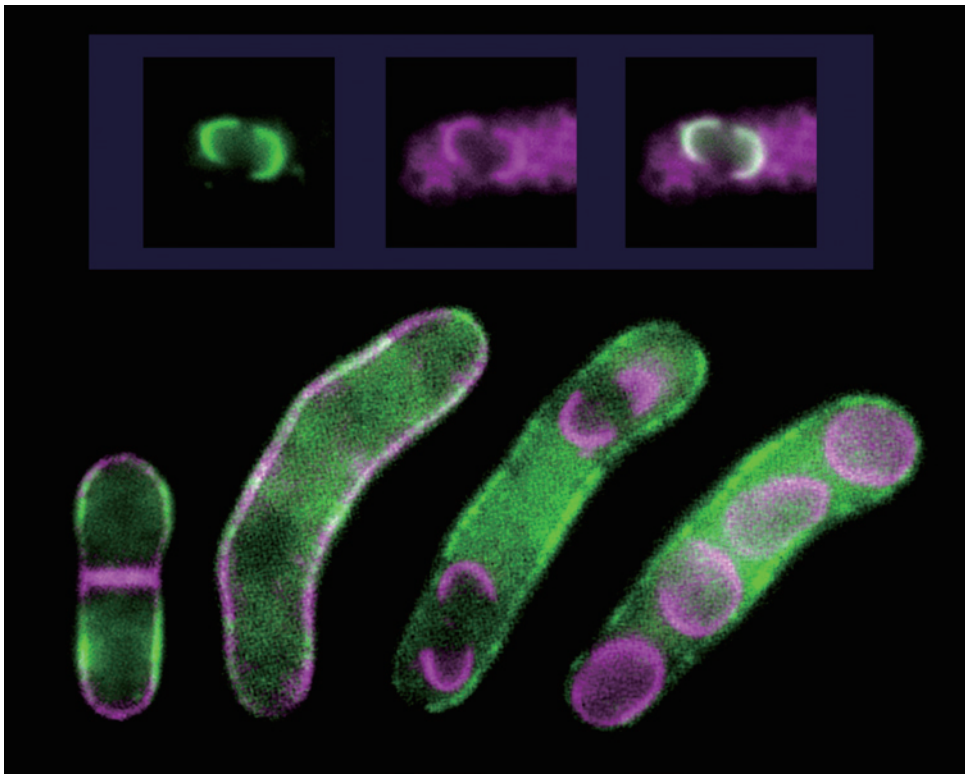
HIGHLIGHTS from *MBoC*

The Editorial Board of *Molecular Biology of the Cell* has highlighted the following articles from the October 2011 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.

Role of malectin in $Glc_2Man_9GlcNAc_2$-dependent quality control of α1-antitrypsin
Y. Chen, D. Hu, R. Yabe, H. Tateno, S.-Y. Qin, N. Matsumoto, J. Hirabayashi, and K. Yamamoto

In cells, human malectin stably interacts with newly synthesized α1-antitrypsin variant null (Hong Kong) (AT^{NHK}) but not α1-antitrypsin, via G2M9 glycans. The interaction of AT^{NHK} with malectin results in enhanced endoplasmic reticulum–associated degradation of AT^{NHK} and prevents the secretion of the misfolded glycoprotein. These findings provide evidence of a role of malectin in glycoprotein quality control via recognition of G2M9.
Mol. Biol. Cell 22 (19), 3559–3570



During spore formation in Schizosaccharomyces pombe*, the syntaxin ortholog Psy1 is endocytosed and dynamically translocates to the nascent forespore membrane (FSM) in late meiosis. The upper insets show the colocalization of GFP-Psy1 (left, green) with the signal from the endocytosis tracer FM4-64 (center, magenta) on the nascent FSM. The upper-right inset shows the merged image of GFP-Psy1 and FM4-64. The bottom images show the localization of mCherry-Psy1 (magenta) and a P-type ATPase, Pma1 (green). See* Mol. Biol. Cell *22 (19), 3658–3670. (Image: Jun Kashiwazaki, Department of Biology, Graduate School of Science, Osaka City University, Sumiyoshi-ku, Osaka 558-8585, Japan)*

Heat shock factor 2 is required for maintaining proteostasis against febrile-range thermal stress and polyglutamine aggregation
T. Shinkawa, K. Tan, M. Fujimoto, N. Hayashida, K. Yamamoto, E. Takaki, R. Takii, R. Prakasam, S. Inouye, V. Mezger, and A. Nakai

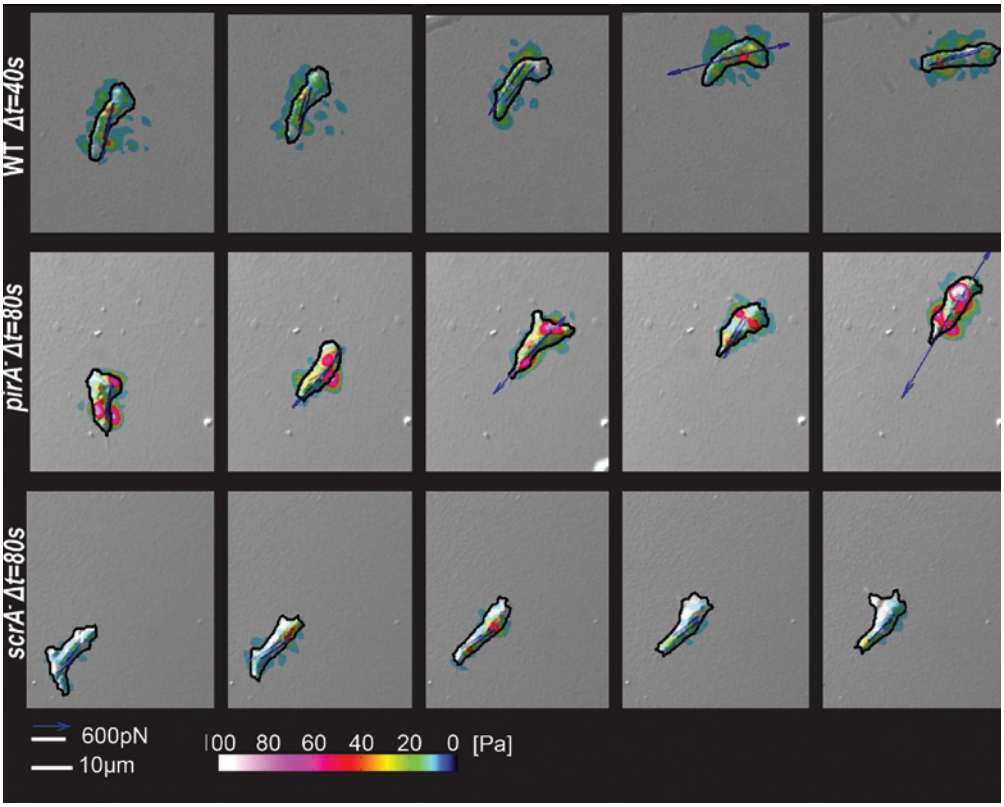
HSF2 regulates proteostasis capacity against febrile-range thermal stress, which provides temperature-dependent mechanisms of cellular adaptation to thermal stress. Furthermore, HSF2 has a strong impact on disease progression of Huntington's disease R6/2 mice, suggesting that it could be a promising therapeutic target for protein misfolding diseases.
Mol. Biol. Cell 22 (19), 3571–3583

A phosphatase threshold sets the level of Cdk1 activity in early mitosis in budding yeast
S. L. Harvey, G. Enciso, N. Dephoure, S. P. Gygi, J. Gunawardena, and D. R. Kellogg

The Wee1 kinase inhibits cyclin-dependent kinase 1 (Cdk1) during early mitosis. A low level of Cdk1 activity must escape Wee1 inhibition to initiate early mitotic events, but the underlying mechanisms have remained unknown. In this paper, we show that a specific form of protein phosphatase 2A opposes activation of Wee1, which allows low-level activation of Cdk1 in early mitosis.
Mol. Biol. Cell 22 (19), 3595–3608

Kinesin-3 and dynein cooperate in long-range retrograde endosome motility along a nonuniform microtubule array
M. Schuster, S. Kilaru, G. Fink, J. Collemare, Y. Roger, and G. Steinberg

We studied molecular motors in long-range motility of early endosomes (EEs) in a fungal model system that contains a bipolar, dendrite-like microtubule (MT) array. Dynein moves retrograde EEs over ~10 μm, before kinesin-3 takes over for a further ~80 μm along antipolar MT bundles. Thus kinesin-3 is the major motor for retrograde EE motility.
Mol. Biol. Cell 22 (19), 3645–3657



Time-lapse images of representative Dictyostelium *wild-type, pirA⁻, and scrA⁻ cells. Each of the two mutant strains lacks one protein of the SCAR/WAVE complex, which regulates Arp2/3-mediated F-actin polymerization. The color map shows the magnitude of the stresses applied to the substrate. The blue arrows show the pole forces applied by the cells. See the article by Bastounis* et al. *in the November 1, 2011, issue of* MBoC. *(Image: Effie Bastounis, Department of Bioengineering, Jacobs School of Engineering, and Section of Cell and Developmental Biology, Division of Biological Sciences, University of California, San Diego, La Jolla, CA)*

Spatial control of Cdc42 activation determines cell width in fission yeast
F. D. Kelly and P. Nurse

We found 11 wide mutants, seven of which affect the activation of Cdc42. Through epistasis analysis and protein retargeting, we showed that a guanine nucleotide exchange factor and a GTPase-activating protein of Cdc42 each affects cell width independently from different cellular domains. We propose that these proteins set up a spatially restricted gradient of activated Cdc42 that directs cell growth.
Mol. Biol. Cell 22 (20), 3801–3811

Rab22 controls NGF signaling and neurite outgrowth in PC12 cells
L. Wang, Z. Liang, and G. Li

Rab22 is a small GTPase that is localized on early endosomes and regulates early endosomal sorting. This study reports that Rab22 promotes NGF signaling–dependent neurite outgrowth and gene expression in PC12 cells by sorting NGF and the activated/phosphorylated receptor (pTrkA) into signaling endosomes to sustain signal transduction in the cell.
Mol. Biol. Cell 22 (20), 3853–3860 ■