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COVER
The current global outbreak of influenza A (H1N1) in humans
appears to have originated in Mexico from infected pigs.
The cover portrait is of “Patient Zero” from La Gloria, Veracruz,
who is now well. Fraser et al. (page 1557) report on an initial
epidemiological analysis and offer baseline estimates for
transmissibility while acknowledging the prevailing uncertainties
at this early stage of the epidemic.

Photo: Erich Schlegel/Rapport/Newscom

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  R. Matzke-Karasz et al.
  Giant ostracode sperm date back at least 100 million years ago.

RESEARCH ARTICLE
1536  Synapse- and Stimulus-Specific Local Translation During Long-Term Neuronal Plasticity
  D. O. Wang et al.
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  V. Sukhovatkin et al.
  Decay of multiple electron-hole pairs, a hindrance in photovoltaic design, proves a boon to sensitivity in a photoconductive detector.

1545  Aggregation-Induced Dissociation of HCl(H₂O)₄ Below 1 K: The Smallest Droplet of Acid
  A. Gutberlet et al.
  Just four water molecules are sufficient to dissolve the acid HCl into a charged ion pair of proton and chloride.
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  J. M. Merritt et al.
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1551  Atmospheric Carbon Dioxide Concentration Across the Mid-Pleistocene Transition
  B. Hönisch et al.
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1554  Fossil Plant Relative Abundances Indicate Sudden Loss of Late Triassic Biodiversity in East Greenland
  J. C. McElwain et al.
  Plant fossils from East Greenland record an abrupt decrease in abundance as CO₂ levels increased.

1557  Pandemic Potential of a Strain of Influenza A (H1N1): Early Findings
  C. Fraser et al.
  An international collaborative effort has analyzed the initial dynamics of the swine flu outbreak.

1561  Rapid and Accurate Large-Scale Coestimation of Sequence Alignments and Phylogenetic Trees
  K. Liu et al.
  A step-wise algorithm iteratively wraps sequence alignment around a phylogenetic tree to reduce bias caused by errors.
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1565  Structure and Mechanism of an Amino Acid Antiporter
  X. Gao et al.
  The architecture of a membrane protein channel helps explain how Escherichia coli survive the acidic conditions of the stomach.

1569  IL-21 Is Required to Control Chronic Viral Infection
  H. Elsaesser et al.
  Interleukin-21 produced by CD4⁺ T cells helps CD8⁺ T cells control viral infection in a mouse model.
  >> Perspective p. 1525

1572  A Vital Role for Interleukin-21 in the Control of a Chronic Viral Infection
  J. S. Yi et al.
  The cytokine interleukin-21 has a profound impact on virus-specific T cell responses to chronic infections in mice.
  >> Perspective p. 1525

1576  IL-21R on T Cells Is Critical for Sustained Functionality and Control of Chronic Viral Infection
  A. Fröhlich et al.
  Thymus cells of the immune system require the cytokine interleukin-21 to control chronic viral infections.
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1580  Merkel Cells Are Essential for Light-Touch Responses
  S. M. Maricich et al.
  In the skin, special cells with specific properties endow their afferent nerves with the ability to resolve fine spatial details.
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1583  Recruitment of an Area Involved in Eye Movements During Mental Arithmetic
  A. Knops et al.
  Addition and subtraction are encoded in the same part of the brain that is responsible for eye movements and spatial attention.

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SCIENCEEXPRESS
www.sciencexpress.org
Successful Conservation of a Threatened Maculinea Butterfly
J. A. Thomas et al.
Prediction of population dynamics in relation to habitat requirements has led to a conservation success in the UK.
10.1126/science.1175726

Penumbral Structure and Outflows in Simulated Sunspots
M. Rempel et al.
Simulations of sunspots show that their structure and outflows can be understood in terms of convection in a magnetic field.
10.1126/science.1173798

Consistency Between Satellite-Derived and Modeled Estimates of the Direct Aerosol Effect
G. Myhre
Observational data and modeling narrows the large range of uncertainty about how much aerosols influence climate.
>> Science Podcast
10.1126/science.1174461

Functional Amyloids as Natural Storage of Peptide Hormones in Pituitary Secretory Granules
S. K. Maji et al.
Peptide and protein hormones are stored in secretory granules in a non-pathological amyloid conformation.
10.1126/science.1173155

Translocator Protein (18 kD) as Target for Anxiolytics Without Benzodiazepine-Like Side Effects
R. Rupprecht et al.
Possible drug alternative for rapid treatment of anxiety disorders could replace benzodiazepines.
10.1126/science.1175055

TECHNICALCOMMENTS

Comment on “Experimental Test of Self-Shielding in Vacuum Ultraviolet Photodissociation of CO”
J. R. Lyons et al.
full text at www.sciencemag.org/cgi/content/full/324/5934/1516-a

Comment on “Experimental Test of Self-Shielding in Vacuum Ultraviolet Photodissociation of CO”
S. R. Federman and E. D. Young
full text at www.sciencemag.org/cgi/content/full/324/5934/1516-b

Comment on “Experimental Test of Self-Shielding in Vacuum Ultraviolet Photodissociation of CO”
Q.-Z. Yin et al.
full text at www.sciencemag.org/cgi/content/full/324/5934/1516-c

Comment on “Experimental Test of Self-Shielding in Vacuum Ultraviolet Photodissociation of CO”
S. Chakraborty et al.
full text at www.sciencemag.org/cgi/content/full/324/5934/1516-d

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Recipe for Life: Water and a Little Lava
Habitable planets require just the right amount of volcanism.

On the Road to a New Species
A small gene change is a big deal for an island bird.

Warp-Speed Raindrops
Some raindrops fall to the ground much faster than expected.

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RESEARCH ARTICLE: Suppression of LPS-Induced TNF-α Production in Macrophages by cAMP Is Mediated by PKA-APKAP95-p105
E. A. Wall et al.
PERSPECTIVE: Putting on the Brakes—Cyclic AMP as a Multipronged Controller of Macrophage Function
M. Peters-Golden
Distinct anchoring proteins enable cAMP signaling to selectively modulate macrophage responses to pathogens.

REVIEW: The Vitamin D Sterol–Vitamin D Receptor Ensemble Model Offers Unique Insights into Both Genomic and Rapid-Response Signaling
M. T. Mizwicki and A. W. Norman
Different vitamin D conformations binding to different pockets of a flexible receptor could elicit distinct responses.

PROTOCOL: Using a Microfluidic Device for High-Content Analysis of Cell Signaling
R. Cheong et al.
This method for analyzing individual cells reveals differences in responses masked by averaging across the population.

SCIENCECAREERS
www.sciencemag.org/career_magazine
Free Career Resources for Scientists

Professional Polish
S. Webb
When dressing for a job interview, it pays to cultivate conformity and attention to detail.

Following in Darwin’s Footsteps
E. Pain
Jordi Serrallonga has developed a career where research and travel are both adventures.

Tooling Up: Four Must-Haves for Convincing Communication
D. Jensen
Anyone can learn to communicate effectively by learning a few key points.

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SCIENCEPODCAST
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Download the 19 June Science Podcast to hear about narrowing in on aerosols’ contribution to climate change, the latest in cystic fibrosis research, demystifying Merkel cells, and more.

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