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A Renowned Field Station Rises From the Ashes

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COVER

Representatives of diverse species from the plant kingdom. The genomes of thale cress (Arabidopsis thaliana), grape (Vitis vinifera), rice (Oryza sativa), and the moss Physcomitrella patens have been sequenced, and there is ongoing genetic research on apple (Malus domestica), rose (Rosa spp.), tomato (Solanum lycopersicum), Gerbera daisy (Gerbera hybrid), monkey flower (Mimulus lewisii), columbine (Aquilegia formosa), maize (Zea mays), wheat (Triticum aestivum), tulip poplar (Liriodendron tulipifera), and the fern Ceratopteris richardi. The special section beginning on page 465 includes News stories and Perspectives exploring plant biology, ecology, economic applications, and the future of plant genomics research.

Photo illustration: Kelly Krause/Science (images: Jupiter Images, Getty Images, USDA, Oregon State University)
CLIMATE CHANGE
The Sensitivity of Polar Ozone Depletion to Proposed Geoengineering Schemes
S. Tilmes, R. Müller, R. Salawitch
Calculations imply that injection of sulfur into the atmosphere to counteract global warming would threaten the ozone layer, as occurred after the Mount Pinatubo eruption.
10.1126/science.1153966

IMMUNOLOGY
Coordination of Early Protective Immunity to Viral Infection by Regulatory T Cells
J. M. Lund, L. Hsing, T. T. Pham, A. Y. Rudensky
In mice infected with herpes virus, an usually immunosuppressive T cell is necessary for rapid arrival of immune cells and elevated cytokine levels at the site of infection.
10.1126/science.1155209

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A. Mahadevan, L. N. Thomas, A. Tandon
full text at www.sciencemag.org/cgi/content/full/320/5875/448b
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FLOW: For Love of Water I. Salina, Director;
Building the Future—Energy N. Brown, Director;
Gimme Green I. Brown and E. Flagg, Directors;

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Harvesting Data from Genetically Engineered Crops
M. Marvier et al.

EDUCATION FORUM
The Advantage of Abstract Examples in Learning Math
J. A. Kaminski, V. M. Sloutsky, A. F. Heckler

PLANT SCIENCE
Cell Identity Mediates the Response of Arabidopsis Roots to Abiotic Stress
J. R. Dinneny et al.
In Arabidopsis root tips exposed to high salinity or iron deficiency, clusters of genes are induced that are unique to one or both of these stress responses.
10.1126/science.1153795

PLANT SCIENCE
Genome-Scale Proteomics Reveals Arabidopsis thaliana Gene Models and Proteome Dynamics
K. Baerenfaller et al.
The Arabidopsis proteome shifts as the plant develops, and proteins not predicted from genome analysis, some derived from introns and pseudogenes, are expressed.
10.1126/science.1157956

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Enigmas of Blood Clot Elasticity
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A One-Sided Signal
G. D. Fain and S. Grinstein Reports pp. 528 and 531
Carbon Crucible
M. Marquis and P. Tans
RNA Metabolism and Oncogenesis
D. L. Johnson and S. A. S. Johnson

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PALEONTOLOGY
Molecular Phylogenetics of Mastodon and Tyrannosaurus rex
C. L. Organ et al.
Phylogenetic analyses of collagen protein fragments from fossils and 21 extant organisms group mastodons with elephants and Tyrannosaurus rex with birds.

RESEARCH ARTICLE
GEOCHEMISTRY
Synchronizing Rock Clocks of Earth History
K. F. Kuiper et al.
Tying an argon-argon dating standard to a section dated with Earth’s orbital variations yields older ages for the standard and for other events, including the K-T boundary.

REPORTS
MATERIALS SCIENCE
Sign Change of Poisson’s Ratio for Carbon Nanotube Sheets
L. J. Hall et al.
When stretched, a sheet made of carbon nanotubes contracts or expands in the opposite direction, depending on how many multiwalled tubes form zig-zag networks.
TAT-1 Protein in Maintaining Axonal Growth

A phospholipid translocase enzyme keeps a critical membrane lipid localized to the inner leaflet of the cell membrane so it does not diffuse across the lipid bilayer. TAT-1 protein is required for axonal growth in a mouse model of spinal muscular atrophy. The expression of a protein that promotes axonal growth can compensate for the gene deletion in spinal muscular atrophy, indicating that axonal growth deficiencies cause the disease.

Vaccinia Virus Uses Macropinocytosis and Apoptotic Mimicry to Enter Host Cells

To infect host cells, vaccinia virus exposes phosphatidylserine on its surfaces, which signals host cells to recognize the virus as cellular debris and take it up for clearance.

Encoding Gender and Individual Information in the Mouse Vomeronasal Organ

Mice can recognize the pheromones from individual mice through unique patterns of receptor activation in the vomeronasal organ.

Metabolic Diversification—Independent Assembly of Operon-Like Gene Clusters in Different Plants

Through strong selection, similar clusters of genes for triterpene biosynthesis have arisen independently through gene duplication and neofunctionalization in several plant lines.

Mechanism of Self-Sterility in a Hermaphroditic Chordate

The sea squirt prevents self-fertilization with two genetic loci, each of which encodes a tightly linked sperm-egg receptor-ligand pair, a system similar to that of flowering plants.
SCIENCE SIGNALING

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PERSPECTIVE: Notch Signaling in Osteoblasts
E. Canalis

Notch signaling plays a role in bone remodeling by inhibiting the differentiation of osteoblasts and osteoclasts.

PERSPECTIVE: Back from the Dormant Stage—Second Messenger Cyclic ADP-Ribose Essential for Toxoplasma gondii Pathogenicity
A. H. Guse

The protozoan parasite T. gondii uses a plant-like signaling pathway to exit host cells.
Editor's Summary

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