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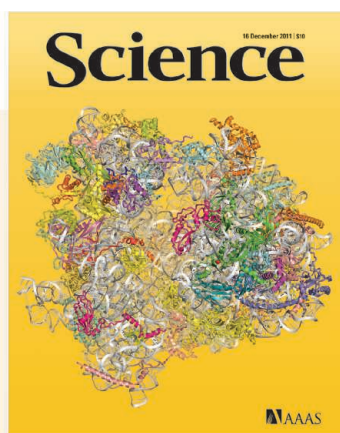
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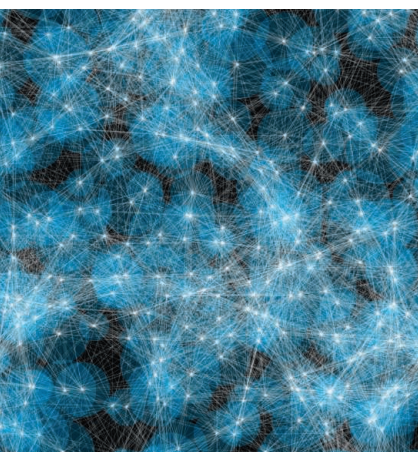
COVER

Crystal structure of the 80S ribosome from the yeast *Saccharomyces cerevisiae*. Ribosomes are responsible for protein synthesis in all cells. The eukaryotic ribosome, which consists of four RNA chains (gray) and 79 different proteins (colored ribbons), is more intricate and 40% larger than its bacterial counterpart. With an atomic mass of 3.3 megadaltons, this is the largest asymmetrical structure resolved by x-ray crystallography to date. See page 1524.

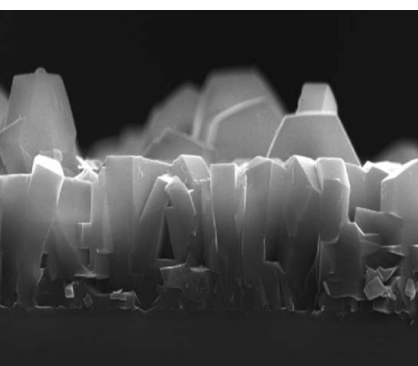
Image: Sergey Melnikov, Nicolas Garreau de Loubresse, Adam Ben-Shem, Lasse Jenner, Gulnara Yusupova, Marat Yusupov/Institut de Génétique et de Biologie Moléculaire et Cellulaire, Université de Strasbourg

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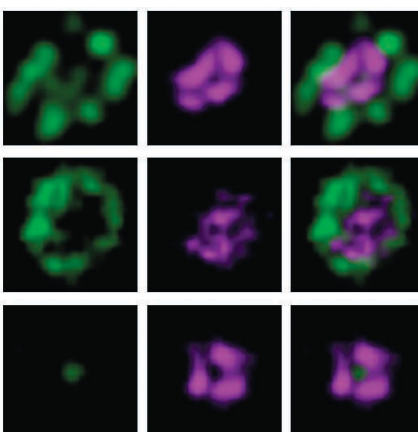
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- 1517 A Natural Deletion of the *HoxC* Cluster in Elasmobranch Fishes
B. L. King et al.
Sequence analysis shows that sharks and batoids lack one of four *Hox* gene clusters once thought necessary for development.

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A statistical method reveals relationships among variables in complex data sets.
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- 1524 The Structure of the Eukaryotic Ribosome at 3.0 Å Resolution
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- 1530 Peak External Photocurrent Quantum Efficiency Exceeding 100% via MEG in a Quantum Dot Solar Cell
O. E. Semonin et al.
An experimental solar cell productively uses an extra fraction of high-energy light typically lost as heat.
>> *Report p. 1541*
- 1533 Growth of Uniformly Oriented Silica MFI and BEA Zeolite Films on Substrates
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- 1538 Revealing Atom-Radical Reactivity at Low Temperature Through the N + OH Reaction
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Rates have been measured for a chemical transformation of interstellar interest in which both reagents are unstable.
>> *Perspective p. 1506*
- 1541 Observing the Multiexciton State in Singlet Fission and Ensuing Ultrafast Multielectron Transfer
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Photoelectron detection reveals a previously elusive, short-lived paired carrier state of interest in solar light harvesting.
>> *Report p. 1530*
- 1545 A Coherent Signature of Anthropogenic Nitrogen Deposition to Remote Watersheds of the Northern Hemisphere
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Deposition of reactive nitrogen from human activities occurred in the preindustrial era.
>> *Perspective p. 1504*

- 1548 High Relatedness Is Necessary and Sufficient to Maintain Multicellularity in *Dictyostelium*
J. J. Kuzdzal-Fick et al.
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Life in a high-carbon dioxide environment has eliminated acid-evoked pain in the naked mole-rat.
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Transmitter release at the fly neuromuscular junction is abolished in the absence of a scaffold protein.
- 1569 Inhibitory Plasticity Balances Excitation and Inhibition in Sensory Pathways and Memory Networks
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Plasticity at inhibitory synapses maintains balanced excitatory and inhibitory synaptic inputs at cortical neurons.
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- 1573 Autophagy-Dependent Anticancer Immune Responses Induced by Chemotherapeutic Agents in Mice
M. Michaud et al.
The release of adenosine triphosphate through autophagy can promote antitumor immune responses.
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- 1578 Uninformed Individuals Promote Democratic Consensus in Animal Groups
I. D. Couzin et al.
Uninformed individuals inhibit extremism and enforce fair representation during collective decision-making.
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SCIENCEONLINE

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The Southern Ocean's Role in Carbon Exchange During the Last Deglaciation

A. Burke and L. F. Robinson

Radiocarbon measurements of deep-sea corals reveal the presence of old, carbon-rich water in the Southern Ocean.

10.1126/science.1208163

Asymmetry and Aging of Mycobacterial Cells Lead to Variable Growth and Antibiotic Susceptibility

B. B. Aldridge et al.

The growing pole of the tuberculosis-causing bacterium is inherited by only one offspring, which can then elongate faster.

10.1126/science.1216166

Asymmetric B Cell Division in the Germinal Center Reaction

B. E. Barnett et al.

Germinal center B cells undergo asymmetric cell division.

10.1126/science.1213495

Equilibrative Nucleoside Transporter 3 Deficiency Perturbs Lysosome Function and Macrophage Homeostasis

C.-L. Hsu et al.

Lack of the transporter critical for recycling of nucleosides after phagocytosis results in a fatal expansion of macrophages.

10.1126/science.1213682

Fitness Trade-Offs and Environmentally Induced Mutation Buffering in Isogenic *C. elegans*

M. O. Casanueva et al.

Stochastic variation in a cellular stress response pathway can predict the outcome of mutations in individuals.

10.1126/science.1213491

Guiding Limited Use of Chimpanzees in Research

B. M. Altevogt et al.

10.1126/science.1217521

>> *News story p. 1484*

SCIENCENOW

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Highlights From Our Daily News Coverage

An 'Arms Race' Between Snakes and Humans

A new analysis suggests that these two kinds of animals have played a large role in each other's evolutionary history.

<http://scim.ag/Snakes-Humans>

How the 'Thermal Grill' Illusion Tricks the Mind

A strange burning sensation may provide clues to how the brain registers pain.

http://scim.ag/Thermal_Grill

'Vocal Fry' Creeping Into U.S. Speech

Young women end sentences with a gravelly buzz in what could be a catching trend.

http://scim.ag/Vocal_Fry

SCIENCE SIGNALING

www.sciencesignaling.org

The Signal Transduction Knowledge Environment

13 December issue: <http://scim.ag/ss121311>

RESEARCH ARTICLE: H₂S-Induced Sulfhydrylation of the Phosphatase PTP1B and Its Role in the Endoplasmic Reticulum Stress Response

N. Krishnan et al.

Reversible inactivation by sulfhydrylation of the protein tyrosine phosphatase PTP1B activates the kinase PERK to promote the ER stress response.

RESEARCH ARTICLE: Triggering Actin Comets Versus Membrane Ruffles—Distinctive Effects of Phosphoinositides on Actin Reorganization

T. Ueno et al.

The ability of phosphoinositides to produce functionally diverse effects may depend on the relative concentrations of different species.

PERSPECTIVE: Is the Regulation of Insulin Signaling Multi-Organismal?

A. E. Douglas

Gut microbiota in *Drosophila* promote metabolic signaling pathways, resulting in increased growth and development rates.

PROTOCOL: A Method to Separate Nuclear, Cytosolic, and Membrane-Associated Signaling Molecules in Cultured Cells

X. Liu and F. Fagotto

A semipermeabilization step and a specific Percoll gradient composition enable effective cellular fractionation.

GLOSSARY

Find out what FLP, sAC, and CR3 mean in the world of cell signaling.

SCIENCE TRANSLATIONAL MEDICINE

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Integrating Medicine and Science

14 December issue: <http://scim.ag/stm121411>

COMMENTARY: dbGaP Data Access Requests—A Call for Greater Transparency

L. Walker et al.

Mandatory data sharing offers scientific advantages, but more transparency around data use is needed.

PERSPECTIVE: Receptor Antibodies as Novel Therapeutics for Diabetes

S. Ussar et al.

RESEARCH ARTICLE: Amelioration of Type 2 Diabetes by Antibody-Mediated Activation of Fibroblast Growth Factor Receptor 1

A.-L. Wu et al.

Designer antibodies that mimic hormone activity provide new approaches to treating diabetes.

RESEARCH ARTICLE: An NKG2D-Mediated Human Lymphoid Stress Surveillance Response with High Interindividual Variation

S. Shafi et al.

The stress surveillance response to cell damage varies among humans, perhaps explaining differences in transplant rejection.

RESEARCH ARTICLE: Pathogenesis of Lethal Cardiac Arrhythmias in *Mecp2* Mutant Mice—Implication for Therapy in Rett Syndrome

M. D. McCauley et al.

Lethal ventricular arrhythmias in a mouse model of Rett syndrome can be prevented.

SCIENCE CAREERS

www.sciencecareers.org/career_magazine

Free Career Resources for Scientists

It Doesn't Add Up

R. Kaufman

A study confirms that girls have as much innate math ability as boys, so where are the women mathematicians?

<http://scim.ag/DoesntAddUp>

Translating Scientific Expertise Into Publishing Success

S. Carpenter

Evelyn Jabri's career transitions are eased by pragmatic optimism and fueled by an insatiable appetite for learning.

<http://scim.ag/EvelynJabri>

Tooling Up: Inflection Points

D. Jensen

From dramatic changes arise new opportunities.

http://scim.ag/TU_Inflection

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On the 16 December *Science* Podcast: the hardy naked mole-rat, finding patterns in large data sets, a new shot at a tuberculosis vaccine, and more.

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Science Policy News and Analysis

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