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ON THE WEB THIS WEEK
>> Science Podcast
Listen to stories on the fate of topsoil microbes under climate change, observations from Voyager 1 at the fringes of the solar system, attacking cancer with T cells, and more.

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RESEARCH ARTICLES
1542 Elongation Factor G Bound to the Ribosome in an Intermediate State of Translocation
D. S. Tourigny et al.
Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1235490

1543 Crystal Structures of EF-G–Ribosome Complexes Trapped in Intermediate States of Translocation
J. Zhou et al.
Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1236086

1544 Control of Ribosomal Subunit Rotation by Elongation Factor G
A. Pulk and J. H. D. Cate
Crystal structures reveal how messenger RNA and transfer RNAs transition through the prokaryotic ribosome during translation. Research Article Summary; for full text: http://dx.doi.org/10.1126/science.1235970

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REPORTS
1545 Terabit-Scale Orbital Angular Momentum Mode Division Multiplexing in Fibers
N. Bozinovic et al.
Encoding data in the twist, or helicity, of photons provides a route to increase optical communication rates in fibers.
>> News story p. 1513

1549 Dinitrogen Cleavage and Hydrogenation by a Trinuclear Titanium Polyhydride Complex
T. Shima et al.
The collective reactivity of three hydride-bridged titanium centers cleaves dinitrogen under mild conditions.
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1552 The Origin of Lunar Mascon Basins
H. J. Melosh et al.
A detailed model of impact basin formation explains the gravity signatures near two lunar craters.
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1555 Continuous Permeability Measurements Record Healing Inside the Wenchuan Earthquake Fault Zone
L. Xue et al.
Measurements of permeability inside a fault zone after a major earthquake reveal rapid healing of fractures.

1560 Dynamic Topography Change of the Eastern United States Since 3 Million Years Ago
D. B. Rowley et al.
Mantle flow has deformed the presumed passive eastern margin of North America by up to 60 meters during the past 5 million years.

1564 Varied Response of Western Pacific Hydrology to Climate Forcings over the Last Glacial Period
S. A. Carolin et al.
Stalagmites from Borneo show how the climate of the western equatorial Pacific region changed over the past 100,000 years.

1567 Supercomplex Assembly Determines Electron Flux in the Mitochondrial Electron Transport Chain
E. Lapuente-Brun et al.
Ordered formation of supercomplexes of respiratory enzymes influences metabolic efficiency in response to food supply.

1570 Intrinsically Disordered Protein Threads Through the Bacterial Outer-Membrane Porin OmpF
N. G. Haasen et al.
An antibacterial peptide can tunnel through cell-surface pores to deliver an epitope signal and initiate cell death.

1574 Temperature Drives the Continental-Scale Distribution of Key Microbes in Topsoil Communities
F. Garcia-Pichel et al.
Climate change is likely to shift the distribution of key cyanobacteria species in desert soils.
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1577 Mechanism of Eukaryotic RNA Polymerase III Transcription Termination
S. Nielsen et al.
Formation of the secondary structure of the transcribed RNA facilitates termination during transcription.

1580 Transcription Under Torsion
J. Ma et al.
RNA polymerase is a potent DNA-based torsional motor than can restart transcription after release of DNA supercoiling stress.

1583 Fe-S Cluster Biosynthesis Controls Uptake of Aminoglycosides in a ROS-Less Death Pathway
B. Ezraty et al.
The respiratory chain is required for antibiotic entry to the target cell rather than for its killing.

1587 B Cells Use Mechanical Energy to Discriminate Antigen Affinities
E. Natkanski et al.
Mechanical forces allow immune B cells to extract high-affinity antigens from membrane surfaces.

1591 Deep Cortical Layers Are Activated Directly by Thalamus
C. M. Constantinople and R. M. Bruno
A direct pathway is used to evoke sensory responses in neurons in multiple layers of the rat barrel cortex.