Contents

PERSPECTIVE

Studying cell biology in the skin
A. Morrow and T. Lechler

BRIEF REPORT

Caenorhabditis elegans Aurora A kinase is required for the formation of spindle microtubules in female meiosis
E. Sumiyoshi, Y. Fukata, S. Namai, and A. Sugimoto

Female meiotic spindles are organized in the absence of centrosomes. Caenorhabditis elegans Aurora A (AIR-1) is dispensable for the initial assembly of meiotic microtubules within the oocyte nuclei, but its kinase activity is continuously required for the stabilization of meiotic spindle microtubules after germinal vesicle breakdown.

ARTICLES

Biosynthesis and Biodegradation

Low doses of ultraviolet radiation and oxidative damage induce dramatic accumulation of mitochondrial DNA replication intermediates, fork regression, and replication initiation shift
R. Torregrosa-Muñumer, S. Goffart, J. A. Haikonen, and J. L.O. Pohjoismäki

Oxidative damage is believed to cause pathological mitochondrial DNA (mtDNA) rearrangements. mtDNA damage induces specific changes in its maintenance, such as formation of x-junctions and changes in replication mode. The findings explain the significance of the different replication mechanisms that have been observed in mitochondria.

Cell Biology of Disease

Activation of G proteins by GIV-GEF is a pivot point for insulin resistance and sensitivity
G. S. Ma, I. Lopez-Sanchez, N. Aznar, N. Kalogriopoulos, S. Pedram, K. Midde, T. P. Ciaraldi, R. R. Henry, and P. Ghosh

A long-held tenet in the field of diabetes is that the tipping point between insulin sensitivity and resistance resides at the level of insulin receptor/insulin receptor substrate–adaptor complexes. Here it is shown that activation of Gai by GIV/Girdin is a decisive event within the metabolic insulin signaling cascade that reversibly orchestrates insulin sensitivity or resistance.

Cell Cycle

Interallelic complementation provides functional evidence for cohesin–cohesin interactions on DNA
T. Eng, V. Guacci, and D. Koshland

A single cohesin is believed to be sufficient to tether sister chromatids. Three examples of interallelic complementation are identified and characterized in which two different mutant cohesin complexes interact to promote cohesin functions. The results support a mechanism by which multiple cohesin complexes interact on DNA to mediate cohesion and condensation.
Cell Motility

Axonemal dynein light chain-1 locates at the microtubule-binding domain of the γ heavy chain

Dynein light chain 1 (LC1) of the outer arm dynein (OAD) complex associates with the microtubule-binding domain (MTBD) of γ heavy chain inside the complex. LC1 is considered to regulate the OAD activity and ciliary/flagellar motion by modulating γ MTBD’s affinity to the B-tubule of the doublet microtubule in the axoneme.

Cytoskeleton

Crescerin uses a TOG domain array to regulate microtubules in the primary cilium

Primary cilia are critical organelles involved in development, sensation, and signaling. Crescerin, a conserved protein family in ciliated and flagellated eukaryotes, uses a TOG domain array with tubulin polymerization activity to regulate cilia microtubules and facilitate proper cilia length, ultrastructure, and function.

Membrane Trafficking

ARF-GEF cytohesin-2/ARNO regulates R-Ras and α5-integrin recycling through an EHD1-positive compartment
J. C. Salem, M. M. Reviriego-Mendoza, and L. C. Santy

R-Ras and cytohesin-2/ARNO coordinate in the control of epithelial cell adhesion, but the mechanism has been unclear. Cytohesin-2/ARNO regulates traffic through an EHD1-positive recycling compartment. Inhibition of cytohesin-2/ARNO activity traps R-Ras and integrins within the EHD1 compartment and impairs adhesion and spreading.

Conserved function of the lysine-based KXD/E motif in Golgi retention for endomembrane proteins among different organisms
Cheuk Hang Woo, Caiji Gao, Ping Yu, Linna Tu, Zhaoyue Meng, D. K. Banfield, Xiaoqiang Yao, and Liwen Jiang

The COPI-interacting KXD/E motif in the C-terminal cytosolic tail of endomembrane proteins (EMPs) is a crucial Golgi retention mechanism for EMPs. KXD/E is a conserved motif in COPI interaction and Golgi retention in eukaryotes.