

Supplementary Material

Table S1. List of antibody and ligand reagents used in this study

Target molecule	Reagent	Reference
Rab proteins		
Rab4a	Rabbit polyclonal (Cell Signaling, Cat.No. 2167P)	Lee et al., 2013
Rab5a	Rabbit polyclonal (Santa Cruz Biotech; Cat. No. sc28570) Rabbit polyclonal (Cell Signaling, Cat.No. 3547P)	ad sc28570 - Meister et al., 2014
Rab6a	Rabbit polyclonal (Cell Signaling; Cat.No. 9625)	Kawauchi and Nabeshima, 2019
Rab7a	Rabbit polyclonal (Cell Signaling; Cat.No. 9367)	Hong et al., 2015; Hubert et al., 2016
Rab8a	Rabbit polyclonal (LS Bio; Cat.No. LS-C313375)	-
Rab9a	Rabbit polyclonal (Cell Signaling; Cat.No. 5118)	Liu et al., 2012
Rab10	Rabbit polyclonal (Cell Signaling; Cat.No. 8127)	Homma and Fukuda, 2016
Rab11a	Rabbit polyclonal (Cell Signaling; Cat.No.5589)	Di Matteo et al., 2017
Rab13	Rabbit polyclonal (Biorbyt; Cat.No. orb36847)	-
Rab14	Rabbit polyclonal (Novus, Cat.No. NBP1-84720)	Goundry et al., 2017
Rab15	Rabbit polyclonal (Biorbyt, Cat.No. orb326053)	-
Rab18	Rabbit polyclonal (Sigma-Aldrich, Cat.No. SAB4200174)	Qinwei et al., 2016
Rab22a	Rabbit polyclonal (LS Bio; Cat.No. LS-C112063)	-
Rab27a	Mouse monoclonal IgG ₁ (Abcam, Cat.No. ab55667) Rabbit polyclonal (Abcam; Cat.No. ab108983) Sheep polyclonal (R&D Systems, Cat.No. AF7245)	ad ab55667 - Ostenfeld et al., 2014

Rab27b	Rabbit polyclonal (Millipore, Cat.No. ABS1026)	Nojima et al., 2016
Rab31/Rab22b	Rabbit polyclonal (LS Bio, Cat.No. LS-C186716)	-
Rab35	Rabbit polyclonal (Cell Signaling; Cat.No. 9690S)	Dikshit et al., 2015
Rab41	Rabbit polyclonal (Biorbyt; Cat.No.orb372858)	-
Rab effectors, GEFs and GAPs		
EPI64	Rabbit polyclonal (Biorbyt; Cat.No. orb313370)	-
MICAL-L1	Mouse monoclonal IgG ₁ (Santa Cruz Biotechnology; Cat.No. sc-398397)	Takahashi et al., 2017
ACAP1	Rabbit polyclonal (biorbyt; Cat.No. orb29096)	-
ACAP2	Mouse monoclonal IgG ₁ (Santa Cruz Biotechnology; Cat.No. sc-376150)	-
Rabenosyn-5	Rabbit polyclonal (LS Bio, Cat.No. LS-C110401)	-
Hrs/HGS	Rabbit polyclonal (LS Bio, Cat.No. LS-B12780)	-
Vps24	Rabbit polyclonal (LS Bio, Cat.No. LS-C94080)	-
PikFYVE	Rabbit polyclonal (LS Bio, Cat.No. LS-C119339)	-
APPL-1	Rabbit polyclonal (Cell Signaling, Cat.No. 3858)	Jung et al., 2017
EEA1	Chicken polyclonal (Invitrogen, Cat.No. 40-5700)	Mu et al., 1995; Simonsen et al., 1998; Christoforidis et al., 1999
ARF proteins and their effectors		
ARF1	Rabbit monoclonal (Abcam; Cat.No. ab32524)	Rocca et al., 2013
ARF3	Rabbit monoclonal (Abcam; Cat.No. ab157467)	-
ARF4	Rabbit polyconal (Novus; Cat.No. NBP1-55918) Rabbit polyclonal (LSBio; Cat.No. LS-C353895)	-
ARF5	Rabbit monoclonal (Abcam; Cat.No. ab125023)	-

ARF6	Rabbit polyclonal (Abcam; Cat.No. ab77581) Rabbit monoclonal (Abcam; Cat.No. ab49931) Rabbit monoclonal (Cell Signaling; Cat.No. 5740S)	ad ab77581 - Allaire et al., 2013; Eva et al., 2012 ad ab49931 - Eva et al., 2012; ad 5740S - Sakagami et al., 2008
BIG1	Rabbit polyclonal (Biorbyt; Cat.No. orb155841)	-
BIG2	Rabbit polyclonal (Abcam, Cat.No. ab75001) Rabbit polyclonal (LSBio; Cat.No. LS-C119793)	-
BRAG2	Rabbit polyclonal (Abcam, Cat.No – ab122442)	Humphreys et al.,2013
Endosomal markers		
CD63	Rat monoclonal IgG _{2b} (MBL International, clone R5G2, Cat.No. D263-3)	Bobrie et al., 2012
Lamp1	Rat monoclonal IgG _{2a} (BD Pharmigen, Cat.No. 553792)	Belaid et al., 2014; Garg et al., 2011
NPC1	Rabbit polyclonal Abs (LifeSpan BioSciences; Cat.No. LS-B6281).	van der Kant et al., 2013
GM1	Alexa Fluor CTxB 555 conjugate (Invitrogen, Cat.No. C34776) Alexa Fluor CTxB 488 conjugate (Invitrogen, Cat.No. C22841)	ad C34776 - Shaw et al., 2006; ad C22841 - Bavari et al., 2002;
Evectin-2	Rabbit polyclonal (Biorbyt, Cat.No. orb312792)	-
AP1 (Anti-adaptin γ)	Mouse monoclonal IgG _{2a} (BD Biosciences, Cat.No. 610385)	Nag et al., 2018
AP2 (Anti-adaptin α)	Mouse monoclonal IgG ₁ (BD Biosciences, Cat.No. 610501)	Stevenson et al., 2017
Vps35	Rabbit monoclonal (Abcam, Cat.No.ab157220)	MacDonald et al., 2018
WASH1	Mouse monoclonal IgG1 (Sigma-Aldrich,Cat.No.SAB4200552)	-
Dynamin2	Rabbit polyclonal IgG (Thermofisher scientific, Cat.No. PA5-19800)	Søreng et al., 2018
LBPA (lysobisphosphatidic acid)	MAbs, hybridoma 6C4 (mouse IgG1; gift of Dr. J. Gruenberg, University of Geneva, Switzerland).	Chevallier et al., 2008; Brankatschk et al., 2011
EHBP1	Rabbit polyclonal (Novus; Cat.No.NBP1-93614)	Simone LC et al., 2013

Endosomal cargo proteins		
MHC-I	MAB, hybridoma SF1-1.1.1 (mouse IgG2a) – recognize the heavy chain of fully conformed H2-K ^d molecule	Noun et al., 1996
CD44	clone IM7, rat	Hiršl et al., 2018
TfR (CD71)	Tranferrin Alexa Fluor 555 conjugate (Invitrogen, Cat.No. T35352) Transferrin Alexa Fluor 488 conjugate (Invitrogen, Cat.No. T13342) Monoclonal antibody, clone R17 217.1.3 (rat IgG2a; ATCC TIB 219).	ad T3535 - Razi et al., 2009 ad T13342 - Barysch et al., 2010 mAb - Mahmutefendić et al., 2011,
M6PR	Rabbit polyclonal (Abcam, Cat.No. ab2733; ab8093)	ad ab2733 - Munson et al., 2015; ad ab8093 - Boonyaratanakornkit et al., 2013
Furin	Rabbit polyclonal (Abcam, Cat.No. ab3467)	Delestre-Delacour et al., 2017
RAE1	Clone Rae1 γ .01, mouse IgG1	
Golgi markers		
GS15	Mouse monoclonal IgG ₁ (BD Biosciences, Cat.No. 610960)	Williams et al., 2014
GM130	Mouse monoclonal IgG ₁ (BD Biosciences, Cat.No. 610823)	Bagh et al., 2017
Vti1a	Mouse monoclonal IgG ₁ (BD Biosciences, Cat. No. 611220)	Crawford et al., 2017; Wong and Munro, 2014
Syntaxin-6	Rabbit Monoclonal (Thermo Fischer Scientific, Cat.No. MA5-14858)	-
Golgin 97	Rabbit polyclonal (Abcam, Cat.No.ab84340)	Doerflinger et al., 2017
TGN-38	Rabbit polyclonal (Novus Biological, Cat.No. NBP1-03495)	Fernandez-Fernandez et al., 2017
Autophagic and apoptotic pathways		
LC3A, B, C	Rabbit polyclonal (MBL, Cat.No. PM036)	Monel et al., 2017
LC3B	Rabbit polyclonal (Cell Signaling Technology, Cat.No. 2775)	Piragyte et al., 2018
p62	Mouse monoclonal IgG _{2a} (Novus; Cat. No. H00008878-M01)	An and Harper, 2018
AIFM1	Rabbit polyclonal (Cell Signaling, cat no 4642)	Park et al., 2017

Cytoskeleton		
Actin	Mouse monoclonal (Millipore, Cat.No. MAB1501)	Treda et al., 2016
Tubulin	Rabbit polyclonal (Sigma, Cat.No. T-3526) Mouse monoclonal IgG ₁ (Invitrogen, Cat.No. A11126)	ad Sigma T-3526 - Zhang et al., 2009 ad Invitrogen A11126 - Cooper et al., 2015
MCMV proteins		
m123/IE1	Mouse monoclonal IgG ₁ ; clone CROMA 101 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-08). Mouse monoclonal IgG _{2a} ; clone IE1.01. (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-12).	Kučić et al., 2005; Budt et al., 2009
M112-113/E1	Mouse monoclonal IgG ₁ , clone CROMA 103 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-07)	Kučić et al., 2005; Podlech et al., 2010
M25	Mouse monoclonal IgG ₁ , clone M25C.01 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-03)	Kutle et al., 2017
M55.1 (gB)	Mouse monoclonal IgG _{2b} , clone M55.01 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-05)	Liu et al., 2014
M55.2 (gB)	Mouse monoclonal IgG _{2a} , clone M55.02 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-14).	Yunis et al., 2019
M57	Mouse monoclonal, clone M57.02 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-6).	Lenac Rovis et al., 2016
M74	Mouse monoclonal IgG ₁ , clone M74.01 (University of Rijeka Center for Proteomics, Cat. No. HR-MCMV-6).	Yunis et al., 2019

Supplementary references:

1. Allaire, P. D., Seyed Sadr, M., Chaineau, M., Seyed Sadr, E., Konefal S., Fotouhi M., et al. (2013). Interplay between Rab35 and Arf6 controls cargo recycling to coordinate cell adhesion and migration. *J. Cell Sci.* 126, 722-731. doi: 10.1242/jcs.112375.
2. An, H., Harper, J. W. (2018). Systematic analysis of ribophagy in human cells reveals bystander flux during selective autophagy. *Nat. Cell Biol.* 20, 135-143. doi: 10.1038/s41556-017-0007-x.
3. Bagh, M. B., Peng, S., Chandra, G., Zhang, Z., Singh, S. P., Pattabiraman, N., et al. (2017) Misrouting of v-ATPase subunit V0a1 dysregulates lysosomal acidification in a

- neurodegenerative lysosomal storage disease model. *Nat. Commun.* 8:14612. doi: 10.1038/ncomms14612.
4. Barysch, S. V., Jahn, R., Rizzoli, S. O. (2010). A fluorescence-based in vitro assay for investigating early endosome dynamics. *Nat. Protoc.* 5, 1127-1137. doi:10.1038/nprot.2010.84.
 5. Bavari, S., Bosio, C. M., Wiegand, E., Ruthel, G., Will, A. B., Geisbert, T. W., et al. (2002). Lipid raft microdomains: a gateway for compartmentalized trafficking of Ebola and Marburg viruses. *J. Exp. Med.* 195, 593-602. doi: 10.1084/jem.20011500.
 6. Belaid, A., Ndiaye, P. D., Cerezo, M., Cailleateau, L., Brest, P., Klionsky, D. J., et al. (2014). Autophagy and SQSTM1 on the RHOA(d) again: emerging roles of autophagy in the degradation of signaling proteins. *Autophagy* 10, 201-208. doi: 10.4161/auto.27198.
 7. Bobrie A., Colombo M., Krumeich S., Raposo G., Théry C. (2012). Diverse subpopulations of vesicles secreted by different intracellular mechanisms are present in exosome preparations obtained by differential ultracentrifugation. *J. Extracell. Vesicles* 1. doi: 10.3402/jev.v1i0.18397.
 8. Bonuccelli G., Casimiro M. C., Sotgia F., Wang C., Liu M., Katiyar S., et al. (2009). Caveolin-1 (P132L), a common breast cancer mutation, confers mammary cell invasiveness and defines a novel stem cell/metastasis-associated gene signature. *Am. J. Pathol.* 174, 1650-1662. doi: 10.2353/ajpath.2009.080648.
 9. Boonyaratanakornkit J., Schomacker H., Collins P., Schmidt A. (2013). Alix serves as an adaptor that allows human parainfluenza virus type 1 to interact with the host cell ESCRT system. *PLoS One* 8, e59462. doi: 10.1371/journal.pone.0059462.
 10. Brankatschk B., Pons V., Parton R. G., Gruenberg J. (2011). Role of SNX16 in the dynamics of tubulo-cisternal membrane domains of late endosomes. *PLoS One* 6, e21771. doi: 10.1371/journal.pone.0021771.
 11. Budt M., Niederstadt L., Valchanova R. S., Jonjić S., Brune W. (2009). Specific inhibition of the PKR-mediated antiviral response by the murine cytomegalovirus proteins m142 and m143. *J. Virol.* 83, 1260-1270. doi: 10.1128/JVI.01558-08.
 12. Chevallier J., Chamoun Z., Jiang G., Prestwich G., Sakai N., Matile S., et al. (2008). Lysobisphosphatidic acid controls endosomal cholesterol levels. *J. Biol. Chem.* 283, 27871-2780. doi: 10.1074/jbc.M801463200.
 13. Christoforidis S., McBride H. M., Burgoyne R. D., Zerial M. (1999). The Rab5 effector EEA1 is a core component of endosome docking. *Nature* 397, 621-625. doi: 10.1038/17618.
 14. Cooper S., Sadok A., Bousgouni V., Bakal C. (2015). Apolar and polar transitions drive the conversion between amoeboid and mesenchymal shapes in melanoma cells. *Mol. Biol. Cell* 26, 4163-4170. doi: 10.1091/mbc.E15-06-0382.
 15. Crawford D. C., Ramirez D. M., Trauterman B., Monteggia L. M., Kavalali E. T. (2017). Selective molecular impairment of spontaneous neurotransmission modulates synaptic efficacy. *Nat. Commun.* 8, 14436. doi: 10.1038/ncomms14436.
 16. Delestre-Delacour C., Carmon O., Laguerre F., Estay-Ahumada C., Courel M., Elias S., et al. (2017). Myosin 1b and F-actin are involved in the control of secretory granule biogenesis. *Sci. Rep.* 7, 5172. doi:10.1038/s41598-017-05617-1.

17. Di Matteo P., Calvello M., Luin S., Marchetti L., Cattaneo A. (2017). An optimized procedure for the site-directed labeling of NGF and proNGF for imaging purposes. *Front. Mol. Biosci.* 4, 4. doi: 10.3389/fmolb.2017.00004.
18. Dikshit N., Bist P., Fenlon S. N., Pulloor N. K., Chua C. E., Scidmore, M. A., et al. (2015). Intracellular uropathogenic *E. coli* exploits host Rab35 for iron acquisition and survival within urinary bladder cells. *PLoS Pathog.* 11, e1005083. doi: 10.1371/journal.ppat.1005083.
19. Doerflinger, S. Y., Cortese, M., Romero-Brey, I., Menne, Z., Tubiana, T., Schenk, C., et al. (2017). Membrane alterations induced by nonstructural proteins of human norovirus. *PLoS Pathog.* 3, e1006705. doi: 10.1371/journal.ppat.1006705.
20. Eva, R., Crisp, S., Marland, J. R., Norman, J. C., Kanamarlapudi, V., French-Constant, C., et al. (2012). ARF6 directs axon transport and traffic of integrins and regulates axon growth in adult DRG neurons. *J. Neurosci.* 32, 10352-10364. doi:10.1523/JNEUROSCI.1409-12.2012.
21. Fernandez-Fernandez, M. R., Ruiz-Garcia, D., Martin-Solana, E., Chichon, F. J., Carrascosa, J. L., Fernandez, J. J. (2017). 3D electron tomography of brain tissue unveils distinct Golgi structures that sequester cytoplasmic contents in neurons. *J. Cell Sci.* 130, 83-89. doi: 10.1242/jcs.188060.
22. Garg S., Sharma M., Ung C., Tuli A., Barral D. C., Hava D. L., et al. (2011). Lysosomal trafficking, antigen presentation, and microbial killing are controlled by the Arf-like GTPase Arl8b. *Immunity* 35, 182-193. doi: 10.1016/j.immuni.2011.06.009.
23. Gundry, C., Marco, S., Rainero, E., Miller, B., Dornier, E., Mitchell, L., et al. (2017). Phosphorylation of Rab-coupling protein by LMTK3 controls Rab14-dependent EphA2 trafficking to promote cell: cell repulsion. *Nat. Commun.* 8, 14646. doi: 10.1038/ncomms14646.
24. Hiltbold, E. M., Poloso, N. J., Roche, P. A. (2003). MHC class II-peptide complexes and APC lipid rafts accumulate at the immunological synapse. *J. Immunol.* 170, 1329-1338. doi: 10.4049/jimmunol.170.3.1329.
25. Hiršl, L., Brizić, I., Jenuš, T., Juranić Lisnić, V., Reichel, J.J., Jurković, S., et al. (2018). Murine CMV expressing the high affinity NKG2D ligand MULT-1: A model for the development of cytomegalovirus-based vaccines. *Front. Immunol.* 9:991. doi: 10.3389/fimmu.2018.00991.
26. Homma, Y., Fukuda, M. (2016). Rabin8 regulates neurite outgrowth in both GEF activity-dependent and -independent manners. *Mol. Biol. Cell* 27, 2107-2118. doi: 10.1091/mbc.E16-02-0091.
27. Hong, N. H., Qi, A., Weaver, A. M. (2015). PI(3,5)P2 controls endosomal branched actin dynamics by regulating cortactin-actin interactions. *J. Cell Biol.* 210, 753-769. doi: 10.1083/jcb.201412127.
28. Hubert, V., Peschel, A., Langer, B., Gröger, M., Rees, A., Kain, R. (2016). LAMP-2 is required for incorporating syntaxin-17 into autophagosomes and for their fusion with lysosomes. *Biol. Open.* 5, 1516-1529. doi: 10.1242/bio.018648.
29. Humphreys, D., Davidson, A. C., Hume, P. J., Makin, L. E., Koronakis, V. (2013). Arf6 coordinates actin assembly through the WAVE complex, a mechanism usurped by *Salmonella* to invade host cells. *Proc. Natl. Acad. Sci. USA* 110, 16880-16885. doi:10.1073/pnas.1311680110.

30. Jung, Y. R., Lee, J. H., Sohn, K. C., Lee, Y., Seo, Y. J., Kim, C. D., et al. (2017). Adiponectin signaling regulates lipid production in human sebocytes. *PLoS One.*; 12, e0169824. doi: 10.1371/journal.pone.0169824.
31. Kahn, O. I., Schätzle, P., van de Willige, D., Tas, R. P., Lindhout, F. W., Portegies, S., et al. (2018). APC2 controls dendrite development by promoting microtubule dynamics. *Nat. Commun.* 9, 2773. doi:10.1038/s41467-018-05124-5.
32. Kawauchi, T., Nabeshima, Y. I. (2019). Growth arrest triggers extra-cell cycle regulatory function in neurons: possible involvement of p27(kip1) in membrane trafficking as well as cytoskeletal regulation. *Front. Cell Dev. Biol.* 7:64. doi:10.3389/fcell.2019.00064.
33. Kučić, N., Mahmutefendić, H., Lucin, P. (2005). Inhibition of protein kinases C prevents murine cytomegalovirus replication. *J. Gen. Virol.* 86, 2153-2161. doi: 10.1099/vir.0.80733-0.
34. Kutle, I., Sengstake, S., Templin, C., Glaß, M., Kubsch, T., Keyser, K. A., et al. (2017). The M25 gene products are critical for the cytopathic effect of mouse cytomegalovirus. *Sci Rep.* 7, 15588. doi: 10.1038/s41598-017-15783-x.
35. Lee, Y., Chung, S., Baek, I. K., Lee, T. H., Paik, S. Y., Lee, J. (2013). UNC119a bridges the transmission of Fyn signals to Rab11, leading to the completion of cytokinesis. *Cell Cycle.* 12, 1303-1315. doi: 10.4161/cc.24404.
36. Lenac Rovis, T., Kucan Brlic, P., Kaynan, N., Juranic Lisnic, V., Brizic I., Jordan, S., et al. (2016). Inflammatory monocytes and NK cells play a crucial role in DNAM-1-dependent control of cytomegalovirus infection. *J. Exp. Med.* 213, 1835-1850. doi: 10.1084/jem.20151899.
37. Liu, G., Zhang, F., Wang, R., London, L., London, S. D. (2014). Protective MCMV immunity by vaccination of the salivary gland via Wharton's duct: replication-deficient recombinant adenovirus expressing individual MCMV genes elicits protection similar to that of MCMV. *FASEB J.* 28, 1698-1710. doi: 10.1096/fj.13-244178.
38. Liu, X. D., Ko, S., Xu, Y., Fattah, E. A., Xiang, Q., Jagannath, C., et al. (2012). Transient aggregation of ubiquitinated proteins is a cytosolic unfolded protein response to inflammation and endoplasmic reticulum stress. *J. Biol. Chem.* 287, 19687-19698. doi: 10.1074/jbc.M112.350934.
39. MacDonald, E., Brown, L., Selvais, A., Liu, H., Waring, T., Newman, D., et al. (2018). HRS-WASH axis governs actin-mediated endosomal recycling and cell invasion. *J. Cell Biol.* 217, 2549-2564. doi: 10.1083/jcb.201710051.
40. Mahmutefendić, H., Blagojević, G., Ilić Tomaš, M., Kučić, N., Lučin, P. (2011). Segregation of open Major Histocompatibility Class I conformers at the plasma membrane and during endosomal trafficking reveals conformation-based sorting in the endosomal system. *Int. J. Biochem. Cell Biol.* 43, 504-515 doi: 10.1016/j.biocel.2010.12.002.
41. Meister, M., Zuk, A., Tikkanen, R. (2014). Role of dynamin and clathrin in the cellular trafficking of flotillins. *FEBS J.* 281, 2956-2976. doi: 10.1111/febs.12834.
42. Mendoza, P., Ortiz, R., Díaz, J., Quest, A.F., Leyton, L., Stupack, D., Torres, V.A. (2013). Rab5 activation promotes focal adhesion disassembly, migration and invasiveness in tumor cells. *J. Cell Sci.* 126, 3835-3847. doi: 10.1242/jcs.119727.

43. Monel, B., Compton, A. A., Bruel, T., Amraoui, S., Burlaud-Gaillard, J., Roy, N., et al. (2017). Zika virus induces massive cytoplasmic vacuolization and paraptosis-like death in infected cells. *EMBO J.* 36, 1653-1668. doi: 10.15252/embj.201695597.
44. Mu, F. T., Callaghan, J. M., Steele-Mortimer, O., Stenmark, H., Parton, R.G., Campbell, P. L., et al. (1995). EEA1, an early endosome-associated protein. EEA1 is a conserved alpha-helical peripheral membrane protein flanked by cysteine "fingers" and contains a calmodulin-binding IQ motif. *J. Biol. Chem.* 270, 13503-13511. doi: 10.15252/embj.201695597.
45. Munson, M. J., Allen, G. F., Toth, R., Campbell, D. G., Lucocq, J. M., Ganley, I. G. (2015). mTOR activates the VPS34-UVRAG complex to regulate autolysosomal tubulation and cell survival. *EMBO J.* 34, 2272-2290. doi: 10.15252/embj.201590992.
46. Nag, S., Rani, S., Mahanty, S., Bissig, C., Arora, P., Azevedo, C., et al. (2018). Rab4A organizes endosomal domains for sorting cargo to lysosome-related organelles. *J. Cell Sci.* 131, pii: jcs216226. doi: 10.1242/jcs.216226.
47. Nojima, H., Konishi, T., Freeman, C. M., Schuster, R. M., Japtok, L., Kleuser, B., et al. (2016) Chemokine receptors, CXCR1 and CXCR2, differentially regulate exosome release in hepatocytes. *PLoS One* 11, e0161443. doi: 10.1371/journal.pone.0161443.
48. Noun, G., Reboul, M., Abastado, J. P., Jaulin, C., Kourilsky, P., Pla, M. (1996). Alloreactive monoclonal antibodies select Kd molecules with different peptide profiles. *J. Immunol.* 157, 2455-2461. PMID: 8805645.
49. Ostefeld, M. S., Jeppesen, D. K., Laurberg, J. R., Boysen, A. T., Bramsen, J. B., Primdal-Bengtson, B., et al. (2014). Cellular disposal of miR23b by RAB27-dependent exosome release is linked to acquisition of metastatic properties. *Cancer Res.* 74, 5758-5771. doi:10.1158/0008-5472.CAN-13-3512.
50. Park, Y. H., Seo, J. H., Park, J. H., Lee, H. S., Kim, K. W. (2017). Hsp70 acetylation prevents caspase dependent/independent apoptosis and autophagic cell death in cancer cells. *Int. J. Oncol.* 51, 573-578. doi: 10.3892/ijo.2017.4039.
51. Piragyte, I., Clapes, T., Polyzou, A., Klein Geltink, R.I., Lefkopoulos, S., Yin, N., et al. (2018). A metabolic interplay coordinated by HLX regulates myeloid differentiation and AML through partly overlapping pathways. *Nat. Commun.* 9, 3090. doi: 10.1038/s41467-018-05311-4.
52. Podlech, J., Pintea, R., Kropp, K. A., Fink, A., Lemmermann, N. A., Erlach, K. C., et al. (2010). Enhancerless cytomegalovirus is capable of establishing a low-level maintenance infection in severely immunodeficient host tissues but fails in exponential growth. *J. Virol.* 84, 6254-6261. doi: 10.1128/JVI.00419-10.
53. Qinwei, W., Xiaqin, S., Weihua, Y., Tianlan, L., Yanyan, R., Tianda, C., Dai, Z. (2016). RAB18, a protein associated with Warburg Micro syndrome, controls neuronal migration in the developing cerebral cortex. *Mol. Brain* 9, 19. doi: 10.1186/s13041-016-0198-2.
54. Razi, M., Chan, E. Y., Tooze, S. A. (2009). Early endosomes and endosomal coatome are required for autophagy. *J. Cell Biol.* 185, 305-321. doi: 10.1083/jcb.200810098.
55. Rocca, D. L., Amici, M., Antoniou, A., Blanco Suarez, E., Halemani, N., Murk, K., et al. (2013). The small GTPase Arf1 modulates Arp2/3-mediated actin polymerization via PICK1 to regulate synaptic plasticity. *Neuron* 79, 293-307. doi: 10.1016/j.neuron.2013.05.003.
56. Sakagami, H., Sanda, M., Fukaya, M., Miyazaki, T., Sukegawa, J., Yanagisawa, T., et al. (2008). IQ ArfGEF/BRAG1 is a guanine nucleotide exchange factor for Arf6 that interacts

- with PSD-95 at postsynaptic density of excitatory synapses. *Neurosci. Res.* 60, 199-212. doi: 10.1016/j.neures.2007.10.013.
57. Shaw, J. E., Epand, R. F., Epand, R. M., Li, Z., Bittman, R., Yip, C. M. (2006). Correlated fluorescence-atomic force microscopy of membrane domains: structure of fluorescence probes determines lipid localization. *Biophys. J.* 90, 2170-2178. doi: 10.1529/biophysj.105.073510.
 58. Simone, L. C., Caplan, S., Naslavsky, N. (2013). Role of phosphatidylinositol 4,5-bisphosphate in regulating EHD2 plasma membrane localization. *PLoS One* 8, e74519. doi: 10.1371/journal.pone.0074519.
 59. Simonsen, A., Lippé, R., Christoforidis, S., Gaullier, J. M., Brech, A., Callaghan, J., et al. (1998). EEA1 links PI(3)K function to Rab5 regulation of endosome fusion. *Nature* 394, 494-498. doi: 10.1038/28879.
 60. Soffientini, U., Caridis, A. M., Dolan, S., Graham, A. (2014). Intracellular cholesterol transporters and modulation of hepatic lipid metabolism: Implications for diabetic dyslipidaemia and steatosis. *Biochim. Biophys. Acta* 1842, 1372-1382. doi: 10.1016/j.bbailip.2014.07.002.
 61. Sørensen, K., Munson, M. J., Lamb, C. A., Bjørndal, G. T., Pankiv, S., Carlsson, S. R., et al. (2018). SNX18 regulates ATG9A trafficking from recycling endosomes by recruiting Dynamin-2. *EMBO Rep.* 19, pii: e44837. doi:10.15252/embr.201744837.
 62. Stevenson, N. L., White, I. J., McCormack, J. J., Robinson, C., Cutler, D. F., Nightingale, T. D. (2017). Clathrin-mediated post-fusion membrane retrieval influences the exocytic mode of endothelial Weibel-Palade bodies. *J Cell Sci.* 130, 2591-2605. doi: 10.1242/jcs.200840.
 63. Takahashi, Y., Tanikawa, C., Miyamoto, T., Hirata, M., Wang, G., Ueda, K., et al. (2017). Regulation of tubular recycling endosome biogenesis by the p53-MICALL1 pathway. *Int. J. Oncol.* 51, 724-736. doi: 10.3892/ijo.2017.4060.
 64. Treda, C., Popeda, M., Ksiazkiewicz, M., Grzela, D. P., Walczak, M. P., Banaszczyk, M., et al. (2016). EGFR activation leads to cell death independent of PI3K/AKT/mTOR in an AD293 cell line. *PLoS One.*; 11, e0155230. doi: 10.1371/journal.pone.0155230.
 65. van der Kant, R., Zondervan, I., Janssen, L., Neefjes, J. (2013). Cholesterol-binding molecules MLN64 and ORP1L mark distinct late endosomes with transporters ABCA3 and NPC1. *J. Lipid Res.* 54, 2153-2165. doi: 10.1194/jlr.M037325.
 66. Williams, K. C., McNeilly, R. E., Coppolino, M. G. (2014). SNAP23, Syntaxin4, and vesicle-associated membrane protein 7 (VAMP7) mediate trafficking of membrane type 1-matrix metalloproteinase (MT1-MMP) during invadopodium formation and tumor cell invasion. *Mol. Biol. Cell* 25, 2061-2070. doi: 10.1091/mbc.E13-10-0582.
 67. Wong, M., Munro, S. (2014). Membrane trafficking. The specificity of vesicle traffic to the Golgi is encoded in the golgin coiled-coil proteins. *Science* 346, 1256898. doi: 10.1126/science.1256898.
 68. Yunis, J., Farrell, H. E., Bruce, K., Lawler, C., Wyer, O., Davis-Poynter, N., et al. (2019). Murine cytomegalovirus glycoprotein O promotes epithelial cell infection in vivo. *J. Virol.* 93, pii: e01378-18. doi: 10.1128/JVI.01378-18.
 69. Zhang, O., Wilson, M. C., Xu, W., Hsu, F. F., Turk, J., Kuhlmann, F. M., et al. (2009). Degradation of host sphingomyelin is essential for *Leishmania* virulence. *PLoS Pathog.* 5, e1000692. doi: 10.1371/journal.ppat.1000692.