of impact occurrence and size, including for the Cretaceous.

CHEMISTRY
Linked Reactivity at Mineral-Water Interfaces
S. V. Yanina and K. M. Rosso
A current flow through a hematite crystal couples dissolution and growth reactions at different surfaces, a finding likely relevant to a broad range of semiconducting minerals.

ECOLOGY
Aligning Conservation Priorities Across Taxa in Madagascar with High-Resolution Planning Tools
C. Kremen et al.
A broad analysis of many taxa throughout Madagascar identifies regions where conservation is likely to protect the most species.

MEDICINE
An Agonist of Toll-Like Receptor 5 Has Radioprotective Activity in Mouse and Primate Models
L. G. Burdelya et al.
A drug that triggers the pathway that cancer cells use to avoid death can protect healthy cells from the harmful effects of radiation treatment.

IMMUNOLOGY
Evidence for Editing of Human Papillomavirus DNA by APOBEC3 in Benign and Precancerous Lesions
A cellular enzyme that defends against infection by causing mutations in retroviruses can also mutate the genome of a DNA virus associated with benign and precancerous cells.

NEUROSCIENCE
Segregation of Axial Motor and Sensory Pathways via Heterotypic Trans-Axonal Signaling
B. W. Gallarda et al.
In mice, axons carrying signals from spinal cord to muscle are kept separate from those going in the opposite direction by ephrin signaling between them.

EVOLUTION
Convergence of Campylobacter Species: Implications for Bacterial Evolution
S. K. Sheppard, N. D. McCarthy, D. Falush, M. C. J. Maiden
A survey of two related human pathogens shows that they are merging, probably as a result of their proximity in a new ecological niche—the intestines of farmed animals.

CELL BIOLOGY
Leiomodin Is an Actin Filament Nucleator in Muscle Cells
D. Chereau et al.
The de novo assembly of the thin filaments in muscle cells is initiated by a newly described protein that efficiently nucleates actin polymer formation.

BIOCHEMISTRY
Deconstruction of Iterative Multidomain Polyketide Synthase Function
J. M. Crawford et al.
A eukaryotic polyketide natural product is synthesized by assembling seven malonyl building blocks on a specialized protein template where a cyclization cascade is initiated.

CELL BIOLOGY
Video-Rate Far-Field Optical Nanoscopy Dissects Synaptic Vesicle Movement
V. Westphal et al.
Sequential subdiffraction resolution images of fluorescently labeled synaptic vesicles in live cells reveal that they exhibit several distinct movement patterns.
Eph receptors and their ephrin ligands coordinate cell-positioning programs during development and oncogenesis. 

JOURNAL CLUB: GABA Effects on Neurogenesis—An Arsenal of Regulation

T.-F. Yuan

γ-aminobutyric acid (GABA) regulates neurogenesis in various circumstances.
Editor's Summary