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COVER
False-colored transmission electron microscopy image of avian H5N1 influenza virus isolated in Hong Kong (field-of-view width ~260 nm). A highly pathogenic influenza subtype is currently pandemic among the world’s wild birds, with serious outbreaks occurring in domestic poultry. Concern about the possibility of the virus evolving into a human pandemic threat has prompted controversial research on mutations that facilitate airborne infection between mammals. See the special section beginning on page 1521 for details of the scientific investigations and policy.

Image: Dr. Gopal Murti/Visuals Unlimited, Inc.

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Wnt Regulates TERT—Putting the Horse Before the Cart

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Wnt/β-Catenin Signaling Regulates Telomerase in Stem Cells and Cancer Cells

K. Hoffmeyer et al.

A molecular link exists between two key regulators of the "undifferentiated" state of proliferative cells.

REPORTS

A Sharp Peak of the Zero-Temperature Penetration Depth at Optimal Composition in BaFe$_2$(As$_{1-x}$P$_x$)$_2$

K. Hashimoto et al.

A quantum critical point may be lurking inside the superconducting dome of a pnictide series.

Electromechanical Properties of Graphene Drumheads

N. N. Klimov et al.

Mechanical straining of suspended graphene films leads to confinement of charge carriers into quantum dots.

Electrical Wind Force–Driven and Dislocation-Templated Amorphization in Phase-Change Nanowires

S.-W. Nam et al.

The transition from crystalline to amorphous states in a phase-change material may not require a melting process.

Breaking the Speed Limits of Phase-Change Memory

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A constant applied voltage causes preordering and accelerates phase changes in Ge$_2$Sb$_2$Te$_5$, leading to faster switching.

Roton-Type Mode Softening in a Quantum Gas with Cavity-Mediated Long-Range Interactions

R. Mottl et al.

Low-energy excitations of the type present in superfluid helium are observed in a cold gas of rubidium atoms.

Baseline Map of Carbon Emissions from Deforestation in Tropical Regions

N. L. Harris et al.

Tropical deforestation and degradation across three continents led to ~0.8 petagrams of yearly carbon emissions from 2000 to 2005.

Endophytic Insect-Parasitic Fungi Translocate Nitrogen Directly from Insects to Plants

S. W. Behie et al.

A fungal plant symbiont also consumes insects in surrounding soil and transfers animal nitrogen to the plant’s roots.

The Dorsal Aorta Initiates a Molecular Cascade That Instructs Sympatho-Adrenal Specification

D. Saito et al.

Morphogenetic proteins provided by the dorsal aorta control early and late processes in neurovascular development.

Membrane Fusion Intermediates via Directional and Full Assembly of the SNARE Complex

J. M. Hernandez et al.

During vesicle membrane fusion, straining of lipids at the edges of an extended contact zone may initiate fusion.

The Fission Yeast FANCM Ortholog Directs Non-Crossover Recombination During Meiosis

A. Lorenz et al.

A homolog of a human Fanconi anemia complementation group protein is involved in controlling crossing over during meiosis.

Septin-Mediated Plant Cell Invasion by the Rice Blast Fungus, Magnaporthe oryzae

Y. F. Dagdas et al.

A plant pathogen mechanically ruptures cell walls in rice leaves to enter the plant cells and initiate infection.

The lac Repressor Displays Facilitated Diffusion in Living Cells

P. Hammar et al.

The lac repressor slides along DNA in living cells, frequently passing its operator before binding.
SCIENCEONLINE

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2.8 Million Years of Arctic Climate Change from Lake El’gygytgyn, NE Russia
M. Meilas et al.
A randomized core from a Russian lake provides a high-latitude climate record where prior terrestrial records have been sparse.
10.1126/science.1222369
Kepler-36: A Pair of Planets with Neighboring Orbits and Dissimilar Densities
J. A. Carter et al.
The Kepler spacecraft detected a super-Earth and a Neptune-like planet in very tightly spaced orbits around the same star.
10.1126/science.1222483
Identifying Influential and Susceptible Members of Social Networks
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A randomized experiment based on product adoption among Facebook friends identified trend setters and followers.
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Human α-Defensin 6 Promotes Mucosal Innate Immunity Through Self-Assembled Peptide Nanonets
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Rather than killing bacteria directly, a gut antimicrobial peptide forms netlike structures that ensnare invading bacteria.
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Deformations Within Moving Kinetochores Reveal Different Sites of Active and Passive Force Generation
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G. R. V. Hammond et al.
The phospholipid phosphatidylinositol 4-phosphate defines important physical properties of the cell membrane.
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Comment on “Seroevidence for H5N1 Influenza Infections in Humans: Meta-Analysis”
M. D. Van Kerkhove et al.
Full text at www.sciencemag.org/cgi/content/full/336/6088/1506-b
Response to Comment on “Seroevidence for H5N1 Influenza Infections in Humans: Meta-Analysis”
T. T. Wang and P. Palese
Full text at www.sciencemag.org/cgi/content/full/336/6088/1506-c

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DarwinTunes helps explain how composers refine their compositions based on audience input.
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Two promising studies head toward clinical research.
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You Owe Your Life to Rock
The erosion of metal-rich granite long ago set the stage for multicellular organisms.
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RESEARCH ARTICLE: Direct Modification and Activation of a Nuclear Receptor—IPMK
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H. A. Ingraham et al.
The transcriptional activity of a nuclear receptor is regulated by the phosphorylation status of a bound lipid.
RESEARCH ARTICLE: Histone Deacetylases 6 and 9 and Sirtuin-1 Control Foxp3+ Regulatory T Cell Function Through Shared and Isoform-Specific Mechanisms
U. H. Beier et al.
Combined inhibition of distinct histone deacetylases enhances the suppressive effects of regulatory T cells.
PERSPECTIVE: How Growth Abnormalities Delay “Puberty” in Drosophila
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An insulin-like peptide delays metamorphosis of the fruit fly in response to injury or tissue overgrowth.

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RESEARCH ARTICLE: DNAzyme Targeting c-jun Suppresses Skin Cancer Growth
H. Cai et al.
FOCUS: Resurrecting DNAzymes as Sequence-Specific Therapeutics
J. S. Rossi et al.
Catalytic DNA molecules that target the transcription factor c-jun inhibit skin cancer growth in mice.
RESEARCH ARTICLE: The Structural Basis for Serotype-Specific Neutralization of Dengue Virus by a Human Antibody
E. P. Teoh et al.
The mechanism of action of a serotype-specific natural human antibody against dengue virus has been identified.

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Free Career Resources for Scientists
Can NIH Renovate the Biomedical Workforce? M. Price
An NIH committee recommends overhauling training, increasing postdoc pay, and improving and expanding staff scientist positions.
http://scim.ag/RenovateWorkforce
Career Q&A: Equality for Quality
E. Pain
Curt Rice of the University of Tromsø discusses why helping women prepare for promotion is both right and smart.
http://scim.ag/QA_CurtRice

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RESEARCH ARTICLE: mTOR Inhibitors Synergize on Regression, Reversal of Gene Expression, and Autophagy in Hepatocellular Carcinoma
H. A. Thomas
Combination therapy causes gene reprogramming, autophagy, and tumor regression in a mouse model approximating human HCC.
RESEARCH ARTICLE: Recombinant MG53 Protein Modulates Therapeutic Cell Membrane Repair in Treatment of Muscular Dystrophy
N. Wetsleder et al.
FOCUS: A Molecular Bandage for Diseased Muscle
D. J. Burkin and R. D. Wüebbeles
Recombinant human MG53 protein can increase membrane repair after injury in cells and can reduce pathology in animal models of muscle injury and muscular dystrophy.

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