Table of Contents

ASCB ANNUAL MEETING ABSTRACTS
2010 Annual Meeting Abstracts
The American Society for Cell Biology ............................................................. 4299–4299

PERSPECTIVE
The Evolution of Extracellular Matrix

MBoC TECHNICAL PERSPECTIVE
Toward Quantitative “In Vivo Biochemistry” with Fluorescence Fluctuation Spectroscopy
B. D. Slaughter and R. Li .......................................................... 4306–4311

ARTICLES

Biosynthesis and Biodegradation
A Novel Testis-specific GTPase Serves as a Link to Proteasome Biogenesis: Functional Characterization of RhoS/RSA-14-44 in Spermatogenesis
We functionally characterized RhoS/RSA-14-44 as a new member of Rho GTPase subfamily in spermatogenesis, which provides a direct link between Rho family GTPase and the proteasome biogenesis.

Cell Biology of Disease
Compartment-Restricted Biotinylation Reveals Novel Features of Prion Protein Metabolism in Vivo
A selective tagging method for detecting minor alternatively-localized populations of a protein is used to study a disease-associated transmembrane form of prion protein. The analysis reveals key features of transmembrane prion protein metabolism and one way this is altered by human disease-causing mutants.

Polycystin-1 Surface Localization Is Stimulated by Polycystin-2 and Cleavage at the G Protein-coupled Receptor Proteolytic Site
H. C. Chapin, V. Rajendran, and M. J. Caplan ................................................... 4338–4348
The localization of polycystin (PC1) to the plasma membrane requires coexpression with PC2 and cleavage at the PC1 G protein-coupled receptor proteolytic site. Neither the PC1 binding capacity of PC2 nor its channel function is required for this effect.

Cell Cycle
A Novel Role of Dma1 in Regulating Forespore Membrane Assembly and Sporulation in Fission Yeast
By characterizing the fission yeast Dma1’s function during meiosis, we revealed that Dma1 is required for spore formation, while it is dispensable for fidelity of nuclear divisions. We also found that Dma1 is functionally related to SIN pathway and meiosis-specific kinase Slk1 during sporulation.

Mps1 Phosphorylation Sites Regulate the Function of Centrin 2 in Centriole Assembly
We show that while Centrin2 is dispensable for centriole assembly, it is an Mps1 substrate that stimulates canonical and aberrant centriole assembly by two different Mps1-dependent mechanisms, HsSas-6-dependent and –independent. Centrin2 phosphorylation is also required for the ability of Mps1 to drive production of mature centrioles.

Zds2p Regulates Swe1p-dependent Polarized Cell Growth in Saccharomyces cerevisiae via a Novel Cdc55p Interaction Domain
K. Yasutis, M. Vignali, M. Ryder, F. Tameire, S. A. Dighe, S. Fields, and K. G. Kozminski ........ 4373–4386
A C-terminal region in Zds2p (ZH4) is required for regulation of Swe1p-dependent polarized cell growth and this region is necessary and sufficient for interaction with protein phosphatase 2A regulatory subunit, Cdc55p. Our results indicate that the Zds proteins regulate the Swe1p-dependent G2/M checkpoint in a CDC55-dependent manner.

Cell Motility
Podoplanin Associates with CD44 to Promote Directional Cell Migration
E. Martín-Villar, B. Fernández-Muñoz, M. Parsons, M. M. Yurrita, D. Megías, E. Pérez-Gómez, G. E. Jones, and M. Quintanilla .................................................. 4387–4399
Podoplanin, a cancer-associated glycoprotein, interacts with CD44. Both glycoproteins are coordinately up-regulated during tumor progression. Podoplanin–CD44 interaction in the cell membrane occurs mainly in migrating cells, and it seems to be required for podoplanin-mediated cell migration and directionality.
# Table of Contents

## Membrane Trafficking

<table>
<thead>
<tr>
<th>A Highlights from MBoC Selection</th>
<th>AS160 Associates with the Na⁺,K⁺-ATPase and Mediates the Adenosine Monophosphate-stimulated Protein Kinase-dependent Regulation of Sodium Pump Surface Expression</th>
</tr>
</thead>
</table>

The sodium pump interacts with AS160, a protein that regulates the trafficking of the GLUT4 glucose transporter. This interaction drives the internalization of the sodium pump from the cell surface, and this process is in turn controlled by the energy-sensing kinase adenosine monophosphate-stimulated protein kinase.

## Signaling

### Dephosphorylation of Nucleophosmin by PP1β Facilitates pRB Binding and Consequent E2F1-dependent DNA Repair


We report a new pathway through which PP1β signals to nucleophosmin (NPM) in response to DNA damage. UV induces dephosphorylation of NPM at multiple sites, leading to enhancement of complex formation between NPM and retinoblastoma tumor suppressor protein and the subsequent upregulation of E2F1. Consequently, such signaling pathway potentiates the cellular DNA repair capacity.

## Theory

### Finding the Cell Center by a Balance of Dynein and Myosin Pulling and Microtubule Pushing: A Computational Study

| J. Zhu, A. Burakov, V. Rodionov, and A. Mogilner | 4418–4427 |

By comparing computer modeling predictions with observations, we conclude that strong dynein and weaker myosin-generated forces pull the microtubules inward competing with microtubule plus-ends pushing the microtubule aster outward and that the balance of these forces positions the centrosome at the cell center.