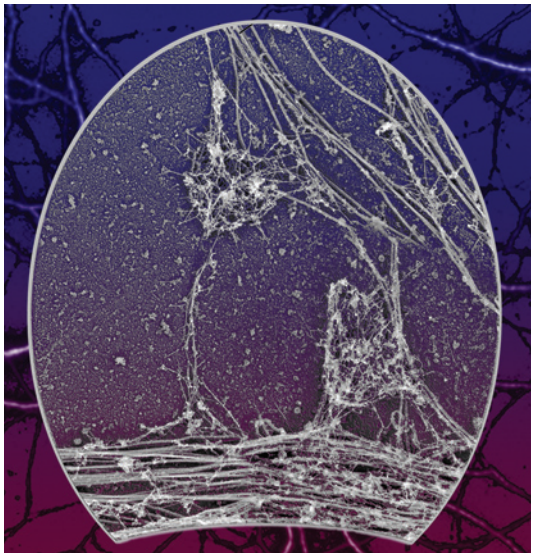
HIGHLIGHTS from *MBoC*



Actin cytoskeleton of dendritic spines (Image: Tatyana Svitkina*)*

The Editorial Board of *Molecular Biology of the Cell* has highlighted the following articles from the January 1, January 15, and February 1, 2010, issues. From among the many fine articles in the journal, the Board selects for these Highlights articles that are of broad interest and significantly advance knowledge or provide new concepts or approaches that extend our understanding.

Mobility, Microtubule Nucleation and Structure of Microtubule-organizing Centers in Multinucleated Hyphae of *Ashbya gossypii*
Claudia Lang, Sandrine Grava, Tineke van den Hoorn, Rhonda Trimble, Peter Philippsen, and Sue L. Jaspersen

The authors used live imaging and EM to study migration of multiple nuclei in *A. gossypii*. Three types of nuclear movements, oscillation, rotation, and bypassing, depend on cytoplasmic microtubules while a fourth type, co-transport with the cytoplasmic stream, does not. Nuclear MTOCs emanating perpendicular and tangential cMTs lead cMT-dependent movements.
***Mol. Biol. Cell* 21(1), 18–28**

Retrograde Neurotrophic Signaling Requires a Protein Interacting with Receptor Tyrosine Kinases via C_2H_2 Zinc Fingers
Xiaoqin Fu, Keling Zang, Zhiwei Zhou, Louis F. Reichardt, and Baoji Xu

NTRAP is a novel protein that interacts with Trk receptors through its C_2H_2 zinc fingers in a kinase-dependent manner. It is associated with signaling endosomes in neurons. Down-regulation of NTRAP inhibits NGF-induced signaling within endosomes and neurite outgrowth in PC12 cells, and it also decreases retrograde neurotrophic signaling in cultured sensory neurons.
***Mol. Biol. Cell* 21(1) 36–49**

Analyzing the Effects of Delaying Aster Separation on Furrow Formation during Cytokinesis in the *Caenorhabditis elegans* Embryo
Lindsay Lewellyn, Julien Dumont, Arshad Desai, and Karen Oegema

Signaling by the centrosomal asters and spindle midzone coordinately directs formation of the cytokinetic furrow. By analyzing the effects of altering inter-aster distance in the *C. elegans* embryo, Lewellyn *et al.* show that signaling by the separated asters couples furrow formation to anaphase onset and restricts furrowing to a single site.
***Mol. Biol. Cell* 21(1) 50–62**

Age-dependent Preferential Dense-Core Vesicle Exocytosis in Neuroendocrine Cells Revealed by Newly Developed Monomeric Fluorescent Timer Protein
Takashi Tsuboi, Tetsuya Kitaguchi, Satoshi Karasawa, Mitsunori Fukuda, and Atsushi Miyawaki

Using a newly developed protein-based fluorescent timer, mK-GO, which changes color with a predictable time course, the authors show that Rab27A effectors, rabphilin and Slp4-a, regulate age-dependent exocytosis of secretory vesicles in PC12 cells, and suggest that coordinate functions of the effectors are required for regulated secretory pathway.
***Mol. Biol. Cell* 21(1) 87–94**

A Novel Mouse HSF3 Has the Potential to Activate Nonclassical Heat-Shock Genes during Heat Shock
Mitsuaki Fujimoto, Naoki Hayashida, Takuma Katoh, Kouji Oshima, Toyohide Shinkawa, Ramachandran Prakasam, Ke Tan, Sachiye Inouye, Ryosuke Takii, and Akira Nakai

HSF1 is a master regulator of the heat-shock response in mammalian cells, whereas in avian cells, HSF3, which was considered an avian-specific factor, is required for the expression of classical heat-shock genes. Here, the authors identify mouse HSF3 and demonstrate that it has the potential to activate only nonclassical heat-shock genes.
***Mol. Biol. Cell* 21(1), 106–116**

Novel Role of ATPase Subunit C Targeting Peptides beyond Mitochondrial Protein Import
Cristofol Vives-Bauza, Jordi Magrané, Antoni L. Andreu, and Giovanni Manfredi

Mammals have three isoforms of F1F0-ATP synthase subunit c, only differing by their mitochondrial targeting peptides. Here, we show that these isoforms are nonredundant, because of different functions conferred by the targeting peptides, which in addition to mediating protein import, play a yet undiscovered role in respiratory chain maintenance.
***Mol. Biol. Cell* 21(1), 131–139**

RSBP-1 Is a Membrane-targeting Subunit Required by the Ga_q-specific But Not the Ga_o-specific R7 Regulator of G protein Signaling in *Caenorhabditis elegans*
Morwenna Y. Porter and Michael R. Koelle

In vivo characterization of the *C. elegans* R7 RGS Binding Protein, RSBP-1, shows that this protein is required to target the Ga_q-specific, but not the Ga_o-specific, R7 RGS protein to the plasma membrane and that plasma membrane localization is essential for function, and suggests that the mechanism of membrane targeting may determine Ga specificity.
***Mol. Biol. Cell* 21(2), 232–243**

Centromeric Localization of Dispersed Pol III Genes in Fission Yeast
Osamu Iwasaki, Atsunari Tanaka, Hideki Tanizawa, Shiv I.S. Grewal, and Ken-ichi Noma

The authors show that Pol III transcribed genes such as *tRNA* and *5S rRNA* genes localize to centromeres in fission yeast. The centromeric localization of Pol III genes is mediated by condensin. This study suggests that there is a functional link between the centromeric localization of dispersed Pol III genes and mitotic chromosome condensation.
***Mol. Biol. Cell* 21(2), 254–265**

CGEF-1 and CHIN-1 Regulate CDC-42 Activity during Asymmetric Division in the *Caenorhabditis elegans* Embryo
Kraig T. Kumfer, Steven J. Cook, Jayne M. Squirrell, Kevin W. Eliceiri, Nina Peel, Kevin F. O'Connell, and John G. White

A fluorescent biosensor reports the localization of CDC-42 activity in the *C. elegans* embryo and was used to identify regulators of CDC-42 activity, one of which is involved in a novel regulatory loop that maintains cortical PAR polarity. CDC-42 activity regulates myosin II recruitment during the maintenance phase via the kinase MRCK-1.
***Mol. Biol. Cell* 21(2), 266–277**

Nuclear-Cytoplasmic Shuttling of Chibby Controls β-Catenin Signaling
Feng-Qian Li, Adaobi Mofunanya, Victoria Fischer, Jason Hall, and Ken-Ichi Takemaru

Chibby (Cby) acts with 14-3-3 to regulate β-catenin localization in the canonical Wnt pathway. We show that Cby harbors functional NLS and NES motifs, and shuttles between the nucleus and cytoplasm. Cby distribution at steady state is controlled by an intricate cooperation between 14-3-3, CRM1, and importin-α, which impacts on β-catenin signaling.
***Mol. Biol. Cell* 21(2), 311–322**

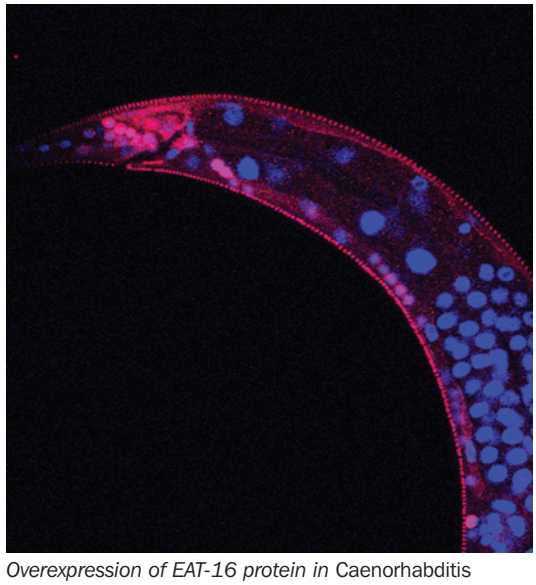
Fast Microtubule Dynamics in Meiotic Spindles Measured by Single Molecule Imaging: Evidence That the Spindle Environment Does Not Stabilize Microtubules
Daniel J. Needleman, Aaron Groen, Ryoma Ohi, Tom Maresca, Leonid Mirny, and Tim Mitchison

Metaphase spindles are steady-state ensembles of microtubules. The authors used single molecule imaging to measure tubulin dynamics in spindles and nonspindle assemblies in *Xenopus* egg extract. The results argue that the high density of microtubules in spindles is caused by local enhancement of nucleation, and not by local stabilization.
***Mol. Biol. Cell* 21(2), 323–333**

Rab5 Mediates Caspase-8–promoted Cell Motility and Metastasis
Vicente A. Torres, Ainhoa Mielgo, Simone Barbero, Ruth Hsiao, John A. Wilkins, and Dwayne G. Stupack

Integrin signaling promotes nonapoptotic functions of caspase-8 via activation of small GTPases from the Rab and Rac families. Integrin ligation promotes Rab5 activity, which mediates subsequent activation of Rac1, cytoskeletal remodeling, and enhanced cell motility.
***Mol. Biol. Cell* 21(2) 369–376**

Myosin II Is Essential for the Spatiotemporal Organization of Traction Forces during Cell Motility
Ruedi Meili, Baldomero Alonso-Latorre, Juan C. del Álamo, Richard A. Firtel, and Juan C. Lasheras
Amoeboid motility results from pseudopod protrusions and retractions driven by traction forces of cells. The authors propose that the motor and actin-crosslinking functions of MyoII differentially control the temporal and spatial distribution of the traction forces, and establish mechanistic relationships between these distributions, enabling cells to move.
***Mol. Biol. Cell* 21(3), 405–417** ■



Overexpression of EAT-16 protein in Caenorhabditis elegans *(Image:* Morwenna Y. Porter*)*