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Cover
Illustration of the black hole in Cygnus X-1, a binary star system 6000 light-years away. A disk of stellar material feeds this black hole, which is 15 times as massive as the Sun but less than 60 kilometers across. As it falls toward the black hole, some of the material gets expelled in two opposite jets. A section highlighting recent research on black holes begins on page 535. For the story behind the cover, go to http://scim.ag/cov6094.

Image: NASA/Chandra X-ray Center/M. Weiss

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The Kepler spacecraft detected a super-Earth and a Neptune-like planet in very tightly spaced orbits around the same star.

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Roughly half of all particulate matter found in the air above North America originates from sources overseas.

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578 Cuckoos Combat Socially Transmitted Defenses of Reed Warbler Hosts with a Plumage Polymorphism
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Parasitic cuckoos sporting new colors flourish after their warbler hosts learn to defend against the mainstream fashion.

580 Unraveling the Life History of Successful Invaders
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Allocating resources to long-lived adults is one means by which birds succeed in new niches.

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A circadian rhythm regulator acts by altering the elongation stage of gene expression.
A 200-Second Quasi-Periodicity After the Tidal Disruption of a Star by a Dormant Black Hole
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Oscillations in x-ray emission from a galaxy’s central black hole imply that a disc formed after the hole captured a star.
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Conduction of Ultracold Fermions Through a Mesoscopic Channel
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Lithium atoms are used to simulate electronic transport.
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Lineage Tracing Reveals Lgr5+ Stem Cell Activity in Mouse Intestinal Adenomas
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Multicolor reporter genes signal the fate of stem cells that fuel the growth of intestinal tumors in mice.
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D. Bogunovic et al.

A mutation that accounts for adverse reactions to the Bacille Calmette-Guérin vaccine against tuberculosis is identified.
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Neurexin and Neuroligin Mediate Retrograde Synaptic Inhibition in C. elegans
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Two synaptic adhesion molecules that have been implicated in psychiatric diseases affect the kinetics of synaptic events.
10.1126/science.1224896

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Administration of patient–specific induced pluripotent stem cells.
1 August issue: http://scim.ag/stm080112

Anacardic acid reduces inflammation and improves –Amyloid—Enemy or Remedy?
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Daclizumab inhibition of inflammation in human autoimmunity is associated with blockade of lympohid tissue inducer cell development.

The Signal Transduction Knowledge Environment
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EDITORIAL GUIDE: Focus Issue—Regulation of Lymphocyte Functions
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Similar modes of regulation across different cell types promote effective innate and adaptive immunity.

RESEARCH ARTICLE: The Shuffling Protein Synapse-Associated Protein 97 Is Required for Enhanced Signaling Through Isotype-Switched IgG Memory B Cell Receptors
W. Liu et al.

PODCAST
S. K. Pierce and A. M. VanHook

A trafficking protein clusters B cell receptors to promote antibody secretion by memory B cells.

RESEARCH ARTICLE: Differential RET Signaling Pathways Drive Development of the Enteric Lymphoid and Nervous Systems
A. Patel et al.

Cis and trans signaling mechanisms direct different developmental responses to ligands for the receptor tyrosine kinase RET.

PERSPECTIVE: T Cell Signaling Targets for Enhancing Regulatory or Effector Function
F. Pan et al.

The PD-1 receptor in effector T cells and the transcription factor Foxp3 in Tregs are promising targets for therapies.

PERSPECTIVE: Tyrosine Kinases Enabling Adaptor Molecules for Chemokine-Induced Rap1 Activation in T Cells
L. P. Malherbe and D. Wang

T cell migration requires phosphorylation of an adaptor protein by Ab1 family kinases to activate guanosine triphosphatase Rap1.

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A peptide inhibits repeat-containing proteins involved in motor neuron and motor cortex degeneration, reducing paralysis.

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