A mouse embryo at 9 days of gestation, stained for α-fetoprotein in the liver bud and yolk sac (upper left and right green domains) and for the transcription factor Pdx-1 in the ventral and dorsal pancreas buds (upper and lower red domains). Understanding the basis for organ development can provide insights into disease and stem cell programming. See the special section beginning on page 1489.

Image: Ewa Wandzioch and Ken Zaret

A Scientific Approach to Policy
by Bruce Alberts

Three Asian Nations Link Up to Form a Formidable Radio Telescope Array

Ministers Bankroll European Space Agency’s Ambitions

Less Vaccine Can Be More

In Rare Encounter, U.S. and Chinese Scientists Craft Nuclear Glossary

Fetal Immune System Hushes Attacks on Maternal Cells

Treat Everyone Now? A ‘Radical’ Model to Stop HIV’s Spread

Hopping to a Better Protein

Sanctuaries Aim to Preserve a Model Organism’s Wild Type

Philippines Plans Research Revival

Coming Soon to a Knee Near You: Cartilage Like Your Very Own

Spore Show Not Gaming the Science System

Limiting the Impact of the Impact Factor

Putting Materials and Methods in Their Place

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ChemCam’s Cost a Drop in the Mars Bucket

An Order of Plumpy’nut, Hold the Aflatoxins

In Defense of GM Crops
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Human Fetal Hemoglobin Expression Is Regulated by the Developmental Stage-Specific Repressor BCL11A
V. G. Sankaran et al.
A way to reactivate a fetal form of γ-globulin in adults—by releasing it from repression by an inhibitor—may prove useful for treating certain genetic anemias.
10.1126/science.1165409

CELL BIOLOGY

Nascent RNA Sequencing Reveals Widespread Pausing and Divergent Initiation at Human Promoters
L. J. Core, J. J. Waterfall, J. T. Lis
RNA sequencing identifies antisense transcription immediately upstream of genes with transcriptionally engaged RNA polymerase.
10.1126/science.1162228

CELL BIOLOGY

Divergent Transcription from Active Promoters
A. C. Seila et al.
Active genes produce promoter-localized sense and antisense short RNAs, suggesting frequent transcription by divergently oriented RNA polymerase II complexes at mammalian promoters.
10.1126/science.1162253

TECHNICAL COMMENT ABSTRACTS

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U. Riebesell et al.
full text at www.sciencemag.org/cgi/content/full/322/5907/1466b
Response to Comment on "Phytoplankton Calcification in a High-CO₂ World"
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S. Gächter, E. Renner, M. Sefton
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Dynamic Proteomics of Individual Cancer Cells in Response to a Drug
A. A. Cohen et al.
Cells that escape death from a chemotherapy drug express a different array of proteins than do genetically identical cells that die, which may help to inform cancer therapeutics.
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Tough, Bio-Inspired Hybrid Materials
E. Munch et al.
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U. Schneider et al.
A cold atom cloud confined to an optical lattice can be tuned from a metal to an insulator. >> Perspective p. 1480

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coordinates cell migration.

Live fluorescence imaging of over 1500 cells within a

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Provide Insights into Collective Cell Migration

Dynamic Analyses of

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Regulatory binding protein, allowing another regulator to constrict

During cell division, a component of the spindle inhibits a small

J. C. Canman

Centralspindlin Is Essential for Cytokinesis

Inhibition of Rac by the GAP Activity of

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A Stress Signaling Pathway in Adipose Tissue

Regulates Hepatic Insulin Resistance

G. Sabia et al.

In mice, some detrimental effects of a diet high in fat—insulin resistance, for instance—result from hormonal signals sent from fat cells to the liver. >> Perspective p. 1483

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Photoexcited CRY2 Interacts with CIB1 to Regulate

Transcription and Floral Initiation in Arabidopsis

H. Liu, X. Yu, K. Li, J. Kleijn, H. Yang, D. Lisiero, C. Lin

Blue light triggers the association of a photoreceptor, transcription factor, and DNA site, thus inducing expression for the gene FT (flowering time) and initiating flowering.

CELL BIOLOGY

Inhibition of Rac by the GAP Activity of Centralspindlin Is Essential for Cytokinesis

J. C. Canman et al.

During cell division, a component of the spindle inhibits a small regulatory binding protein, allowing another regulator to constrict a ring between the separating daughter cells.

DEVELOPMENTAL BIOLOGY

Dynamic Analyses of Drosophila Gastrulation

Provide Insights into Collective Cell Migration

A. McMahon, W. Supatto, S. E. Fraser, A. Stathopoulos

Live fluorescence imaging of over 1500 cells within a Drosophila embryo during gastrulation reveals that a fibroblast growth factor coordinates cell migration.

NEUROSCIENCE

Astrogial Metabolic Networks Sustain Hippocampal

Synaptic Transmission

N. Rouach, A. Koulakoff, V. Abudara, K. Willecke, C. Giaume

The glial astrocytes that surround neurons supply glucose or lactate to excitatory synapses though gap junctions that open when the neurons are active.

NEUROSCIENCE

Activation of Pannexin-1 Hemichannels Augments

Aberrant Bursting in the Hippocampus

R. J. Thompson et al.

Activation of a glutamate receptor in hippocampal cells leads to secondary opening of a gap junction–like channel that can contribute to seizure-like bursting.

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Centromere-Associated Female Meiotic Drive Entails

Male Fitness Costs in Monkeyflowers

L. Fishman and A. Saunders

Competition between chromosomal homologs causes non-Mendelian meiotic segregation and fitness polymorphism in a natural monkeyflower population. >> Perspective p. 1484

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Maternal Alloantigens Promote the Development of

Tolerogenic Fetal Regulatory T Cells in Utero

J. E. Mold et al.

Exposure of the human fetus to maternal cells during pregnancy can prompt development of regulatory T cells that prevent responses to non-inherited maternal antigens. >> News story p. 1450; Science Podcast

sciencemag.org  SCIENCE VOL 322  5 DECEMBER 2008  1427
The physiological activities of PPARγ are too soon to conclude that are truly ligand-independent.

Podcast
S. W. Lee, P. P. Ongusaha, A. M. VanHook
Sam Lee and Pat Ongusaha discuss their research on the mechanisms by which ultraviolet B radiation induces cell death.

Glossary
Find out what TSC, NG2, and ASIC mean in the world of cell signaling.

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K. Hede
Job opportunities make a bright future for scientists with clinical degrees.

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Science is one of many priorities for the new presidential administration.

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Ligand-binding pocket of PPARγ.

Hidden impact crater in Canada unmasked.

Ligand-dependent and -independent Regulation of PPARγ and Orphan Nuclear Receptors
H. E. Xu and Y. Li
It is too soon to conclude that the physiological activities of PPARγ are truly ligand-independent.

Podcast
S. W. Lee, P. P. Ongusaha, A. M. VanHook
Sam Lee and Pat Ongusaha discuss their research on the mechanisms by which ultraviolet B radiation induces cell death.

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