HIGHLIGHTS from *MBoC*

The Editorial Board of *Molecular Biology of the Cell* has highlighted the following articles from the December 2011 and January 2012 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 for a Cindr–Arf6 axis in patterning emerging epithelia
R. I. Johnson, A. Sedgwick, C. D'Souza-Schorey, and R. L. Cagan

The fly pupal eye is used to explore dArf6 activity regulated by the Arf GTPase–activating proteins (ArfGAPs) dAsap and dArfGAP3 and Arf GTP exchange factors Schizo and dPsd, which promote cellular extensions that presage cell rearrangements. The adaptor protein Cindr binds to dArfGAP3 and dAsap to sequester ArfGAP function to Neph1/nephrin adhesion complexes, liberating active dArf6 elsewhere.
Mol. Biol. Cell 22 (23), 4513–4526

Hook2 is involved in the morphogenesis of the primary cilium
C. L. Baron Gaillard, E. Pallesi-Pocachard, D. Massey-Harroche, F. Richard, J.-P. Arsanto, J.-P. Chauvin, P. Lecine, H. Krämer, J.-P. Borg, and A. Le Bivic

Hook2 partitions between the Golgi apparatus and the centrosome, and its depletion hinders ciliogenesis after mother centriole maturation without Golgi breakdown. Hook2 interacts with PCM1 and Rab8a, and Hook2-depleted cells can be forced to grow primary cilia by overexpressing GFP::Rab8a, indicating that Rab8a acts downstream of Hook2 and PCM1.
Mol. Biol. Cell 22 (23), 4549–4562

Microtubules support a disk-like septin arrangement at the plasma membrane of mammalian cells
M. E. Sellin, P. Holmfeldt, S. Stenmark, and M. Gullberg

Septin assemblies during the interphase of animal cells remain poorly defined and are the topic of this report. The data point to a general model for assembly of higher-order septin arrangements at locations providing the greatest opportunity for binding cooperativity, which depends on both the cell type and external cues.
Mol. Biol. Cell 22 (23), 4588–4601

Protrudin serves as an adaptor molecule that connects KIF5 and its cargoes in vesicular transport during process formation
F. Matsuzaki, M. Shirane, M. Matsumoto, and K. I. Nakayama

Protrudin is a key regulator of vesicular transport during neurite extension. Using a proteomics approach, this study identified KIF5 as a protrudin-associated protein. Protrudin functions synergistically with KIF5 and facilitates the interaction of KIF5 with Rab11, suggesting that the Rab11–protrudin–KIF5 complex contributes to vesicular transport in neurons.
Mol. Biol. Cell 22 (23), 4602–4620

Deficiencies in lamin B1 and lamin B2 cause neurodevelopmental defects and distinct nuclear shape abnormalities in neurons
C. Coffinier, H.-J. Jung, C. Nobumori, S. Chang, Y. Tu, R. H. Barnes II, Y. Yoshinaga, P. J. de Jong, L. Vergnes, K. Reue, L. G. Fong, and S. G. Young

Lamin B1 is essential for neuronal migration and progenitor proliferation during the development of the cerebral cortex. The observation of distinct phenotypes of Lmnb1- and Lmnb2-knockout mice and the differences in the nuclear morphology of cortical neurons in vivo suggest that lamin B1 and lamin B2 play distinct functions in the developing brain.
Mol. Biol. Cell 22 (23), 4683–4693

Reevaluation of the role of the Pam18:Pam16 interaction in translocation of proteins by the mitochondrial Hsp70-based import motor
J. E. Pais, B. Schilke, and E. A. Craig

Pam18, the J-protein cochaperone of the Hsp70-based mitochondrial import motor, forms a heterodimer with the structurally related protein Pam16. Genetic and biochemical studies suggest a critical role of this interaction in maintaining Pam18's association with the translocon rather than its previously proposed regulatory role.
Mol. Biol. Cell 22 (24), 4740–4749

The schizophrenia susceptibility factor dysbindin and its associated complex sort cargoes from cell bodies to the synapse
J. Larimore, K. Tornieri, P. V. Ryder, A. Gokhale, S. A. Zlatic, B. Craige, J. D. Lee, K. Talbot, J.-F. Pare, Y. Smith, and V. Faundez

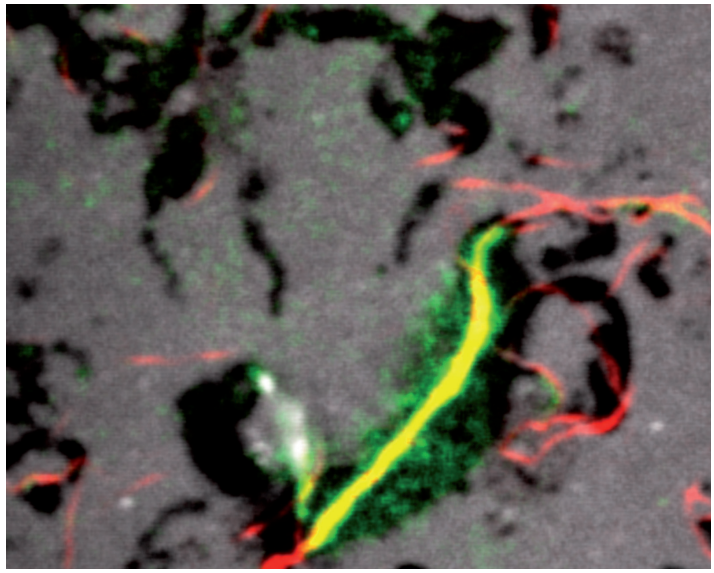
A novel vesicle transport mechanism is described that requires dysbindin-associated complexes for cargo targeting from neuronal cell bodies to neurites and nerve terminals. The results suggest that mistargeting of specific vesicular cargoes may underlie, in part, the molecular pathogenesis of schizophrenia.
Mol. Biol. Cell 22 (24), 4854–4867

Recruitment of OCRL and Inpp5B to phagosomes by Rab5 and APPL1 depletes phosphoinositides and attenuates Akt signaling
M. Bohdanowicz, D. M. Balkin, P. De Camilli, and S. Grinstein

Two inositol 5-phosphatases, OCRL and Inpp5B, become associated with nascent phagosomes. Both phosphatases associate with the adaptor APPL1, which is recruited to phagosomes by active Rab5. The phosphatases complete the elimination of PI(4,5)P2 and PI(3,4,5)P3, facilitating phagosome closure and termination of Akt activation.
Mol. Biol. Cell 23 (1), 176–187

Physiological type I collagen organization induces the formation of a novel class of linear invadosomes
A. Juin, C. Billottet, V. Moreau, O. Destaing, C. Albiges-Rizo, J. Rosenbaum, E. Génot, and F. Saltel

This study shows that fibrillar collagen I is the physiological inducer of a novel class of invadosomes, which we named "linear invadosomes." They are dependent on the scaffold protein Tks5 and are able to degrade extracellular matrix elements. Moreover, we demonstrate that they are β1- and β3-integrin independent, unlike classical invadosomes.
Mol. Biol. Cell 23 (2), 297–309



Invadosomes are F-actin structures able to degrade the matrix through the activation of matrix metalloproteases. In this image of a Src-3T3 cell that was seeded onto fluorescent type I collagen fibrils, a linear invadosome has formed along a collagen fibril (red) and is associated with an area of gelatin degradation. The scaffold protein Tks5, known to be a Src substrate and implicated in invadopodia formation but not in focal adhesions, is shown in green. The merged area is yellow. See Mol. Biol. Cell 23 (2), 297–309. (Image: Amélie Juin, *Institut National de la Santé et de la Recherche Médicale and Université Bordeaux Segalen, Bordeaux, France).*

The cytoskeletal mechanisms of cell–cell junction formation in endothelial cells
M. K. Hoelzle and T. Svitkina

Cell–cell contact is initiated by lamellipodia, followed by filopodia-like structure formation. Filopodia-like bridges maintain cell–cell contact through adherens junctions. Although bridges are structurally similar to filopodia, they are formed via a unique mechanism. Myosin II activity is important for bridge formation and cadherin accumulation.
Mol. Biol. Cell 23 (2), 310–323

A new role for the architecture of microvillar actin bundles in apical retention of membrane proteins
C. Revenu, F. Ubelmann, I. Hurbain, F. El-Marjou, F. Dingli, D. Loew, D. Delacour, J. Gilet, E. Brot-Laroche, F. Rivero, D. Louvard, and S. Robine

The bundled architecture of actin filaments is not needed for intestinal microvillar morphogenesis, as shown in knockout mice devoid of microvillar actin-bundling proteins. This architecture is essential for the apical anchorage of digestive proteins, probably via the recruitment of key players in apical retention, such as myosin-1a, and, as a result, for intestinal physiology.
Mol. Biol. Cell 23 (2), 324–336

Characterization of NE81, the first lamin-like nucleoskeleton protein in a unicellular organism
A. Krüger, P. Batsios, O. Baumann, E. Luckert, H. Schwarz, R. Stick, I. Meyer, and R. Gräf

Dictyostelium NE81 is the first protein found in a lower eukaryote with properties justifying its denomination as a lamin-like protein. Knockout and overexpression mutants revealed an important role for NE81 in nuclear integrity, chromatin organization, and mechanical stability of cells.
Mol. Biol. Cell 23 (2), 360–370 ■