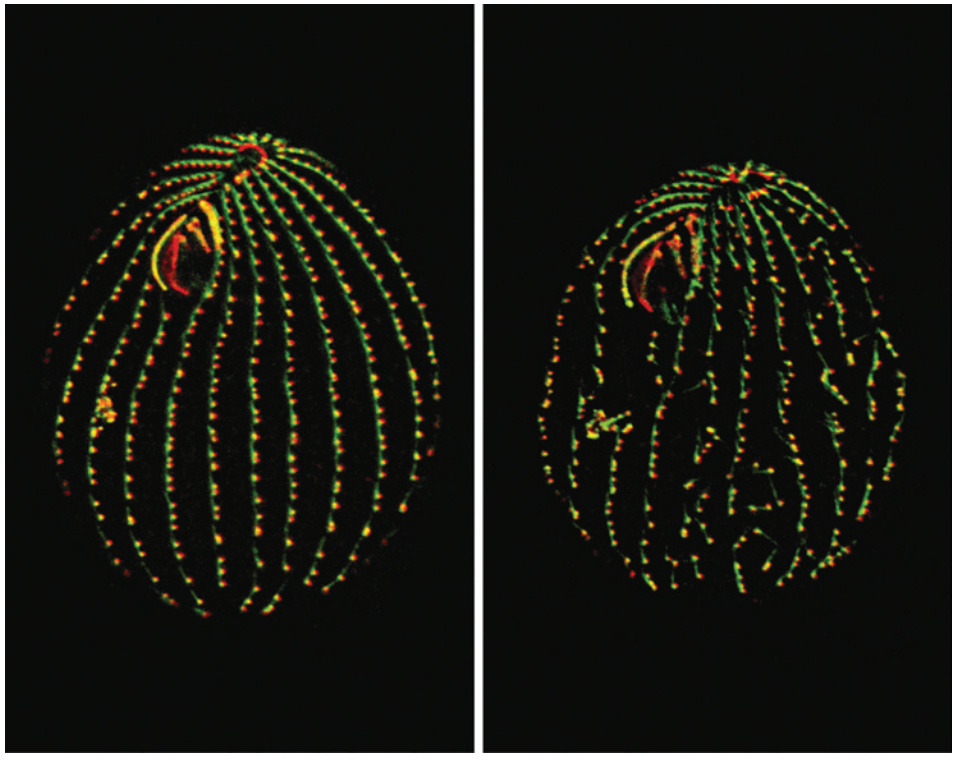
HIGHLIGHTS from *MBoC*

The Editorial Board of *Molecular Biology of the Cell* has highlighted the following articles from the July 1 and 15, 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.



Straight cortical rows of basal bodies in wild-type Tetrahymena *(left) contrast with the misoriented cortical row basal bodies in a cell containing a centrin-1 mutant allele with perturbed calcium binding in the two N-terminal EF-hands of the protein (right; green: anti-Sas6a, which labels basal bodies and has a background signal from fibers that run alongside basal bodies; red: centrin). (Image:* Tyson Vonderfecht, *Department of Molecular, Cellular, and Developmental Biology, University of Colorado Boulder)*

Mitochondrial protein turnover: role of the precursor intermediate peptidase Oct1 in protein stabilization
F.-N. Vögtle, C. Prinz, J. Kellermann, F. Lottspeich, N. Pfanner, and C. Meisinger

An increasing number of mitochondrial preproteins are sequentially processed upon import by the presequence mitochondrial processing peptidase (MPP) and the intermediate peptidase octapeptidyl aminopeptidase 1 (Oct1). This study shows that Oct1 removes destabilizing residues from import intermediates generated by MPP. Oct1 therefore acts as a quality control system, preventing premature substrate degradation.
Mol. Biol. Cell 22 (13), 2135–2143

The two domains of centrin have distinct basal body functions in *Tetrahymena*
T. Vonderfecht, A. J. Stemm-Wolf, M. Hendershott, T. H. Giddings, Jr., J. B. Meehl, and M. Winey

The basal body is a microtubule-organizing center responsible for organizing the cilium. A widely conserved basal body component is the Ca^{2+}-binding protein centrin. A mutagenic analysis of the *Tetrahymena* centrin shows that its two domains have distinct basal body functions and that Ca^{2+} is necessary for both functions.
Mol. Biol. Cell 22 (13), 2221–2234

Vimentin intermediate filaments modulate the motility of mitochondria
O. E. Nekrasova, M. G. Mendez, I. S. Chernoivanenko, P. A. Tyurin-Kuzmin, E. R. Kuczmarski, V. I. Gelfand, R. D. Goldman, and A. A. Minin

The vimentin N-terminal domain contains the sequence responsible for the interaction with mitochondria. The interaction of vimentin intermediate filaments with mitochondria causes the inhibition of their movements and contributes to their anchoring in cytoplasm.
Mol. Biol. Cell 22 (13), 2282–2289

The LC3 recruitment mechanism is separate from Atg9L1-dependent membrane formation in the autophagic response against *Salmonella*
S. Kageyama, H. Omori, T. Saitoh, T. Sone, J.-L. Guan, S. Akira, F. Imamoto, T. Noda, and T. Yoshimori

When *Salmonella* invade mammalian epithelial cells, some populations are surrounded by the autophagy protein LC3. This study shows that LC3 is recruited in proximity to *Salmonella* independently of both Atg9L1 and FIP200, which are required for formation of autophagosomes. The dynamics of the ULK1 complex and Atg9L1 are dependent on one another.
Mol. Biol. Cell 22 (13), 2290–2300

Exposed hydrophobicity is a key determinant of nuclear quality control degradation
E. K. Fredrickson, J. C. Rosenbaum, M. N. Locke, T. I. Milac, and R. G. Gardner
The yeast nuclear protein quality control ubiquitin ligase San1 recognizes exposed hydrophobicity in its misfolded substrates. San1 recognition is triggered by exposure of as few as five contiguous hydrophobic residues, which defines the minimum window of hydrophobicity required for San1 targeting.
Mol. Biol. Cell 22 (13), 2384–2395

Bundle-forming pilus retraction enhances enteropathogenic *Escherichia coli* infectivity
E. E. Zahavi, J. A. Lieberman, M. S. Donnenberg, M. Nitzan, K. Baruch, I. Rosenshine, J. R. Turner, N. Melamed-Book, N. Feinstein, E. Zlotkin-Rivkin, and B. Aroeti

Enteropathogenic *Escherichia coli* (EPEC) and other pathogenic bacteria use dynamic type IV pili to adhere to the host. This study shows that the capacity of the EPEC type IV pili to retract is required for the breakdown of the host epithelial tight-junction barrier, efficient actin-pedestal formation, and translocation of effectors via the type III secretion system.
Mol. Biol. Cell 22 (14), 2436–2447

A contractile actomyosin network linked to adherens junctions by Canoe/afadin helps drive convergent extension
J. K. Sawyer, W. Choi, K.-C. Jung, L. He, N. J. Harris, and M. Peifer

Coordination of adhesion and the actin cytoskeleton is critical in morphogenesis. *Drosophila* germband extension is a model for convergent extension. Canoe/afadin is found to have a novel role in this process. It helps to coordinate a contractile apical actomyosin network with cell shape change and regulates apical polarity protein localization.
Mol. Biol. Cell 22 (14), 2491–2508

A mechanism of Rap1-induced stabilization of endothelial cell–cell junctions
J. J. Liu, R. A. Stockton, A. R. Gingras, A. J. Ablooglu, J. Han, A. A. Bobkov, and M. H. Ginsberg

Rap1 stabilizes cell–cell junctions by directly binding to KRIT1, displacing it from microtubules and enabling localization at the junctions.
Mol. Biol. Cell 22 (14), 2509–2519

The CSC is required for complete radial spoke assembly and wild-type ciliary motility
E. E. Dymek, T. Heuser, D. Nicastro, and E. F. Smith

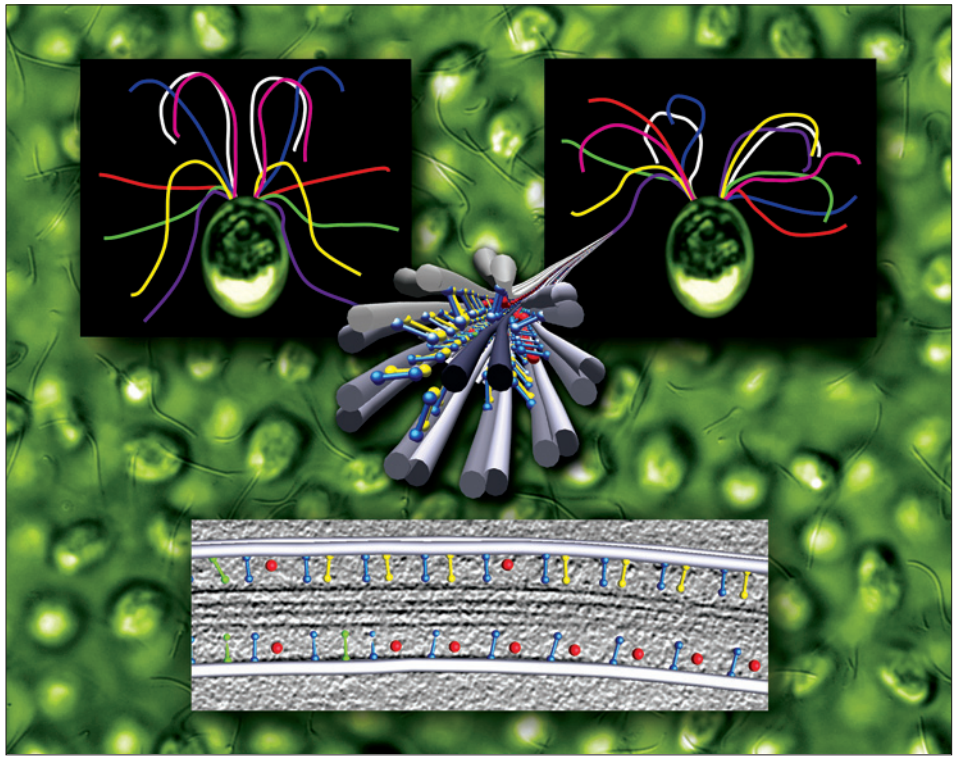
Structural and functional analyses of artificial micro RNA (amiRNA) mutants reveal that the CSC plays a role not only in generating wild-type motility, but also in assembly of at least a subset of radial spokes. This study also produced the unexpected finding that, contrary to current belief, the radial spokes may not be homogeneous.
Mol. Biol. Cell 22 (14), 2520–2531

***Caenorhabditis elegans* SNAP-29 is required for organellar integrity of the endomembrane system and general exocytosis in intestinal epithelial cells**
M. Sato, K. Saegusa, K. Sato, T. Hara, A. Harada, and K. Sato

Caenorhabditis elegans SNAP-29 is required for the proper morphology and functions of the Golgi and endosomes and general exocytosis.
Mol. Biol. Cell 22 (14), 2579–2587

CDK promotes interactions of Sld3 and Drc1 with Cut5 for initiation of DNA replication in fission yeast
M. Fukuura, K. Nagao, C. Obuse, T. S. Takahashi, T. Nakagawa, and H. Masukata

Study of the essential roles of CDK in initiation of DNA replication in fission yeast indicates that CDK phosphorylates Sld3 and Drc1/Sld2 and promotes their interactions with Cut5, which are required for origin loading of Cut5. Thus CDK regulates assembly of replication factors onto origins by promoting ternary Sld3–Cut5–Drc1 complex formation.
Mol. Biol. Cell 22 (14), 2620–2633 ■



The green alga Chlamydomonas *has two flagella, as can be seen in the false-colored differential interference contrast microscopy (DIC) image (background). DIC images of single cells with overlaid waveform diagrams show that flagella beat in synchrony in wild type (top left) but out of synchrony in the calmodulin- and spoke-associated complex mutant 6E6 (top right). Cryo-electron tomography of the 6E6 mutant flagella, shown here as graphical 3D model (center) and tomographic slice with overlaid model (bottom), reveals defects in the flagellar structure: Radial spoke 2 (yellow) is frequently missing (red dots), while radial spoke 1 (blue) is unaffected. Occasionally, misplaced spokes are observed (green). (Image:* Thomas Heuser *and* Daniela Nicastro, *Department of Biology, Brandeis University, Waltham, MA)*