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T. R. Maines et al.
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Animal experiments compare the dynamics and effects of the virus causing the 2009 flu outbreak to those of seasonal H1N1 flu.
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The Dynamics of Phenotypic Change and the Shrinking Sheep of St. Kilda
A. Ozgul et al.
Environmental change has led to decreasing body size in a sheep population over 20 years, despite selection for increased size.
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Radio Imaging of the Very-High-Energy γ-Ray Emission Region in the Central Engine of a Radio Galaxy
*The VERITAS Collaboration* et al.
Particles are accelerated to very high energies in close proximity to a super-massive black hole.
10.1126/science.1175406

Detection of 16 Gamma-Ray Pulsars Through Blind Frequency Searches Using the Fermi LAT
A. A. Abdo et al.
Most of these identifications correspond to gamma-ray sources long suspected to be pulsars.
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A Population of Gamma-Ray Millisecond Pulsars Seen with the Fermi Large Area Telescope
A. A. Abdo et al.
These objects appear to share a common emission mechanism with standard gamma-ray pulsars.
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Warmer climates accelerate evolution rate in mammals, a new study says.
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New discoveries indicate that cave-dwellers played music 35,000 years ago.
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M. B. Yaffe
The deluge of NIH “challenge grants” promises to strain the reviewer pool.

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B. Schober et al.
Computational modeling of the ErbB signaling network affirms ErbB3 as a therapeutic target.

RESEARCH ARTICLE: PKCε Regulation of an α5 Integrin–ZO-1 Complex Controls Lamellae Formation in Migrating Cancer Cells
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Phosphorylated ZO-1 relocalizes from tight junctions to lamellae to associate with α5 integrin and control migration.

PERPECTIVE: AIMing 2 Detect Foreign DNA
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PODCAST
U. B. Nielsen and A. M. VanHook
Mathematical modeling of signaling pathways can be used to identify candidate targets for cancer therapies.

GLOSSARY
Find out what ERM, FMN, and LH mean in the world of cell signaling.

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