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Science

Mysteries of the Cell

 AAAS

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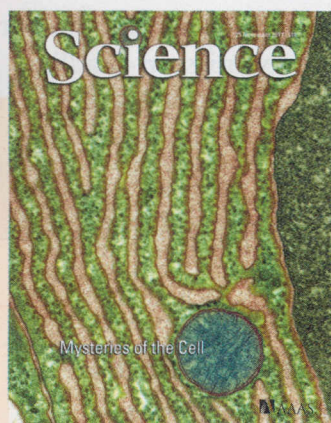
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COVER

False-colored electron micrograph of the rough endoplasmic reticulum (ER, light green), which consists of elongated membrane structures studded with ribosomes (dark green dots) and is adjacent to the nuclear envelope (dark green, right). The ER is the entry portal for newly synthesized membrane and secretory proteins (circular mitochondrion: ~0.49 micrometers wide). Two Reviews (pages 1081 and 1086) describe the ER's role in protein quality control. A News package (beginning on page 1046) discusses a number of fundamental mysteries in cell biology.

Image: MedImage/Photo Researchers, Inc.

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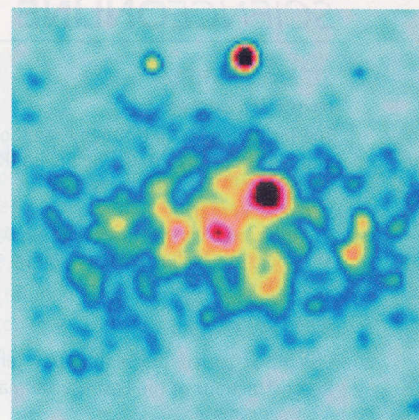
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www.sciencexpress.org

The Technology Path to Deep Greenhouse Gas Emissions Cuts by 2050: The Pivotal Role of Electricity

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Reducing greenhouse gas emissions to 80% below 1990 levels by 2050 requires widespread electrification of transportation and other sectors.

10.1126/science.1208365

>> [Science Podcast](#)

Climate Sensitivity Estimated from Temperature Reconstructions of the Last Glacial Maximum

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Last Glacial Maximum temperature reconstructions and model simulations can constrain the equilibrium climate sensitivity.

10.1126/science.1203513

Using the Past to Predict the Future?

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Molecular Mimicry Regulates ABA Signaling by SnRK2 Kinases and PP2C Phosphatases

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Two players and one chair regulate this plant hormone signaling cascade.

10.1126/science.1215106

Direct Redox Regulation of F-Actin Assembly and Disassembly by Mical

R.-J. Hung et al.

A protein involved in redox signaling disassembles actin filaments and alters their reassembly.

10.1126/science.1211956

Mouse B-Type Lamins Are Required for Proper Organogenesis But Not by Embryonic Stem Cells

Y. Kim et al.

Mice lacking critical structural components of the nucleus, lamin-B intermediate filament proteins, remain viable until birth.

10.1126/science.1211222

TECHNICALCOMMENTS

Comment on "Hydrogen Mapping of the Lunar South Pole Using the LRO Neutron Detector Experiment LEND"

D. J. Lawrence et al.

Full text at www.sciencemag.org/cgi/content/full/334/6059/1058-c

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I. G. Mitrofanov et al.

Full text at www.sciencemag.org/cgi/content/full/334/6059/1058-d

SCIENCENOW

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Highlights From Our Daily News Coverage

Eruptions Swept Life From Land and Sea

Volcanic activity at the end of the Permian period struck a devastating blow to life.

<http://scim.ag/VolcanicEruptions>

Earth's 'Time Capsules' May Be Flawed

Minerals found within ancient crystals may have been chemically altered.

<http://scim.ag/zircon>

Particle Smasher Hints at Physics Breakthrough

This result might help explain why the universe is full of matter, not antimatter.

<http://scim.ag/PhysicsBreakthrough>

SCIENCESIGNALING

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The Signal Transduction Knowledge Environment

22 November issue: <http://scim.ag/ss112211>

EDITORIAL GUIDE: Focus Issue—Fine Tuning

Hedgehog Signaling in Development and Disease

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The Hedgehog signaling cascade is regulated by a complex and diverse set of mechanisms.

PERSPECTIVE: Barcoding Hedgehog for Intracellular Transport

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Cholesterol modification may influence where Hedgehog is released.

PRESENTATION: Sonic Hedgehog Activates the GTPases Rac1 and RhoA in a Gli-Independent Manner Through Coupling of Smoothed

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Smoothed signals through small G proteins in one type of noncanonical Hedgehog signaling.

PRESENTATION: Direct Delivery Mechanisms of Morphogen Dispersion

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PRESENTATION: Hedgehog Signaling and the Gli Code in Stem Cells, Cancer, and Metastases

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RESEARCH ARTICLE: Agonist-Driven Maturation and Plasma Membrane Insertion of Calcium-Sensing Receptors Dynamically Control Signal Amplitude

M. P. Grant et al.

Activation of a G protein-coupled receptor increases its own surface abundance to enhance its signaling.

RESEARCH ARTICLE: Ric-8 Proteins Are Molecular Chaperones That Direct Nascent G Protein α Subunit Membrane Association

M. Gabay et al.

Control of the insertion of G protein α subunits into endomembranes by Ric-8 proteins regulates the abundance and function of heterotrimeric G proteins.

RESEARCH ARTICLE: Ric-8 Proteins Are Molecular Chaperones That Direct Nascent G Protein α Subunit Membrane Association

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FOCUS: Glowing Tumors Make for Better Detection and Resection

M. Bouvet and R. M. Hoffman

Topical fluorescent probes make tumors selectively fluorescent and may improve cancer detection and removal.

RESEARCH ARTICLE: Rapid Cancer Detection by Topically Spraying a γ -Glutamyltranspeptidase-Activated Fluorescent Probe

Y. Urano et al.

A small-molecule imaging probe that fluoresces upon cleavage by a cancer-specific enzyme may improve surgical removal procedures of tumors.

RESEARCH ARTICLE: Bactericidal/Permeability-Increasing Protein (rBPI21) and Fluoroquinolone Mitigate Radiation-Induced Bone Marrow Aplasia and Death

E. C. Guinan et al.

An endotoxin-neutralizing protein fragment plus a fluoroquinolone antibiotic improve survival and hematopoietic recovery in mice after lethal radiation.

SCIENCECAREERS

www.sciencereers.org/career_magazine

Free Career Resources for Scientists

Perspective: The STEM Job Market

J. Austin

Recent reports on the scientific and technical workforce draw widely divergent conclusions.

<http://scim.ag/STEMJobsPerspective>

Experimental Error: Thanks 10⁶

A. Ruben

When you carve the turkey, don't forget to thank science.

http://scim.ag/EE_GivingThanks

Networking Your Way to a Job

E. Pain

Biologist Mary-Rose Hoja has forged a career in strategic networking, social media, and mingling.

http://scim.ag/Hoja_Profile

SCIENCEPODCAST

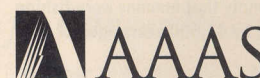
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