A mouse embryo at 9 days of gestation, stained for \(\alpha\)-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

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NASCENT RNA SEQUENCING REVEALS WIDESPREAD PAUSING AND DIVERGENT INITIATION AT HUMAN PROMOTERS
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RNA sequencing identifies antisense transcription immediately upstream of genes with transcriptionally engaged RNA polymerase.
10.1126/science.1162228

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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

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P. Preker et al.
Highly unstable transcripts exist upstream of active human promoters.
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A technique based on resolving the momentum of an electron escaping from a helium atom in an elliptically polarized light field clocks tunneling at less than 34 attoseconds.

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Optical Absorption and Radiative Thermal Conductivity Silicate Perovskite to 125 Gpa

H. Keppler, L. S. Dubrovinsky, O. Narygina, I. Kantor

At high pressures, silicate perovskite, abundant in Earth’s mantle, is not opaque to optical and infrared light, implying that radiative heat flow is important in the deep Earth.

**PLANETARY SCIENCE**

Quasi-Periodic Bedding in the Sedimentary Rock Record of Mars

K. W. Lewis et al.

Stereo topographic mapping on Mars shows that some large impact craters were filled with sedimentary rock sequences made up of cyclical packages of meter-scaled beds.

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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**

A Stress Signaling Pathway in Adipose Tissue Regulates Hepatic Insulin Resistance

G. Sabio 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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Inhibition of Rac by the GAP Activity of Centralspinulin 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.

**NEUROSCIENCE**

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.

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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
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PERSPECTIVE: 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.

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S. W. Lee, P. P. Ongusaha, A. M. VanHook
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