Spore-bearing fungal parasites emerge from the digested corpses of three bdelloid rotifers. These freshwater invertebrates (length <0.5 millimeters) present an evolutionary puzzle because they have reproduced without sex for millions of years but have not been driven extinct by relentlessly coevolving parasites. Bdelloids can escape fungal parasites in space and time through complete desiccation and dispersal by wind to uninfected habitats. See page 574.

Image: Kent Loeffler, Kathie T. Hodge, Chris Wilson
SCIENCE PRIZE ESSAY

538 Making Genetics Easy to Understand
L. A. Stark and K. Pompei

>> Editorial p. 504

REVIEW

542 Coexistence of Quiescent and Active Adult Stem Cells in Mammals
L. Li and H. Clevers

BREVIA

546 Role of ABA and ABI3 in Desiccation Tolerance
A. Khandelwal et al.
The hormone pathway that stabilizes seeds may have served more primitive seedless plants in supporting desiccation tolerance.

RESEARCH ARTICLE

547 Local and Long-Range Reciprocal Regulation of cAMP and cGMP in Axon/Dendrite Formation
M. Shelly et al.
Cyclic adenosine monophosphate and cyclic guanosine monophosphate regulate axon formation and exert opposite actions on dendrite formation.

REPORTS

552 Phase Transitions of Adsorbed Atoms on the Surface of a Carbon Nanotube
Z. Wang et al.
The adsorption behavior of rare gases is followed through changes in resonance frequency of a single-walled carbon nanotube.

555 Spontaneous and X-ray–Triggered Crystallization at Long Range in Self-Assembling Filament Networks
H. Cui et al.
Dilute solutions of alkyl-terminated peptide filaments can undergo ordering upon x-ray exposure.

560 The Free-Energy Landscape of Clusters of Attractive Hard Spheres
G. Meng et al.
Entropic effects favor the formation of small clusters of colloidal particles that have lower symmetry.

564 A Tricyclic Aromatic Isomer of Hexasilabenzene
K. Abersfelder et al.
A structural isomer of benzene in which carbon is replaced by silicon exhibits unexpected electronic stabilization.

566 Combined Effects on Selectivity in Fe-Catalyzed Methylene Oxidation
M. S. Chen and M. C. White
An iron catalyst shows selectivity for the oxidation of secondary C–H bonds in organic molecules.

571 A Basal Alvarezsauroid Theropod from the Early Late Jurassic of Xinjiang, China
J. N. Choiniere et al.
The Alvarezsauroidea group extends the clade containing birds and their theropod relatives back to 160 million years ago.

574 Anciently Asexual Bdelloid Rotifers Escape Lethal Fungal Parasites by Drying Up and Blowing Away
C. G. Wilson and P. W. Sherman
Asexual bdelloid rotifers avoid the evolutionary parasite trap through desiccation resistance and dispersal.

576 Objective Confirmation of Subjective Measures of Human Well-Being: Evidence from the U.S.A.
A. J. Oswald and S. Wu
Subjective life-satisfaction scores agree with objective measures of well-being across 50 American states.

580 Platelets Amplify Inflammation in Arthritis via Collagen-Dependent Microparticle Production
E. Boilard et al.
Microparticles released by platelets contribute to inflammation underlying rheumatoid arthritis.

584 Decorrelated Neuronal Firing in Cortical Microcircuits
A. S. Ecker et al.
Despite dense connectivity and shared input, the firing rates of nearby neurons are largely uncorrelated.

587 The Asynchronous State in Cortical Circuits
A. Renart et al.
A general theoretical description of correlations in highly connected recurrent neuronal circuits.

590 Direct Restart of a Replication Fork Stalled by a Head-On RNA Polymerase
R. T. Pomerantz and M. O’Donnell
Head-on collisions between DNA and RNA polymerases are resolved in vitro.

593 p53 Controls Radiation-Induced Gastrointestinal Syndrome in Mice Independent of Apoptosis
D. G. Kirsch et al.
Ionizing radiation destroys gastrointestinal epithelial cells by a mechanism that appears to be independent of apoptosis.
SCIENCE ONLINE

SCIENCEPRESS
www.sciencexpress.org

N-Terminal Acetylation of Cellular Proteins Creates Specific Degradation Signals
C.-S. Hwang et al.
In vivo protein stoichiometries are regulated through N-terminally acetylated degrons.
10.1126/science.1183147

Generating a Prion with Bacterially Expressed Recombinant Prion Protein
F. Wang et al.
Purified recombinant prion protein recapitulates the characteristics of the infectious agent in prion disease.
10.1126/science.1183748

Contributions of Stratospheric Water Vapor to Decadal Changes in the Rate of Global Warming
S. Solomon et al.
Decreases in stratospheric water vapor after the year 2000 slowed the rate of increase in global surface temperature.
10.1126/science.1182488

Symmetric Inertial Confinement Fusion Implosions at Ultra-High Laser Energies
S. H. Glenzner et al.
10.1126/science.1185634

Charged-Particle Probing of X-ray–Driven Inertial-Fusion Implosions
C. K. Li et al.
Laser-driven temperatures and implosion symmetry are close to the requirements for inertial-fusion ignition.
10.1126/science.1185747

Food Security: The Challenge of Feeding 9 Billion People
H. C. J. Godfray et al.
10.1126/science.1185833

SCIENCE CAREERS
www.sciencecareers.org/career_magazine
Free Career Resources for Scientists
Perspective: From 'Pet' to Peer
S. Pfirman et al.
Diverse probationary faculty members may be denied a fair chance to become peers.
Mind Matters: Gossip in the Lab
I. S. Levine
Workplace gossip may not be all bad, but it needs to be handled with care.
Funding News
D. Adams
Get the latest announcements of research funding, fellowships, and internships.

SCIENCE SIGNALING
www.sciencesignaling.org
The Signal Transduction Knowledge Environment
RESEARCH ARTICLE: Molecular Basis of the Death-Associated Protein Kinase–Calcium/Calmodulin Regulator Complex
I. de Diego et al.
The structure of the death-associated protein kinase and calmodulin complex reveals how calmodulin binding leads to kinase activation.
RESEARCH ARTICLE: A Crucial Role for RACK1 in the Regulation of Glucose-Stimulated IRE1α Activation in Pancreatic β-cells
Y. Qiu et al.
RACK1 dictates the response of the intracellular stress sensor IRE1α to different extracellular stimuli.
PERSPECTIVE: Proteomics Modifies Our Understanding of Cell Cycle Complexity
M. C. Hall
Thousands of modified proteins were revealed in global cell cycle studies of phosphorylation and O-GlycNAcylation.

PODCAST
M. Lofen and A. M. VanHook
A single amino acid substitution in a viral protein is sufficient to attenuate rabies virulence.

SCIENCE TRANSLATIONAL MEDICINE
www.sciencetranslationalmedicine.org
Integrating Medicine and Science
Perspective: Pathogen Microevolution in High Resolution
R. K. Aziz and V. Nizet
Next-generation high-throughput sequencing provides insight into the origin and spread of microbial pathogens.
COMMENTARY: Transforming Medicine via Digital Innovation
E. J. Topol
Digital devices have exceptional promise for changing the future of medicine.

RESEARCH ARTICLE: Resiliency and Vulnerability in the HER2-HER3 Tumorigenic Driver
D. N. Amin et al.
The ability to overcome drug-resistant breast cancers may lie in dosage frequency.

RESEARCH ARTICLE: Metabolomic Imaging for Human Prostate Cancer Detection
C.-I. Wu et al.
Metabolic imaging in the prostate reveals cancerous regions, guides biopsies, and helps prognosis.

SCIENCE PODCAST
www.sciencemag.org/multimedia/podcast
Free Weekly Show
Download the 29 January Science Podcast to hear about dealing with parasites in the absence of sex, the advent of quantum machines, your letters to Science, and more.

SCIENCEINSIDER
blogs.sciencemag.org/scienceinsider
Science Policy News and Analysis

SCIENCE
VOL 327 29 JANUARY 2010
Published by AAAS