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Science



INVESTING EARLY IN EDUCATION

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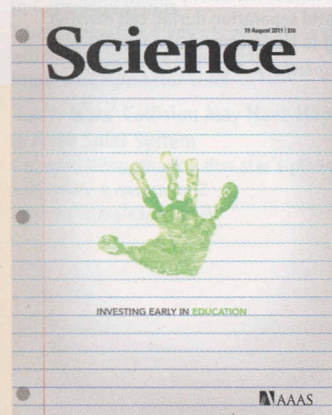
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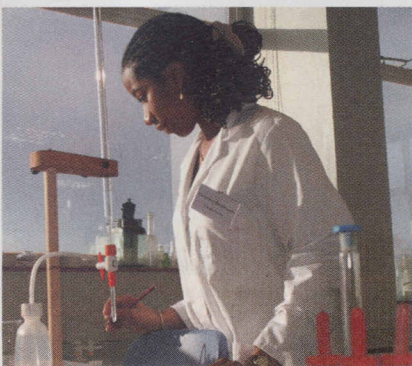
COVER

Prior to beginning formal schooling, young children can learn a great deal, forming affiliations with favorite topics and experiences. What are these children best able to learn? What value does this early learning hold for later-life experiences? The special section beginning on p. 951 focuses on science that can guide decisions about when, how, and what to teach in these early years.

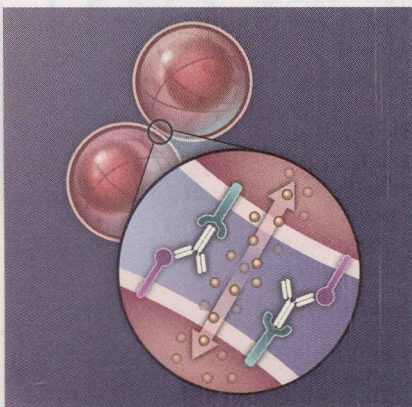
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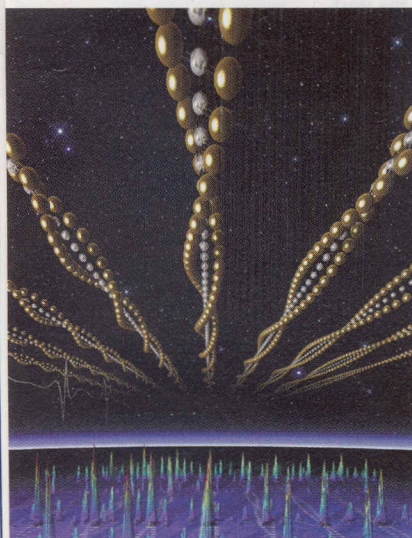
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C. J. E. Metcalf et al.
As malaria progresses, red blood cell availability and immune control change depending on the initial dose of parasites.
>> *Perspective p. 943*
- 988 A Large and Persistent Carbon Sink in the World's Forests**
Y. Pan et al.
Net average global annual uptake of atmospheric carbon dioxide by forests was 1.1 petagrams of carbon, roughly one-sixth of fossil fuel emissions.

REPORTS

- 993 Detection of Emerging Sunspot Regions in the Solar Interior**
S. Ilonidis et al.
Helioseismic observations allow the detection of sunspots before they emerge at the surface of the Sun.
- 996 Quantum Simulation of Frustrated Classical Magnetism in Triangular Optical Lattices**
J. Struck et al.
An optical lattice of trapped atoms provides a tractable and tunable setup to study complex magnetic interactions.
- 999 Visualizing Individual Nitrogen Dopants in Monolayer Graphene**
L. Zhao et al.
Nitrogen atoms that replace carbon atoms in the graphene lattice strongly modify the local electronic structure.
- 1003 Guided Growth of Millimeter-Long Horizontal Nanowires with Controlled Orientations**
D. Tsivion et al.
Long, horizontal gallium nitride nanowires are controllably grown on different faces of a sapphire substrate.
- 1008 A Main Group Metal Sandwich: Five Lithium Cations Jammed Between Two Corannulene Tetraanion Decks**
A. V. Zabula et al.
Characterization of the lithium-ion arrangement between two carbon sheets may ultimately aid in the design of battery electrodes.
- 1011 CRASY: Mass- or Electron-Correlated Rotational Alignment Spectroscopy**
C. Schröter et al.
A technique merging rotational spectroscopy with mass spectrometry facilitates analysis of a complex isotopic mixture.
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- 1015 Race, Ethnicity, and NIH Research Awards**
D. K. Ginther et al.
NIH research project grants from 2000 to 2006 show evidence of racial/ethnic disparities in the probability of receiving an award.
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- 1019 Three Periods of Regulatory Innovation During Vertebrate Evolution**
C. B. Lowe et al.
Patterns of vertebrate gene regulation have changed during the course of evolution.
>> *Perspective p. 946*
- 1024 Rapid Range Shifts of Species Associated with High Levels of Climate Warming**
I.-C. Chen et al.
A meta-analysis shows that species are shifting their distributions in response to climate change at an accelerating rate.
>> *Science Podcast*
- 1026 Aneuploidy Drives Genomic Instability in Yeast**
J. M. Sheltzer et al.
Extra chromosomes cause general genomic instability in yeast.
>> *Perspective p. 942; Report p. 1039*
- 1030 Inhibitory Fcγ Receptor Engagement Drives Adjuvant and Anti-Tumor Activities of Agonistic CD40 Antibodies**
F. Li and J. V. Ravetch
Engagement of an inhibitory receptor improves the anti-tumor efficacy of a monoclonal antibody.
>> *Perspective p. 944*
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J. P. Allen et al.
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D. F. Feldon et al.
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- 1039 Mutational Inactivation of STAG2 Causes Aneuploidy in Human Cancer**
D. A. Solomon et al.
Tumors harbor mutations that disrupt chromatid separation during cell division, leading to chromosomal abnormalities.
>> *Perspective p. 942; Report p. 1026*

SCIENCEONLINE

SCIENCEEXPRESS

www.sciencexpres.org

Human Sperm Binding Is Mediated by the Sialyl-Lewis^x Oligosaccharide on the Zona Pellucida
P.-C. Pang et al.

Fertilization in humans is initiated by binding of spermatozoa to a selectin ligand on the egg's extracellular matrix.
10.1126/science.1207438

Unfolded Proteins Are Ire1-Activating Ligands That Directly Induce the Unfolded Protein Response

B. M. Gardner and P. Walter

Misfolded secretory proteins activate a quality control pathway by binding a sensor in the endoplasmic reticulum.

10.1126/science.1209126

Recently Formed Polyploid Plants Diversify at Lower Rates

I. Mayrose et al.

The doubling of genomes does not cause increased plant speciation unless the progenitor lineages are highly fit.

10.1126/science.1207205

Ice Flow of the Antarctic Ice Sheet

E. Rignot et al.

A high-resolution map of ice motion in Antarctica shows the details of ice movement in a warming climate.

10.1126/science.1208336

Soil Nitrite as a Source of Atmospheric HONO and OH Radicals

H. Su et al.

Biogenic nitrite in soils is an important source of atmospheric HONO and OH.

10.1126/science.1207687

SCIENCENOW

www.sciencenow.org

Highlights From Our Daily News Coverage

Iconic Fishes Face New Threat

Western trout are likely to be hammered by climate change, with native species hit particularly hard.

<http://scim.ag/iconic-fish>

Fukushima Reactor Damage Picked Up in California Winds

Trace radioactive elements offer clues to radiation within the Japanese power plant.

<http://scim.ag/reactor-wind>

'Earth-Mars' Collision May Have Happened in Alien Solar System

Did something whack a dim star's planet—and create a new moon?

<http://scim.ag/earth-mars>

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment
16 August issue: <http://scim.ag/ss081611>

RESEARCH ARTICLE: Yeast Dynamically Modify Their Environment to Achieve Better Mating Efficiency

M. Jin et al.

By reshaping the pheromone gradient through proteolysis, yeast find partners of the opposite "sex" for mating.

PRESENTATION: miR-221/222 Targeting of Trichorhinophalangeal 1 (TRPS1) Promotes Epithelial-to-Mesenchymal Transition in Breast Cancer

S. Stinson et al.

MicroRNAs miR-221 and miR-222 are associated with a clinically aggressive form of breast cancer and promote epithelial-to-mesenchymal transition.

SCIENCE TRANSLATIONAL MEDICINE

www.sciencetranslationalmedicine.org

Integrating Medicine and Science

17 August issue: <http://scim.ag/stm081711>

COMMENTARY: Evaluating Preclinical Efficacy

M. A. Atkinson

Translation of modern type 1 diabetes treatments from mouse to humans depends on implementation of therapeutic efficacy standards.

COMMENTARY: Biomedical Innovation—A Risky Business at Risk

R. S. Stack and R. A. Harrington

Biomedical innovation needs a new regulatory framework that better balances the benefits and risks to the public of pioneering products.

RESEARCH ARTICLE: Computational Repositioning of the Anticonvulsant Topiramate for Inflammatory Bowel Disease

J. T. Dudley et al.

RESEARCH ARTICLE: Discovery and Preclinical Validation of Drug Indications Using Compendia of Public Gene Expression Data

M. Sirota et al.

PERSPECTIVE: The Emergence of Genome-Based Drug Repositioning

Y. A. Lussier and J. L. Chen

Genome-wide methods of mRNA signature analyses permit the high-throughput evaluation of medications for drug repurposing.

RESEARCH ARTICLE: Stem Cell-Mediated Transfer of a Human Artificial Chromosome Ameliorates Muscular Dystrophy

F. S. Tedesco et al.

Combining gene delivery using a human artificial chromosome with stem cell transplantation ameliorates muscular dystrophy in a mouse model.

SCIENCE CAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Overcoming the R01 Race Gap

M. Price

A new finding says black scientists win NIH R01 grants 10 percent less often than whites; here's how they can improve the odds.

<http://scim.ag/R01RaceGap>

>> News story p. 925; Policy Forum p. 940;

Report p. 1015

Translational Research in Early Childhood Education

S. Carpenter

Two researchers combine neuroscience and education to discover interventions for children with learning difficulties.

<http://scim.ag/NeuroEducation>

>> Education section p. 951 and www.sciencemag.org/special/education2011/

Tooling Up: Clinical Trials Careers

D. Jensen

A recent book describes several clinical career paths that can be entered by people without clinical experience.

http://scim.ag/TU_ClinicalTrials

SCIENCE PODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

On the 19 August Science Podcast: shifting species ranges in response to climate change, improving learning through social interactions, searching for exoplanets, and more.

SCIENCE INSIDER

news.sciencemag.org/scienceinsider

Science Policy News and Analysis

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