

DEPARTAMENTO DE BIOLOGÍA CEL·LULAR I ANATOMIA PATOLÒGICA
FACULTAT DE MEDICINA



**DINÁMICA DE LA ACTINA Y TRÁFICO DE MEMBRANAS ASOCIADO AL
COMPLEJO DE GOLGI: PAPEL REGULADOR DE RHOA, RAC1 Y CDC42**

**Tesis presentada por Olga B. Matas Guadix y
dirigida por el Dr. Gustavo Egea Guri
para optar al grado de Doctora en Bioquímica**

Barcelona, Mayo del 2005

VIII. BIBLIOGRAFÍA

Abo, A., Qu, J., Cammarano, M. S., Dan, C., Fritsch, A., Baud, V., Belisle, B., and Minden, A., 1998, PAK4, a novel effector for Cdc42Hs, is implicated in the reorganization of the actin cytoskeleton and in the formation of filopodia: *Embo Journal*, 17, 6527-6540.

Adamson, P., Paterson, H. F., and Hall, A., 1992, Intracellular-Localization of the P21(Rho) Proteins: *Journal of Cell Biology*, 119, 617-627.

Aderem, A. and Underhill, D. M., 1999, Mechanisms of phagocytosis in macrophages: *Annual Review of Immunology*, 17, 593-623.

Alberts, A. S., 2001, Identification of a carboxyl-terminal diaphanous-related formin homology protein autoregulatory domain: *Journal of Biological Chemistry*, 276, 2824-2830.

Allan, V. J. and Schroer, T. A., 1999, Membrane motors: *Current Opinion in Cell Biology*, 11, 476-482.

Amann, K. J. and Pollard, T. D., 2001, The Arp2/3 complex nucleates actin filament branches from the sides of pre-existing filaments: *Nature Cell Biology*, 3, 306-310.

Apodaca, G., 2001, Endocytic traffic in polarized epithelial cells: role of the actin and microtubule cytoskeleton: *Traffic*, 2, 149-159.

Aridor, M., Bannykh, S. I., Rowe, T., and Balch, W. E., 1995, Sequential coupling between COPII and COPI vesicle coats in endoplasmic reticulum to Golgi transport: *Journal of Cell Biology*, 131, 875-893.

Aridor, M., Weissman, J., Bannykh, S., Nuoffer, C., and Balch, W. E., 1998, Cargo selection by the COPII budding machinery during export from the ER: *Journal of Cell Biology*, 141, 61-70.

Ayala, I., Babia, T., Baldassarre, M., Pompeo, A., Fabra, A., Kok, J. W., Luini, A., Buccione, R., and Egea, G., 1999, Morphological and biochemical analysis of the secretory pathway in melanoma cells with distinct metastatic potential: *Febs Letters*, 451, 315-20

Bannykh, S. I., Rowe, T., and Balch, W. E., 1996, The organization of endoplasmic reticulum export complexes: *Journal of Cell Biology*, 135, 19-35.

Bannykh, S. I. and Balch, W. E., 1997, Membrane dynamics at the endoplasmic reticulum-Golgi interface: *Journal of Cell Biology*, 138, 1-4.

Barbacid, M., 1987, Ras Genes: *Annual Review of Biochemistry*, 56, 779-827.

Barlowe, C. and Schekman, R., 1993, SEC12 encodes a guanine-nucleotide-exchange factor essential for transport vesicle budding from the ER: *Nature*, 365, 347-349.

Barlowe, C., Orci, L., Yeung, T., Hosobuchi, M., Hamamoto, S., Salama, N., Rexach, M. F., Ravazzola, M., Amherdt, M., and Schekman, R., 1994, COPII: a membrane coat formed by Sec proteins that drive vesicle budding from the endoplasmic reticulum: *Cell*, 77, 895-907.

Barnard, R. J. O., Morgan, A., and Burgoyne, R. D., 1997, Stimulation of NSF ATPase activity by alpha-SNAP is required for SNARE complex disassembly and exocytosis: *Journal of Cell Biology*, 139, 875-883.

Barsagi, D. and Feramisco, J. R., 1986, Induction of Membrane Ruffling and Fluid-Phase Pinocytosis in Quiescent Fibroblasts by Ras Proteins: *Science*, 233, 1061-1068.

Bashour, A. M., Fullerton, A. T., Hart, M. J., and Bloom, G. S., 1997, IQGAP1, a Rac- and Cdc42-binding protein, directly binds and cross-links microfilaments: *Journal of Cell Biology*, 137, 1555-1566.

Bear, J. E., Rawls, J. F., and Saxe, C. L. 3rd., 1998, SCAR, a WASP-related protein, isolated as a suppressor of receptor defects in late Dictyostelium development: *Journal of Cell Biology*, 142, 1325-1335

Beck, K. A., Buchanan, J. A., Malhotra, V., and Nelson, W. J., 1994, Golgi spectrin: identification of an erythroid beta-spectrin homolog associated with the Golgi complex: *Journal of Cell Biology*, 127, 707-723.

Becker, B. and Melkonian, M., 1996, The secretory pathway of protists: spatial and functional organization and evolution: *Microbiol Rev*, 60, 697-721.

Beckers, J. M., and Rhotman, J. E., 1992, Transport between Golgi cisternae: *Methods in enzymology*, 219, 5-12.

Bishop, A. L. and Hall, A., 2000, Rho GTPases and their effector proteins: *Biochem J*, 348 Pt 2, 241-255.

Blanchoin, L., Amann, K. J., Higgs, H. N., Marchand, J. B., Kaiser, D. A., and Pollard, T. D., 2000, Direct observation of dendritic actin filament networks nucleated by Arp2/3 complex and WASP/Scar proteins: *Nature*, 404, 1007-1011.

Boivin, D. and Beliveau, R., 1995, Subcellular-Distribution and Membrane Association of Rho-Related Small Gtp-Binding Proteins in Kidney Cortex: *American Journal of Physiology-Renal Physiology*, 38, F180-F189.

Bompard, G. and Caron, E., 2004, Regulation of WASP/WAVE proteins: making a long story short: *Journal of Cell Biology*, 166, 957-962.

Bonfanti, L., Mironov, A. A., Martinez-Menarguez, J. A., Martella, O., Fusella, A., Baldassarre, M., Buccione, R., Geuze, H. J., Mironov, A. A., and Luini, A., 1998, Procollagen traverses the Golgi stack without leaving the lumen of Cisternae: Evidence for cisternal maturation: *Cell*, 95, 993-1003.

Bonifacino, J. S. and Glick, B. S., 2004, The mechanisms of vesicle budding and fusion:

Cell, 116, 153-166.

Bourne, H. R., Sanders, D. A., and McCormick, F., 1991, The Gtpase Superfamily - Conserved Structure and Molecular Mechanism: *Nature*, 349, 117-127.

Bretscher, A. and Weber, K., 1980, Fimbrin, a new microfilament-associated protein present in microvilli and other cell surface structures: *Journal of Cell Biology*, 86, 335-340.

Burkhardt, J. K., Echeverri, C. J., Nilsson, T., and Vallee, R. B., 1997, Overexpression of the dynamitin (p50) subunit of the dynactin complex disrupts dynein-dependent maintenance of membrane organelle distribution: *Journal of Cell Biology*, 139, 469-484.

Burridge, K. and Wennerberg, K., 2004, Rho and Rac take center stage: *Cell*, 116, 167-179.

Burstein, E. S. and Macara, I. G., 1992, Characterization of a guanine nucleotide-releasing factor and a GTPase-activating protein that are specific for the ras-related protein p25rab3A: *Proceedings of the National Academy of Sciences of the United States of America*, 89, 1154-1158.

Camera, P., Da Silva, J. S., Griffiths, G., Giuffrida, M. G., Ferrara, L., Schubert, V., Imarisio, S., Silengo, L., Dotti, C. G., and Di Cunto, F., 2003, Citron-N is a neuronal Rho-associated protein involved in Golgi organization through actin cytoskeleton regulation: *Nature Cell Biology*, 5, 1071-1078.

Cao, H., Orth, J. D., Chen, J., Weller, S. G., Heuser, J. E., and McNiven, M. A., 2003, Cortactin is a component of clathrin-coated pits and participates in receptor-mediated endocytosis: *Molecular and Cellular Biology*, 23, 2162-2170.

Cao, H., Weller, S., Orth, J. D., Chen, J., Huang, B., Chen, J., Stamnes, M., and McNiven, M., 2005, Actin and Arf1-dependent recruitment of a cortactin-dynamamin complex to the Golgi regulates post-Golgi transport: *Nature Cell Biology*, in press.

Carlier, M. F. and Pantaloni, D., 1997, Control of actin dynamics in cell motility: *J Mol Biol*, 269, 459-467.

Caron, E. and Hall, A., 1998, Identification of two distinct mechanisms of phagocytosis controlled by different Rho GTPases: *Science*, 282, 1717-1721.

Caron, E., 2003, Regulation by phosphorylation: Yet another twist in the WASP story: *Developmental Cell*, 4, 772-773.

Castrillon, D. H. and Wasserman, S. A., 1994, Diaphanous Is Required for Cytokinesis in *Drosophila* and Shares Domains of Similarity with the Products of the Limb Deformity Gene: *Development*, 120, 3367-3377.

Chen, H., Bernstein, B. W., and Bamburg, J. R., 2000, Regulating actin-filament

dynamics in vivo: *Trends in Biochemical Science*, 25, 19-23.

Chen, J. L., Lacomis, L., Erdjument-Bromage, H., Tempst, P., and Stannnes, M., 2004, Cytosol-derived proteins are sufficient for Arp2/3 recruitment and ARF/coatomer-dependent actin polymerization on Golgi membranes: *Febs Letters*, 566, 281-286.

Clermont, Y., Xia, L., Rambourg, A., Turner, J. D., and Hermo, L., 1993, Transport of casein submicelles and formation of secretion granules in the Golgi apparatus of epithelial cells of the lactating mammary gland of the rat: *Anat Rec*, 235, 363-373.

Cohen, D., Musch, A., and Rodriguez-Boulan, E., 2001, Selective control of basolateral membrane protein polarity by cdc42: *Traffic*, 2, 556-564.

Cole, N. B. and Lippincott Schwartz, J., 1995, Organization of Organelles and Membrane Traffic by Microtubules: *Current Opinion in Cell Biology*, 7, 55-64.

Cooper, J. A., Walker, S. B., and Pollard, T. D., 1983, Pyrene actin: documentation of the validity of a sensitive assay for actin polymerization: *J Muscle Res Cell Motil.* 4, 253-262.

Cooper, J. A. and Schafer, D. A., 2000, Control of actin assembly and disassembly at filament ends: *Current Opinion in Cell Biology*, 12, 97-103.

Cory, G. O. C., Cramer, R., Blanchoin, L., and Ridley, A. J., 2003, Phosphorylation of the WASP-VCA domain increases its affinity for the Arp2/3 complex and enhances actin polymerization by WASP: *Molecular Cell*, 11, 1229-1239.

Cosson, P. and Letourneur, F., 1994, Coatomer interaction with di-lysine endoplasmic reticulum retention motifs: *Science*, 263, 1629-1631.

Cosson, P. and Letourneur, F., 1997, Coatomer (COPI)-coated vesicles: role in intracellular transport and protein sorting: *Current Opinion in Cell Biology*, 9, 484-487.

Cuif, M. H., Possmayer, F., Zander, H., Bordes, N., Jollivet, F., Couedel-Courteille, A., Janoueix-Lerosey, I., Langsley, G., Bornens, M., and Goud, B., 1999, Characterization of GAPCenA, a GTPase activating protein for Rab6, part of which associates with the centrosome: *Embo Journal*, 18, 1772-1782.

Cukierman, E., Huber, I., Rotman, M., and Cassel, D., 1995, The Arf1 Gtpase-Activating Protein - Zinc-Finger Motif and Golgi-Complex Localization: *Science*, 270, 1999-2002.

Daniels, R. H., Hall, P. S., and Bokoch, G. M., 1998, Membrane targeting of p21-activated kinase 1 (PAK1) induces neurite outgrowth from PC12 cells: *Embo Journal*, 17, 754-764.

Daub, H., Gevaert, K., Vandekerckhove, J., Sobel, A., and Hall, A., 2001, Rac/Cdc42 and p65PAK regulate the microtubule-destabilizing protein stathmin through phosphorylation at serine 16: *Journal of Biological Chemistry*, 276, 1677-1680.

Defacque, H., Egeberg, M., Habermann, A., Diakonova, M., Roy, C., Mangeat, P., Voelter, W., Marriott, G., Pfannstiel, J., Faulstich, H., and Griffiths, G., 2000, Involvement of ezrin/moesin in de novo actin assembly on phagosomal membranes: *Embo Journal*, 19, 199-212.

Denzel, A., Otto, F., Girod, A., Pepperkok, R., Watson, R., Rosewell, I., Bergeron, J. J., Solari, R. C., and Owen, M. J., 2000, The p24 family member p23 is required for early embryonic development: *Current Biology*, 10, 55-58.

Depina, A. S. and Langford, G. M., 1999, Vesicle transport: The role of actin filaments and myosin motors: *Microscopy Research and Technique*, 47, 93-106.

Der, C. J. and Balch, W. E., 2000, Cell biology - GTPase traffic control: *Nature*, 405, 749-752.

Derry, J. M., Ochs, H. D., and Francke, U., 1994, Isolation of a novel gene mutated in Wiskott-Aldrich syndrome: *Cell*, 78, 635-644.

Devarajan, P., Stabach, P. R., Mann, A. S., Ardito, T., Kashgarian, M., and Morrow, J. S., 1996, Identification of a small cytoplasmic ankyrin (AnkG119) in the kidney and muscle that binds beta I sigma spectrin and associates with the Golgi apparatus: *Journal of Cell Biology*, 133, 819-830.

Dharmawardhane, S., Schurmann, A., Sells, M. A., Chernoff, J., Schmid, S. L., and Bokoch, G. M., 2000, Regulation of macropinocytosis by p21-activated kinase-1: *Molecular Biology of the Cell*, 11, 3341-3352.

di Campli, A., Valderrama, F., Babia, T., De Matteis, M. A., Luini, A., and Egea, G., 1999, Morphological changes in the Golgi complex correlate with actin cytoskeleton rearrangements: *Cell Motility and Cytoskeleton*, 43, 334-348.

Dominguez, M., Dejgaard, K., Fullekrug, J., Dahan, S., Fazel, A., Paccaud, J. P., Thomas, D. Y., Bergeron, J. J., and Nilsson, T., 1998, gp25L/emp24/p24 protein family members of the cis-Golgi network bind both COP I and II coatomer: *Journal of Cell Biology*, 140, 751-765.

Donaldson, J. G., Cassel, D., Kahn, R. A., and Klausner, R. D., 1992, ADP-ribosylation factor, a small GTP-binding protein, is required for binding of the coatomer protein beta-COP to Golgi membranes: *Proceedings of the National Academy of Sciences of the United States of America*, 89, 6408-6412.

Dorner, C., Ciossek, T., Muller, S., Moller, N. P. H., Ullrich, A., and Lammers, R., 1998, Characterization of KIF1C, a new kinesin-like protein involved in vesicle transport from the Golgi apparatus to the endoplasmic reticulum: *Journal of Biological Chemistry*, 273, 20267-20275.

Drenckhahn, D. and Pollard, T. D., 1986, Elongation of Actin-Filaments Is A Diffusion-Limited Process at the Barbed End But Not the Pointed End: *Biophysical Journal*, 49, A416.

Du, Y. R., Weed, S. A., Xiong, W. C., Marshall, T. D., and Parsons, J. T., 1998, Identification of a novel cortactin SH3 domain-binding protein and its localization to growth cones of cultured neurons: *Molecular and Cellular Biology*, 18, 5838-5851.

Duran, J. M., Valderrama, F., Castel, S., Magdalena, J., Tomas, M., Hosoya, H., Renau-Piqueras, J., Malhotra, V., and Egea, G., 2003, Myosin motors and not actin comets are mediators of the actin-based Golgi-to-endoplasmic reticulum protein transport: *Molecular Biology of the Cell*, 14, 445-459.

Echard, A., Opdam, F. J. M., de Leeuw, H. J. P. C., Jollivet, F., Savelkoul, P., Hendriks, W., Voorberg, A., Goud, B., and Fransen, J. A. M., 2000, Alternative splicing of the human Rab6A gene generates two close but functionally different isoforms: *Molecular Biology of the Cell*, 11, 3819-3833.

Eden, S., Rohatgi, R., Podtelejnikov, A. V., Mann, M., and Kirschner, M. W., 2002, Mechanism of regulation of WAVE1-induced actin nucleation by Rac1 and Nck: *Nature*, 418, 790-793.

Edwards, D. C., Sanders, L. C., Bokoch, G. M., and Gill, G. N., 1999, Activation of LIM-kinase by Pak1 couples Rac/Cdc42 GTPase signalling to actin cytoskeletal dynamics: *Nature Cell Biology*, 1, 253-259.

Engel, J., Fasold, H., Hulla, F. W., Waechter, F., and Wegner, A., 1977, Polymerization Reaction of Muscle Actin: *Molecular and Cellular Biochemistry*, 18, 3-13.

Erickson, J. W., Zhang, C., Kahn, R. A., Evans, T., and Cerione, R. A., 1996, Mammalian Cdc42 is a brefeldin A-sensitive component of the Golgi apparatus: *J Biol Chem*, 271, 26850-26854.

Erickson, J. W., Cerione, R. A., and Hart, M. J., 1997, Identification of an actin cytoskeletal complex that includes IQGAP and the Cdc42 GTPase: *Journal of Biological Chemistry*, 272, 24443-24447.

Erickson, J. W. and Cerione, R. A., 2001, Multiple roles for Cdc42 in cell regulation: *Current Opinion in Cell Biology*, 13, 153-157.

Erickson, J. W. and Cerione, R. A., 2004, Structural elements, mechanism, and evolutionary convergence of Rho protein-guanine nucleotide exchange factor complexes: *Biochemistry*, 43, 837-842.

Espenshade, P., Gimeno, R. E., Holzmacher, E., Teung, P., and Kaiser, C. A., 1995, Yeast Sec16 Gene Encodes A Multidomain Vesicle Coat Protein That Interacts with Sec23P: *Journal of Cell Biology*, 131, 311-324.

Etienne-Manneville, S. and Hall, A., 2002, Rho GTPases in cell biology: *Nature*, 420, 629-635.

Etienne-Manneville, S. and Hall, A., 2003, Cdc42 regulates GSK-3 beta and adenomatous polyposis coli to control cell polarity: *Nature*, 421, 753-756.

Etienne-Manneville, S., 2004, Cdc42 - the centre of polarity: *Journal of Cell Science*, 117, 1291-1300.

Evangelista, M., Klebl, B. M., Tong, A. H., Webb, B. A., Leeuw, T., Leberer, E., Whiteway, M., Thomas, D. Y., and Boone, C., 2000, A role for myosin-I in actin assembly through interactions with Vrp1p, Bee1p, and the Arp2/3 complex: *Journal of Cell Biology*, 148, 353-362.

Evangelista, M., Zigmond, S., and Boone, C., 2003, Formins: signaling effectors for assembly and polarization of actin filaments: *Journal of Cell Science*, 116, 2603-2611.

Fagotti, A., Di, R., I, Simoncelli, F., Chaponnier, C., Gabbiani, G., and Pascolini, R., 1998, Actin isoforms in amphioxus *Branchiostoma lanceolatum*: *Cell and Tissue Research*, 292, 173-176.

Farquhar, M. G., Bergeron, J. J., and Palade, G. E., 1974, Cytochemistry of Golgi fractions prepared from rat liver: *Journal of Cell Biology*, 60, 8-25.

Faucherre, A., Desbois, P., Satre, V., Lunardi, J., Dorseuil, O., and Gacon, G., 2003, Lowe syndrome protein OCRL1 interacts with Rac GTPase in the trans-Golgi network: *Human Molecular Genetics*, 12, 2449-2456.

Fleming, I. N., Elliott, C. M., and Exton, J. H., 1996, Differential translocation of Rho family GTPases by lysophosphatidic acid, endothelin-1, and platelet-derived growth factor: *Journal of Biological Chemistry*, 271, 33067-33073.

Fucini, R.V., Navarrete, A., Vadakkan, C., Lacomis, L., Erdjument-Bromage, H., Tempst, P., and Stamnes, M., 2000, Activated ADP-ribosylation factor assembles distinct pools of actin on golgi membranes: *Journal of Biological Chemistry*, 275, 18824-18829.

Fucini, R. V., Chen, J. L., Sharma, C., Kessels, M. M., and Stamnes, M., 2002, Golgi vesicle proteins are linked to the assembly of an actin complex defined by mAbp1: *Molecular Biology of the Cell*, 13, 621-631.

Fujimoto, L. M., Roth, R., Heuser, J. E., and Schmid, S. L., 2000, Actin assembly plays a variable, but not obligatory role in receptor-mediated endocytosis in mammalian cells: *Traffic*, 1, 161-171.

Fujiwara, I., Suetsugu, S., Uemura, S., Takenawa, T., and Ishiwata, S., 2002, Visualization and force measurement of branching by Arp2/3 complex and N-WASP in actin filament: *Biochemical and Biophysical Research Communications*, 293, 1550-1555.

Fukata, M., Kuroda, S., Fujii, K., Nakamura, T., Shoji, I., Matsuura, Y., Okawa, K., Iwamatsu, A., Kikuchi, A., and Kaibuchi, K., 1997, Regulation of cross-linking of actin filament by IQGAP1, a target for Cdc42: *Journal of Biological Chemistry*, 272, 29579-29583.

Garrett, M. D., Self, A. J., Vanoers, C., and Hall, A., 1989, Identification of Distinct Cytoplasmic Targets for Ras R-Ras and Rho-Regulatory Proteins: *Journal of Biological Chemistry*, 264, 10-13.

Gautreau, A., Ho, H. Y. H., Li, J. X., Steen, H., Gygi, S. P., and Kirschner, M. W., 2004, Purification and architecture of the ubiquitous Wave complex: *Proceedings of the National Academy of Sciences of the United States of America*, 101, 4379-4383.

Gaynor, E. C. and Emr, S. D., 1997, COPI-independent anterograde transport: Cargo-selective ER to Golgi protein transport in yeast COPI mutants: *Journal of Cell Biology*, 136, 789-802.

Gimeno, R. E., Espenshade, P., and Kaiser, C. A., 1996, COPII coat subunit interactions: Sec24p and Sec23p bind to adjacent regions of Sec16p: *Molecular Biology of the Cell*, 7, 1815-1823.

Girod, A., Storrie, B., Simpson, J. C., Johannes, L., Goud, B., Roberts, L. M., Lord, J. M., Nilsson, T., and Pepperkok, R., 1999, Evidence for a COP-I-independent transport route from the Golgi complex to the endoplasmic reticulum: *Nature Cell Biology*, 1, 423-430.

Godi, A., Santone, I., Pertile, P., Devarajan, P., Stabach, P. R., Morrow, J. S., Di Tullio, G., Polishchuk, R., Petrucci, T. C., Luini, A., and De Matteis, M. A., 1998, ADP ribosylation factor regulates spectrin binding to the Golgi complex: *Proceedings of the National Academy of Sciences of the United States of America*, 95, 8607-8612.

Goode, B. L., Rodal, A. A., Barnes, G., and Drubin, D. G., 2001, Activation of the Arp2/3 complex by the actin filament binding protein Abp1p: *J Cell Biol*, 153, 627-634.

Hall, A., 1998, Rho GTPases and the actin cytoskeleton: *Science*, 279, 509-514.

Harris, E. S. and Higgs, H. N., 2004, Actin cytoskeleton: Formins lead the way: *Current Biology*, 14, R520-R522.

Hart, M. J., Callow, M. G., Souza, B., and Polakis, P., 1996, IQGAP1, a calmodulin-binding protein with a rasGAP-related domain, is a potential effector for cdc42Hs: *Embo Journal*, 15, 2997-3005.

Hauri, H. P. and Schweizer, A., 1992, The endoplasmic reticulum-Golgi intermediate compartment: *Current Opinion in Cell Biology*, 4, 600-608.

Hay, J. C. and Scheller, R. H., 1997, SNAREs and NSF in targeted membrane fusion: *Current Opinion in Cell Biology*, 9, 505-512.

Heimann, K., Percival, J. M., Weinberger, R., Gunning, P., and Stow, J. L., 1999, Specific isoforms of actin-binding proteins on distinct populations of Golgi-derived vesicles: *Journal of Biological Chemistry*, 274, 10743-10750.

Helms, J. B. and Rothman, J. E., 1992, Inhibition by Brefeldin-A of A Golgi Membrane Enzyme That Catalyzes Exchange of Guanine-Nucleotide Bound to Arf: *Nature*, 360, 352-354.

Higgs, H. N., Blanchoin, L., and Pollard, T. D., 1999, Influence of the C terminus of Wiskott-Aldrich syndrome protein (WASp) and the Arp2/3 complex on actin polymerization: *Biochemistry*, 38, 15212-15222.

Higgs, H. N. and Pollard, T. D., 2000, Activation by Cdc42 and PIP(2) of Wiskott-Aldrich syndrome protein (WASp) stimulates actin nucleation by Arp2/3 complex: *Journal of Cell Biology*, 150, 1311-1320.

Hill, C. S., Wynne, J., and Treisman, R., 1995, The Rho-Family Gtpases Rhoa, Rac1, and Cdc42Hs Regulate Transcriptional Activation by Srf: *Cell*, 81, 1159-1170.

Hirao, M., Sato, N., Kondo, T., Yonemura, S., Monden, M., Sasaki, T., Takai, Y., and Tsukita, S., 1996, Regulation mechanism of ERM (ezrin/radixin/moesin) protein/plasma membrane association: possible involvement of phosphatidylinositol turnover and Rho-dependent signaling pathway: *Journal of Cell Biology*, 135, 37-51.

Hirschberg, K., Miller, C. M., Ellenberg, J., Presley, J. F., Siggia, E. D., Phair, R. D., and Lippincott-Schwartz, J., 1998, Kinetic analysis of secretory protein traffic and characterization of Golgi to plasma membrane transport intermediates in living cells: *Journal of Cell Biology*, 143, 1485-1503.

Hoogenraad, C. C., Akhmanova, A., Howell, S. A., Dortland, B. R., De Zeeuw, C. I., Willemsen, R., Visser, P., Grosveld, F., and Galjart, N., 2001, Mammalian Golgi-associated Bicaudal-D2 functions in the dynein-dynactin pathway by interacting with these complexes: *Embo Journal*, 20, 4041-4054.

Huang, J. D., Brady, S. T., Richards, B. W., Stenoién, D., Resau, J. H., Copeland, N. G., and Jenkins, N. A., 1999, Direct interaction of microtubule- and actin-based transport motors: *Nature*, 397, 267-270.

Hui, N., Nakamura, N., Slusarewicz, P., and Warren, G., 1998, Purification of rat liver Golgi stacks: *Cell Biology: a Laboratory Handbook*, 2nd Ed. Vol. 2

Ichetovkin, I., Grant, W., and Condeelis, J., 2002, Cofilin produces newly polymerized actin filaments that are preferred for dendritic nucleation by the Arp2/3 complex: *Current Biology*, 12, 79-84.

Infante, C., Ramos-Morales, F., Fedriani, C., Bornens, M., and Rios, R. M., 1999, GMAP-210, a cis-Golgi network-associated protein, is a minus end microtubule-binding protein: *Journal of Cell Biology*, 145, 83-98.

Innocenti, M., Zucconi, A., Disanza, A., Frittoli, E., Areces, L.B., Steffen, A., Stradal, T.E.B., Di Fiore, P.P., Carlier, M.F., and Scita, G., 2004, Abi1 is essential for the formation and activation of a WAVE2 signalling complex: *Nature Cell Biology*, 6, 319-327.

Itin, C., Kappeler, F., Linstedt, A. D., and Hauri, H. P., 1995, A Novel Endocytosis Signal Related to the Kkxx Er-Retrieval Signal: *Embo Journal*, 14, 2250-2256.

Jackson, M. R., Nilsson, T., and Peterson, P. A., 1990, Identification of a consensus motif for retention of transmembrane proteins in the endoplasmic reticulum: *Embo Journal*, 9, 3153-3162.

Janmey, P. A. and Stossel, T. P., 1987, Modulation of Gelsolin Function by Phosphatidylinositol 4,5-Bisphosphate: *Nature*, 325, 362-364.

Joneson, T., McDonough, M., Bar-Sagi, D., and Van Aelst, L., 1996, RAC regulation of actin polymerization and proliferation by a pathway distinct from Jun kinase: *Science*, 274, 1374-1376.

Jou, T. S., Leung, S. M., Fung, L. M., Ruiz, W. G., Nelson, W. J., and Apodaca, G., 2000, Selective alterations in biosynthetic and endocytic protein traffic in Madin-Darby canine kidney epithelial cells expressing mutants of the small GTPase Rac1: *Molecular Biology of the Cell*, 11, 287-304.

Kahn, R. A., Kern, F. G., Clark, J., Gelmann, E. P., and Rulka, C., 1991, Human ADP-ribosylation factors. A functionally conserved family of GTP-binding proteins: *Journal of Biological Chemistry*, 266, 2606-2614.

Kaibuchi, K., Kuroda, S., and Amano, M., 1999, Regulation of the cytoskeleton and cell adhesion by the Rho family GTPases in mammalian cells: *Annual Review of biochemistry*, 68, 459-486.

Kaksonen, M., Peng, H. B., and Rauvala, H., 2000, Association of cortactin with dynamic actin in lamellipodia and on endosomal vesicles: *Journal of Cell Science*, 113, 4421-4426.

Kanner, S. B., Reynolds, A. B., Vines, R. R., and Parsons, J. T., 1990, Monoclonal-Antibodies to Individual Tyrosine-Phosphorylated Protein Substrates of Oncogene-Encoded Tyrosine Kinases: *Proceedings of the National Academy of Sciences of the United States of America*, 87, 3328-3332.

Kelly, R. B., 1999, Deconstructing membrane traffic: *Trends in Cell Biology*, 9, M29-M33.

Kempiak, S. J., Yamaguchi, H., Sarmiento, C., Sidani, M., Ghosh, M., Eddy, R. J., DesMarais, V., Way, M., Condeelis, J., and Segall, J. E., 2005, A neural Wiskott-Aldrich syndrome protein-mediated pathway for localized activation of actin polymerization that is regulated by cortactin: *Journal of Biological Chemistry*, 280, 5836-5842.

Kessels, M. M., Engqvist-Goldstein, A. E. Y., and Drubin, D. G., 2000, Association of mouse actin-binding protein 1 (mAbp1/SH3P7), an Src kinase target, with dynamic

regions of the cortical actin cytoskeleton in response to Rac1 activation: *Molecular Biology of the Cell*, 11, 393-412.

Kessels, M. M., and Qualmann, B., 2002, Syndapins integrate N-WASP in receptor-mediated endocytosis: *Embo Journal*, 21, 6083-6094.

King, S. J., Eckley, M., Rodgers, M., and Schroer, T. A., 1999, Analysis of the dynein : dynactin interaction in vitro: *Molecular Biology of the Cell*, 10, 248A.

Kirchhausen, T., Bonifacino, J. S., and Riezman, H., 1997, Linking cargo to vesicle formation: receptor tail interactions with coat proteins: *Current Opinion in Cell Biology*, 9, 488-495.

Kitamura, D., Kaneko, H., Miyagoe, Y., Ariyasu, T., and Watanabe, T., 1989, Isolation and Characterization of A Novel Human-Gene Expressed Specifically in the Cells of Hematopoietic Lineage: *Nucleic Acids Research*, 17, 9367-9379.

Kitamura, D., Kaneko, H., Taniuchi, I., Akagi, K., Yamamura, K. I., and Watanabe, T., 1995, Molecular-Cloning and Characterization of Mouse Hs1: *Biochemical and Biophysical Research Communications*, 208, 1137-1146.

Klopfenstein, D. R. C., Kappeler, F., and Hauri, H. P., 1998, A novel direct interaction of endoplasmic reticulum with microtubules: *Embo Journal*, 17, 6168-6177.

Klumperman, J., Schweizer, A., Clausen, H., Tang, B. L., Hong, W. J., Oorschot, V., and Hauri, H. P., 1998, The recycling pathway of protein ERGIC-53 and dynamics of the ER-Golgi intermediate compartment: *Journal of Cell Science*, 111, 3411-3425.

Knaus, U. G., Heyworth, P. G., Evans, T., Curnutte, J. T., and Bokoch, G. M., 1991, Regulation of Phagocyte Oxygen Radical Production by the Gtp-Binding Protein Rac-2: *Science*, 254, 1512-1515.

Kovar, D. R. and Pollard, T. D., 2004, Insertional assembly of actin filament barbed ends in association with formins produces piconewton forces: *Proceedings of the National Academy of Sciences of the United States of America*, 101, 14725-14730.

Kovilur, S., Jacobson, J. W., Beach, R. L., Jeffery, W. R., and Tomlinson, C. R., 1993, Evolution of the chordate muscle actin gene: *J Mol Evol*, 36, 361-368.

Kowalski, J. R., Egile, C., Gil, S., Snapper, S. B., Li, R., and Thomas, S. M., 2005, Cortactin regulates cell migration through activation of N-WASP: *Journal of Cell Science*, 118, 79-87.

Kozma, R., Ahmed, S., Best, A., and Lim, L., 1995, The Ras-Related Protein Cdc42Hs and Bradykinin Promote Formation of Peripheral Actin Microspikes and Filopodia in Swiss 3T3 Fibroblasts: *Molecular and Cellular Biology*, 15, 1942-1952.

Kranenburg, O., Poland, M., Gebbink, M., Oomen, L., and Moolenaar, W. H., 1997, Dissociation of LPA-induced cytoskeletal contraction from stress fiber formation by differential localization of RhoA: *Journal of Cell Science*, 110, 2417-2427.

Kraynov, V. S., Chamberlain, C., Bokoch, G. M., Schwartz, M. A., Slabaugh, S., and Hahn, K. M., 2000, Localized Rac activation dynamics visualized in living cells: *Science*, 290, 333-337.

Kroschewski, R., Hall, A., and Mellman, I., 1999, Cdc42 controls secretory and endocytic transport to the basolateral plasma membrane of MDCK cells: *Nature Cell Biology*, 1, 8-13.

Krueger, E. W., Orth, J. D., Cao, H., and McNiven, M. A., 2003, A dynamin-cortactin-Arp2/3 complex mediates actin reorganization in growth factor-stimulated cells: *Molecular Biology of the Cell*, 14, 1085-1096.

Krugmann, S., Jordens, I., Gevaert, K., Driessens, M., Vandekerckhove, J., and Hall, A., 2001, Cdc42 induces filopodia by promoting the formation of an IRSp53 : Mena complex: *Current Biology*, 11, 1645-1655.

Kuehn, M. J., Herrmann, J. M., and Schekman, R., 1998, COPII-cargo interactions direct protein sorting into ER-derived transport vesicles: *Nature*, 391, 187-190.

Kuge, O., Dascher, C., Orci, L., Rowe, T., Amherdt, M., Plutner, H., Ravazzola, M., Tanigawa, G., Rothman, J. E., and Balch, W. E., 1994, Sar1 promotes vesicle budding from the endoplasmic reticulum but not Golgi compartments: *Journal of Cell Biology*, 125, 51-65.

Kuroda, S., Fukata, M., Kobayashi, K., Nakafuku, M., Nomura, N., Iwamatsu, A., and Kaibuchi, K., 1996, Identification of IQGAP as a putative target for the small GTPases, Cdc42 and Rac1: *Journal of Biological Chemistry*, 271, 23363-23367.

Kuroda, S., Fukata, M., Nakagawa, M., Fujii, K., Nakamura, T., Ookubo, T., Izawa, I., Nagase, T., Nomura, N., Tani, H., Shoji, I., Matsuura, Y., Yonehara, S., and Kaibuchi, K., 1998, Role of IQGAP1, a target of the small GTPases Cdc42 and Rac1, in regulation of E-cadherin-mediated cell-cell adhesion: *Science*, 281, 832-835.

Ladinsky, M. S., Mastronarde, D. N., McIntosh, J. R., Howell, K. E., and Staehelin, L. A., 1999, Golgi structure in three dimensions: functional insights from the normal rat kidney cell: *Journal of Cell Biology*, 144, 1135-1149.

Lamarche, N., Tapon, N., Stowers, L., Burbelo, P. D., Aspenstrom, P., Bridges, T., Chant, J., and Hall, A., 1996, Rac and Cdc42 induce actin polymerization and G1 cell cycle progression independently of p65(PAK) and the JNK/SAPK MAP kinase cascade: *Cell*, 87, 519-529.

Lamaze, C. and Schmid, S. L., 1995, The Emergence of Clathrin-Independent Pinocytic Pathways: *Current Opinion in Cell Biology*, 7, 573-580.

Lamaze, C., Chuang, T. H., Terlecky, L. J., Bokoch, G. M., and Schmid, S. L., 1996, Regulation of receptor-mediated endocytosis by Rho and Rac: *Nature*, 382, 177-179.

Lavoie, C., Paiement, J., Dominguez, M., Roy, L., Dahan, S., Gushue, J. N., and

- Bergeron, J. J., 1999, Roles for alpha(2)p24 and COPI in endoplasmic reticulum cargo exit site formation: *Journal of Cell Biology*, 146, 285-299.
- Le Bot, N., Antony, C., White, J., Karsenti, E., and Vernos, I., 1998, Role of Xklp3, a subunit of the *Xenopus* Kinesin-II in membrane transport at the ER/Golgi interface: *Molecular Biology of the Cell*, 9, 32A.
- Le Clainche, C., Didry, D., Carlier, M. F., and Pantaloni, D., 2001, Activation of Arp2/3 complex by Wiskott-Aldrich Syndrome protein is linked to enhanced binding of ATP to Arp2: *Journal of Biological Chemistry*, 276, 46689-46692.
- Lechler, T., Shevchenko, A., and Li, R., 2000, Direct involvement of yeast type I myosins in Cdc42-dependent actin polymerization: *Journal of Cell Biology*, 148, 363-373.
- Lee, W. L., Bezanilla, M., and Pollard, T. D., 2000, Fission yeast myosin-I, Myo1p, stimulates actin assembly by Arp2/3 complex and shares functions with WASp: *Journal of Cell Biology*, 151, 789-800.
- Letourneur, F., Gaynor, E. C., Hennecke, S., Demolliere, C., Duden, R., Emr, S. D., Riezman, H., and Cosson, P., 1994, Coatamer is essential for retrieval of dilysine-tagged proteins to the endoplasmic reticulum: *Cell*, 79, 1199-1207.
- Leung, S. M., Rojas, R., Maples, C., Flynn, C., Ruiz, W. G., Jou, T. S., and Apodaca, G., 1999, Modulation of endocytic traffic in polarized Madin-Darby canine kidney cells by the small GTPase RhoA: *Molecular Biology of the Cell*, 10, 4369-4384.
- Lewis, A. K. and Bridgman, P. C., 1992, Nerve Growth Cone Lamellipodia Contain 2 Populations of Actin-Filaments That Differ in Organization and Polarity: *Journal of Cell Biology*, 119, 1219-1243.
- Lewis, M. J. and Pelham, H. R. B., 1990, A Human Homolog of the Yeast Hdel Receptor: *Nature*, 348, 162-163.
- Lewis, M. J. and Pelham, H. R., 1996, SNARE-mediated retrograde traffic from the Golgi complex to the endoplasmic reticulum: *Cell*, 85, 205-215.
- Li, F. and Higgs, H. N., 2003, The mouse formin mDial1 is a potent actin nucleation factor regulated by autoinhibition: *Current Biology*, 13, 1335-1340.
- Li, R., 1997, Bee1, a yeast protein with homology to Wiscott-Aldrich syndrome protein, is critical for the assembly of cortical actin cytoskeleton: *Journal of Cell Biology*, 136, 649-658.
- Lin, R., Bagrodia, S., Cerione, R., and Manor, D., 1997, A novel Cdc42Hs mutant induces cellular transformation: *Current Biology*, 7, 794-797.
- Linstedt, A. and Hauri, H. P., 1993, Identification of A Novel Golgi Protein Containing A Cytoplasmic Domain of Greater Than 300Kd: *Journal of Cellular Biochemistry*, 26.

Liou, W., Geuze, H. J., and Slot, J. W., 1996, Improving structural integrity of cryosections for immunogold labeling: *Histochemistry and Cell Biology*, 106, 41-58.

Lippincott-Schwartz, J., Cole, N., and Presley, J., 1998, Unravelling Golgi membrane traffic with green fluorescent protein chimeras: *Trends in Cell Biology*, 8, 16-20.

Luna, A., Matas, O. B., Martínez-Menarguez, J. A., Mato, E., Duran, J. M., Ballesta, J., Way, M., and Egea, G., 2002, Regulation of protein transport from the golgi complex to the endoplasmic reticulum by CDC42 and N-WASP: *Molecular Biology of the Cell*, 13, 866-879.

Machesky, L. M., Atkinson, S. J., Ampe, C., Vandekerckhove, J., and Pollard, T. D., 1994, Purification of a cortical complex containing two unconventional actins from *Acanthamoeba* by affinity chromatography on profilin-agarose: *Journal of Cell Biology*, 127, 107-115.

Machesky, L. M. and Hall, A., 1997, Role of actin polymerization and adhesion to extracellular matrix in Rac- and Rho-induced cytoskeletal reorganization: *Journal of Cell Biology*, 138, 913-926.

Machesky, L. M., Mullins, R. D., Higgs, H. N., Kaiser, D. A., Blanchoin, L., May, R. C., Hall, M. E., and Pollard, T. D., 1999, Scar, a WASp-related protein, activates nucleation of actin filaments by the Arp2/3 complex: *Proceedings of the National Academy of Sciences of the United States of America U S A*, 96, 3739-3744.

Madania, A., Dumoulin, P., Grava, S., Kitamoto, H., Scharer-Brodbeck, C., Soulard, A., Moreau, V., and Winsor, B., 1999, The *Saccharomyces cerevisiae* homologue of human Wiskott-Aldrich syndrome protein Las17p interacts with the Arp2/3 complex: *Molecular Biology of the Cell*, 10, 3521-3538.

Malhotra, V., Serafini, T., Orci, L., Shepherd, J. C., and Rothman, J. E., 1989, Purification of A Novel Class of Coated Vesicles Mediating Biosynthetic Protein-Transport Through the Golgi Stack: *Cell*, 58, 329-336.

Mallard, F., Tang, B. L., Galli, T., Tenza, D., Saint-Pol, A., Yue, X., Antony, C., Hong, W. J., Goud, B., and Johannes, L., 2002, Early/recycling endosomes-to-TGN transport involves two SNARE complexes and a Rab6 isoform: *Journal of Cell Biology*, 156, 653-664.

Manser, E., Chong, C., Zhao, Z. S., Leung, T., Michael, G., Hall, C., and Lim, L., 1995, Molecular-Cloning of A New Member of the P21-Cdc42/Rac-Activated Kinase (Pak) Family: *Journal of Biological Chemistry*, 270, 25070-25078.

Marchand, J. B., Kaiser, D. A., Pollard, T. D., and Higgs, H. N., 2001, Interaction of WASP/Scar proteins with actin and vertebrate Arp2/3 complex: *Nature Cell Biology*, 3, 76-82.

Martínez-Alonso, E., Egea, G., Ballesta, J., and Martínez-Menárguez, J. A., 2005, Structure and dynamics of the Golgi complex at 15 degrees C: Low temperature induces

the formation of Golgi-derived tubules: *Traffic*, 6, 32-44.

Martínez-Menárguez, J. A., Geuze, H. J., Slot, J. W., and Klumperman, J., 1999, Vesicular tubular clusters between the ER and Golgi mediate concentration of soluble secretory proteins by exclusion from COPI-coated vesicles: *Cell*, 98, 81-90.

Martínez-Quiles, N., Ho, H. Y. H., Kirschner, M. W., Armes, N., and Geha, R. S., 2004, Erk/Src phosphorylation of cortactin acts as a switch off mechanism that controls its ability to activate N-WASP: *Molecular and Cellular Biology*, 24, 5269-5280.

Massol, P., Montcourrier, P., Guillemot, J. C., and Chavrier, P., 1998, Fc receptor-mediated phagocytosis requires CDC42 and Rac1: *Embo Journal*, 17, 6219-6229.

Matanis, T., Akhmanova, A., Wulf, P., del Nery, E., Weide, T., Stepanova, T., Galjart, N., Grosveld, F., Goud, B., De Zeeuw, C. I., Barnekow, A., and Hoogenraad, C. C., 2002, Bicaudal-D regulates COPI-independent Golgi-ER transport by recruiting the dynein-dynactin motor complex: *Nature Cell Biology*, 4, 986-992.

Matsudaira, P., 1991, Modular organization of actin crosslinking proteins: *Trends Biochemical Science*, 16, 87-92.

May, R. C., Caron, E., Hall, A., and Machesky, L. M., 2000, Involvement of the Arp2/3 complex in phagocytosis mediated by Fc gamma R or CR3: *Nature Cell Biology*, 2, 246-248.

McGavin, M. K. H., Badour, K., Hardy, L. A., Kubiseski, T. J., Zhang, J. Y., and Siminovitch, K. A., 2001, The intersectin 2 adaptor links Wiskott Aldrich syndrome protein (WASP)-mediated actin polymerization to T cell antigen receptor endocytosis: *Journal of Experimental Medicine*, 194, 1777-1787.

McNiven, M. A., Kim, L., Krueger, E. W., Orth, J. D., Cao, H., and Wong, T. W., 2000, Regulated interactions between dynamin and the actin-binding protein cortactin modulate cell shape: *Journal of Cell Biology*, 151, 187-198.

Merrifield, C. J., Feldman, M. E., Wan, L., and Almers, W., 2002, Imaging actin and dynamin recruitment during invagination of single clathrin-coated pits: *Nature Cell Biology*, 4, 691-698.

Merrifield, C. J., Qualmann, B., Kessels, M. M., and Almers, W., 2004, Neural Wiskott Aldrich Syndrome Protein (N-WASP) and the Arp2/3 complex are recruited to sites of clathrin-mediated endocytosis in cultured fibroblasts: *European Journal of Cell Biology*, 83, 13-18.

Michaelson, D., Silletti, J., Murphy, G., D'Eustachio, P., Rush, M., and Philips, M. R., 2001, Differential localization of Rho GTPases in live cells: Regulation by hypervariable regions and RhoGDI binding: *Journal of Cell Biology*, 152, 111-126.

Michaely, P. A., Mineo, C., Ying, Y. S., and Anderson, R. G. W., 1999, Polarization distribution of endogenous Rac1 and RhoA at the cell surface: *Journal of Biological Chemistry*, 274, 21430-21436.

Migliarese, M. R., Mannionhenderson, J., Wu, H., Parsons, J. T., and Bender, T. P., 1994, The Protein-Tyrosine Kinase Substrate Cortactin Is Differentially Expressed in Murine-B Lymphoid Tumors: *Oncogene*, 9, 1989-1997.

Miki, H., Miura, K., and Takenawa, T., 1996, N-WASP, a novel actin-depolymerizing protein, regulates the cortical cytoskeletal rearrangement in a PIP2-dependent manner downstream of tyrosine kinases: *Embo Journal*, 15, 5326-5335.

Miki, H., Suetsugu, S., and Takenawa, T., 1998, WAVE, a novel WASP-family protein involved in actin reorganization induced by Rac: *Embo Journal*, 17, 6932-6941.

Miki, H., Yamaguchi, H., Suetsugu, S., and Takenawa, T., 2000, IRSp53 is an essential intermediate between Rac and WAVE in the regulation of membrane ruffling: *Nature*, 408, 732-735.

Miles, S., Heather, M., Kimberly, E. F., and Storrie, B., 2001, Evidence that the entire Golgi apparatus cycles in interphase HeLa cells: sensitivity of Golgi matrix proteins to an ER exit block: *Journal of Cell Biology*, 12, 543-555.

Minden, A., Lin, A. N., Claret, F. X., Abo, A., and Karin, M., 1995, Selective Activation of the Jnk Signaling Cascade and C-Jun Transcriptional Activity by the Small Gtpases Rac and Cdc42Hs: *Cell*, 81, 1147-1157.

Mironov, A. A., Weidman, P., and Luini, A., 1997, Variations on the intracellular transport theme: maturing cisternae and trafficking tubules: *Journal of Cell Biology*, 138, 481-484.

Mironov, A. A., Mironov, A. A., Beznoussenko, G. V., Trucco, A., Lupetti, P., Smith, J. D., Geerts, W. J. C., Koster, A. J., Burger, K. N. J., Martone, M. E., Deerinck, T. J., Ellisman, M. H., and Luini, A., 2003, ER-to-golgi carriers arise through direct en bloc protrusion and multistage maturation of specialized ER exit domains: *Developmental Cell*, 5, 583-594.

Mizutani, K., Suetsugu, S., and Takenawa, T., 2004, FBP11 regulates nuclear localization of N-WASP and inhibits N-WASP-dependent microspike formation: *Biochemical and Biophysical Research Communications*, 313, 468-474.

Mooseker, M. S., 1985, Organization, chemistry, and assembly of the cytoskeletal apparatus of the intestinal brush border: *Annual Review of Cell Biology*, 1, 209-241.

Mukherjee, S., Ghosh, R. N., and Maxfield, F. R., 1997, Endocytosis: *Physiological Reviews*, 77, 759-803.

Mullins, R. D., Heuser, J. A., and Pollard, T. D., 1998, The interaction of Arp2/3 complex with actin: nucleation, high affinity pointed end capping, and formation of branching networks of filaments: *Proceedings of the National Academy of Sciences of the United States of America*, 95, 6181-6186.

Munro, S. and Pelham, H. R., 1987, A C-terminal signal prevents secretion of luminal ER proteins: *Cell*, 48, 899-907.

Murphy, C., Saffrich, R., Grummt, W., Gournier, H., Rybin, V., Rubino, M., Auvinen, P., Lutcke, A., Parton, R. G., and Zerial, M., 1996, Endosome dynamics regulated by a Rho protein: *Nature*, 384, 427-432.

Müsch, A., Cohen, D., Kreitzer, G., and Rodriguez-Boulan, E., 2001, cdc42 regulates the exit of apical and basolateral proteins from the trans-Golgi network: *Embo Journal*, 20, 171-2179.

Nakajima, H., Kunioka, Y., Nakano, K., Shimizu, K., Seto, M., and Ando, T., 1997, Scanning force microscopy of the interaction events between a single molecule of heavy meromyosin and actin: *Biochemical and Biophysical Research Communications*, 234, 178-182.

Nakamura, N., Rabouille, C., Watson, R., Nilsson, T., Hui, N., Slusarewicz, P., Kreis, T. E., and Warren, G., 1995, Characterization of a cis-Golgi matrix protein, GM130: *Journal of Cell Biology*, 131, 1715-1726.

Nassar, N., Hoffman, G. R., Manor, D., Clardy, J. C., and Cerione, R. A., 1998, Structures of Cdc42 bound to the active and catalytically compromised forms of Cdc42GAP: *Nature Structural Biology*, 5, 1047-1052.

Nobes, C. D. and Hall, A., 1995, Rho, rac, and cdc42 GTPases regulate the assembly of multimolecular focal complexes associated with actin stress fibers, lamellipodia, and filopodia: *Cell*, 81, 53-62.

O'Brien, L. E., Jou, T. S., Pollack, A. L., Zhang, Q. H., Hansen, S. H., Yurchenco, P., and Mostov, K. E., 2001, Rac1 orientates epithelial apical polarity through effects on basolateral laminin assembly: *Nature Cell Biology*, 3, 831-838.

Ochs, H. D., 1998, The Wiskott-Aldrich syndrome: *Semin. Hematol.* 35, 332-345.

Oka, T. and Nakano, A., 1994, Inhibition of Gtp Hydrolysis by Sar1P Causes Accumulation of Vesicles That Are A Functional Intermediate of the Er-To-Golgi Transport in Yeast: *Journal of Cell Biology*, 124, 425-434.

Olazabal, I. M. and Machesky, L. M., 2001, Abp1p and cortactin, new "hand-holds" for actin: *Journal of Cell Biology*, 154, 679-682.

Opdam, F. J. M., Echard, A., Croes, H. J. E., van den Hurk, J. A. J. M., van de Vorstenbosch, R. A., Ginsel, L. A., Goud, B., and Fransen, J. A. M., 2000, The small GTPase Rab6B, a novel Rab6 subfamily member, is cell-type specifically expressed and localised to the Golgi apparatus: *Journal of Cell Science*, 113, 2725-2735.

Orci, L., Ravazzola, M., Meda, P., Holcomb, C., Moore, H. P., Hicke, L., and Schekman, R., 1991, Mammalian Sec23P Homolog Is Restricted to the Endoplasmic-Reticulum Transitional Cytoplasm: *Proceedings of the National Academy of Sciences of the United States of America*, 88, 8611-8615.

Orci, L., Stamnes, M., Ravazzola, M., Amherdt, M., Perrelet, A., Sollner, T. H., and Rothman, J. E., 1997, Bidirectional transport by distinct populations of COPI-coated vesicles: *Cell*, 90, 335-349.

Ostermann, J., Orci, L., Tani, K., Amherdt, M., Ravazzola, M., Elazar, Z., and Rothman, J. E., 1993, Stepwise Assembly of Functionally Active-Transport Vesicles: *Cell*, 75, 1015-1025.

Paccaud, J. P., Reith, W., Carpentier, J. L., Ravazzola, M., Amherdt, M., Schekman, R., and Orci, L., 1996, Cloning and functional characterization of mammalian homologues of the COPII component Sec23: *Molecular Biology of the Cell*, 7, 1535-1546.

Palade, G., 1975, Intracellular Aspects of Process of Protein-Synthesis: *Science*, 189, 347-58.

Palazzo, A. F., Cook, T. A., Alberts, A. S., and Gunderson, G. G., 2001, mDia mediates Rho-regulated formation and orientation of stable microtubules: *Nature Cell Biology*, 3, 723-729.

Panchal, S. C., Kaiser, D. A., Torres, E., Pollard, T. D., and Rosen, M. K., 2003, A conserved amphipathic helix in WASP/Scar proteins is essential for activation of Arp2/3 complex: *Nature Structural Biology*, 10, 591-598.

Pantaloni, D., Boujemaa, R., Didry, D., Gounon, P., and Carlier, M. F., 2000, The Arp2/3 complex branches filament barbed ends: functional antagonism with capping proteins: *Nature Cell Biology*, 2, 385-391.

Parton, R. G., Joggerst, B., and Simons, K., 1994, Regulated Internalization of Caveolae: *Journal of Cell Biology*, 127, 1199-1215.

Pelham, H. R., 1991, Recycling of proteins between the endoplasmic reticulum and Golgi complex: *Current Opinion in Cell Biology*, 3, 585-591.

Pelham, H. R., 1998, Getting through the Golgi complex: *Trends in Cell Biology*, 8, 45-49.

Peng, J., Wallar, B. J., Flanders, A., Swiatek, P. J., and Alberts, A. S., 2003, Disruption of the diaphanous-related formin Drf1 gene encoding mDia1 reveals a role for Drf3 as an effector for Cdc42: *Current Biology*, 13, 534-545.

Pestonjamasp, K., Amieva, M. R., Strassel, C. P., Nauseef, W. M., Furthmayr, H., and Luna, E. J., 1995, Moesin, ezrin, and p205 are actin-binding proteins associated with neutrophil plasma membranes: *Molecular Biology of the Cell*, 6, 247-259.

Philips, M. R., Pillinger, M. H., Staud, R., Volker, C., Rosenfeld, M. G., Weissmann, G., and Stock, J. B., 1993, Carboxyl Methylation of Ras-Related Proteins During Signal Transduction in Neutrophils: *Science*, 259, 977-980.

Philips, M. R., Feoktistov, A. S., and Pillinger, M. H., 1995, Carboxyl Methylation of Rho-Family Ras-Related Proteins in Human Neutrophils Is Associated with Actin Polymerization: *Arthritis and Rheumatism*, 38, 159.

Polishchuk, R. S. and Mironov, A. A., 2004, Structural aspects of Golgi function: *Cellular and Molecular Life Sciences*, 61, 146-158.

Pollard, T. D., 1986, Rate constants for the reactions of ATP- and ADP-actin with the ends of actin filaments: *Journal of Cell Biology*, 103, 2747-2754.

Pollard, T. D., Blanchoin, L., and Mullins, R. D., 2000, Molecular mechanisms controlling actin filament dynamics in nonmuscle cells: *Annu Rev Biophys Biomol Struct*, 29, 545-576.

Pollard, T. D. and Borisy, G. G., 2003, Cellular motility driven by assembly and disassembly of actin filaments: *Cell*, 112, 453-465.

Prehoda, K. E., Scott, J. A., Mullins, R. D., and Lim, W. A., 2000, Integration of multiple signals through cooperative regulation of the N-WASP-Arp2/3 complex: *Science*, 290, 801-806.

Prescott, A. R., Lucocq, J. M., James, J., Lister, J. M., and Ponnambalam, S., 1997, Distinct compartmentalization of TGN46 and beta 1,4-galactosyltransferase in HeLa cells: *European Journal of Cell Biology*, 72, 238-246.

Presley, J. F., Cole, N. B., Schroer, T. A., Hirschberg, K., Zaal, K. J. M., and Lippincott-Schwartz, J., 1997, ER-to-Golgi transport visualized in living cells: *Nature*, 389, 81-85.

Qiu, R. G., Chen, J., McCormick, F., and Symons, M., 1995, A Role for Rho in Ras Transformation: *Proceedings of the National Academy of Sciences of the United States of America*, 92, 11781-11785.

Qualmann, B., Roos, J., DiGregorio, P. J., and Kelly, R. B., 1999, Syndapin I, a synaptic dynamin binding protein that associates with the neural Wiskott-Aldrich syndrome protein: *Molecular Biology of the Cell*, 10, 501-513.

Qualmann, B., Kessels, M. M., and Kelly, R. B., 2000, Molecular links between endocytosis and the actin cytoskeleton: *Journal of Cell Biology*, 150, F111-F116.

Qualmann, B. and Mellor, H., 2003, Regulation of endocytic traffic by rho GTPases: *Biochemical Journal*, 371, 233-241.

Raftopoulou, M. and Hall, A., 2004, Cell migration: Rho GTPases lead the way: *Developmental Biology*, 265, 23-32.

Ren, X. D., Bokoch, G. M., Traynor-Kaplan, A., Jenkins, G. H., Anderson, R. A., and Schwartz, M. A., 1996, Physical association of the small GTPase Rho with a 68-kDa

phosphatidylinositol 4-phosphate 5-kinase in Swiss 3T3 cells: *Molecular Biology of the Cell*, 7, 435-442.

Rexach, M. F., Latterich, M., and Schekman, R. W., 1994, Characteristics of endoplasmic reticulum-derived transport vesicles: *Journal of Cell Biology*, 126, 1133-1148.

Ridley, A. J., Paterson, H. F., Johnston, C. L., Diekmann, D., and Hall, A., 1992, The Small Gtp-Binding Protein Rac Regulates Growth-Factor Induced Membrane Ruffling: *Cell*, 70, 401-410.

Ridley, A. J., 1999, Stress fibres take shape: *Nature Cell Biology*, 1, E64-E66.

Ridley, A. J., 2001(a), Rho proteins: Linking signaling with membrane trafficking: *Traffic*, 2, 303-310.

Ridley, A. J., 2001(b), Rho GTPases and cell migration: *Journal of Cell Science*, 114, 2713-2722.

Robinson, R. C., Turbedsky, K., Kaiser, D. A., Marchand, J. B., Higgs, H. N., Choe, S., and Pollard, T. D., 2001, Crystal structure of Arp2/3 complex: *Science*, 294, 1679-1684.

Rogalski, A. A. and Singer, S. J., 1984, Associations of Elements of the Golgi-Apparatus with Microtubules: *Journal of Cell Biology*, 99, 1092-1100.

Roghi, C. and Allan, V. J., 1999, Dynamic association of cytoplasmic dynein heavy chain 1a with the Golgi apparatus and intermediate compartment: *Journal of Cell Science*, 112, 4673-4685.

Rohatgi, R., Ma, L., Miki, H., Lopez, M., Kirchhausen, T., Takenawa, T., and Kirschner, M. W., 1999, The interaction between N-WASP and the Arp2/3 complex links Cdc42-dependent signals to actin assembly: *Cell*, 97, 221-231.

Rojas, R., Ruiz, W. G., Leung, S. M., Jou, T. S., and Apodaca, G., 2001, Cdc42-dependent modulation of tight junctions and membrane protein traffic in polarized madin-darby canine kidney cells: *Molecular Biology of the Cell*, 12, 2257-2274.

Rojo, M., Emery, G., Marjomaki, V., McDowall, A. W., Parton, R. G., and Gruenberg, J., 2000, The transmembrane protein p23 contributes to the organization of the Golgi apparatus: *Journal of Cell Science*, 113 (Pt 6), 1043-1057.

Rothman, J. E., 1994, Intracellular membrane fusion: *Adv Second Messenger Phosphoprotein Res*, 29, 81-96.

Rothman, J. E. and Warren, G., 1994, Implications of the Snare Hypothesis for Intracellular Membrane Topology and Dynamics: *Current Biology*, 4, 220-233.

Rothman, J. E. and Wieland, F. T., 1996, Protein sorting by transport vesicles: *Science*, 272, 227-234.

Rowe, T., Aridor, M., McCaffery, J. M., Plutner, H., Nuoffer, C., and Balch, W. E., 1996, COPII vesicles derived from mammalian endoplasmic reticulum microsomes recruit COPI: *Journal of Cell Biology*, 135, 895-911.

Rozelle, A. L., Machesky, L. M., Yamamoto, M., Driessens, M. H., Insall, R. H., Roth, M. G., Luby-Phelps, K., Marriott, G., Hall, A., and Yin, H. L., 2000, Phosphatidylinositol 4,5-bisphosphate induces actin-based movement of raft-enriched vesicles through WASP-Arp2/3: *Current Biology*, 10, 311-320.

Sahai, E., Alberts, A. S., and Treisman, R., 1998, RhoA effector mutants reveal distinct effector pathways for cytoskeletal reorganization, SRF activation and transformation: *Embo Journal*, 17, 1350-1361.

Scales, S. J., Pepperkok, R., and Kreis, T. E., 1997, Visualization of ER-to-Golgi transport in living cells reveals a sequential mode of action for COPII and COPI: *Cell*, 90, 1137-1148.

Schafer, D. A., Jennings, P. B., and Cooper, J. A., 1996, Dynamics of capping protein and actin assembly in vitro: uncapping barbed ends by polyphosphoinositides: *Journal of Cell Biology*, 135, 169-179.

Schafer, D. A., D'Souza-Schorey, C., and Cooper, J. A., 2000, Actin assembly at membranes controlled by ARF6: *Traffic*, 1, 892-903.

Schafer, D. A., 2002, Coupling actin dynamics and membrane dynamics during endocytosis: *Current Opinion in Cell Biology*, 14, 76-81.

Schekman, R., and Orci, L., 1996, Coat proteins and vesicle budding: *Science*, 271, 1526-33.

Schlegel, A. and Lisanti, M. P., 2001, Caveolae and their coat proteins, the caveolins: From electron microscopic novelty to biological launching pad: *Journal of Cellular Physiology*, 186, 329-337.

Schliwa, M. and Woehlke, G., 2003, Molecular motors: *Nature*, 422, 759-765.

Schutze, M. P., Peterson, P. A., and Jackson, M. R., 1994, An N-terminal double-arginine motif maintains type II membrane proteins in the endoplasmic reticulum: *Embo Journal*, 13, 1696-1705.

Seemann, J., Jokitalo, E., Pypaert, M., and Warren, G., 2000, Matrix protein can generate the higher order architecture of the Golgi apparatus: *Nature*, 407, 1022-1026.

Self, A. J. and Hall, A., 1995, Measurement of Intrinsic Nucleotide Exchange and Gtp Hydrolysis Rates: *Small Gtpases and Their Regulators*, Pt B, 256, 67-76.

Sells, M. A., Knaus, U. G., Bagrodia, S., Ambrose, D. M., Bokoch, G. M., and Chernoff, J., 1997, Human p21-activated kinase (Pak1) regulates actin organization in

mammalian cells: *Current Biology*, 7, 202-210.

Sepp, K. J. and Auld, V. J., 2003, RhoA and Rac1 GTPases mediate the dynamic rearrangement of actin in peripheral glia: *Development*, 130, 1825-1835.

Sesso, A., de Faria, F. P., Iwamura, E. S., and Correa, H., 1994, A three-dimensional reconstruction study of the rough ER-Golgi interface in serial thin sections of the pancreatic acinar cell of the rat: *Journal of Cell Science*, 107 (Pt 3), 517-528.

Shaywitz, D. A., Orci, L., Ravazzola, M., Swaroop, A., and Kaiser, C. A., 1995, Human Sec13Rp Functions in Yeast and Is Located on Transport Vesicles Budding from the Endoplasmic-Reticulum: *Journal of Cell Biology*, 128, 769-777.

Shaywitz, D. A., Espenshade, P. J., Gimeno, R. E., and Kaiser, C. A., 1997, COPII subunit interactions in the assembly of the vesicle coat: *Journal of Biological Chemistry*, 272, 25413-25416.

Slot, J. W., Geuze, H. J., Gigengack, S., Lienhard, G. E., and James, D. E., 1991, Immuno-Localization of the Insulin Regulatable Glucose Transporter in Brown Adipose-Tissue of the Rat: *Journal of Cell Biology*, 113, 123-135.

Small, J. V., Isenberg, G., and Celis, J. E., 1978, Polarity of Actin at Leading-Edge of Cultured-Cells: *Nature*, 272, 638-639.

Small, J. V., Stradal, T., Vignal, E., and Rottner, K., 2002, The lamellipodium: where motility begins: *Trends in Cell Biology*, 12, 112-120.

Sohn, K., Orci, L., Ravazzola, M., Amherdt, M., Bremser, M., Lottspeich, F., Fiedler, K., Helms, J. B., and Wieland, F. T., 1996, A major transmembrane protein of Golgi-derived COPI-coated vesicles involved in coatomer binding: *Journal of Cell Biology*, 135, 1239-1248.

Sollner, T., Whitehart, S. W., Brunner, M., Erdjumentbromage, H., Geromanos, S., Tempst, P., and Rothman, J. E., 1993, Snap Receptors Implicated in Vesicle Targeting and Fusion: *Nature*, 362, 318-324.

Sonnichsen, B., Watson, R., Clausen, H., Misteli, T., and Warren, G., 1996, Sorting by COP I-coated vesicles under interphase and mitotic conditions: *Journal of Cell Biology*, 134, 1411-1425.

Springer, S. and Schekman, R., 1998, Nucleation of COPII vesicular coat complex by endoplasmic reticulum to Golgi vesicle SNAREs: *Science*, 281, 698-700.

Steel, G. J. and Morgan, A., 1998, Selective stimulation of the D1 ATPase domain of N-ethylmaleimide-sensitive fusion protein (NSF) by soluble NSF attachment proteins: *FEBS Letters*, 423, 113-116.

Steffen, A., Rottner, K., Ehinger, J., Innocenti, M., Scita, G., Wehland, A., and Stradal, T. E. B., 2004, Sra-1 and Nap1 link Rac to actin assembly driving lamellipodia formation: *EMBO Journal*, 23, 749-759.

Stephens, D. J. and Pepperkok, R., 2002, Imaging of procollagen transport reveals COPI-dependent cargo sorting during ER-to-Golgi transport in mammalian cells: *Journal of Cell Science*, 115, 1149-1160.

Storrie, B., White, J., Rottger, S., Stelzer, E. H., Suganuma, T., and Nilsson, T., 1998, Recycling of golgi-resident glycosyltransferases through the ER reveals a novel pathway and provides an explanation for nocodazole-induced Golgi scattering: *Journal of Cell Biology*, 143, 1505-1521.

Suetsugu, S., Miki, H., and Takenawa, T., 1999, Identification of two human WAVE/SCAR homologues as general actin regulatory molecules which associate with the Arp2/3 complex: *Biochemical & Biophysical Research Communication* 24, 296-302.

Suetsugu, S., Hattori, M., Miki, H., Tezuka, T., Yamamoto, T., Mikoshiba, K., and Takenawa, T., 2002, Sustained activation of N-WASP through phosphorylation is essential for neurite extension: *Developmental Cell*, 3, 645-658.

Suetsugu, S. and Takenawa, T., 2003, Translocation of N-WASP by nuclear localization and export signals into the nucleus modulates expression of HSP90: *Journal of Biological Chemistry*, 278, 42515-42523.

Suetsugu, S., Yamazaki, D., Kurisu, S., and Takenawa, T., 2003, Differential roles of WAVE1 and WAVE2 in dorsal and peripheral ruffle formation for fibroblast cell migration: *Developmental Cell*, 5, 595-609.

Svitkina, T. M. and Borisy, G. G., 1999, Arp2/3 complex and actin depolymerizing factor/cofilin in dendritic organization and treadmilling of actin filament array in lamellipodia: *Journal of Cell Biology*, 145, 1009-1026.

Svitkina, T. M., Bulanova, E. A., Chaga, O. Y., Vignjevic, D. M., Kojima, S., Vasiliev, J. M., and Borisy, G. G., 2003, Mechanism of filopodia initiation by reorganization of a dendritic network: *Journal of Cell Biology*, 160, 409-421.

Symons, M. and Settleman, J., 2000, Rho family GTPases: more than simple switches: *Trends in Cell Biology*, 10, 415-419.

Symons, M. and Rusk, N., 2003, Control of vesicular trafficking by Rho GTPases: *Current Biology*, 13, R409-R418

Tai, A. W., Chuang, J. Z., and Sung, C. H., 1998, Localization of Tctex-1, a cytoplasmic dynein light chain, to the golgi apparatus and evidence for dynein complex heterogeneity: *Journal of Biological Chemistry*, 273, 19639-19649.

Takahashi, K., Sasaki, T., Mammoto, A., Hotta, I., Takaishi, K., Imamura, H., Nakano, K., Kodama, A., and Takai, Y., 1998, Interaction of radixin with Rho small G protein GDP/GTP exchange protein Dbl: *Oncogene*, 16, 3279-3284.

Takai, Y., Sasaki, T., and Matozaki, T., 2001, Small GTP-binding proteins: *Physiological Reviews*, 81, 153-208.

Tang, B. L., Kausalya, J., Low, D. Y. H., Lock, M. L., and Hong, W. J., 1999, A family of mammalian proteins homologous to yeast Sec24p: *Biochemical and Biophysical Research Communications*, 258, 679-684.

Taunton, J., Rowning, B. A., Coughlin, M. L., Wu, M., Moon, R. T., Mitchison, T. J., and Larabell, C. A., 2000, Actin-dependent propulsion of endosomes and lysosomes by recruitment of N-WASP: *Journal of Cell Biology*, 148, 519-530.

Tepass, U. and Tanentzapf, G., 2001, Epithelial cell polarity and cell junctions in *Drosophila*: *Annual Review of Genetics*, 35, 747-784.

Terasaki, M., Chen, L. B., and Fujiwara, K., 1986, Microtubules and the endoplasmic reticulum are highly interdependent structures: *Journal of Cell Biology*, 103, 1557-1568.

Tolias, K. F., Hartwig, J. H., Ishihara, H., Shibasaki, Y., Cantley, L. C., and Carpenter, C. L., 2000, Type I alpha phosphatidylinositol-4-phosphate 5-kinase mediates Rac-dependent actin assembly: *Current Biology*, 10, 153-156.

Tsukita, S. and Yonemura, S., 1999, Cortical actin organization: lessons from ERM (ezrin/radixin/moesin) proteins: *Journal of Biological Chemistry*, 274, 34507-34510.

Uruno, T., Liu, J. L., Li, Y. S., Smith, N., and Zhan, X., 2003, Sequential interaction of actin-related proteins 2 and 3 (Arp2/3) complex with neural Wiscott-Aldrich syndrome protein (N-WASP) and cortactin during branched actin filament network formation: *Journal of Biological Chemistry*, 278, 26086-26093.

Vaisberg, E. A., Grissom, P. M., and McIntosh, J. R., 1996, Mammalian cells express three distinct dynein heavy chains that are localized to different cytoplasmic organelles: *Journal of Cell Biology*, 133, 831-842.

Valderrama, F., Babia, T., Ayala, I., Kok, J. W., Renau-Piqueras, J., and Egea, G., 1998, Actin microfilaments are essential for the cytological positioning and morphology of the Golgi complex: *European Journal of Cell Biology*, 76, 9-17.

Valderrama, F., Luna, A., Babia, T., Martinez-Menarguez, J. A., Ballesta, J., Barth, H., Chaponnier, C., Renau-Piqueras, J., and Egea, G., 2000, The golgi-associated COPI-coated buds and vesicles contain beta/gamma -actin: *Proceedings of the National Academy of Sciences of the United States of America*, 97, 1560-1565.

Valderrama, F., Duran, M., Babia, T., Barth, H., Renau-Piqueras, J., and Egea, G., 2001, Actin Microfilaments Facilitate the Retrograde Transport from the Golgi Complex to the Endoplasmic Reticulum in Mammalian Cells: *Traffic*, 2, 717-726.

Vale, R. D., 1987, Intracellular transport using microtubule-based motors: *Annual Review of Cell Biology*, 3, 347-378.

Vale, R. D., 2003, The molecular motor toolbox for intracellular transport: *Cell*, 112,

467-480.

VanAelst, L., Joneson, T., and Barsagi, D., 1996, Identification of a novel Rac1-interacting protein involved in membrane ruffling: *Embo Journal*, 15, 3778-3786.

Van Aelst, L. and Symons, M., 2002, Role of Rho family GTPases in epithelial morphogenesis: *Genes & Development*, 16, 1032-1054.

Vandekerckhove, J. and Weber, K., 1984, Chordate muscle actins differ distinctly from invertebrate muscle actins. The evolution of the different vertebrate muscle actins: *J Mol Biol*, 179, 391-413.

Vasioukhin, V., Bauer, C., Yin, M., and Fuchs, E., 2000, Directed actin polymerization is the driving force for epithelial cell-cell adhesion: *Cell*, 100, 209-219.

Walev, I., Bhakdi, S. C., Hofmann, F., Djonder, N., Valeva, A., Aktories, K., and Bhakdi, S., 2001, Delivery of proteins into living cells by reversible membrane permeabilization with streptolysin-O: *Proceedings of the National Academy of Sciences of the United States of America*, 98, 3185-3190.

Wallar, B. J. and Alberts, A. S., 2003, The formins: active scaffolds that remodel the cytoskeleton: *Trends in Cell Biology*, 13, 435-446.

Walworth, N. C., Brennwald, P., Kabcenell, A. K., Garrett, M., and Novick, P., 1992, Hydrolysis of GTP by Sec4 protein plays an important role in vesicular transport and is stimulated by a GTPase-activating protein in *Saccharomyces cerevisiae*: *Molecular and Cellular Biology*, 12, 2017-2028.

Ward, T. H., Polishchuk, R. S., Caplan, S., Hirschberg, H., and Lippincott-Schwartz, J., 2001, Maintenance of Golgi structure and function depends on the integrity of ER export: *Journal of Cell Biology*, 155, 557-570.

Warren, G. and Mellman, I., 1999, Bulk flow redux?: *Cell*, 98, 125-127.

Wasserman, S., 1998, FH proteins as cytoskeletal organizers: *Trends in Cell Biology*, 8, 111-115.

Watanabe, N., Kato, T., Fujita, A., Ishizaki, T., and Narumiya, S., 1999, Cooperation between mDia1 and ROCK in Rho-induced actin reorganization: *Nat Cell Biol*, 1, 136-143.

Waters, M. G., Serafini, T., and Rothman, J. E., 1991, 'Coatomer': a cytosolic protein complex containing subunits of non-clathrin-coated Golgi transport vesicles: *Nature*, 349, 248-251.

Weaver, A. M., Karginov, A. V., Kinley, A. W., Weed, S. A., Li, Y., Parsons, J. T., and Cooper, J. A., 2001, Cortactin promotes and stabilizes Arp2/3-induced actin filament network formation: *Current Biology*, 11, 370-374.

Weaver, A. M., Heuser, J. E., Karginov, A. V., Lee, W. L., Parsons, J. T., and Cooper, J. A., 2002, Interaction of cortactin and N-WASP with Arp2/3 complex: Current Biology, 12, 1270-1278.

Weed, S. A., Du, Y. R., and Parsons, J. T., 1998, Translocation of cortactin to the cell periphery is mediated by the small GTPase Rac1: Journal of Cell Science, 111, 2433-2443.

Weed, S.A., Karginov, A.V., Schafer, D.A., Weaver, A.M., Kinley, A.W., Cooper, J.A., and Parsons, J.T., 2000, Cortactin localization to sites of actin assembly in lamellipodia requires interactions with F-actin and the Arp2/3 complex: Journal of Cell Biology, 151,29-40.

Weernink, P. A. O., Schulte, P., Guo, Y. J., Wetzels, J., Amano, M., Kaibuchi, K., Haverland, S., Voss, M., Schmidt, M., Mayr, G. W., and Jakobs, K. H., 2000, Stimulation of phosphatidylinositol-4-phosphate 5-kinase by Rho-kinase: Journal of Biological Chemistry, 275, 10168-10174.

Wegner, A., 1982, Treadmilling of actin at physiological salt concentrations. An analysis of the critical concentrations of actin filaments: J Mol Biol, 161, 607-615.

White, J., Johannes, L., Mallard, F., Girod, A., Grill, S., Reinsch, S., Keller, P., Tzschaschel, B., Echard, A., Goud, B., and Stelzer, E. H., 1999, Rab6 coordinates a novel Golgi to ER retrograde transport pathway in live cells: Journal of Cell Biology, 147, 743-760.

Wieland, F. T., Gleason, M. L., Serafini, T. A., and Rothman, J. E., 1987, The rate of bulk flow from the endoplasmic reticulum to the cell surface: Cell, 50, 289-300.

Woehlke, G. and Schliwa, M., 2000, Walking on two heads: the many talents of kinesin: Nature Review of Molecular and Cellular Biology, 1, 50-58.

Wu, W. J., Leonard, D. A., ACerione, R., and Manor, D., 1997, Interaction between Cdc42Hs and RhoGDI is mediated through the Rho insert region: Journal of Biological Chemistry, 272, 26153-26158.

Wu, W. J., Erickson, J. W., Lin, R., and Cerione, R. A., 2000, The gamma-subunit of the coatamer complex binds Cdc42 to mediate transformation: Nature, 405, 800-804.

Xu, Y. W., Moseley, J. B., Sagot, I., Poy, F., Pellman, D., Goode, B. L., and Eck, M. J., 2004, Crystal structures of a formin homology-2 domain reveal a tethered dimer architecture: Cell, 116, 711-723.

Yamanaka, T., Horikoshi, Y., Suzuki, A., Sugiyama, Y., Kitamura, K., Maniwa, R., Nagai, Y., Yamashita, A., Hirose, T., Ishikawa, H., and Ohno, S., 2001, PAR-6 regulates aPKC activity in a novel way and mediates cell-cell contact-induced formation of the epithelial junctional complex: Genes to Cells, 6, 721-731.

Yang, Z. H. and Goldstein, L. S. B., 1998, Characterization of the KIF3C neural kinesin-like motor from mouse: *Molecular Biology of the Cell*, 9, 249-261.

Yao, X., Chaponnier, C., Gabbiani, G., and Forte, J. G., 1995, Polarized distribution of actin isoforms in gastric parietal cells: *Molecular Biology of the Cell*, 6, 541-557.

Yoshihisa, T., Barlowe, C., and Schekman, R., 1993, Requirement for a GTPase-activating protein in vesicle budding from the endoplasmic reticulum: *Science*, 259, 1466-1468.

Young, J., Stauber, T., del Nery, E., Vernos, I., Pepperkok, R., and Nilsson, T., 2005, Regulation of microtubule-dependent recycling at the trans-golgi network by Rab6A and Rab6A: *Molecular Biology of the Cell*, 16, 162-177.

Zalevsky, J., Grigorova, I., and Mullins, R. D., 2001, Activation of the Arp2/3 complex by the *Listeria* ActA protein - ActA binds two actin monomers and three subunits of the Arp2/3 complex: *Journal of Biological Chemistry*, 276, 3468-3475.

Zeller, R., Haramis, A. G., Zuniga, A., McGuigan, C., Dono, R., Davidson, G., and Chabanis, S., 1999, Formin defines a large family of morphoregulatory genes and functions in establishment of the polarising region: *Cell and Tissue Research*, 296, 85-93.

Zettl, M. and Way, M., 2001, New tricks for an old dog?: *Nature Cell Biology*, 3, E74-E75.

Zhang, J., Shehabeldin, A., da Cruz, L. A. G., Butler, J., Somani, A. K., McGavin, M., Koziaradzki, I., dos Santos, A. O., Nagy, A., Grinstein, S., Penninger, J. M., and Siminovitch, K. A., 1999, Antigen receptor-induced activation and cytoskeletal rearrangement are impaired in Wiskott-Aldrich syndrome protein-deficient lymphocytes: *Journal of Experimental Medicine*, 190, 1329-1341.

Zohn, I. M., Campbell, S. L., Khosravi-Far, R., Rossman, K. L., and Der, C. J., 1998, Rho family proteins and Ras transformation: the RHOad less traveled gets congested *Journal of Experimental Medicine: Oncogene*, 17, 1415-1438.

Zhu, J., Zhou, K., Jao, J. J., Liu, J., Smith, N., and Zhan, X., 2005, Regulation of cortactin/dynamin interaction by actin polymerization during the fission of clathrin-coated Pits: *Journal of Cell Science*, 118, 807-817.