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Alan I. Leshner

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COVER
Male rhinoceros beetles (*Trypoxylus dichotomus*) wield a huge forked horn on their heads. Sexual selection may favor the evolution of exaggerated trait sizes because the developmental mechanism responsible for increased growth also results in signal reliability. See page 860.

Photo: Will Freihofer and Douglas Emlen

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**815** Type 6 Secretion Dynamics Within and Between Bacterial Cells
M. Basler and J. J. Mekalanos
Time-lapse video records a bacterial protein transportation machine in action.

**RESEARCH ARTICLE**

**816** A Programmable Dual-RNA–Guided DNA Endonuclease in Adaptive Bacterial Immunity
M. Jinek et al.
A prokaryotic RNA–directed targeting system can be designed to cleave any DNA sequence.

**REPORTS**

**821** Long-Range Incommensurate Charge Fluctuations in (Y,Nd)Ba$_2$Cu$_3$O$_{6+x}$
G. Ghiringhelli et al.
Scattering experiments uncover an order competing with superconductivity in a cuprate family.

**825** Long-Range Ordered Carbon Clusters: A Crystalline Material with Amorphous Building Blocks
L. Wang et al.
Amorphous carbon clusters can be constructed into a crystalline material.

**828** Camouflage and Display for Soft Machines
S. A. Morin et al.
Soft robots with microfluidic channels in a skin layer show camouflage abilities.

**832** Mixed-Phase Oxide Catalyst Based on Mn-Mullite (Sm,Gd)Mn$_2$O$_5$ for NO Oxidation in Diesel Exhaust
W. Wang et al.
Costly platinum catalysts for removing nitrogen oxide pollutants could potentially be replaced with metal oxide catalysts.

**835** UV Dosage Levels in Summer: Increased Risk of Ozone Loss from Convectively Injected Water Vapor
J. G. Anderson et al.
Convective injection of water vapor into the stratosphere increases the rate of ozone destruction there.

**839** Circadian Rhythm of Redox State Regulates Excitability in Suprachiasmatic Nucleus Neurons
T. A. Wang et al.
Diurnal metabolic changes in circadian clock neurons are coupled to changes in potassium channel activity.

**843** Identification of the Cdc48-20S Proteasome as an Ancient AAA+ Proteolytic Machine
D. Barthelme and R. T. Sauer
The AAA+ enzyme Cdc48 combines with the 20S peptidase to function as an alternative type of proteasome.

**846** The Double-Edged Sword: Does Biomechanism Increase or Decrease Judges’ Sentencing of Psychopaths?
L. G. Aspinwall et al.
An empirical study of sentencing judgments suggests that perceived biological predisposition induces leniency.

**849** Hippocampal Place Fields Emerge upon Single-Cell Manipulation of Excitability During Behavior
D. Lee et al.
Nonspatial, cellular factors can play a decisive role in how neurons respond to inputs in awake behaving animals.

**853** Neural Representations of Location Composed of Spatially Periodic Bands
J. Krupic et al.
The brain performs a Fourier analysis of space to produce the representations of space in and around the hippocampus.

**857** A TGC$_2$αβ-tubulin Complex Structure Reveals Conformation-Based Mechanisms for a Microtubule Polymerase
P. Ayaz et al.
Conformation-selective interactions with microtubule subunits explain how assembly enzymes recognize the growing end.

**860** A Mechanism of Extreme Growth and Reliable Signaling in Sexually Selected Ornaments and Weapons
D. J. Emlen et al.
Rhinoceros beetle horns, a sexually selected weapon, are more sensitive to nutrition and reliably indicate male quality.
The Precise Solar Shape and Its Variability
J. R. Kuhn et al.
Observations with NASA’s Solar Dynamics Observatory show that the shape of the Sun does not vary with the 11-year solar cycle.
10.1126/science.1220712

Next-Generation Digital Information Storage in DNA
G. M. Church et al.
Digital information can be stored in DNA at densities higher than digital media such as flash memory or quantum holography.
10.1126/science.1226355

Intestinal Inflammation Targets Cancer-Inducing Activity of the Microbiota
J. C. Arthur et al.
Microbes resident in the gut can promote colorectal cancer in mice in an inflammation-independent manner.
10.1126/science.1224820

Single Reconstituted Neuronal SNARE Complexes Zipper in Three Distinct Stages
Y. Gao et al.
Zipping of a single SNARE complex generates high force and energy that can potentially drive synaptic membrane fusion.
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Predatory Fish Select for Coordinated Collective Motion in Virtual Prey
C. C. Ioannou et al.
Computer-generated prey evolve coordinated group behaviors when attacked by bluegill sunfish.
10.1126/science.1218919

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Why Do Women Get More Migraines?
Brain differences may explain the disparity between the sexes.
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Landscape of Dead Bodies May Have Inspired First Mummies
South American hunter-gatherers began mummmifying their dead about 7000 years ago.
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Too Much Rock ‘n’ Roll?
A new technique could help designers create safer structures when fans rock too hard.
http://scim.ag/Safer-Structures

RESEARCH ARTICLE: Elicitation of Broadly Neutralizing Influenza Antibodies in Animals with Prior Influenza Exposure
C.-J. Wei et al.
Broadly neutralizing antibodies to influenza can be elicited by vaccination in animals previously infected or immunized by the virus.
10.1126/science.1224492

RESEARCH ARTICLE: Proteasome Inhibition Alleviates SNARE-Dependent Neurodegeneration
M. Sharma et al.
Neurodegeneration in a mouse model is abrogated by proteasome inhibitors that reverse impaired SNARE-complex assembly.

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D. U. Andrews et al.
Enol tautomers may play a bigger role in atmospheric chemistry than previously suspected.
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