

DEPARTAMENTO DE BIOLOGÍA CELULAR Y ANATOMÍA PATOLÓGICA
FACULTAD DE MEDICINA



**IMPLICACIÓN DE LOS FILAMENTOS DE ACTINA EN LA ARQUITECTURA,
HOMEOSTASIS Y TRÁFICO DE SALIDA DEL APARATO DE GOLGI
Y
ESTUDIO DE LA FORMACIÓN Y DEGRADACIÓN DE
UN AGRESOMA DE ACTINA**

El director

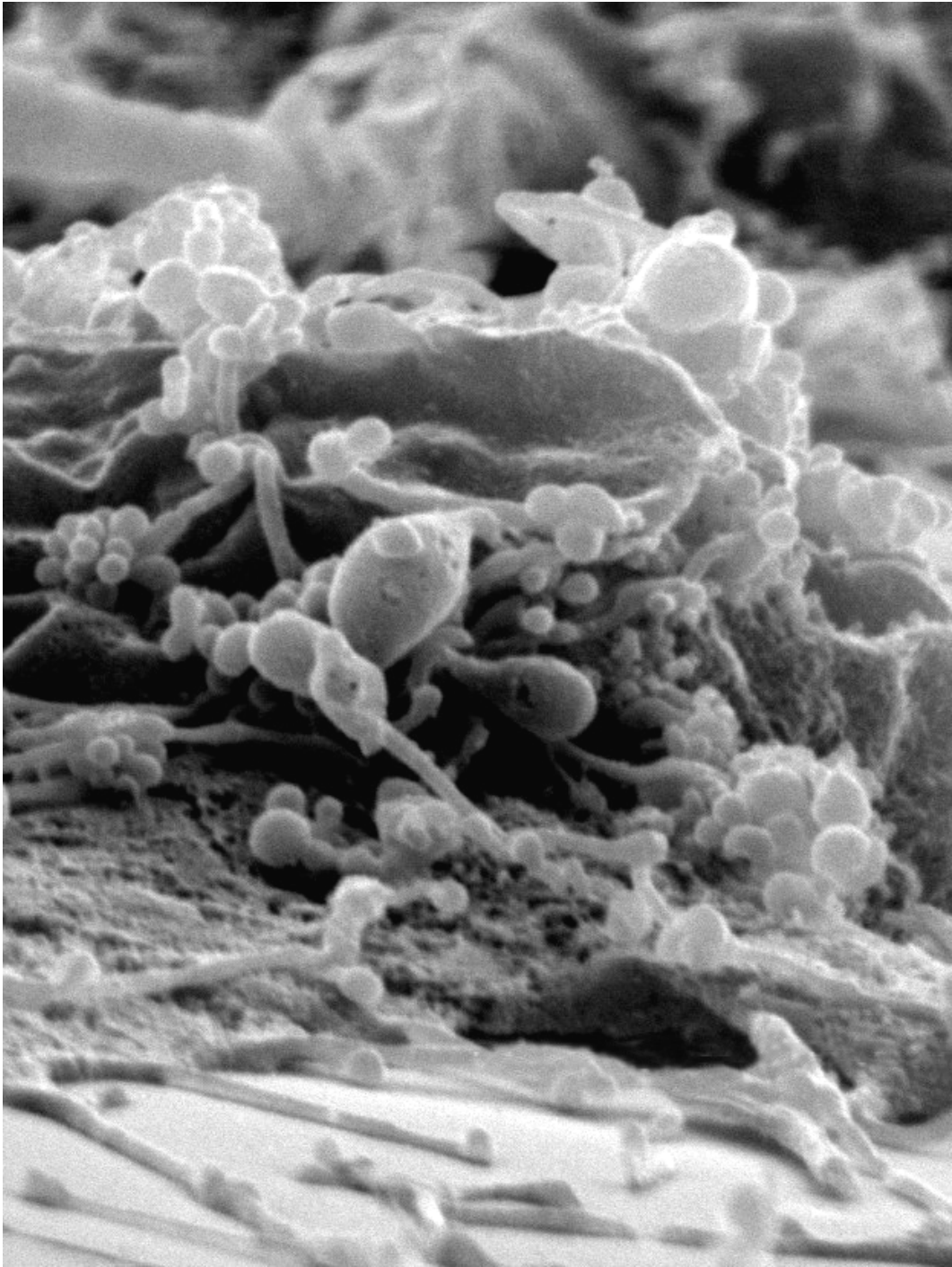
El autor

Gustavo Egea

Francisco Lázaro Diéguez

Tesis presentada por Francisco Lázaro Diéguez
dirigida por el Dr. Gustavo Egea
para optar al título de Doctor por la Universidad de Barcelona

Barcelona, Marzo de 2008



- BIBLIOGRAFÍA -

- Aguda,A.H., Burtnick,L.D., and Robinson,R.C. (2005). The state of the filament. *EMBO Rep.* 6, 220-226.
- Aharonovitz,O., Zaun,H.C., Balla,T., York,J.D., Orłowski,J., and Grinstein,S. (2000). Intracellular pH regulation by Na⁽⁺⁾/H⁽⁺⁾ exchange requires phosphatidylinositol 4,5-bisphosphate. *J. Cell Biol.* 150, 213-224.
- Ahmad,M., Attoub,S., Singh,M.N., Martin,F.L., and El Agnaf,O.M. (2007). Gamma-synuclein and the progression of cancer. *FASEB J.* 21, 3419-3430.
- Ahuja,R., Pinyol,R., Reichenbach,N., Custer,L., Klingensmith,J., Kessels,M.M., and Qualmann,B. (2007). Cordon-bleu is an actin nucleation factor and controls neuronal morphology. *Cell* 131, 337-350.
- Aizawa,H., Fukui,Y., and Yahara,I. (1997). Live dynamics of Dictyostelium cofilin suggests a role in remodeling actin latticework into bundles. *J. Cell Sci.* 110 (Pt 19), 2333-2344.
- Akel,A., Wagner,C.A., Kovacicova,J., Kasinathan,R.S., Kiedaisch,V., Koka,S., Alper,S.L., Bernhardt,I., Wieder,T., Huber,S.M., and Lang,F. (2007). Enhanced suicidal death of erythrocytes from gene-targeted mice lacking the Cl-/HCO₃(-)-exchanger AE1. *Am. J. Physiol Cell Physiol* 292, C1759-C1767.
- Aktories,K. and Barth,H. (2004). Clostridium botulinum C2 toxin--new insights into the cellular up-take of the actin-ADP-ribosylating toxin. *Int. J. Med. Microbiol.* 293, 557-564.
- Alberts,A.S. (2001). Identification of a carboxyl-terminal diaphanous-related formin homology protein autoregulatory domain. *J. Biol. Chem.* 276, 2824-2830.
- Alberts,A.S. (2002). Diaphanous-related Formin homology proteins. *Curr. Biol.* 12, R796.
- Alexander,R.T., Furuya,W., Szaszi,K., Orłowski,J., and Grinstein,S. (2005). Rho GTPases dictate the mobility of the Na/H exchanger NHE3 in epithelia: role in apical retention and targeting. *Proc. Natl. Acad. Sci. U. S. A* 102, 12253-12258.
- Allingham,J.S., Klenchin,V.A., and Rayment,I. (2006). Actin-targeting natural products: structures, properties and mechanisms of action. *Cell Mol. Life Sci.* 63, 2119-2134.
- Allingham,J.S., Zampella,A., D'Auria,M.V., and Rayment,I. (2005). Structures of microfilament destabilizing toxins bound to actin provide insight into toxin design and activity. *Proc. Natl. Acad. Sci. U. S. A* 102, 14527-14532.
- Amos,L.A., van den,E.F., and Lowe,J. (2004). Structural/functional homology between the bacterial and eukaryotic cytoskeletons. *Curr. Opin. Cell Biol.* 16, 24-31.
- Anderson,R.G. and Jacobson,K. (2002). A role for lipid shells in targeting proteins to caveolae, rafts, and other lipid domains. *Science* 296, 1821-1825.
- Ang,A.L., Folsch,H., Koivisto,U.M., Pypaert,M., and Mellman,I. (2003). The Rab8 GTPase selectively regulates AP-1B-dependent basolateral transport in polarized Madin-Darby canine kidney cells. *J. Cell Biol.* 163, 339-350.
- Anton,I.M., Jones,G.E., Wandosell,F., Geha,R., and Ramesh,N. (2007). WASP-interacting protein (WIP): working in polymerisation and much more. *Trends Cell Biol.* 17, 555-562.
- Arcangeletti,C., Sutterlin,R., Aebi,U., De Conto,F., Missorini,S., Chezzi,C., and Scherrer,K. (1997). Visualization of prosomes (MCP-proteasomes), intermediate filament and actin networks by "instantaneous fixation" preserving the cytoskeleton. *J. Struct. Biol.* 119, 35-58.
- 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. *J. Cell Biol.* 141, 61-70.
- Aschenbrenner,L., Lee,T., and Hasson,T. (2003). Myo6 facilitates the translocation of endocytic vesicles from cell peripheries. *Mol. Biol. Cell* 14, 2728-2743.
- Asher,G., Reuven,N., and Shaul,Y. (2006). 20S proteasomes and protein degradation "by default". *Bioessays* 28, 844-849.
- Au,J.S., Puri,C., Ihrke,G., Kendrick-Jones,J., and Buss,F. (2007). Myosin VI is required for sorting of AP-1B-dependent cargo to the basolateral domain in polarized MDCK cells. *J. Cell Biol.* 177, 103-114.
- Avila,J. and Hernandez,F. (2007). GSK-3 inhibitors for Alzheimer's disease. *Expert. Rev. Neurother.* 7, 1527-1533.
- Axelsson,M.A., Karlsson,N.G., Steel,D.M., Ouwendijk,J., Nilsson,T., and Hansson,G.C. (2001). Neutralization of pH in the Golgi apparatus causes redistribution of glycosyltransferases and changes in the O-glycosylation of mucins. *Glycobiology* 11, 633-644.
- Azorin,I., Portoles,M., Marin,P., Lazaro-Dieguez,F., Megias,L., Egea,G., and Renau-Piqueras,J. (2004). Prenatal ethanol exposure alters the cytoskeleton and induces glycoprotein microheterogeneity in rat newborn hepatocytes. *Alcohol Alcohol* 39, 203-212.
- Bader,N., Jung,T., and Grune,T. (2007). The proteasome and its role in nuclear protein maintenance. *Exp. Gerontol.* 42, 864-870.
- Bai,R., Verdier-Pinard,P., Gangwar,S., Stessman,C.C., McClure,K.J., Sausville,E.A., Pettit,G.R., Bates,R.B., and Hamel,E. (2001). Dolastatin 11, a marine depsipeptide, arrests cells at cytokinesis and induces hyperpolymerization of purified actin. *Mol. Pharmacol.* 59, 462-469.
- Baker,J.P. and Titus,M.A. (1998). Myosins: matching functions with motors. *Curr. Opin. Cell Biol.* 10, 80-86.
- Balch,W.E., Kahn,R.A., and Schwaninger,R. (1992). ADP-ribosylation factor is required for vesicular trafficking between the endoplasmic reticulum and the cis-Golgi compartment. *J. Biol. Chem.* 267, 13053-13061.
- Bannykh,S.I., Nishimura,N., and Balch,W.E. (1998). Getting into the Golgi. *Trends Cell Biol.* 8, 21-25.
- Bardag-Gorce,F., Riley,N.E., Nan,L., Montgomery,R.O., Li,J., French,B.A., Lue,Y.H., and French,S.W. (2004). The proteasome inhibitor, PS-341, causes cytokeratin aggresome formation. *Exp. Mol. Pathol.* 76, 9-16.
- 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.
- Bauer,N.G. and Richter-Landsberg,C. (2006). The dynamic instability of microtubules is required for aggresome formation in oligodendroglial cells after proteolytic stress. *J. Mol. Neurosci.* 29, 153-168.

- Baumgartner,M., Patel,H., and Barber,D.L. (2004). Na(+)/H(+) exchanger NHE1 as plasma membrane scaffold in the assembly of signaling complexes. *Am. J. Physiol Cell Physiol* 287, C844-C850.
- Bear,J.E., Svitkina,T.M., Krause,M., Schafer,D.A., Loureiro,J.J., Strasser,G.A., Maly,I.V., Chaga,O.Y., Cooper,J.A., Borisy,G.G., and Gertler,F.B. (2002). Antagonism between Ena/VASP proteins and actin filament capping regulates fibroblast motility. *Cell* 109, 509-521.
- Beck,K.A. (2005). Spectrins and the Golgi. *Biochim. Biophys. Acta* 1744, 374-382.
- Becker,B., Bolinger,B., and Melkonian,M. (1995). Anterograde transport of algal scales through the Golgi complex is not mediated by vesicles. *Trends Cell Biol.* 5, 305-307.
- Becker,B. and Melkonian,M. (1996). The secretory pathway of protists: spatial and functional organization and evolution. *Microbiol. Rev.* 60, 697-721.
- Bennett,V. and Baines,A.J. (2001). Spectrin and ankyrin-based pathways: metazoan inventions for integrating cells into tissues. *Physiol Rev.* 81, 1353-1392.
- Bergmann,A. (2007). Autophagy and cell death: no longer at odds. *Cell* 131, 1032-1034.
- Bernstein,B.W., Chen,H., Boyle,J.A., and Bamberg,J.R. (2006). Formation of actin-ADF/cofilin rods transiently retards decline of mitochondrial potential and ATP in stressed neurons. *Am. J. Physiol Cell Physiol* 291, C828-C839.
- Bethune,J., Wieland,F., and Moelleken,J. (2006). COPI-mediated transport. *J. Membr. Biol.* 211, 65-79.
- Bigay,J., Gounon,P., Robineau,S., and Antonny,B. (2003). Lipid packing sensed by ArfGAP1 couples COPI coat disassembly to membrane bilayer curvature. *Nature* 426, 563-566.
- Bishop,A.L. and Hall,A. (2000). Rho GTPases and their effector proteins. *Biochem. J.* 348 Pt 2, 241-255.
- Blazquez,M. and Shennan,K.I. (2000). Basic mechanisms of secretion: sorting into the regulated secretory pathway. *Biochem. Cell Biol.* 78, 181-191.
- Boillee,S., Vande,V.C., and Cleveland,D.W. (2006). ALS: a disease of motor neurons and their nonneuronal neighbors. *Neuron* 52, 39-59.
- Bonifacino,J.S. and Traub,L.M. (2003). Signals for sorting of transmembrane proteins to endosomes and lysosomes. *Annu. Rev. Biochem.* 72, 395-447.
- Bossard,C., Bresson,D., Polishchuk,R.S., and Malhotra,V. (2007). Dimeric PKD regulates membrane fission to form transport carriers at the TGN. *J. Cell Biol.* 179, 1123-1131.
- Brandt,R., Hundelt,M., and Shahani,N. (2005). Tau alteration and neuronal degeneration in tauopathies: mechanisms and models. *Biochim. Biophys. Acta* 1739, 331-354.
- Bremser,M., Nickel,W., Schweikert,M., Ravazzola,M., Amherdt,M., Hughes,C.A., Sollner,T.H., Rothman,J.E., and Wieland,F.T. (1999). Coupling of coat assembly and vesicle budding to packaging of putative cargo receptors. *Cell* 96, 495-506.
- Brodsky,F.M., Chen,C.Y., Knuehl,C., Towler,M.C., and Wakeham,D.E. (2001). Biological basket weaving: formation and function of clathrin-coated vesicles. *Annu. Rev. Cell Dev. Biol.* 17, 517-568.
- Brown,D.A. and London,E. (2000). Structure and function of sphingolipid- and cholesterol-rich membrane rafts. *J. Biol. Chem.* 275, 17221-17224.
- Brownlees,J., Ackerley,S., Grierson,A.J., Jacobsen,N.J., Shea,K., Anderton,B.H., Leigh,P.N., Shaw,C.E., and Miller,C.C. (2002). Charcot-Marie-Tooth disease neurofilament mutations disrupt neurofilament assembly and axonal transport. *Hum. Mol. Genet.* 11, 2837-2844.
- Bubb,M.R., Senderowicz,A.M., Sausville,E.A., Duncan,K.L., and Korn,E.D. (1994). Jasplakinolide, a cytotoxic natural product, induces actin polymerization and competitively inhibits the binding of phalloidin to F-actin. *J. Biol. Chem.* 269, 14869-14871.
- Bubb,M.R., Spector,I., Beyer,B.B., and Fosen,K.M. (2000). Effects of jasplakinolide on the kinetics of actin polymerization. An explanation for certain in vivo observations. *J. Biol. Chem.* 275, 5163-5170.
- Buneeva,O.A. and Medvedev,A.E. (2006). Ubiquitin-protein ligase parkin and its role in the development of Parkinson's disease. *Biochemistry (Mosc.)* 71, 851-860.
- Buss,F., Arden,S.D., Lindsay,M., Luzio,J.P., and Kendrick-Jones,J. (2001). Myosin VI isoform localized to clathrin-coated vesicles with a role in clathrin-mediated endocytosis. *EMBO J.* 20, 3676-3684.
- Buss,F., Spudich,G., and Kendrick-Jones,J. (2004). Myosin VI: cellular functions and motor properties. *Annu. Rev. Cell Dev. Biol.* 20, 649-676.
- 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. *Mol. Cell Biol.* 23, 2162-2170.
- Cao,H., Weller,S., Orth,J.D., Chen,J., Huang,B., Chen,J.L., Stamnes,M., and McNiven,M.A. (2005). Actin and Arf1-dependent recruitment of a cortactin-dynamin complex to the Golgi regulates post-Golgi transport. *Nat. Cell Biol.* 7, 483-492.
- Carlen,B. and Stenram,U. (2005). Primary ciliary dyskinesia: a review. *Ultrastruct. Pathol.* 29, 217-220.
- Caroni,P. (2001). New EMBO members' review: actin cytoskeleton regulation through modulation of PI(4,5)P(2) rafts. *EMBO J.* 20, 4332-4336.
- Carragher,N.O. (2006). Calpain inhibition: a therapeutic strategy targeting multiple disease states. *Curr. Pharm. Des* 12, 615-638.
- Carreno,S., Engqvist-Goldstein,A.E., Zhang,C.X., McDonald,K.L., and Drubin,D.G. (2004). Actin dynamics coupled to clathrin-coated vesicle formation at the trans-Golgi network. *J. Cell Biol.* 165, 781-788.
- Castle,A. and Castle,D. (2005). Ubiquitously expressed secretory carrier membrane proteins (SCAMPs) 1-4 mark different pathways and exhibit limited constitutive trafficking to and from the cell surface. *J. Cell Sci.* 118, 3769-3780.
- Caviston,J.P., Ross,J.L., Antony,S.M., Tokito,M., and Holzbaur,E.L. (2007). Huntingtin facilitates dynein/dynactin-mediated vesicle transport. *Proc. Natl. Acad. Sci. U. S. A* 104, 10045-10050.

- Chandran, J., Ding, J., and Cai, H. (2007). Alsln and the molecular pathways of amyotrophic lateral sclerosis. *Mol. Neurobiol.* *36*, 224-231.
- Chaponnier, C., Goethals, M., Janmey, P.A., Gabbiani, F., Gabbiani, G., and Vandekerckhove, J. (1995). The specific NH₂-terminal sequence Ac-EEED of alpha-smooth muscle actin plays a role in polymerization in vitro and in vivo. *J. Cell Biol.* *130*, 887-895.
- Charras, G.T., Yarrow, J.C., Horton, M.A., Mahadevan, L., and Mitchison, T.J. (2005). Non-equilibration of hydrostatic pressure in blebbing cells. *Nature* *435*, 365-369.
- Chen, H., Khan, A.A., Liu, F., Gilligan, D.M., Peters, L.L., Messick, J., Haschek-Hock, W.M., Li, X., Ostafin, A.E., and Chishti, A.H. (2007). Combined deletion of mouse dematin-headpiece and beta-adducin exerts a novel effect on the spectrin-actin junctions leading to erythrocyte fragility and hemolytic anemia. *J. Biol. Chem.* *282*, 4124-4135.
- Chen, J.L., Fucini, R.V., Lacomis, L., Erdjument-Bromage, H., Tempst, P., and Stames, M. (2005). Coatamer-bound Cdc42 regulates dynein recruitment to COPI vesicles. *J. Cell Biol.* *169*, 383-389.
- Chen, J.L., Lacomis, L., Erdjument-Bromage, H., Tempst, P., and Stames, M. (2004a). Cytosol-derived proteins are sufficient for Arp2/3 recruitment and ARF/coatamer-dependent actin polymerization on Golgi membranes. *FEBS Lett.* *566*, 281-286.
- Chen, S.H., Bubb, M.R., Yarmola, E.G., Zuo, J., Jiang, J., Lee, B.S., Lu, M., Gluck, S.L., Hurst, I.R., and Holliday, L.S. (2004b). Vacuolar H⁺-ATPase binding to microfilaments: regulation in response to phosphatidylinositol 3-kinase activity and detailed characterization of the actin-binding site in subunit B. *J. Biol. Chem.* *279*, 7988-7998.
- Chiosis, G., Caldas, L.E., and Solit, D. (2006). Heat shock protein-90 inhibitors: a chronicle from geldanamycin to today's agents. *Curr. Opin. Investig. Drugs* *7*, 534-541.
- Chou, Y.H., Flitney, F.W., Chang, L., Mendez, M., Grin, B., and Goldman, R.D. (2007). The motility and dynamic properties of intermediate filaments and their constituent proteins. *Exp. Cell Res.* *313*, 2236-2243.
- Chow, C.W., Khurana, S., Woodside, M., Grinstein, S., and Orłowski, J. (1999). The epithelial Na⁽⁺⁾/H⁽⁺⁾ exchanger, NHE3, is internalized through a clathrin-mediated pathway. *J. Biol. Chem.* *274*, 37551-37558.
- Ciechanover, A. (2005a). Intracellular protein degradation: from a vague idea thru the lysosome and the ubiquitin-proteasome system and onto human diseases and drug targeting. *Cell Death. Differ.* *12*, 1178-1190.
- Ciechanover, A. (2005b). Proteolysis: from the lysosome to ubiquitin and the proteasome. *Nat. Rev. Mol. Cell Biol.* *6*, 79-87.
- Ciechanover, A. and Brundin, P. (2003). The ubiquitin proteasome system in neurodegenerative diseases: sometimes the chicken, sometimes the egg. *Neuron* *40*, 427-446.
- Ciechanover, A. and Schwartz, A.L. (2004). The ubiquitin system: pathogenesis of human diseases and drug targeting. *Biochim. Biophys. Acta* *1695*, 3-17.
- Cobbold, C., Coventry, J., Ponnambalam, S., and Monaco, A.P. (2004). Actin and microtubule regulation of trans-Golgi network architecture, and copper-dependent protein transport to the cell surface. *Mol. Membr. Biol.* *21*, 59-66.
- Conner, S.D. and Schmid, S.L. (2003). Regulated portals of entry into the cell. *Nature* *422*, 37-44.
- Corn, P.G. (2007). Role of the ubiquitin proteasome system in renal cell carcinoma. *BMC. Biochem.* *8 Suppl 1*, S4.
- Corthesy-Theulaz, I., Pauloin, A., and Pfeffer, S.R. (1992). Cytoplasmic dynein participates in the centrosomal localization of the Golgi complex. *J. Cell Biol.* *118*, 1333-1345.
- Csizmadia, V., Raczyński, A., Csizmadia, E., Fedyk, E.R., Rottman, J., and Alden, C.L. (2007). Effect of an experimental proteasome inhibitor on the cytoskeleton, cytosolic protein turnover, and induction in the neuronal cells in vitro. *Neurotoxicology*.
- Cvrckova, F., Rivero, F., and Bavlnka, B. (2004). Evolutionarily conserved modules in actin nucleation: lessons from Dictyostelium discoideum and plants. Review article. *Protoplasma* *224*, 15-31.
- D'Souza-Schorey, C. and Chavrier, P. (2006). ARF proteins: roles in membrane traffic and beyond. *Nat. Rev. Mol. Cell Biol.* *7*, 347-358.
- daSilva, L.L., Snapp, E.L., Denecke, J., Lippincott-Schwartz, J., Hawes, C., and Brandizzi, F. (2004). Endoplasmic reticulum export sites and Golgi bodies behave as single mobile secretory units in plant cells. *Plant Cell* *16*, 1753-1771.
- Davis, R.C., Furukawa, R., and Fehhheimer, M. (2008). A cell culture model for investigation of Hirano bodies. *Acta Neuropathol.* *115*, 205-217.
- de Arruda, M.V., Watson, S., Lin, C.S., Leavitt, J., and Matsudaira, P. (1990). Fimbrin is a homologue of the cytoplasmic phosphoprotein plastin and has domains homologous with calmodulin and actin gelation proteins. *J. Cell Biol.* *111*, 1069-1079.
- De Matteis, M.A. and Godi, A. (2004). Protein-lipid interactions in membrane trafficking at the Golgi complex. *Biochim. Biophys. Acta* *1666*, 264-274.
- De, C., V, Gettemans, J., De Ville, Y., Waelkens, E., and Vandekerckhove, J. (1996). Fragmin, a microfilament regulatory protein from Physarum polycephalum, is phosphorylated by casein kinase II-type enzymes. *Biochemistry* *35*, 5472-5480.
- 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 J.* *19*, 199-212.
- del Toro, D., Canals, J.M., Gines, S., Kojima, M., Egea, G., and Alberch, J. (2006). Mutant huntingtin impairs the post-Golgi trafficking of brain-derived neurotrophic factor but not its Val66Met polymorphism. *J. Neurosci.* *26*, 12748-12757.
- Demarchi, F. and Schneider, C. (2007). The calpain system as a modulator of stress/damage response. *Cell Cycle* *6*, 136-138.
- Demaurex, N. (2002). pH Homeostasis of cellular organelles. *News Physiol Sci.* *17*, 1-5.
- Demaurex, N., Furuya, W., D'Souza, S., Bonifacino, J.S., and Grinstein, S. (1998). Mechanism of acidification of the trans-Golgi network (TGN). In situ measurements of pH using retrieval of TGN38 and furin from the cell surface. *J. Biol. Chem.* *273*, 2044-2051.

- DePina,A.S. and Langford,G.M. (1999). Vesicle transport: the role of actin filaments and myosin motors. *Microsc. Res. Tech.* *47*, 93-106.
- DePina,A.S., Wollert,T., and Langford,G.M. (2007). Membrane associated nonmuscle myosin II functions as a motor for actin-based vesicle transport in clam oocyte extracts. *Cell Motil. Cytoskeleton* *64*, 739-755.
- Der,C.J. and Balch,W.E. (2000). GTPase traffic control. *Nature* *405*, 749, 751-749, 752.
- Dettmer,J., Hong-Hermesdorf,A., Stierhof,Y.D., and Schumacher,K. (2006). Vacuolar H⁺-ATPase activity is required for endocytic and secretory trafficking in Arabidopsis. *Plant Cell* *18*, 715-730.
- 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 Motil. Cytoskeleton* *43*, 334-348.
- Dice,J.F. (2007). Chaperone-mediated autophagy. *Autophagy* *3*, 295-299.
- Didier,C., Merdes,A., Gairin,J.E., and Jabrane-Ferrat,N. (2007). Inhibition of Proteasome Activity Impairs Centrosome-dependent Microtubule Nucleation and Organization. *Mol. Biol. Cell*.
- Dixon,N., Pali,T., Ball,S., Harrison,M.A., Marsh,D., Findlay,J.B., and Kee,T.P. (2003). New biophysical probes for structure-activity analyses of vacuolar-H⁺-ATPase enzymes. *Org. Biomol. Chem.* *1*, 4361-4363.
- Dixon,N., Pali,T., Kee,T.P., Ball,S., Harrison,M.A., Findlay,J.B., Nyman,J., Vaananen,K., Finbow,M.E., and Marsh,D. (2008). Interaction of spin-labeled inhibitors of the vacuolar H⁺-ATPase with the transmembrane Vo-sector. *Biophys. J.* *94*, 506-514.
- Donohue,T.M., Jr., Cederbaum,A.I., French,S.W., Barve,S., Gao,B., and Osna,N.A. (2007). Role of the proteasome in ethanol-induced liver pathology. *Alcohol Clin. Exp. Res.* *31*, 1446-1459.
- Doolittle,R.F. and York,A.L. (2002). Bacterial actins? An evolutionary perspective. *Bioessays* *24*, 293-296.
- Drory,O. and Nelson,N. (2006a). Structural and functional features of yeast V-ATPase subunit C. *Biochim. Biophys. Acta* *1757*, 297-303.
- Drory,O. and Nelson,N. (2006b). The emerging structure of vacuolar ATPases. *Physiology. (Bethesda.)* *21*, 317-325.
- 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. *Mol. Biol. Cell* *14*, 445-459.
- Echard,A., Jollivet,F., Martinez,O., Lacapere,J.J., Rousset,A., Janoueix-Lerosey,I., and Goud,B. (1998). Interaction of a Golgi-associated kinesin-like protein with Rab6. *Science* *279*, 580-585.
- Eddidin,M. (2001). Shrinking patches and slippery rafts: scales of domains in the plasma membrane. *Trends Cell Biol.* *11*, 492-496.
- Efimov,A., Kharitonov,A., Efimova,N., Loncarek,J., Miller,P.M., Andreyeva,N., Gleeson,P., Galjart,N., Maia,A.R., McLeod,I.X., Yates,J.R., III, Maiato,H., Khodjakov,A., Akhmanova,A., and Kaverina,I. (2007). Asymmetric CLASP-dependent nucleation of noncentrosomal microtubules at the trans-Golgi network. *Dev. Cell* *12*, 917-930.
- Egea G. (2001). Train trip into the cell: the Golgi Apparatus as the central station of the intracellular membrane traffic. *Ciencia al dia Internacional* *4*, 1-20.
- Egea,G., Lazaro-Dieguez,F., and Vilella,M. (2006). Actin dynamics at the Golgi complex in mammalian cells. *Curr. Opin. Cell Biol.* *18*, 168-178.
- El Sayed,K.A., Youssef,D.T., and Marchetti,D. (2006). Bioactive natural and semisynthetic latrunculins. *J. Nat. Prod.* *69*, 219-223.
- Erickson,H.P. (2007). Evolution of the cytoskeleton. *Bioessays* *29*, 668-677.
- Ertmer,A., Huber,V., Gilch,S., Yoshimori,T., Erfle,V., Duyster,J., Elsasser,H.P., and Schatzl,H.M. (2007). The anticancer drug imatinib induces cellular autophagy. *Leukemia* *21*, 936-942.
- Esposito,A., Dohm,C.P., Kermer,P., Bahr,M., and Wouters,F.S. (2007). alpha-Synuclein and its disease-related mutants interact differentially with the microtubule protein tau and associate with the actin cytoskeleton. *Neurobiol. Dis.* *26*, 521-531.
- Etienne-Manneville,S. and Hall,A. (2002). Rho GTPases in cell biology. *Nature* *420*, 629-635.
- Evangelista,M., Zigmund,S., and Boone,C. (2003). Formins: signaling effectors for assembly and polarization of actin filaments. *J. Cell Sci.* *116*, 2603-2611.
- Fant,X. and Merdes,A. (2002). The carboxy-terminus of protein 4.1r resembles Beta-tubulin. *Cell Biol. Int.* *26*, 371-377.
- Farina,C., Gagliardi,S., Nadler,G., Morvan,M., Parini,C., Belfiore,P., Visentin,L., and Gowen,M. (2001). Novel bone antiresorptive agents that selectively inhibit the osteoclast V-H⁺-ATPase. *Farmacology* *56*, 113-116.
- Fass,E., Shvets,E., Degani,I., Hirschberg,K., and Elazar,Z. (2006). Microtubules support production of starvation-induced autophagosomes but not their targeting and fusion with lysosomes. *J. Biol. Chem.* *281*, 36303-36316.
- Fath,K.R. (2005). Characterization of myosin-II binding to Golgi stacks in vitro. *Cell Motil. Cytoskeleton* *60*, 222-235.
- Fechheimer,M., Furukawa,R., Maselli,A., and Davis,R.C. (2002). Hirano bodies in health and disease. *Trends Mol. Med.* *8*, 590-591.
- Fedorov,A., Merican,A.F., and Gilbert,W. (2002). Large-scale comparison of intron positions among animal, plant, and fungal genes. *Proc. Natl. Acad. Sci. U. S. A* *99*, 16128-16133.
- Feng,J. (2006). Microtubule: a common target for parkin and Parkinson's disease toxins. *Neuroscientist* *12*, 469-476.
- Fernandes,F., Loura,L.M., Fedorov,A., Dixon,N., Kee,T.P., Prieto,M., and Hemminga,M.A. (2006). Binding assays of inhibitors towards selected V-ATPase domains. *Biochim. Biophys. Acta* *1758*, 1777-1786.
- Fernandez-Ulibarri,I., Vilella,M., Lazaro-Dieguez,F., Sarri,E., Martinez,S.E., Jimenez,N., Claro,E., Merida,I., Burger,K.N., and Egea,G. (2007). Diacylglycerol is required for the formation of COPI vesicles in the Golgi-to-ER transport pathway. *Mol. Biol. Cell* *18*, 3250-3263.

- Field,C., Li,R., and Oegema,K. (1999). Cytokinesis in eukaryotes: a mechanistic comparison. *Curr. Opin. Cell Biol.* *11*, 68-80.
- Fischer,R.S. and Fowler,V.M. (2003). Tropomodulins: life at the slow end. *Trends Cell Biol.* *13*, 593-601.
- Fortun,J., Verrier,J.D., Go,J.C., Madorsky,I., Dunn,W.A., and Notterpek,L. (2007). The formation of peripheral myelin protein 22 aggregates is hindered by the enhancement of autophagy and expression of cytoplasmic chaperones. *Neurobiol. Dis.* *25*, 252-265.
- 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. *Mol. Biol. Cell* *13*, 621-631.
- Gagescu,R., Demaurex,N., Parton,R.G., Hunziker,W., Huber,L.A., and Gruenberg,J. (2000). The recycling endosome of Madin-Darby canine kidney cells is a mildly acidic compartment rich in raft components. *Mol. Biol. Cell* *11*, 2775-2791.
- Galloway,P.G., Perry,G., and Gambetti,P. (1987). Hirano body filaments contain actin and actin-associated proteins. *J. Neuropathol. Exp. Neurol.* *46*, 185-199.
- Gao,Y. and Sztul,E. (2001). A novel interaction of the Golgi complex with the vimentin intermediate filament cytoskeleton. *J. Cell Biol.* *152*, 877-894.
- Garcia-Alai,M.M., Gallo,M., Salame,M., Wetzler,D.E., McBride,A.A., Paci,M., Cicero,D.O., and Prat-Gay,G. (2006). Molecular basis for phosphorylation-dependent, PEST-mediated protein turnover. *Structure.* *14*, 309-319.
- Garcia-Mata,R., Bebok,Z., Sorscher,E.J., and Sztul,E.S. (1999). Characterization and dynamics of aggresome formation by a cytosolic GFP-chimera. *J. Cell Biol.* *146*, 1239-1254.
- Garcia-Mata,R., Gao,Y.S., and Sztul,E. (2002). Hassles with taking out the garbage: aggravating aggresomes. *Traffic.* *3*, 388-396.
- Gaynor,E.C. and Emr,S.D. (1997). COPI-independent anterograde transport: cargo-selective ER to Golgi protein transport in yeast COPI mutants. *J. Cell Biol.* *136*, 789-802.
- Gekle,M., Drumm,K., Mildenerger,S., Freudinger,R., Gassner,B., and Silbernagl,S. (1999). Inhibition of Na⁺-H⁺ exchange impairs receptor-mediated albumin endocytosis in renal proximal tubule-derived epithelial cells from opossum. *J. Physiol* *520 Pt 3*, 709-721.
- Gekle,M., Serrano,O.K., Drumm,K., Mildenerger,S., Freudinger,R., Gassner,B., Jansen,H.W., and Christensen,E.I. (2002). NHE3 serves as a molecular tool for cAMP-mediated regulation of receptor-mediated endocytosis. *Am. J. Physiol Renal Physiol* *283*, F549-F558.
- Geli,M.I. and Riezman,H. (1996). Role of type I myosins in receptor-mediated endocytosis in yeast. *Science* *272*, 533-535.
- Gettemans,J., De Ville,Y., Vandekerckhove,J., and Waalkens,E. (1992). Physarum actin is phosphorylated as the actin-fragmin complex at residues Thr203 and Thr202 by a specific 80 kDa kinase. *EMBO J.* *11*, 3185-3191.
- Geyer,M., Fackler,O.T., and Peterlin,B.M. (2002). Subunit H of the V-ATPase involved in endocytosis shows homology to beta-adaptins. *Mol. Biol. Cell* *13*, 2045-2056.
- Gillard,B.K., Clement,R., Colucci-Guyon,E., Babinet,C., Schwarzmann,G., Taki,T., Kasama,T., and Marcus,D.M. (1998). Decreased synthesis of glycosphingolipids in cells lacking vimentin intermediate filaments. *Exp. Cell Res.* *242*, 561-572.
- Gillard,B.K., Thurmon,L.T., Harrell,R.G., Capetanaki,Y., Saito,M., Yu,R.K., and Marcus,D.M. (1994). Biosynthesis of glycosphingolipids is reduced in the absence of a vimentin intermediate filament network. *J. Cell Sci.* *107 (Pt 12)*, 3545-3555.
- 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. *Nat. Cell Biol.* *1*, 423-430.
- Gkantiragas,I., Brugger,B., Stuken,E., Kaloyanova,D., Li,X.Y., Lohr,K., Lottspeich,F., Wieland,F.T., and Helms,J.B. (2001). Sphingomyelin-enriched microdomains at the Golgi complex. *Mol. Biol. Cell* *12*, 1819-1833.
- Glotzer,M., Murray,A.W., and Kirschner,M.W. (1991). Cyclin is degraded by the ubiquitin pathway. *Nature* *349*, 132-138.
- Goddette,D.W. and Frieden,C. (1985). The binding of cytochalasin D to monomeric actin. *Biochem. Biophys. Res. Commun.* *128*, 1087-1092.
- Goddette,D.W. and Frieden,C. (1986). Actin polymerization. The mechanism of action of cytochalasin D. *J. Biol. Chem.* *261*, 15974-15980.
- Godsel,L.M., Hobbs,R.P., and Green,K.J. (2007). Intermediate filament assembly: dynamics to disease. *Trends Cell Biol.*
- Goedert,M. and Spillantini,M.G. (2006). A century of Alzheimer's disease. *Science* *314*, 777-781.
- Gold,E.S., Underhill,D.M., Morrisette,N.S., Guo,J., McNiven,M.A., and Aderem,A. (1999). Dynamin 2 is required for phagocytosis in macrophages. *J. Exp. Med.* *190*, 1849-1856.
- Goldberg,J. (1999). Structural and functional analysis of the ARF1-ARFGAP complex reveals a role for coatamer in GTP hydrolysis. *Cell* *96*, 893-902.
- Gonatas,N.K., Stieber,A., and Gonatas,J.O. (2006). Fragmentation of the Golgi apparatus in neurodegenerative diseases and cell death. *J. Neurol. Sci.* *246*, 21-30.
- Grenier,C., Bissonnette,C., Volkov,L., and Roucou,X. (2006). Molecular morphology and toxicity of cytoplasmic prion protein aggregates in neuronal and non-neuronal cells. *J. Neurochem.* *97*, 1456-1466.
- Grunow,A., Rusing,M., Becker,B., and Melkonian,M. (1999). V-ATPase is a major component of the Golgi complex in the scaly green flagellate *Scherffelia dubia*. *Protist.* *150*, 265-281.
- Hall,A. (1998). Rho GTPases and the actin cytoskeleton. *Science* *279*, 509-514.
- Harada,A., Takei,Y., Kanai,Y., Tanaka,Y., Nonaka,S., and Hirokawa,N. (1998). Golgi vesiculation and lysosome dispersion in cells lacking cytoplasmic dynein. *J. Cell Biol.* *141*, 51-59.
- Harada,M., Kumemura,H., Omary,M.B., Kawaguchi,T., Maeyama,N., Hanada,S., Taniguchi,E., Koga,H., Suganuma,T., Ueno,T., and Sata,M. (2003). Proteasome inhibition induces inclusion bodies associated with intermediate filaments and fragmentation of the Golgi apparatus. *Exp. Cell Res.* *288*, 60-69.
- Harris,E.S. and Higgs,H.N. (2004). Actin cytoskeleton: formins lead the way. *Curr. Biol.* *14*, R520-R522.

- Harris,E.S., Li,F., and Higgs,H.N. (2004). The mouse formin, FRLalpha, slows actin filament barbed end elongation, competes with capping protein, accelerates polymerization from monomers, and severs filaments. *J. Biol. Chem.* 279, 20076-20087.
- Hartford,C.M. and Ratain,M.J. (2007). Rapamycin: something old, something new, sometimes borrowed and now renewed. *Clin. Pharmacol. Ther.* 82, 381-388.
- Hawes,C. and Satiat-Jeuemaitre,B. (2005). The plant Golgi apparatus--going with the flow. *Biochim. Biophys. Acta* 1744, 466-480.
- He,C.Y. (2007). Golgi biogenesis in simple eukaryotes. *Cell Microbiol.* 9, 566-572.
- Hegde,A.N. and Upadhy,S.C. (2007). The ubiquitin-proteasome pathway in health and disease of the nervous system. *Trends Neurosci.* 30, 587-595.
- Hehnly,H. and Stamnes,M. (2007). Regulating cytoskeleton-based vesicle motility. *FEBS Lett.* 581, 2112-2118.
- 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. *J. Biol. Chem.* 274, 10743-10750.
- Helfand,B.T., Chang,L., and Goldman,R.D. (2003). The dynamic and motile properties of intermediate filaments. *Annu. Rev. Cell Dev. Biol.* 19, 445-467.
- Helfand,B.T., Mikami,A., Vallee,R.B., and Goldman,R.D. (2002). A requirement for cytoplasmic dynein and dynactin in intermediate filament network assembly and organization. *J. Cell Biol.* 157, 795-806.
- Helms,J.B. and Zurzolo,C. (2004). Lipids as targeting signals: lipid rafts and intracellular trafficking. *Traffic.* 5, 247-254.
- Henderson,G.P., Gan,L., and Jensen,G.J. (2007). 3-D ultrastructure of *O. tauri*: electron cryotomography of an entire eukaryotic cell. *PLoS. ONE.* 2, e749.
- Hennessey,E.S., Drummond,D.R., and Sparrow,J.C. (1993). Molecular genetics of actin function. *Biochem. J.* 291 (Pt 3), 657-671.
- Herbst,M. and Wanker,E.E. (2007). Small molecule inducers of heat-shock response reduce polyQ-mediated huntingtin aggregation. A possible therapeutic strategy. *Neurodegener. Dis.* 4, 254-260.
- Higgs,H.N. and Pollard,T.D. (1999). Regulation of actin polymerization by Arp2/3 complex and WASp/Scar proteins. *J. Biol. Chem.* 274, 32531-32534.
- 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. *J. Cell Biol.* 150, 1311-1320.
- Hille-Rehfeld,A. (1995). Mannose 6-phosphate receptors in sorting and transport of lysosomal enzymes. *Biochim. Biophys. Acta* 1241, 177-194.
- Hirano,A. (1994). Hirano bodies and related neuronal inclusions. *Neuropathol. Appl. Neurobiol.* 20, 3-11.
- Hirano,A., Dembitzer,H.M., Kurland,L.T., and Zimmerman,H.M. (1968). The fine structure of some intraganglionic alterations. Neurofibrillary tangles, granulovacuolar bodies and "rod-like" structures as seen in Guam amyotrophic lateral sclerosis and parkinsonism-dementia complex. *J. Neuropathol. Exp. Neurol.* 27, 167-182.
- Holappa,K. and Kellokumpu,S. (2003). Targeting of the AE2 anion exchanger to the Golgi apparatus is cell type-dependent and correlates with the expression of Ank(195), a Golgi membrane skeletal protein. *FEBS Lett.* 546, 257-264.
- Holappa,K., Munoz,M.T., Egea,G., and Kellokumpu,S. (2004). The AE2 anion exchanger is necessary for the structural integrity of the Golgi apparatus in mammalian cells. *FEBS Lett.* 564, 97-103.
- Holliday,L.S., Bubb,M.R., Jiang,J., Hurst,I.R., and Zuo,J. (2005). Interactions between vacuolar H⁺-ATPases and microfilaments in osteoclasts. *J. Bioenerg. Biomembr.* 37, 419-423.
- Holmes,K.C., Popp,D., Gebhard,W., and Kabsch,W. (1990). Atomic model of the actin filament. *Nature* 347, 44-49.
- Holzinger,A. (2001). Jasplakinolide. An actin-specific reagent that promotes actin polymerization. *Methods Mol. Biol.* 161, 109-120.
- Hood,J.L., Brooks,W.H., and Roszman,T.L. (2006). Subcellular mobility of the calpain/calpastatin network: an organelle transient. *Bioessays* 28, 850-859.
- Hotulainen,P. and Lappalainen,P. (2006). Stress fibers are generated by two distinct actin assembly mechanisms in motile cells. *J. Cell Biol.* 173, 383-394.
- Hoyer-Hansen,M., Bastholm,L., Szyniarowski,P., Campanella,M., Szabadkai,G., Farkas,T., Bianchi,K., Fehrenbacher,N., Elling,F., Rizzuto,R., Mathiasen,I.S., and Jaattela,M. (2007). Control of macroautophagy by calcium, calmodulin-dependent kinase kinase-beta, and Bcl-2. *Mol. Cell* 25, 193-205.
- Hurtado-Lorenzo,A., Skinner,M., El Annan,J., Futai,M., Sun-Wada,G.H., Bourgoin,S., Casanova,J., Wildeman,A., Bechoua,S., Ausiello,D.A., Brown,D., and Marshansky,V. (2006). V-ATPase interacts with ARNO and Arf6 in early endosomes and regulates the protein degradative pathway. *Nat. Cell Biol.* 8, 124-136.
- Ihrke,G., Bruns,J.R., Luzio,J.P., and Weisz,O.A. (2001). Competing sorting signals guide endolyn along a novel route to lysosomes in MDCK cells. *EMBO J.* 20, 6256-6264.
- Inoue,T., Wang,Y., Jefferies,K., Qi,J., Hinton,A., and Forgac,M. (2005). Structure and regulation of the V-ATPases. *J. Bioenerg. Biomembr.* 37, 393-398.
- Iwata,A., Riley,B.E., Johnston,J.A., and Kopito,R.R. (2005). HDAC6 and microtubules are required for autophagic degradation of aggregated huntingtin. *J. Biol. Chem.* 280, 40282-40292.
- Izumiyama,N., Ohtsubo,K., Tachikawa,T., and Nakamura,H. (1991). Elucidation of three-dimensional ultrastructure of Hirano bodies by the quick-freeze, deep-etch and replica method. *Acta Neuropathol.* 81, 248-254.
- Jacob,R., Heine,M., Alfalah,M., and Naim,H.Y. (2003). Distinct cytoskeletal tracks direct individual vesicle populations to the apical membrane of epithelial cells. *Curr. Biol.* 13, 607-612.
- Jang,D.H., Han,J.H., Lee,S.H., Lee,Y.S., Park,H., Lee,S.H., Kim,H., and Kaang,B.K. (2005). Cofilin expression induces cofilin-actin rod formation and disrupts synaptic structure and function in Aplysia synapses. *Proc. Natl. Acad. Sci. U. S. A* 102, 16072-16077.
- Janmey,P.A., Iida,K., Yin,H.L., and Stossel,T.P. (1987). Polyphosphoinositide micelles and polyphosphoinositide-containing

- vesicles dissociate endogenous gelsolin-actin complexes and promote actin assembly from the fast-growing end of actin filaments blocked by gelsolin. *J. Biol. Chem.* *262*, 12228-12236.
- Jefferies, K.C. and Forgac, M. (2007). Subunit H of the V-ATPase inhibits ATP hydrolysis by the free V1 domain by interaction with the rotary subunit F. *J. Biol. Chem.*
- Jespersen, T., Rasmussen, H.B., Grunnet, M., Jensen, H.S., Angelo, K., Dupuis, D.S., Vogel, L.K., Jorgensen, N.K., Klaerke, D.A., and Olesen, S.P. (2004). Basolateral localisation of KCNQ1 potassium channels in MDCK cells: molecular identification of an N-terminal targeting motif. *J. Cell Sci.* *117*, 4517-4526.
- Johnson, D., Lanahan, A., Buck, C.R., Sehgal, A., Morgan, C., Mercer, E., Bothwell, M., and Chao, M. (1986). Expression and structure of the human NGF receptor. *Cell* *47*, 545-554.
- Johnston, J.A., Illing, M.E., and Kopito, R.R. (2002). Cytoplasmic dynein/dynactin mediates the assembly of aggresomes. *Cell Motil. Cytoskeleton* *53*, 26-38.
- Johnston, J.A., Ward, C.L., and Kopito, R.R. (1998). Aggresomes: a cellular response to misfolded proteins. *J. Cell Biol.* *143*, 1883-1898.
- Jones, A.T. (2007). Macropinocytosis: searching for an endocytic identity and role in the uptake of cell penetrating peptides. *J. Cell Mol. Med.* *11*, 670-684.
- Just, I., Hofmann, F., Genth, H., and Gerhard, R. (2001). Bacterial protein toxins inhibiting low-molecular-mass GTP-binding proteins. *Int. J. Med. Microbiol.* *291*, 243-250.
- Kaniuk, N.A., Kiraly, M., Bates, H., Vranic, M., Volchuk, A., and Brumell, J.H. (2007). Ubiquitinated-protein aggregates form in pancreatic beta-cells during diabetes-induced oxidative stress and are regulated by autophagy. *Diabetes* *56*, 930-939.
- Katsumoto, T., Inoue, M., Naguro, T., and Kurimura, T. (1991). Association of cytoskeletons with the Golgi apparatus: three-dimensional observation and computer-graphic reconstruction. *J. Electron Microsc. (Tokyo)* *40*, 24-28.
- Kaushik, S., Kiffin, R., and Cuervo, A.M. (2007). Chaperone-mediated autophagy and aging: a novel regulatory role of lipids revealed. *Autophagy* *3*, 387-389.
- Kawa, G., Yamamoto, A., Yoshimori, T., Muguruma, K., Matsuda, T., and Moriyama, Y. (2000). Immunohistochemical localization of V-ATPases in rat spermatids. *Int. J. Androl* *23*, 278-283.
- Kawasaki-Nishi, S., Bowers, K., Nishi, T., Forgac, M., and Stevens, T.H. (2001). The amino-terminal domain of the vacuolar proton-translocating ATPase a subunit controls targeting and in vivo dissociation, and the carboxyl-terminal domain affects coupling of proton transport and ATP hydrolysis. *J. Biol. Chem.* *276*, 47411-47420.
- Keller, P., Toomre, D., Diaz, E., White, J., and Simons, K. (2001). Multicolour imaging of post-Golgi sorting and trafficking in live cells. *Nat. Cell Biol.* *3*, 140-149.
- Kepes, F., Rambourg, A., and Satiat-Jeunemaitre, B. (2005). Morphodynamics of the secretory pathway. *Int. Rev. Cytol.* *242*, 55-120.
- Kerkhoff, E. (2006). Cellular functions of the Spir actin-nucleation factors. *Trends Cell Biol.* *16*, 477-483.
- Kerkhoff, E., Simpson, J.C., Leberfinger, C.B., Otto, I.M., Doerks, T., Bork, P., Rapp, U.R., Raabe, T., and Pepperkok, R. (2001). The Spir actin organizers are involved in vesicle transport processes. *Curr. Biol.* *11*, 1963-1968.
- Kessels, M.M., Engqvist-Goldstein, A.E., 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. *Mol. Biol. Cell* *11*, 393-412.
- Kessels, M.M., Engqvist-Goldstein, A.E., Drubin, D.G., and Qualmann, B. (2001). Mammalian Abp1, a signal-responsive F-actin-binding protein, links the actin cytoskeleton to endocytosis via the GTPase dynamin. *J. Cell Biol.* *153*, 351-366.
- Kim, J.H., Johannes, L., Goud, B., Antony, C., Lingwood, C.A., Daneman, R., and Grinstein, S. (1998). Noninvasive measurement of the pH of the endoplasmic reticulum at rest and during calcium release. *Proc. Natl. Acad. Sci. U. S. A* *95*, 2997-3002.
- Kirchhausen, T. (2007). Making COPII coats. *Cell* *129*, 1251-1252.
- Kirkegaard, K., Taylor, M.P., and Jackson, W.T. (2004). Cellular autophagy: surrender, avoidance and subversion by microorganisms. *Nat. Rev. Microbiol.* *2*, 301-314.
- Kneen, M., Farinas, J., Li, Y., and Verkman, A.S. (1998). Green fluorescent protein as a noninvasive intracellular pH indicator. *Biophys. J.* *74*, 1591-1599.
- Kondylis, V. and Rabouille, C. (2003). A novel role for dp115 in the organization of tER sites in *Drosophila*. *J. Cell Biol.* *162*, 185-198.
- Kopito, R.R. (2000). Aggresomes, inclusion bodies and protein aggregation. *Trends Cell Biol.* *10*, 524-530.
- 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. *Mol. Cell Biol.* *15*, 1942-1952.
- Kreis, T.E. and Pepperkok, R. (1994). Coat proteins in intracellular membrane transport. *Curr. Opin. Cell Biol.* *6*, 533-537.
- Kroschewski, R., Hall, A., and Mellman, I. (1999). Cdc42 controls secretory and endocytic transport to the basolateral plasma membrane of MDCK cells. *Nat. Cell Biol.* *1*, 8-13.
- Ktistakis, N.T., Brown, H.A., Waters, M.G., Sternweis, P.C., and Roth, M.G. (1996). Evidence that phospholipase D mediates ADP ribosylation factor-dependent formation of Golgi coated vesicles. *J. Cell Biol.* *134*, 295-306.
- Kumemura, H., Harada, M., Omary, M.B., Sakisaka, S., Sukanuma, T., Namba, M., and Sata, M. (2004). Aggregation and loss of cyokeratin filament networks inhibit golgi organization in liver-derived epithelial cell lines. *Cell Motil. Cytoskeleton* *57*, 37-52.
- Kunita, R., Otomo, A., Mizumura, H., Suzuki-Utsunomiya, K., Hadano, S., and Ikeda, J.E. (2007). The Rab5 activator ALS2/alsin acts as a novel Rac1 effector through Rac1-activated endocytosis. *J. Biol. Chem.* *282*, 16599-16611.
- Kurashima, K., D'Souza, S., Szaszi, K., Ramjeesingh, R., Orłowski, J., and Grinstein, S. (1999). The apical Na⁽⁺⁾/H⁽⁺⁾ exchanger isoform NHE3 is regulated by the actin cytoskeleton. *J. Biol. Chem.* *274*, 29843-29849.
- Kweon, H.S., Beznoussenko, G.V., Micaroni, M., Polishchuk, R.S., Trucco, A., Martella, O., Di Giandomenico, D., Marra, P., Fusella, A.,

- Di Pentima, A., Berger, E.G., Geerts, W.J., Koster, A.J., Burger, K.N., Luini, A., and Mironov, A.A. (2004). Golgi enzymes are enriched in perforated zones of golgi cisternae but are depleted in COPI vesicles. *Mol. Biol. Cell* *15*, 4710-4724.
- Laas, R. and Hagel, C. (1994). Hirano bodies and chronic alcoholism. *Neuropathol. Appl. Neurobiol.* *20*, 12-21.
- 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. *J. Cell Biol.* *144*, 1135-1149.
- Lamaze, C., Dujancourt, A., Baba, T., Lo, C.G., Benmerah, A., and Dautry-Varsat, A. (2001). Interleukin 2 receptors and detergent-resistant membrane domains define a clathrin-independent endocytic pathway. *Mol. Cell* *7*, 661-671.
- Landen, C.N., Jr., Lin, Y.G., Immaneni, A., Deavers, M.T., Merritt, W.M., Spanuth, W.A., Bodurka, D.C., Gershenson, D.M., Brinkley, W.R., and Sood, A.K. (2007). Overexpression of the centrosomal protein Aurora-A kinase is associated with poor prognosis in epithelial ovarian cancer patients. *Clin. Cancer Res.* *13*, 4098-4104.
- Larsen, A.K., Lametsch, R., Elce, J.S., Larsen, J.K., Thomsen, B., Larsen, M.R., Lawson, M.A., Greer, P.A., and Ertbjerg, P. (2007). Genetic disruption of calpain correlates with loss of membrane blebbing and differential expression of RhoGDI-1, cofilin and tropomyosin. *Biochem. J.*
- Lebart, M.C. and Benyamin, Y. (2006). Calpain involvement in the remodeling of cytoskeletal anchorage complexes. *FEBS J.* *273*, 3415-3426.
- Lee, D.H. and Goldberg, A.L. (1998). Proteasome inhibitors: valuable new tools for cell biologists. *Trends Cell Biol.* *8*, 397-403.
- Lee, V.M., Goedert, M., and Trojanowski, J.Q. (2001). Neurodegenerative tauopathies. *Annu. Rev. Neurosci.* *24*, 1121-1159.
- Lenart, P., Bacher, C.P., Daigle, N., Hand, A.R., Eils, R., Terasaki, M., and Ellenberg, J. (2005). A contractile nuclear actin network drives chromosome congression in oocytes. *Nature* *436*, 812-818.
- Levine, B. and Kroemer, G. (2008). Autophagy in the Pathogenesis of Disease. *Cell* *132*, 27-42.
- Lewis, M.J. and Pelham, H.R. (1990). A human homologue of the yeast HDEL receptor. *Nature* *348*, 162-163.
- Li, J., Lykotrafitis, G., Dao, M., and Suresh, S. (2007). Cytoskeletal dynamics of human erythrocyte. *Proc. Natl. Acad. Sci. U. S. A* *104*, 4937-4942.
- Li, J.Y. and Wu, C.F. (2003). Perspectives on the origin of microfilaments, microtubules, the relevant chaperonin system and cytoskeletal motors--a commentary on the spirochaete origin of flagella. *Cell Res.* *13*, 219-227.
- Li, X., Galli, T., Leu, S., Wade, J.B., Weinman, E.J., Leung, G., Cheong, A., Louvard, D., and Donowitz, M. (2001). Na⁺-H⁺ exchanger 3 (NHE3) is present in lipid rafts in the rabbit ileal brush border: a role for rafts in trafficking and rapid stimulation of NHE3. *J. Physiol* *537*, 537-552.
- Liao, H., Ellena, J., Liu, L., Szabo, G., Cafiso, D., and Castle, D. (2007). Secretory carrier membrane protein SCAMP2 and phosphatidylinositol 4,5-bisphosphate interactions in the regulation of dense core vesicle exocytosis. *Biochemistry* *46*, 10909-10920.
- Lin, P.J., Williams, W.P., Kobiljski, J., and Numata, M. (2007). Caveolins bind to (Na⁺, K⁺)/H⁺ exchanger NHE7 by a novel binding module. *Cell Signal.* *19*, 978-988.
- Lin, P.J., Williams, W.P., Luu, Y., Molday, R.S., Orłowski, J., and Numata, M. (2005). Secretory carrier membrane proteins interact and regulate trafficking of the organellar (Na⁺,K⁺)/H⁺ exchanger NHE7. *J. Cell Sci.* *118*, 1885-1897.
- Linseman, D.A. and Loucks, F.A. (2008). Diverse roles of Rho family GTPases in neuronal development, survival, and death. *Front Biosci.* *13*, 657-676.
- Lippincott-Schwartz, J. and Liu, W. (2006). Insights into COPI coat assembly and function in living cells. *Trends Cell Biol.* *16*, e1-e4.
- Liu, L., Liao, H., Castle, A., Zhang, J., Casanova, J., Szabo, G., and Castle, D. (2005). SCAMP2 interacts with Arf6 and phospholipase D1 and links their function to exocytotic fusion pore formation in PC12 cells. *Mol. Biol. Cell* *16*, 4463-4472.
- Llouis, J., McCaffery, J.M., Miyawaki, A., Farquhar, M.G., and Tsien, R.Y. (1998). Measurement of cytosolic, mitochondrial, and Golgi pH in single living cells with green fluorescent proteins. *Proc. Natl. Acad. Sci. U. S. A* *95*, 6803-6808.
- Lorenz, M., Popp, D., and Holmes, K.C. (1993). Refinement of the F-actin model against X-ray fiber diffraction data by the use of a directed mutation algorithm. *J. Mol. Biol.* *234*, 826-836.
- Losev, E., Reinke, C.A., Jellen, J., Strongin, D.E., Bevis, B.J., and Glick, B.S. (2006). Golgi maturation visualized in living yeast. *Nature* *441*, 1002-1006.
- Lu, Z., Joseph, D., Bugnard, E., Zaal, K.J., and Ralston, E. (2001). Golgi complex reorganization during muscle differentiation: visualization in living cells and mechanism. *Mol. Biol. Cell* *12*, 795-808.
- Luders, J. and Stearns, T. (2007). Microtubule-organizing centres: a re-evaluation. *Nat. Rev. Mol. Cell Biol.* *8*, 161-167.
- Luna, A., Matas, O.B., Martinez-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. *Mol. Biol. Cell* *13*, 866-879.
- Luna, E.J. and Hitt, A.L. (1992). Cytoskeleton--plasma membrane interactions. *Science* *258*, 955-964.
- Lux, S.E. (1979). Dissecting the red cell membrane skeleton. *Nature* *281*, 426-429.
- 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. *J. Cell Biol.* *127*, 107-115.
- Maciver, S.K. and Harrington, C.R. (1995). Two actin binding proteins, actin depolymerizing factor and cofilin, are associated with Hirano bodies. *Neuroreport* *6*, 1985-1988.
- Malikov, V., Cytrynbaum, E.N., Kashina, A., Mogilner, A., and Rodionov, V. (2005). Centering of a radial microtubule array by translocation along microtubules spontaneously nucleated in the cytoplasm. *Nat. Cell Biol.* *7*, 1213-1218.
- Malikov, V., Kashina, A., and Rodionov, V. (2004). Cytoplasmic dynein nucleates microtubules to organize them into radial arrays in vivo. *Mol. Biol. Cell* *15*, 2742-2749.

- Maloney,M.T. and Bamburg,J.R. (2007). Cofilin-mediated neurodegeneration in Alzheimer's disease and other amyloidopathies. *Mol. Neurobiol.* 35, 21-44.
- Maloney,M.T., Minamide,L.S., Kinley,A.W., Boyle,J.A., and Bamburg,J.R. (2005). Beta-secretase-cleaved amyloid precursor protein accumulates at actin inclusions induced in neurons by stress or amyloid beta: a feedforward mechanism for Alzheimer's disease. *J. Neurosci.* 25, 11313-11321.
- Mangold,U., Hayakawa,H., Coughlin,M., Munger,K., and Zetter,B.R. (2008). Antizyme, a mediator of ubiquitin-independent proteasomal degradation and its inhibitor localize to centrosomes and modulate centriole amplification. *Oncogene* 27, 604-613.
- Mardones,G.A., Snyder,C.M., and Howell,K.E. (2006). Cis-Golgi matrix proteins move directly to endoplasmic reticulum exit sites by association with tubules. *Mol. Biol. Cell* 17, 525-538.
- Marsh,B.J., Mastronarde,D.N., Buttle,K.F., Howell,K.E., and McIntosh,J.R. (2001). Organellar relationships in the Golgi region of the pancreatic beta cell line, HIT-T15, visualized by high resolution electron tomography. *Proc. Natl. Acad. Sci. U. S. A* 98, 2399-2406.
- Marsh,B.J., Volkman,N., McIntosh,J.R., and Howell,K.E. (2004). Direct continuities between cisternae at different levels of the Golgi complex in glucose-stimulated mouse islet beta cells. *Proc. Natl. Acad. Sci. U. S. A* 101, 5565-5570.
- Martinez,O., Antony,C., Pehau-Arnaudet,G., Berger,E.G., Salamero,J., and Goud,B. (1997). GTP-bound forms of rab6 induce the redistribution of Golgi proteins into the endoplasmic reticulum. *Proc. Natl. Acad. Sci. U. S. A* 94, 1828-1833.
- Martinez,S.E. and Egea,G. (2007). Novel molecular targets for the prevention of fetal alcohol syndrome. *Recent Patents. CNS. Drug Discov.* 2, 23-35.
- Marx,F.P., Soehn,A.S., Berg,D., Melle,C., Schiesling,C., Lang,M., Kautzmann,S., Strauss,K.M., Franck,T., Engelender,S., Pahnke,J., Dawson,S., von Eggeling,F., Schulz,J.B., Riess,O., and Kruger,R. (2007). The proteasomal subunit S6 ATPase is a novel synphilin-1 interacting protein--implications for Parkinson's disease. *FASEB J.* 21, 1759-1767.
- Maselli,A., Furukawa,R., Thomson,S.A., Davis,R.C., and Fehheimer,M. (2003). Formation of Hirano bodies induced by expression of an actin cross-linking protein with a gain-of-function mutation. *Eukaryot. Cell* 2, 778-787.
- Maselli,A.G., Davis,R., Furukawa,R., and Fehheimer,M. (2002). Formation of Hirano bodies in Dictyostelium and mammalian cells induced by expression of a modified form of an actin-crosslinking protein. *J. Cell Sci.* 115, 1939-1949.
- Massey,A.C., Zhang,C., and Cuervo,A.M. (2006). Chaperone-mediated autophagy in aging and disease. *Curr. Top. Dev. Biol.* 73, 205-235.
- 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. *Nat. Cell Biol.* 4, 986-992.
- Matas,O.B., Martinez-Menarguez,J.A., and Egea,G. (2004). Association of Cdc42/N-WASP/Arp2/3 signaling pathway with Golgi membranes. *Traffic.* 5, 838-846.
- Matsudaira,P. (1991). Modular organization of actin crosslinking proteins. *Trends Biochem. Sci.* 16, 87-92.
- Matsunaga,S. (2006). Trisoxazole macrolides from Hexabranchnus nudibranchs and other marine invertebrates. *Prog. Mol. Subcell. Biol.* 43, 241-260.
- Matsuura-Tokita,K., Takeuchi,M., Ichihara,A., Mikuriya,K., and Nakano,A. (2006). Live imaging of yeast Golgi cisternal maturation. *Nature* 441, 1007-1010.
- Maxfield,F.R. and McGraw,T.E. (2004). Endocytic recycling. *Nat. Rev. Mol. Cell Biol.* 5, 121-132.
- Meriin,A.B. and Sherman,M.Y. (2005). Role of molecular chaperones in neurodegenerative disorders. *Int. J. Hyperthermia* 21, 403-419.
- Merrifield,C.J., Perrais,D., and Zenisek,D. (2005). Coupling between clathrin-coated-pit invagination, cortactin recruitment, and membrane scission observed in live cells. *Cell* 121, 593-606.
- Merrill,A.H., Jr. (2002). De novo sphingolipid biosynthesis: a necessary, but dangerous, pathway. *J. Biol. Chem.* 277, 25843-25846.
- Mielenz,D., Vettermann,C., Hampel,M., Lang,C., Avramidou,A., Karas,M., and Jack,H.M. (2005). Lipid rafts associate with intracellular B cell receptors and exhibit a B cell stage-specific protein composition. *J. Immunol.* 174, 3508-3517.
- Mignot,C., Delarasse,C., Escaich,S., Della,G.B., Noe,E., Colucci-Guyon,E., Babinet,C., Pekny,M., Vicart,P., Boespflug-Tanguy,O., Dautigny,A., Rodriguez,D., and Pham-Dinh,D. (2007). Dynamics of mutated GFAP aggregates revealed by real-time imaging of an astrocyte model of Alexander disease. *Exp. Cell Res.* 313, 2766-2779.
- Miki,H., Okada,Y., and Hirokawa,N. (2005). Analysis of the kinesin superfamily: insights into structure and function. *Trends Cell Biol.* 15, 467-476.
- Miki,H., Suetsugu,S., and Takenawa,T. (1998). WAVE, a novel WASP-family protein involved in actin reorganization induced by Rac. *EMBO J.* 17, 6932-6941.
- Minamide,L.S., Striegel,A.M., Boyle,J.A., Meberg,P.J., and Bamburg,J.R. (2000a). Neurodegenerative stimuli induce persistent ADF/cofilin-actin rods that disrupt distal neurite function. *Nat. Cell Biol.* 2, 628-636.
- Mineo,C. and Anderson,R.G. (2001). Potocytosis. *Robert Feulgen Lecture. Histochem. Cell Biol.* 116, 109-118.
- Minogue,S., Waugh,M.G., De Matteis,M.A., Stephens,D.J., Berditchevski,F., and Hsuan,J.J. (2006). Phosphatidylinositol 4-kinase is required for endosomal trafficking and degradation of the EGF receptor. *J. Cell Sci.* 119, 571-581.
- Mironov,A.A., Beznoussenko,G.V., Nicoziani,P., Martella,O., Trucco,A., Kweon,H.S., Di Giandomenico,D., Polishchuk,R.S., Fusella,A., Lupetti,P., Berger,E.G., Geerts,W.J., Koster,A.J., Burger,K.N., and Luini,A. (2001). Small cargo proteins and large aggregates can traverse the Golgi by a common mechanism without leaving the lumen of cisternae. *J. Cell Biol.* 155, 1225-1238.
- Mironov,A.A., Mironov,A.A., Jr., Beznoussenko,G.V., Trucco,A., Lupetti,P., Smith,J.D., Geerts,W.J., Koster,A.J., Burger,K.N., 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. *Dev. Cell* 5, 583-594.
- Mironov,A.A., Weidman,P., and Luini,A. (1997). Variations on the intracellular transport theme: maturing cisternae and trafficking tubules. *J. Cell Biol.* 138, 481-484.
- Mitchison,T.J. (1995). Evolution of a dynamic cytoskeleton. *Philos. Trans. R. Soc. Lond B Biol. Sci.* 349, 299-304.
- Mittal,S., Dubey,D., Yamakawa,K., and Ganesh,S. (2007). Lafora disease proteins malin and laforin are recruited to aggresomes in response to proteasomal impairment. *Hum. Mol. Genet.* 16, 753-762.
- Mizuno,M. and Singer,S.J. (1994). A possible role for stable microtubules in intracellular transport from the endoplasmic reticulum to the Golgi apparatus. *J. Cell Sci.* 107 (Pt 5), 1321-1331.
- Moffitt,K.L., Martin,S.L., and Walker,B. (2007). The emerging role of serine proteases in apoptosis. *Biochem. Soc. Trans.* 35, 559-560.
- Mogelsvang,S., Marsh,B.J., Ladinsky,M.S., and Howell,K.E. (2004). Predicting function from structure: 3D structure studies of the mammalian Golgi complex. *Traffic.* 5, 338-345.
- Mogensen,M.M., Malik,A., Piel,M., Bouckson-Castaing,V., and Bornens,M. (2000). Microtubule minus-end anchorage at centrosomal and non-centrosomal sites: the role of ninein. *J. Cell Sci.* 113 (Pt 17), 3013-3023.
- Morris,A. and Tannenbaum,J. (1980). Cytochalasin D does not produce net depolymerization of actin filaments in HEp-2 cells. *Nature* 287, 637-639.
- Morris,C.E. and Homann,U. (2001). Cell surface area regulation and membrane tension. *J. Membr. Biol.* 179, 79-102.
- Morton,W.M., Ayscough,K.R., and McLaughlin,P.J. (2000). Latrunculin alters the actin-monomer subunit interface to prevent polymerization. *Nat. Cell Biol.* 2, 376-378.
- 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. *Proc. Natl. Acad. Sci. U. S. A* 95, 6181-6186.
- Munafò,D.B. and Colombo,M.I. (2001). A novel assay to study autophagy: regulation of autophagosome vacuole size by amino acid deprivation. *J. Cell Sci.* 114, 3619-3629.
- Munro,S. (1995). An investigation of the role of transmembrane domains in Golgi protein retention. *EMBO J.* 14, 4695-4704.
- Munro,S. and Pelham,H.R. (1987). A C-terminal signal prevents secretion of luminal ER proteins. *Cell* 48, 899-907.
- Muqit,M.M., Abou-Sleiman,P.M., Saurin,A.T., Harvey,K., Gandhi,S., Deas,E., Eaton,S., Payne,S., Venner,K., Matilla,A., Healy,D.G., Gilks,W.P., Lees,A.J., Holton,J., Revesz,T., Parker,P.J., Harvey,R.J., Wood,N.W., and Latchman,D.S. (2006). Altered cleavage and localization of PINK1 to aggresomes in the presence of proteasomal stress. *J. Neurochem.* 98, 156-169.
- Murata,T., Goshima,F., Nishizawa,Y., Daikoku,T., Takakuwa,H., Ohtsuka,K., Yoshikawa,T., and Nishiyama,Y. (2002). Phosphorylation of cytokeratin 17 by herpes simplex virus type 2 US3 protein kinase. *Microbiol. Immunol.* 46, 707-719.
- Murtazina,R., Kovbasnjuk,O., Donowitz,M., and Li,X. (2006). Na⁺/H⁺ exchanger NHE3 activity and trafficking are lipid Raft-dependent. *J. Biol. Chem.* 281, 17845-17855.
- Musch,A. (2004). Microtubule organization and function in epithelial cells. *Traffic.* 5, 1-9.
- Musch,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 J.* 20, 2171-2179.
- Musch,A., Cohen,D., and Rodriguez-Boulan,E. (1997). Myosin II is involved in the production of constitutive transport vesicles from the TGN. *J. Cell Biol.* 138, 291-306.
- Nakamura,N., Tanaka,S., Teko,Y., Mitsui,K., and Kanazawa,H. (2005). Four Na⁺/H⁺ exchanger isoforms are distributed to Golgi and post-Golgi compartments and are involved in organelle pH regulation. *J. Biol. Chem.* 280, 1561-1572.
- Nanda,A., Brumell,J.H., Nordstrom,T., Kjeldsen,L., Sengelov,H., Borregaard,N., Rotstein,O.D., and Grinstein,S. (1996). Activation of proton pumping in human neutrophils occurs by exocytosis of vesicles bearing vacuolar-type H⁺-ATPases. *J. Biol. Chem.* 271, 15963-15970.
- Nilsson,T., Jackson,M., and Peterson,P.A. (1989). Short cytoplasmic sequences serve as retention signals for transmembrane proteins in the endoplasmic reticulum. *Cell* 58, 707-718.
- Nishida,E., Iida,K., Yonezawa,N., Koyasu,S., Yahara,I., and Sakai,H. (1987). Cofilin is a component of intranuclear and cytoplasmic actin rods induced in cultured cells. *Proc. Natl. Acad. Sci. U. S. A* 84, 5262-5266.
- Nishino,I. (2006). Autophagic vacuolar myopathy. *Semin. Pediatr. Neurol.* 13, 90-95.
- Nobes,C.D. and Hall,A. (1995). Rho, rac and cdc42 GTPases: regulators of actin structures, cell adhesion and motility. *Biochem. Soc. Trans.* 23, 456-459.
- Nowak,K., McCullagh,K., Poon,E., and Davies,K.E. (2005). Muscular dystrophies related to the cytoskeleton/nuclear envelope. *Novartis. Found. Symp.* 264, 98-111.
- Numata,M. and Orlowski,J. (2001). Molecular cloning and characterization of a novel (Na⁺,K⁺)/H⁺ exchanger localized to the trans-Golgi network. *J. Biol. Chem.* 276, 17387-17394.
- O'Neill,G.M., Stehn,J., and Gunning,P.W. (2008). Tropomyosins as interpreters of the signalling environment to regulate the local cytoskeleton. *Semin. Cancer Biol.* 18, 35-44.
- Oda,T., Namba,K., and Maeda,Y. (2005). Position and orientation of phalloidin in F-actin determined by X-ray fiber diffraction analysis. *Biophys. J.* 88, 2727-2736.
- Ohgaki,R., Fukura,N., Matsushita,M., Mitsui,K., and Kanazawa,H. (2007). Cell surface levels of organellar Na⁺/H⁺ exchanger isoform 6 are regulated by interaction with the receptor for activated C-kinase 1. *J. Biol. Chem.*
- Olink-Coux,M., Arcangeletti,C., Pinardi,F., Minisini,R., Huesca,M., Chezzi,C., and Scherrer,K. (1994). Cytolocalization of prosome antigens on intermediate filament subnetworks of cytokeratin, vimentin and desmin type. *J. Cell Sci.* 107 (Pt 3), 353-366.
- Ono,S., Abe,H., and Obinata,T. (1996). Stimulus-dependent disorganization of actin filaments induced by overexpression of cofilin in C2 myoblasts. *Cell Struct. Funct.* 21, 491-499.

- Orci, L., Ravazzola, M., Volchuk, A., Engel, T., Gmachl, M., Amherdt, M., Perrelet, A., Sollner, T.H., and Rothman, J.E. (2000). Anterograde flow of cargo across the golgi stack potentially mediated via bidirectional "percolating" COPI vesicles. *Proc. Natl. Acad. Sci. U. S. A* 97, 10400-10405.
- Orci, L., Stannnes, 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.
- Orlowski, J. and Grinstein, S. (2007). Emerging roles of alkali cation/proton exchangers in organellar homeostasis. *Curr. Opin. Cell Biol.* 19, 483-492.
- Ortega, Z., Diaz-Hernandez, M., and Lucas, J.J. (2007). Is the ubiquitin-proteasome system impaired in Huntington's disease? *Cell Mol. Life Sci.* 64, 2245-2257.
- Ostrowski, M., Grzanka, A., and Izdebska, M. (2005). [The role of actin in Alzheimer's disease]. *Postepy Hig. Med. Dosw. (Online.)* 59, 224-228.
- Paladino, S., Sarnataro, D., Tivodar, S., and Zurzolo, C. (2007). Oligomerization is a specific requirement for apical sorting of glycosyl-phosphatidylinositol-anchored proteins but not for non-raft-associated apical proteins. *Traffic* 8, 251-258.
- Pali, T., Whyteside, G., Dixon, N., Kee, T.P., Ball, S., Harrison, M.A., Findlay, J.B., Finbow, M.E., and Marsh, D. (2004). Interaction of inhibitors of the vacuolar H(+)-ATPase with the transmembrane Vo-sector. *Biochemistry* 43, 12297-12305.
- Palokangas, H., Ying, M., Vaananen, K., and Saraste, J. (1998). Retrograde transport from the pre-Golgi intermediate compartment and the Golgi complex is affected by the vacuolar H+-ATPase inhibitor bafilomycin A1. *Mol. Biol. Cell* 9, 3561-3578.
- Pelham, H.R. and Rothman, J.E. (2000). The debate about transport in the Golgi--two sides of the same coin? *Cell* 102, 713-719.
- Pelkmans, L., Puntener, D., and Helenius, A. (2002). Local actin polymerization and dynamin recruitment in SV40-induced internalization of caveolae. *Science* 296, 535-539.
- Pelletier, L., Stern, C.A., Pypaert, M., Sheff, D., Ngo, H.M., Roper, N., He, C.Y., Hu, K., Toomre, D., Coppens, I., Roos, D.S., Joiner, K.A., and Warren, G. (2002). Golgi biogenesis in *Toxoplasma gondii*. *Nature* 418, 548-552.
- 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. *Curr. Biol.* 13, 534-545.
- Percival, J.M. and Froehner, S.C. (2007). Golgi complex organization in skeletal muscle: a role for Golgi-mediated glycosylation in muscular dystrophies? *Traffic* 8, 184-194.
- Percival, J.M., Hughes, J.A., Brown, D.L., Schevzov, G., Heimann, K., Vrhovski, B., Bryce, N., Stow, J.L., and Gunning, P.W. (2004). Targeting of a tropomyosin isoform to short microfilaments associated with the Golgi complex. *Mol. Biol. Cell* 15, 268-280.
- Perrais, D. and Merrifield, C.J. (2005). Dynamics of endocytic vesicle creation. *Dev. Cell* 9, 581-592.
- Perrin, B.J., Amann, K.J., and Huttenlocher, A. (2006). Proteolysis of cortactin by calpain regulates membrane protrusion during cell migration. *Mol. Biol. Cell* 17, 239-250.
- Peth, A., Boettcher, J.P., and Dubiel, W. (2007). Ubiquitin-dependent proteolysis of the microtubule end-binding protein 1, EB1, is controlled by the COP9 signalosome: possible consequences for microtubule filament stability. *J. Mol. Biol.* 368, 550-563.
- Pickart, C.M. and Cohen, R.E. (2004). Proteasomes and their kin: proteases in the machine age. *Nat. Rev. Mol. Cell Biol.* 5, 177-187.
- Pietrement, C., Sun-Wada, G.H., Silva, N.D., McKee, M., Marshansky, V., Brown, D., Futai, M., and Breton, S. (2006). Distinct expression patterns of different subunit isoforms of the V-ATPase in the rat epididymis. *Biol. Reprod.* 74, 185-194.
- Podlubnaia, Z.A. and Nowak, E. (2006). [The C-terminal fragment of thymopoietin forms F-actin bundles: electron microscopic data]. *Biofizika* 51, 804-809.
- Polishchuk, R., Di Pentima, A., and Lippincott-Schwartz, J. (2004). Delivery of raft-associated, GPI-anchored proteins to the apical surface of polarized MDCK cells by a transcytotic pathway. *Nat. Cell Biol.* 6, 297-307.
- Pollard, T.D. (2007). Regulation of actin filament assembly by Arp2/3 complex and formins. *Annu. Rev. Biophys. Biomol. Struct.* 36, 451-477.
- Pollard, T.D. and Borisy, G.G. (2003). Cellular motility driven by assembly and disassembly of actin filaments. *Cell* 112, 453-465.
- Ponnambalam, S. and Baldwin, S.A. (2003). Constitutive protein secretion from the trans-Golgi network to the plasma membrane. *Mol. Membr. Biol.* 20, 129-139.
- Potter, B.A., Ihrke, G., Bruns, J.R., Weixel, K.M., and Weisz, O.A. (2004). Specific N-glycans direct apical delivery of transmembrane, but not soluble or glycosylphosphatidylinositol-anchored forms of endolyn in Madin-Darby canine kidney cells. *Mol. Biol. Cell* 15, 1407-1416.
- Poupon, V., Girard, M., Legendre-Guillemin, V., Thomas, S., Bourbonniere, L., Philie, J., Bright, N.A., and McPherson, P.S. (2007). Clathrin light chains function in mannose phosphate receptor trafficking via regulation of actin assembly. *Proc. Natl. Acad. Sci. U. S. A.*
- Poupon, V., Girard, M., Legendre-Guillemin, V., Thomas, S., Bourbonniere, L., Philie, J., Bright, N.A., and McPherson, P.S. (2008). Clathrin light chains function in mannose phosphate receptor trafficking via regulation of actin assembly. *Proc. Natl. Acad. Sci. U. S. A* 105, 168-173.
- Prahlad, V., Yoon, M., Moir, R.D., Vale, R.D., and Goldman, R.D. (1998). Rapid movements of vimentin on microtubule tracks: kinesin-dependent assembly of intermediate filament networks. *J. Cell Biol.* 143, 159-170.
- Preuss, D., Mulholland, J., Franzusoff, A., Segev, N., and Botstein, D. (1992). Characterization of the *Saccharomyces* Golgi complex through the cell cycle by immunoelectron microscopy. *Mol. Biol. Cell* 3, 789-803.
- Prydz, K., Dick, G., and Tveit, H. (2008). How many ways through the Golgi maze? *Traffic* 9, 299-304.
- Qualmann, B., Kessels, M.M., and Kelly, R.B. (2000). Molecular links between endocytosis and the actin cytoskeleton. *J. Cell Biol.* 150, F111-F116.
- 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. *Mol. Biol. Cell* *10*, 501-513.
- Quinlan,R.A., Brenner,M., Goldman,J.E., and Messing,A. (2007). GFAP and its role in Alexander disease. *Exp. Cell Res.* *313*, 2077-2087.
- Rabouille,C., Hui,N., Hunte,F., Kieckbusch,R., Berger,E.G., Warren,G., and Nilsson,T. (1995). Mapping the distribution of Golgi enzymes involved in the construction of complex oligosaccharides. *J. Cell Sci.* *108 (Pt 4)*, 1617-1627.
- Rabouille,C. and Klumperman,J. (2005). Opinion: The maturing role of COPI vesicles in intra-Golgi transport. *Nat. Rev. Mol. Cell Biol.* *6*, 812-817.
- Ralston,E., Lu,Z., and Ploug,T. (1999). The organization of the Golgi complex and microtubules in skeletal muscle is fiber type-dependent. *J. Neurosci.* *19*, 10694-10705.
- Ralston,E., Ploug,T., Kalhovde,J., and Lomo,T. (2001). Golgi complex, endoplasmic reticulum exit sites, and microtubules in skeletal muscle fibers are organized by patterned activity. *J. Neurosci.* *21*, 875-883.
- Rambourg,A., Jackson,C.L., and Clermont,Y. (2001). Three dimensional configuration of the secretory pathway and segregation of secretion granules in the yeast *Saccharomyces cerevisiae*. *J. Cell Sci.* *114*, 2231-2239.
- Rao,M.V., Engle,L.J., Mohan,P.S., Yuan,A., Qiu,D., Cataldo,A., Hassinger,L., Jacobsen,S., Lee,V.M., Andreadis,A., Julien,J.P., Bridgman,P.C., and Nixon,R.A. (2002). Myosin Va binding to neurofilaments is essential for correct myosin Va distribution and transport and neurofilament density. *J. Cell Biol.* *159*, 279-290.
- Raposo,G., Cordonnier,M.N., Tenza,D., Menichi,B., Durrbach,A., Louvard,D., and Coudrier,E. (1999). Association of myosin I alpha with endosomes and lysosomes in mammalian cells. *Mol. Biol. Cell* *10*, 1477-1494.
- Ravikumar,B. and Rubinsztein,D.C. (2006). Role of autophagy in the clearance of mutant huntingtin: a step towards therapy? *Mol. Aspects Med.* *27*, 520-527.
- Rechsteiner,M. and Rogers,S.W. (1996). PEST sequences and regulation by proteolysis. *Trends Biochem. Sci.* *21*, 267-271.
- Reed,S.I. (2006). The ubiquitin-proteasome pathway in cell cycle control. *Results Probl. Cell Differ.* *42*, 147-181.
- Reid,E., Kloos,M., Ashley-Koch,A., Hughes,L., Bevan,S., Svenson,I.K., Graham,F.L., Gaskell,P.C., Dearlove,A., Pericak-Vance,M.A., Rubinsztein,D.C., and Marchuk,D.A. (2002). A kinesin heavy chain (KIF5A) mutation in hereditary spastic paraplegia (SPG10). *Am. J. Hum. Genet.* *71*, 1189-1194.
- 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. *Mol. Biol. Cell* *7*, 435-442.
- Ridley,A.J. (2001). Rho proteins: linking signaling with membrane trafficking. *Traffic* *2*, 303-310.
- Ridley,A.J. (2006). Rho GTPases and actin dynamics in membrane protrusions and vesicle trafficking. *Trends Cell Biol.* *16*, 522-529.
- Rios,R.M. and Bornens,M. (2003). The Golgi apparatus at the cell centre. *Curr. Opin. Cell Biol.* *15*, 60-66.
- Robinson,D.G., Albrecht,S., and Moriysu,Y. (2004). The V-ATPase inhibitors concanamycin A and bafilomycin A lead to Golgi swelling in tobacco BY-2 cells. *Protoplasma* *224*, 255-260.
- Robinson,M.S. and Bonifacino,J.S. (2001). Adaptor-related proteins. *Curr. Opin. Cell Biol.* *13*, 444-453.
- Rodriguez,M.L., Brignoni,M., and Salas,P.J. (1994). A specifically apical sub-membrane intermediate filament cytoskeleton in non-brush-border epithelial cells. *J. Cell Sci.* *107 (Pt 11)*, 3145-3151.
- Rodriguez-Boulan,E., Kreitzer,G., and Musch,A. (2005). Organization of vesicular trafficking in epithelia. *Nat. Rev. Mol. Cell Biol.* *6*, 233-247.
- Rogalski,A.A., Bergmann,J.E., and Singer,S.J. (1984). Effect of microtubule assembly status on the intracellular processing and surface expression of an integral protein of the plasma membrane. *J. Cell Biol.* *99*, 1101-1109.
- Ross,C.A. and Poirier,M.A. (2004). Protein aggregation and neurodegenerative disease. *Nat. Med.* *10 Suppl*, S10-S17.
- 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. *Curr. Biol.* *10*, 311-320.
- Rubinsztein,D.C., Ravikumar,B., Acevedo-Aroza,A., Imarisio,S., O'Kane,C.J., and Brown,S.D. (2005). Dyneins, autophagy, aggregation and neurodegeneration. *Autophagy* *1*, 177-178.
- Safer,D., Sosnick,T.R., and Elzinga,M. (1997). Thymosin beta 4 binds actin in an extended conformation and contacts both the barbed and pointed ends. *Biochemistry* *36*, 5806-5816.
- Sahlender,D.A., Roberts,R.C., Arden,S.D., Spudich,G., Taylor,M.J., Luzzio,J.P., Kendrick-Jones,J., and Buss,F. (2005). Optineurin links myosin VI to the Golgi complex and is involved in Golgi organization and exocytosis. *J. Cell Biol.* *169*, 285-295.
- Saito,S. and Karaki,H. (1996). A family of novel actin-inhibiting marine toxins. *Clin. Exp. Pharmacol. Physiol* *23*, 743-746.
- Saito,S., Watabe,S., Ozaki,H., Fusetani,N., and Karaki,H. (1994). Mycalolide B, a novel actin depolymerizing agent. *J. Biol. Chem.* *269*, 29710-29714.
- Salas,P.J., Rodriguez,M.L., Viciano,A.L., Vega-Salas,D.E., and Hauri,H.P. (1997). The apical submembrane cytoskeleton participates in the organization of the apical pole in epithelial cells. *J. Cell Biol.* *137*, 359-375.
- Santa-Maria,I., Hernandez,F., Del Rio,J., Moreno,F.J., and Avila,J. (2007). Tramiprosate, a drug of potential interest for the treatment of Alzheimer's disease, promotes an abnormal aggregation of tau. *Mol. Neurodegener.* *2*, 17.
- Schapiro,F.B. and Grinstein,S. (2000). Determinants of the pH of the Golgi complex. *J. Biol. Chem.* *275*, 21025-21032.
- Scherz-Shouval,R. and Elazar,Z. (2007). ROS, mitochondria and the regulation of autophagy. *Trends Cell Biol.* *17*, 422-427.
- Schick,V., Majores,M., Koch,A., Elger,C.E., Schramm,J., Urbach,H., and Becker,A.J. (2007). Alterations of phosphatidylinositol 3-kinase pathway components in epilepsy-associated glioneuronal lesions. *Epilepsia* *48 Suppl 5*, 65-73.

- Schoenberger,C.A., Steinmetz,M.O., Stoffler,D., Mandinova,A., and Aebi,U. (1999). Structure, assembly, and dynamics of actin filaments in situ and in vitro. *Microsc. Res. Tech.* *47*, 38-50.
- Schott,D., Ho,J., Pruyne,D., and Bretscher,A. (1999). The COOH-terminal domain of Myo2p, a yeast myosin V, has a direct role in secretory vesicle targeting. *J. Cell Biol.* *147*, 791-808.
- Schroder,J.M., Sommer,C., and Schmidt,B. (1990). Desmin and actin associated with cytoplasmic bodies in skeletal muscle fibers: immunocytochemical and fine structural studies, with a note on unusual 18- to 20-nm filaments. *Acta Neuropathol.* *80*, 406-414.
- Schroer,T.A. (2004). Dynactin. *Annu. Rev. Cell Dev. Biol.* *20*, 759-779.
- Schuck,S. and Simons,K. (2004). Polarized sorting in epithelial cells: raft clustering and the biogenesis of the apical membrane. *J. Cell Sci.* *117*, 5955-5964.
- Schulze,E., Asai,D.J., Bulinski,J.C., and Kirschner,M. (1987). Posttranslational modification and microtubule stability. *J. Cell Biol.* *105*, 2167-2177.
- Selkoe,D.J. (1998). The cell biology of beta-amyloid precursor protein and presenilin in Alzheimer's disease. *Trends Cell Biol.* *8*, 447-453.
- Sennoune,S.R., Bakunts,K., Martinez,G.M., Chua-Tuan,J.L., Kebir,Y., Attaya,M.N., and Martinez-Zaguilan,R. (2004). Vacuolar H⁺-ATPase in human breast cancer cells with distinct metastatic potential: distribution and functional activity. *Am. J. Physiol Cell Physiol* *286*, C1443-C1452.
- Sept,D. and McCammon,J.A. (2001). Thermodynamics and kinetics of actin filament nucleation. *Biophys. J.* *81*, 667-674.
- Seto,E.S., Bellen,H.J., and Lloyd,T.E. (2002). When cell biology meets development: endocytic regulation of signaling pathways. *Genes Dev.* *16*, 1314-1336.
- Shacka,J.J., Roth,K.A., and Zhang,J. (2008). The autophagy-lysosomal degradation pathway: role in neurodegenerative disease and therapy. *Front Biosci.* *13*, 718-736.
- Sheetz,M.P. (2001). Cell control by membrane-cytoskeleton adhesion. *Nat. Rev. Mol. Cell Biol.* *2*, 392-396.
- Sheterline,P., Clayton,J., and Sparrow,J. (1995). Actin. *Protein Profile.* *2*, 1-103.
- Shih,Y.L. and Rothfield,L. (2006). The bacterial cytoskeleton. *Microbiol. Mol. Biol. Rev.* *70*, 729-754.
- Short,B., Haas,A., and Barr,F.A. (2005). Golgins and GTPases, giving identity and structure to the Golgi apparatus. *Biochim. Biophys. Acta* *1744*, 383-395.
- Slepov,E.R., Rainey,J.K., Sykes,B.D., and Fliegel,L. (2007). Structural and functional analysis of the Na⁺/H⁺ exchanger. *Biochem. J.* *401*, 623-633.
- Small,J.V., Isenberg,G., and Celis,J.E. (1978). Polarity of actin at the 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 Cell Biol.* *12*, 112-120.
- Southgate,C.D., Chishti,A.H., Mitchell,B., Yi,S.J., and Palek,J. (1996). Targeted disruption of the murine erythroid band 3 gene results in spherocytosis and severe haemolytic anaemia despite a normal membrane skeleton. *Nat. Genet.* *14*, 227-230.
- Spector,I., Braet,F., Shochet,N.R., and Bubb,M.R. (1999). New anti-actin drugs in the study of the organization and function of the actin cytoskeleton. *Microsc. Res. Tech.* *47*, 18-37.
- Spector,I., Shochet,N.R., Blasberger,D., and Kashman,Y. (1989). Latrunculins--novel marine macrolides that disrupt microfilament organization and affect cell growth: I. Comparison with cytochalasin D. *Cell Motil. Cytoskeleton* *13*, 127-144.
- Spector,I., Shochet,N.R., Kashman,Y., and Groweiss,A. (1983). Latrunculins: novel marine toxins that disrupt microfilament organization in cultured cells. *Science* *219*, 493-495.
- Stamnes,M. (2002). Regulating the actin cytoskeleton during vesicular transport. *Curr. Opin. Cell Biol.* *14*, 428-433.
- Stauber,T., Simpson,J.C., Pepperkok,R., and Vernos,I. (2006). A role for kinesin-2 in COPI-dependent recycling between the ER and the Golgi complex. *Curr. Biol.* *16*, 2245-2251.
- Staufenbiel,M. and Lazarides,E. (1986). Ankyrin is fatty acid acylated in erythrocytes. *Proc. Natl. Acad. Sci. U. S. A* *83*, 318-322.
- Stow,J.L. and Heimann,K. (1998). Vesicle budding on Golgi membranes: regulation by G proteins and myosin motors. *Biochim. Biophys. Acta* *1404*, 161-171.
- Styers,M.L., Salazar,G., Love,R., Peden,A.A., Kowalczyk,A.P., and Faundez,V. (2004). The endo-lysosomal sorting machinery interacts with the intermediate filament cytoskeleton. *Mol. Biol. Cell* *15*, 5369-5382.
- Sudakin,V. and Yen,T.J. (2007). Targeting mitosis for anti-cancer therapy. *BioDrugs.* *21*, 225-233.
- Sun-Wada,G.H., Wada,Y., and Futai,M. (2003). Lysosome and lysosome-related organelles responsible for specialized functions in higher organisms, with special emphasis on vacuolar-type proton ATPase. *Cell Struct. Funct.* *28*, 455-463.
- Suresh,S. (2007). Biomechanics and biophysics of cancer cells. *Acta Biomater.* *3*, 413-438.
- 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. *J. Cell Biol.* *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. *J. Cell Biol.* *160*, 409-421.
- Szaszi,K., Paulsen,A., Szabo,E.Z., Numata,M., Grinstein,S., and Orłowski,J. (2002). Clathrin-mediated endocytosis and recycling of the neuron-specific Na⁺/H⁺ exchanger NHE5 isoform. Regulation by phosphatidylinositol 3'-kinase and the actin cytoskeleton. *J. Biol. Chem.* *277*, 42623-42632.
- Szeverenyi,I., Cassidy,A.J., Chung,C.W., Lee,B.T., Common,J.E., Ogg,S.C., Chen,H., Sim,S.Y., Goh,W.L., Ng,K.W., Simpson,J.A., Chee,L.L., Eng,G.H., Li,B., Lunny,D.P., Chuon,D., Venkatesh,A., Khoo,K.H., McLean,W.H., Lim,Y.P., and Lane,E.B. (2007). The Human Intermediate Filament Database: comprehensive information on a gene family involved in many human diseases. *Hum. Mutat.*

- Takahashi,M., Shibata,H., Shimakawa,M., Miyamoto,M., Mukai,H., and Ono,Y. (1999). Characterization of a novel giant scaffolding protein, CG-NAP, that anchors multiple signaling enzymes to centrosome and the golgi apparatus. *J. Biol. Chem.* *274*, 17267-17274.
- Takenawa,T. and Suetsugu,S. (2007). The WASP-WAVE protein network: connecting the membrane to the cytoskeleton. *Nat. Rev. Mol. Cell Biol.* *8*, 37-48.
- Tang,Y., Olufemi,L., Wang,M.T., and Nie,D. (2008). Role of Rho GTPases in breast cancer. *Front Biosci.* *13*, 759-776.
- Tassin,A.M., Maro,B., and Bornens,M. (1985). Fate of microtubule-organizing centers during myogenesis in vitro. *J. Cell Biol.* *100*, 35-46.
- Tehrani,S., Tomasevic,N., Weed,S., Sakowicz,R., and Cooper,J.A. (2007). Src phosphorylation of cortactin enhances actin assembly. *Proc. Natl. Acad. Sci. U. S. A* *104*, 11933-11938.
- Thyberg,J. and Moskalewski,S. (1999). Role of microtubules in the organization of the Golgi complex. *Exp. Cell Res.* *246*, 263-279.
- Tolias,K. and Carpenter,C.L. (2000). In vitro interaction of phosphoinositide-4-phosphate 5-kinases with Rac. *Methods Enzymol.* *325*, 190-200.
- 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. *Curr. Biol.* *10*, 153-156.
- Tomas,M., Marin,P., Megias,L., Egea,G., and Renau-Piqueras,J. (2005). Ethanol perturbs the secretory pathway in astrocytes. *Neurobiol. Dis.* *20*, 773-784.
- Toyomura,T., Murata,Y., Yamamoto,A., Oka,T., Sun-Wada,G.H., Wada,Y., and Futai,M. (2003). From lysosomes to the plasma membrane: localization of vacuolar-type H⁺-ATPase with the $\alpha 3$ isoform during osteoclast differentiation. *J. Biol. Chem.* *278*, 22023-22030.
- Trucco,A., Polishchuk,R.S., Martella,O., Di Pentima,A., Fusella,A., Di Giandomenico,D., San Pietro,E., Beznoussenko,G.V., Polishchuk,E.V., Baldassarre,M., Buccione,R., Geerts,W.J., Koster,A.J., Burger,K.N., Mironov,A.A., and Luini,A. (2004). Secretory traffic triggers the formation of tubular continuities across Golgi sub-compartments. *Nat. Cell Biol.* *6*, 1071-1081.
- Tsuboi,Y. (2006). Neuropathology of familial tauopathy. *Neuropathology.* *26*, 471-474.
- Tsukita,S. and Yonemura,S. (1999). Cortical actin organization: lessons from ERM (ezrin/radixin/moesin) proteins. *J. Biol. Chem.* *274*, 34507-34510.
- Upadhyya,S.C. and Hegde,A.N. (2007). Role of the ubiquitin proteasome system in Alzheimer's disease. *BMC. Biochem.* *8 Suppl 1*, S12.
- Upadhyaya,A. and Sheetz,M.P. (2004). Tension in tubulovesicular networks of Golgi and endoplasmic reticulum membranes. *Biophys. J.* *86*, 2923-2928.
- Usui,T., Kazami,S., Dohmae,N., Mashimo,Y., Kondo,H., Tsuda,M., Terasaki,A.G., Ohashi,K., Kobayashi,J., and Osada,H. (2004). Amphidinolide h, a potent cytotoxic macrolide, covalently binds on actin subdomain 4 and stabilizes actin filament. *Chem. Biol.* *11*, 1269-1277.
- Uversky,V.N. (2007). Neuropathology, biochemistry, and biophysics of alpha-synuclein aggregation. *J. Neurochem.* *103*, 17-37.
- 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. *Eur. J. Cell Biol.* *76*, 9-17.
- Valderrama,F., Duran,J.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.
- 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. *Proc. Natl. Acad. Sci. U. S. A* *97*, 1560-1565.
- van den,E.F., Amos,L.A., and Lowe,J. (2001). Prokaryotic origin of the actin cytoskeleton. *Nature* *413*, 39-44.
- van Deurs,B., Roepstorff,K., Hommelgaard,A.M., and Sandvig,K. (2003). Caveolae: anchored, multifunctional platforms in the lipid ocean. *Trends Cell Biol.* *13*, 92-100.
- Van Troys,M., Vandekerckhove,J., and Ampe,C. (1999). Structural modules in actin-binding proteins: towards a new classification. *Biochim. Biophys. Acta* *1448*, 323-348.
- Ventruiti,A. and Cuervo,A.M. (2007). Autophagy and neurodegeneration. *Curr. Neurol. Neurosci. Rep.* *7*, 443-451.
- Vitavska,O., Merzendorfer,H., and Wieczorek,H. (2005). The V-ATPase subunit C binds to polymeric F-actin as well as to monomeric G-actin and induces cross-linking of actin filaments. *J. Biol. Chem.* *280*, 1070-1076.
- Vitavska,O., Wieczorek,H., and Merzendorfer,H. (2003). A novel role for subunit C in mediating binding of the H⁺-V-ATPase to the actin cytoskeleton. *J. Biol. Chem.* *278*, 18499-18505.
- Wada,S., Matsunaga,S., Saito,S., Fusetani,N., and Watabe,S. (1998). Actin-binding specificity of marine macrolide toxins, mycalolide B and kabiramide D. *J. Biochem. (Tokyo)* *123*, 946-952.
- Wagner,C.A., Finberg,K.E., Breton,S., Marshansky,V., Brown,D., and Geibel,J.P. (2004). Renal vacuolar H⁺-ATPase. *Physiol Rev.* *84*, 1263-1314.
- Wang,X., Cheung,H.W., Chun,A.C., Jin,D.Y., and Wong,Y.C. (2008). Mitotic checkpoint defects in human cancers and their implications to chemotherapy. *Front Biosci.* *13*, 2103-2114.
- Warner,C.L., Stewart,A., Luzio,J.P., Steel,K.P., Libby,R.T., Kendrick-Jones,J., and Buss,F. (2003). Loss of myosin VI reduces secretion and the size of the Golgi in fibroblasts from Snell's waltzer mice. *EMBO J.* *22*, 569-579.
- Warner,S.L., Gray,P.J., and Von Hoff,D.D. (2006). Tubulin-associated drug targets: Aurora kinases, Polo-like kinases, and others. *Semin. Oncol.* *33*, 436-448.
- Webb,J.L., Ravikumar,B., and Rubinsztein,D.C. (2004). Microtubule disruption inhibits autophagosome-lysosome fusion: implications for studying the roles of aggresomes in polyglutamine diseases. *Int. J. Biochem. Cell Biol.* *36*, 2541-2550.

- Weclawicz,K., Kristensson,K., and Svensson,L. (1994). Rotavirus causes selective vimentin reorganization in monkey kidney CV-1 cells. *J. Gen. Virol.* 75 (Pt 11), 3267-3271.
- Weernink,P.A., Guo,Y., Zhang,C., Schmidt,M., Eichel-Streiber,C., and Jakobs,K.H. (2000). Control of cellular phosphatidylinositol 4,5-bisphosphate levels by adhesion signals and rho GTPases in NIH 3T3 fibroblasts involvement of both phosphatidylinositol-4-phosphate 5-kinase and phospholipase C. *Eur. J. Biochem.* 267, 5237-5246.
- Welch,M.D. and Mullins,R.D. (2002). Cellular control of actin nucleation. *Annu. Rev. Cell Dev. Biol.* 18, 247-288.
- Wells,A.L., Lin,A.W., Chen,L.Q., Safer,D., Cain,S.M., Hasson,T., Carragher,B.O., Milligan,R.A., and Sweeney,H.L. (1999). Myosin VI is an actin-based motor that moves backwards. *Nature* 401, 505-508.
- Whiteside,G., Meek,P.J., Ball,S.K., Dixon,N., Finbow,M.E., Kee,T.P., Findlay,J.B., and Harrison,M.A. (2005). Concanamycin and indolyl pentadienamide inhibitors of the vacuolar H⁺-ATPase bind with high affinity to the purified proteolipid subunit of the membrane domain. *Biochemistry* 44, 15024-15031.
- Wieland,T. and Faulstich,H. (1977). The action of phalloidin. *Curr. Probl. Clin. Biochem.* 7, 11-14.
- Willipinski-Stapelfeldt,B., Riethdorf,S., Assmann,V., Woelfle,U., Rau,T., Sauter,G., Heukeshoven,J., and Pantel,K. (2005). Changes in cytoskeletal protein composition indicative of an epithelial-mesenchymal transition in human micrometastatic and primary breast carcinoma cells. *Clin. Cancer Res.* 11, 8006-8014.
- Woelfle,U., Sauter,G., Santjer,S., Brakenhoff,R., and Pantel,K. (2004). Down-regulated expression of cytokeratin 18 promotes progression of human breast cancer. *Clin. Cancer Res.* 10, 2670-2674.
- Wojcik,C. and DeMartino,G.N. (2003). Intracellular localization of proteasomes. *Int. J. Biochem. Cell Biol.* 35, 579-589.
- Wu,M.M., Grabe,M., Adams,S., Tsien,R.Y., Moore,H.P., and Machen,T.E. (2001). Mechanisms of pH regulation in the regulated secretory pathway. *J. Biol. Chem.* 276, 33027-33035.
- Yamashiro,S., Yamakita,Y., Ono,S., and Matsumura,F. (1998). Fascin, an actin-bundling protein, induces membrane protrusions and increases cell motility of epithelial cells. *Mol. Biol. Cell* 9, 993-1006.
- Yang,J.S., Lee,S.Y., Gao,M., Bourgoin,S., Randazzo,P.A., Premont,R.T., and Hsu,V.W. (2002). ARFGAP1 promotes the formation of COPI vesicles, suggesting function as a component of the coat. *J. Cell Biol.* 159, 69-78.
- Yeaman,C., Ayala,M.I., Wright,J.R., Bard,F., Bossard,C., Ang,A., Maeda,Y., Seufferlein,T., Mellman,I., Nelson,W.J., and Malhotra,V. (2004). Protein kinase D regulates basolateral membrane protein exit from trans-Golgi network. *Nat. Cell Biol.* 6, 106-112.
- Yilla,M., Tan,A., Ito,K., Miwa,K., and Ploegh,H.L. (1993). Involvement of the vacuolar H⁽⁺⁾-ATPases in the secretory pathway of HepG2 cells. *J. Biol. Chem.* 268, 19092-19100.
- Ying,M., Flatmark,T., and Saraste,J. (2000). The p58-positive pre-golgi intermediates consist of distinct subpopulations of particles that show differential binding of COPI and COPII coats and contain vacuolar H⁽⁺⁾-ATPase. *J. Cell Sci.* 113 (Pt 20), 3623-3638.
- Yorimitsu,T. and Klionsky,D.J. (2007). Endoplasmic reticulum stress: a new pathway to induce autophagy. *Autophagy.* 3, 160-162.
- Yoshimori,T., Keller,P., Roth,M.G., and Simons,K. (1996). Different biosynthetic transport routes to the plasma membrane in BHK and CHO cells. *J. Cell Biol.* 133, 247-256.
- Yu,H., King,R.W., Peters,J.M., and Kirschner,M.W. (1996). Identification of a novel ubiquitin-conjugating enzyme involved in mitotic cyclin degradation. *Curr. Biol.* 6, 455-466.
- Zatloukal,K., French,S.W., Stumptner,C., Strnad,P., Harada,M., Toivola,D.M., Cadrin,M., and Omary,M.B. (2007). From Mallory to Mallory-Denk bodies: what, how and why? *Exp. Cell Res.* 313, 2033-2049.
- Zavasnik-Bergant,T. and Turk,B. (2007). Cysteine proteases: destruction ability versus immunomodulation capacity in immune cells. *Biol. Chem.* 388, 1141-1149.
- Zeller,R., Haramis,A.G., Zuniga,A., McGuigan,C., Dono,R., Davidson,G., Chabanis,S., and Gibson,T. (1999). Formin defines a large family of morphoregulatory genes and functions in establishment of the polarising region. *Cell Tissue Res.* 296, 85-93.
- Zuo,J., Jiang,J., Chen,S.H., Vergara,S., Gong,Y., Xue,J., Huang,H., Kaku,M., and Holliday,L.S. (2006). Actin binding activity of subunit B of vacuolar H⁺-ATPase is involved in its targeting to ruffled membranes of osteoclasts. *J. Bone Miner. Res.* 21, 714-721.