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ON THE WEB THIS WEEK
>> Science Podcast
Listen to a special show focused on smarter pesticides, including stories on preventing pesticide suicides, RNA interference for bugs, and manipulating the plant immune system.

>> Find More Online
Check out Science Express, our podcast, videos, daily news, our research journals, and Science Careers at www.sciencemag.org.

COVER
Stem rust fungus Ug99 is deadly to unprotected wheat strains (two stems on the right), but not to those protected by innate resistance genes (three stems on the left). In this special issue, we explore past and future strategies for responding to diseases and infestations caused by pests. The solutions demand our best knowledge of chemistry, immune responses, and ecosystem stability. See page 728.

Photo: Evans Lagudah and Zak Pretorius
779 Earlyest Evolution of Multituberculate Mammals Revealed by a New Jurassic Fossil
C.-K. Yuan et al.
A fossilized skeleton reveals the origins of diverse feeding and locomotor adaptations of
once-common rodent-like multituberculates.

783 Identification of Wheat Gene Sr35 That Confers Resistance to Ug99 Stem Rust
Race Group
C. Saintenac et al.
Two resistance genes are identified that could protect wheat from a virulent fungus that can
severely reduce crop yields.

786 The Gene Sr33, an Ortholog of Barley Mla Genes, Encodes Resistance to
Wheat Stem Rust Race Ug99
S. Periyannan et al.

789 A Long Noncoding RNA Mediates Both Activation and Repression of Immune
Response Genes
S. Carpenter et al.
In mice, a broadly acting RNA, lincRNA-Cox2, regulates the circuit that controls the
inflammatory response.

792 Cleavage of Fibrinogen by Proteinases
Elicits Allergic Responses Through Toll-Like
Receptor 4
V. O. Milburn et al.
Allergic inflammation requires proteinase-
dependent cleavage of fibrinogen that
activates innate immunity through Toll-like
receptor 4.

796 Recurrent Insect Outbreaks Caused by
Temperature-Driven Changes in System
Stability
W. A. Nelson et al.
Seasonal temperature changes destabilize
population cycles in the tea tortrix moth
and drive the timing of pest outbreaks.

800 A Gut Lipid Messenger Links Excess Dietary
Fat to Dopamine Deficiency
L. A. Tellez et al.
In mice, a high-fat diet functionally disrupts
a gut lipid that controls the brain’s perception
of the reward value of food.

777 Basal Drainage System Response to
Increasing Surface Melt on the Greenland
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T. Meierbachtol et al.
Basal drainage structures at the edges of the
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774 Incision into the Eastern Andean Plateau
During Pliocene Cooling
R. O. Lease and T. A. Ehlers
Climate had stronger control of canyon
incision than tectonics in the eastern Andes
4 million years ago.

771 Control of Metal Nanocrystal Size Reveals
Metal-Support Interface Role for Ceria
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M. Cargnello et al.
Comparing nanocrystals of different sizes
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779 Triggering an Optical Transistor
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776 Mapping Neuronal Diversity
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H. Wichterle et al.

RESEARCH ARTICLE
676 The Xist lncRNA Exploits Three-Dimensional
Genome Architecture to Spread Across
the X Chromosome
J. M. Engreitz et al.
A large noncoding RNA uses folds within
the chromosome to drive the spread of a
chromatin repressive complex.
Research Article Summary; for full text:
http://dx.doi.org/10.1126/science.1237973

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