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**ARTICLES**

*Biochemistry and Biodegradation*

**A Highlights from MBoC Selection**  The yeast Hsp70 Ssa1 is a sensor for activation of the heat shock response by thiol-reactive compounds  
Y. Wang, P. A. Gibney, J. D. West, and K. A. Morano 3290–3298

Diverse thiol-reactive compounds are found to activate the Hsf1-regulated heat shock response in *Saccharomyces cerevisiae*. The highly conserved cytosolic Hsp70 protein chaperone is shown to act as a sensor for these molecules through a pair of reactive cysteine residues in the nucleotide-binding domain.

*Cell Biology of Disease*

Critical role of the first transmembrane domain of Cx26 in regulating oligomerization and function  

This study identifies a motif within the first transmembrane domain of Cx26, from amino acids Val-37 through Ala-40, that is critical for oligomerization and function. The impacts of deafness-associated mutations within this motif upon gap junction channel and hemichannel functions correlate with the severity of disease that they cause.

**A Highlights from MBoC Selection**  Structure and functional studies of N-terminal Cx43 mutants linked to oculodentodigital dysplasia  
Q. Shao, Q. Liu, R. Lorentz, X.-Q. Gong, D. Bai, G. S. Shaw, and D. W. Laird 3312–3321

Mutations in the connexin-43 gap junction protein cause the developmental disease known as oculodentodigital dysplasia. Structure and function approaches are used to demonstrate that the nature of the missense mutation in the amino-terminal domain of connexin-43 governs the mechanism that leads to loss of connexin-43 function.
The centriolar satellite proteins Cep72 and Cep290 interact and are required for recruitment of BBS proteins to the cilium


3322–3335

The ciliopathy-associated proteins Cep290 and BBS4 localize to cytoplasmic particles called centriolar satellites, yet the significance of this association is unknown. A new component of satellites, Cep72, is identified. Its role in the regulation of Cep290 and BBS4 is described, as are developmental defects resulting from loss of satellites in zebrafish.

Cell Cycle

A Highlights from MBoC Selection

Cdk1-dependent control of membrane-trafficking dynamics

D. McCusker, A. Royou, C. Velours, and D. Kellogg

3336–3347

Cyclin-dependent kinase 1 (Cdk1) is required for initiation and maintenance of polarized cell growth in budding yeast. Cdk1 activates Rho-family GTPases, which trigger polarization of the actin cytoskeleton for delivery of membrane to growth sites. It is found that Cdk1’s function in polarized growth extends beyond that of actin organization.

Dnt1 acts as a mitotic inhibitor of the spindle checkpoint protein dma1 in fission yeast


3348–3356

The interaction between Dma1 and Dnt1 in fission yeast is characterized. The results show that, similar to its homologue Chfr in higher eukaryotes, Dma1 in fission yeast can also affect factors required for microtubule nucleation and spindle formation at early mitosis.

Cell Motility

Distinct roles of AKT isoforms in regulating β1-integrin activity, migration, and invasion in prostate cancer

R. Virtakoivu, T. Pellinen, J. K. Rantala, M. Perälä, and J. Ivaska

3357–3369

On the basis of an RNA interference screen, we identify AKT1 and AKT2 as inhibitors of β1-integrin activity and invasion in prostate cancer. AKT1 siRNA induces β-integrin activity and up-regulation of RTKs known to function in cooperation with integrins. In contrast, AKT2 siRNA up-regulates microRNA-200, which increases integrin activity.

Cell Physiology

Septin 7 forms a complex with CD2AP and nephrin and regulates glucose transporter trafficking


3370–3379

Septin 7 is expressed in glomerular podocytes and interacts with nephrin, CD2-associated protein (CD2AP), and vesicle-associated membrane protein 2. The filamentous localization of septin 7 in podocytes depends on CD2AP and intact actin organization. Depletion of septin 7 or inhibition of septin assembly facilitates glucose uptake into cells. The data suggest that septin 7 hinders vesicle trafficking.

Cytoskeleton

A Highlights from MBoC Selection

Cell cycle–regulated cortical dynein/dynactin promotes symmetric cell division by differential pole motion in anaphase

E. S. Collins, S. K. Balchand, J. L. Faraci, P. Wadsworth, and W.-L. Lee

3380–3390

Evidence is presented for dynamic cortical association of dynein and dynactin in mammalian cells and its regulation by Plk1, astral microtubules, and the cell cycle. The asymmetric spindle positioning in LLC-Pk1 cells and its correction by dynein and dynactin provide a new system for analysis of spindle position and symmetric cell division.

Septin ring size scaling and dynamics require the coiled-coil region of Shs1p

R. A. Meseroll, L. Howard, and A. S. Gladfelter

3391–3406

How the size and dynamics of higher-order septin structures is determined is not well understood in any system. In this paper, we show that the coiled-coil domain of the septin Shs1p limits septin ring size and dynamics in the filamentous fungus Ashbya gossypii, providing a link between protein exchange and the scaling of septin assemblies.
Ndm, a coiled-coil domain protein that suppresses macropinocytosis and has effects on cell migration

J. S. Kelsey, N. M. Fastman, E. F. Noratel, and D. D. Blumberg

The Ndm protein colocalizes with coronin and is necessary for formation of rounded lamellipodia and cell spreading. Ndm-null cells show increased endocytosis and lamellipodia that break up into endocytic cups. The protein functions to limit endocytosis and facilitate lamellipodia formation.

Membrane Trafficking

An essential novel component of the noncanonical mitochondrial outer membrane protein import system of trypanosomatids

M. Pusnik, J. Mani, O. Schmidt, M. Niemann, S. Oeljeklaus, F. Schnanwiler, B. Warscheid, T. Lithgow, C. Meisinger, and A. Schneider

The mitochondrial outer membrane protein Tom40 is the entry gate for imported proteins in essentially all eukaryotes. Trypanosomatids lack a conventional Tom40 and use instead a protein termed ATOM. pATOM36 is a novel essential component of the trypanosomal outer membrane protein import system that interacts with ATOM.

Phosphorylation of the effector complex HOPS by the vacuolar kinase Yck3p confers Rab nucleotide specificity for vacuole docking and fusion

M. Zick and W. Wickner

The Rab GTPase Ypt7p and its effector complex HOPS participate in catalyzing the fusion of yeast vacuoles. The role of the vacuolar kinase Yck3p in this relation is examined. It is shown how the regulatory ability of the Rab GTPase cycle is enforced only by posttranslational modification of the effector complex HOPS.

Yeast vacuoles fragment in an asymmetrical two-phase process with distinct protein requirements

M. Zieger and A. Mayer

Yeast vacuoles are large organelles that fragment and fuse in response to environmental conditions, such as changes in osmotic conditions or nutrient availability. The morphological changes during salt-induced vacuole fission are characterized, different stages are identified, and the functions of known fission factors are assigned to these stages.

Nuclear Functions

Dual effect of heat shock on DNA replication and genome integrity

A. K. Velichko, N. V. Petrova, O. L. Kantidze, and S. V. Razin

The data presented here suggest that in an asynchronous cell culture, heat shock might affect DNA integrity both directly and via arrest of replication fork progression and that the phosphorylation of histone H2AX has a protective effect on the arrested replication forks in addition to its known DNA damage signaling function.

Signaling

Identification of ILK as a new partner of the ADAM12 disintegrin and metalloprotease in cell adhesion and survival

A. Leyme, K. Bourd-Boittin, D. Bonnier, A. Falconer, Y. Arlot-Bonnemains, and N. Théret

ILK is identified as a new partner for ADAM12L cell signaling functions. ADAM12L colocalizes with ILK at focal adhesions and induces the Akt-dependent survival pathway via stimulation of β1 integrins and activation of PI3K. This effect is independent of ADAM12L proteolytic activity and involves its cytoplasmic domain.

Collagen/β1 integrin signaling up-regulates the ABCC1/MRP-1 transporter in an ERK/MAPK-dependent manner

M.-A. El Azreq, D. Naci, and F. Aoudjit

Collagen/β1 integrin/extracellular signal-regulated kinase signaling up-regulates the expression and function of ABCC1 transporter. This suggests that its activation could represent an important pathway in cancer chemoresistance.

Cdc28–Cln3 phosphorylation of Sla1 regulates actin patch dynamics in different modes of fungal growth

G. Zeng, Y.-M. Wang, and Y. Wang

There is differential regulation of actin patch dynamics and endocytosis between the yeast and hyphal growth in Candida albicans. The mechanism involves phosphorylation of the endocytic protein Sla1 by the CDP Cdc28–Cln3 and the actin-regulating kinase Prk1. The results establish the first molecular link between CDK and the endocytic machinery in fungi.