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COVER
Maltose binding protein (translucent), shown suspended in its molten globule state with chaperone protein SecB (yellow), destined for transport across the cellular membrane. The Gordon Research Conference on Visualization in Science & Education will be held 26 to 31 July 2009 at Magdalen College, Oxford, UK. The schedules for the 2009 Gordon Research Conferences begin on page 1084.

Image: Graham Johnson/www.fivth.com and Scripps Research Institute; Sander Tans/AMOLF Institute

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Oxide Nanoelectronics on Demand

C. Cen et al.

An atomic force microscope is used to pattern and fabricate devices created at the interface between different oxides.

Macroscopic 10-Terabit–per–Square-Inch Arrays from Block Copolymers with Lateral Order

S. Park et al.

The sawtooth topography of annealed sapphire wafers guides the phase separation of a block copolymer to create a nearly defect-free patterned film.

The Formation of Warm Dense Matter: Experimental Evidence for Electronic Bond Hardening in Gold

R. Ernstorfer et al.

Injecting energy into a gold film can create a transient excited state with stronger bonds prior to melting.

Switching Off Hydrogen Peroxide Hydrogenation in the Direct Synthesis Process

J. K. Edwards et al.

Unwanted product hydrogenation was avoided by using a modified catalyst that had smaller gold-palladium nanoparticles.

Strong Release of Methane on Mars in Northern Summer 2003

M. J. Mumma et al.

Earth-based spectrometers have detected seasonal variations of methane emissions from certain locations on Mars in 2003.

Isotopic Evidence for an Aerobic Nitrogen Cycle in the Latest Archean

J. Garvin et al.

A modern nitrogen cycle developed and microbial metabolisms evolved as soon as some free oxygen was present.

Zircon Dating of Oceanic Crustal Accretion

C. J. Lissenberg et al.

Zircon dates from the slow-spreading mid-Atlantic Ridge show that magmatic intrusions formed new oceanic crust regularly and evenly, thereby providing cooling times.

A Self-Regulatory System of Interlinked Signaling Feedback Loops Controls Mouse Limb Patterning

J.-D. Bénazet et al.

Interactions between three signaling pathways allow robust regulation of vertebrate limb development.

Trifurcate Feed-Forward Regulation of Age-Dependent Cell Death Involving mir164 in Arabidopsis

J. H. Kim et al.

A logic circuit involving microRNA and transcription factors ensures the timely demise of plant leaves.

HIN-200 Proteins Regulate Caspase Activation in Response to Foreign Cytoplasmic DNA

T. L. Roberts et al.

A family of proteins is identified that binds to foreign cytoplasmic DNA in mammalian cells and regulates the immune response.

A Genetic Defect Caused by a Triplet Repeat Expansion in Arabidopsis thaliana

S. Sureshkumar et al.

A strain of Arabidopsis provides a plant model for the harmful effects of repeat nucleotide expansions in populations.

Stress-Inducible Regulation of Heat Shock Factor 1 by the Deacetylase SIRT1

S. D. Westerheide et al.

The longevity factor SIRT1 influences protein stability by keeping heat shock factor 1 in its active state.

Disruption of Vertical Motility by Shear Triggers Formation of Thin Phytoplankton Layers

W. M. Durham et al.

Extensive sheets of photosynthetic algae accumulate in coastal waters when their upward swimming is disrupted by counter currents in lateral water flow.

Cytosolic Viral Sensor RIG-I Is a 5'–Triphosphate–Dependent Translocase on Double-Stranded RNA

S. Myong et al.

A host protein that recognizes invading viruses activates innate immunity defenses only when it senses both double-stranded RNA and a 5’ triphosphate.

Neuronal Activity–Induced Gadd45b Promotes Epigenetic DNA Demethylation and Adult Neurogenesis

D. K. Ma et al.

Neural activity induces an immediate early gene that triggers epigenetic modifications needed for neurogenesis.

Harmonic Convergence in the Love Songs of the Dengue Vector Mosquito

L. J. Cator et al.

Male and female mosquitoes change their wing beat frequencies to match each other as a prelude to mating.
A near miss is almost as good as a win to gamblers’ hedonics (with audio slideshow). A reporter takes a real-world tour of Horseshoes, Hand Grenades—and Slot Machines? starting with a dog-led truffle hunt and ending with a dog-food taste test, our reporter takes a real-world tour of hedonics (with audio slideshow).

The Signal Transduction Knowledge Environment

>> News story p. 1006

The guanine nucleotide exchange factor Bx is required in lymphocytes for the expression of nfat5 in response to osmotic stress.

The transcription of A. Cheng and A. R. Saltiel an Orphan (and Its Partner)

The order of FGFR1 tyrosine autophosphorylation is kinetically controlled and determined by primary and tertiary structures.

The Signal Transduction Knowledge Environment

Science Policy News and Analysis

Find solves decades-old debate about mysterious toxins.

Ancient Virus Gave Wasps Their Sting

Find solves decades-old debate about mysterious toxins.

Faith and Science in Balance

E. Pain Ph.D. student Imre Szilágyi strives to succeed in order to glorify God.

SCIENCEPODCAST

www.sciencemag.org/multimedia/podcast

Free Weekly Show

Download the 20 February Science Podcast to hear about open access and global participation in science, the role of water vapor in global warming, microchips sans silicon, and more.

RESEARCH ARTICLE: The Precise Sequence of FGF Receptor Autophosphorylation Is Kinetically Driven and Is Disrupted by Oncogenic Mutations E. D. Lew et al. The order of FGFR1 tyrosine autophosphorylation is kinetically controlled and determined by primary and tertiary structures.

PERSPECTIVE: Von Gierke’s Disease Adopts an Orphan (and Its Partner) A. Cheng and A. R. Saltiel The transcription of glucose-6-phosphatase is positively regulated by a nuclear receptor and coactivator.
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