OptiPrep™ Reference List RS12

Endocytosis – studies on various tissue and cell types

The following references are concerned with the pathways of the endocytic process and describe the use of iodixanol gradients for the purification of a variety of membrane compartments.

- References are primarily sorted into **cell/tissue type**, or occasionally a cell process: e.g. **virus processing**
- Each **cell/tissue type** may be sorted according to the **principal analytical study**.
- In each section or subsection references are listed alphabetically according to **first autho**r; a particular reference may appear in more than one subsection
- Note that the **Application Sheet S42** summarizes the available methods for fractionation of components of the endocytic system

There are also several Application Sheets, accessible from the "Subcellular Membranes Index", devoted to the use of cultured cells or mammalian liver:

- **Cultured cells – buoyant density: Application Sheet S46**
- **Rat liver/hepatocytes – lysosome/late-endosome events: Application Sheet S54**
- **Rat liver/hepatocytes – sedimentation velocity gradients: Application Sheet S44**
- **Clathrin-coated vesicles/endosomes/lysosomes (self-generated gradient): Application Sheet S45**

There are three other **Reference Lists** that provide bibliographies of papers reporting the analysis of lipid-rich plasma membrane domains, which may also be relevant in the endocytic process

- **RS06 Lipid rich detergent-resistant domains from mammalian cells, tissues and organelles**
- **RS07 Detergent-free strategy for lipid raft isolation from mammalian cells and tissues**
- **RS08 Purification of caveolae in gradients prepared from OptiPrep™**
- All of the **Application Sheets** and **Reference Lists** referred to above can be found via the following website: www.Optiprep.com. One the website click on the "**Methodology**" tab for the Application Sheets or the "**Reference Lists**" tab.

- To assist the identification of a relevant reference in the following index key words are highlighted in blue.

Adipocytes

Methodology

Sadler, J.B.A., Lamb, C.A., Gould, G.W. and Bryant, N.J. (2016) *Iodixanol gradient centrifugation to separate components of the low-density membrane fraction from 3T3-L1 adipocytes* Cold Spring Harb. Protoc., doi:10.1101/pdb.prot083709

Sadler, J.B.A., Lamb, C.A., Welburn, C.R., Adamson, I.S., D., Kioumourtzoglou1, Chi, N-W., Gould, G.W. and Bryant, N.J. (2019) *The deubiquitinating enzyme USP25 binds tankyrase and regulates trafficking of the facilitative glucose transporter GLUT4 in adipocytes* Sci. Rep., 9: 4710

Airway epithelial cells

Cystic fibrosis membrane conductance regulator

Bomberger, J.M., MacEachran, D., Ye, S., Swiatecka-Urban, A., et al (2007) *CFTR inhibitory factor (CIF) reduces the plasma membrane expression of CFTR by altering intracellular trafficking of CFTR to the lysosomal pathway* FASEB J., **21**, 944.4

Bomberger, J.M., Ye, S., MacEachran, D.P., Koeppen, K., et al (2011) *A Pseudomonas aeruginosa toxin that hijacks the host ubiquitin proteolytic system* PLoS Pathog., **7**: e1001325

Bomberger, J.M., Guggino, W.B. and Stanton, B.A. (2011) *Methods to monitor cell surface expression and endocytic trafficking of CFTR in polarized epithelial cells* In Cystic Fibrosis, Methods Mol. Biol. (eds. Amaral, M.D. and Kunzelmann, K.) Springer Science+Business Media, pp 271-283

Astrocytes

Autophagy

Luo, G., Sun, Y., Feng, R., Zhao, Q. and Wen, T. (2018) *ARL3 subcellular localization and its suspected role in autophagy* Biochimie, **154**, 187-193

Notch signalling

Valapala, M., Hose, S., Gongora, C., Dong, L., et al (2013) *Impaired endolysosomal function disrupts Notch signalling in optic nerve astrocytes* Nat. Commun., 4: 1629

Persistent fetal vasculature

Zigler Jr. J.S., Valapala, M., Shang, P., Hose, S., Goldberg, M.F. and Sinha, D. (2016) *βA3/A1-crystallin and persistent fetal vasculature (PFV) disease of the eye* Biochim. Biophys. Acta, **1860**, 287–298

Bacterial phagosomes

Lee, B-Y., Jethwaney, D., Schilling, B., Clemens, D.L., Gibson, B.W. and Horwitz, M.A. (2010) *The Mycobacterium bovis bacilli Calmette-Guérin phagosome proteome* Mol. Cell. Proteom., **9**, 32–53
Li, Q., Jagannath, C., Rao, P.K., Singh, C.R. and Lostumbo, G. (2010) *Analysis of phagosomal proteomes: From latex-bead to bacterial phagosomes* Proteomics, **10**, 4098–4116

BHK cells

Helicobacter pylori toxin

Molinari, M., Galli, C., Norais, N., Telford, J.L., et al (1997) *Vacuoles induced by Helicobacter pylori toxin contain both late endosomal and lysosomal markers* J. Biol. Chem., **272**, 25339-25344

Brain tissue/neural cells (see also “Astrocytes” and “Glial cells”)

Adaptins

Zizioli, D., Geumann, C., Kratzke, M., Mishra, R., Borsani, G., Finazzi, D., Candiello, E. and Schua, P. (2017) *γ2 and γ1AP-1 complexes: Different essential functions and regulatory mechanisms in clathrin-dependent protein sorting* Eur. J. Cell Biol., **96**, 356–368

β-Amyloid protein

Barbero-Camps, E., Roca-Agujetas, V., Bartolessis, I., de Dios, C., Fernández-Checa, J.C., Marí, M., Morales, A, Hartmann, T. and Colell, A. (2018) *Cholesterol impairs autophagy-mediated clearance of amyloid beta while promoting its secretion.* Autophagy, **14,** 1129-1154
Sato, N., Shinohara, M., Rakugi, H. and Morishita, R. (2012) *Dual effects of statins on Aβ metabolism: upregulation of the degradation of APP-CTF and Aβ clearance* Neurodegener. Dis., **10**, 305–308
Shinohara, M., Sato, N., Kurinami, H., Takeuchi, D., et al (2010) *Reduction of brain β-amyloid (Aβ) by fluvastatin, a hydroxymethylglutaryl-CoA reductase inhibitor, through increase in degradation of amyloid precursor protein C-terminal fragments (APP-CTFs) and Aβ clearance* J. Biol. Chem., **285**, 22091–22102
Tamboli, I.Y., Hampel, H., Sandhoff, K. and Walter, J. (2006) *Accumulation of sphingolipids increases secretion of the amyloid β-peptide by stabilization of the β-amyloid precursor protein* Alzheimers Dement., **2**, Suppl. 1, S528-S529

Dendritic trafficking

Schwenk, B.M., Lang, C.M., Hogl, S., Tahirovic, S., et al (2014) *The FTLD risk factor TMEM106B and MAP6 control dendritic trafficking of lysosomes* EMBO J., **33**, 450-467

Down syndrome mouse model

D'Acunzo, P., Hargash, T., Pawlik, M., Goulbourne, C.N., Perez-Gonzalez, R. and Levy, E. (2019) *Enhanced generation of intraluminal vesicles in neuronal late endosomes in the brain of a Down syndrome mouse model with endosomal dysfunction* Devel. Neurobiol., **79**, 656–663

Early endosome maturation

Candiello, E., Kratzke, M., Wenzel, D., Cassel, D. and Schu, P. (2016) *AP-1/σ1A and AP-1/σ1B adaptorproteins differentially regulate neuronal early endosome maturation via the Rab5/Vps34-pathway* Sci. Rep., **6**: 29950

Glycolipids

Takamura, A., Higaki, K., Ninomiya, H., Takai, T., et al (2011) *Lysosomal accumulation of Trk protein in brain of G_{M1}-gangliosidosis mouse and its restoration by chemical chaperone* J. Neurochem., **118**, 399–406

Hereditary spastic paraplegia

Khundadze, M., Kollmann, K., Koch, N., Biskup, C., et al (2013) *A hereditary spastic paraplegia mouse model supports a role of ZFYVE26/SPASTIZIN for the endolysosomal system* PloS Genet., **9**: e1003988

Neurite outgrowth

Tao, T., Sun, J., Peng, Y., Li, Y., Wang, P., Chen, X., Zhao, W., Zheng, Y-Y., Wei, L. et al (2019) *Golgi-resident TRIO regulates membrane trafficking during neurite outgrowth* J. Biol. Chem., **294**, 10954–10968

Trk protein

Fu, X., Yang, Y., Xu, C., Niu, Y., et al (2011) *Retrolinkin cooperates with endophilin A1 to mediate BDNF–TrkB early endocytic trafficking and signaling from early endosomes* Mol. Biol. Cell, 22, 3684-3698

Takamura, A., Higaki, K., Ninomiya, H., Takai, T., et al (2011) *Lysosomal accumulation of Trk protein in brain of G_{M1}-gangliosidosis mouse and its restoration by chemical chaperone* J. Neurochem., **118**, 399–406

Caco-2 cells

Cholera toxin

Orlandi, P.A. (1997) *Protein-disulfide isomerase-mediated reduction of the A subunit of cholera toxin in a human intestinal cell line* J. Biol. Chem., **272**, 4591-4599

Van den Broeck, D., Lagrou, A.R. and De Wolf, M.J.S. (2007) *Distinct role of clathrin-mediated endocytosis in the functional uptake of cholera toxin* Acta Biochim. Polonica, **54**, 757-767

Methodology

Li, X. and Donowitz, M. (2008) *Fractionation of subcellular membrane vesicles of epithelial and nonepithelial cells by OptiPrep™ density gradient ultracentrifugation* In Methods Mol. Biol., **440**, Exocytosis and Endocytosis (ed. Ivanov, A.I.) Humana Press, Totowa, NJ, pp 97-110

Li, X. and Donowitz, M. (2014) *Fractionation of subcellular membrane vesicles of epithelial and non-epithelial cells by OptiPrep™ density gradient ultracentrifugation* In Exocytosis and Endocytosis, Methods in Molecular Biology, **1174** (ed. Ivanov, A,I.) Springer Science+Business Media New York 2014, pp 85-99

Carcinoma cells (incl. HeLa)

Adaptor proteins

Urbanska, A., Sadowski, L., Kalaidzidis, Y. and Miaczynska, M. (2011) *Biochemical characterization of APPL endosomes: the role of annexin A2 in APPL membrane recruitment* Traffic, **12**, 1227–1241

Autophagy

Cohen-Kaplan, V., Livneh, I., Kwon, Y.T. and Ciechanover, A. (2019) *Monitoring stress-induced autophagic engulfment and degradation of the 26S proteasome in mammalian cells* Meth. Enzymol., **619**, 337-366

Gui, X., Yang, H., Li, T., Tan, X., Shi, P., Li, M., Du, F., Chen, Z.J. (2019) *Autophagy induction via STING trafficking is a primordial function of the cGAS pathway* Nature **567**, 262-285

β-Amyloid precursor protein

Matsuda, S., Matsuda, Y., Snapp, E.L. and D'Adamioa, L. (2011) *Maturation of BRI2 generates a specific inhibitor that reduces APP processing at the plasma membrane and in endocytic vesicles* Neurobiol. Aging, **32**, 1400–1408

Vorobyeva, A.G., Lee, R., Miller, S., Longen, C., Sharoni, M. et al (2014) *Cyclopamine modulates γ-secretase-mediated cleavage of amyloid precursor protein by altering its subcellular trafficking and lysosomal degradation* J. Biol. Chem., **289**, 33258–33274

Biogenesis and cargo selection

Dengje, J., Høyer-Hansen, M., Nielsen, M.O., Eisenberg, T., et al (2012) *Identification of autophagosome-associated proteins and regulators by quantitative proteomic analysis and genetic screens* Mol. Cell. Proteom., **11:** M111.014035

Clathrin-mediated
Barroso-González, J., Machado, J-D., García-Expósito, L. and Valenzuela-Fernández, A. (2009) *Moesin regulates the trafficking of nascent clathrin-coated vesicles* J. Biol. Chem., **284**, 2419–2434

Colon cancer
Duong, H.Q., Nemazanyy, I., Rambow, F., Tang, S.C., Delaunay, S., Tharun, L., Florin, A., Büttner, R., et al (2018) *The endosomal protein CEMIP links WNT signaling to MEK1–ERK1/2 activation in selumetinib-resistant intestinal organoids* Cancer Res. 78, 4533–4548

Ohata, H., Shiokawa, D., Obata, Y., Sato, A., Sakai, H., Fukami, M., Hara, W., Taniguchi, H. et al (2019) *NOX1-Dependent mTORC1 activation via S100A9 oxidation in cancer stem-like cells leads to colon cancer progression* Cell Rep., **28**, 1282–1295

COPI COPII vesicles
Adolf, F., Rhiel, M., Hessling, B., Gao, Q., Hellwig, A., Béthune, J. and Wieland, F.T. (2019) *Proteomic profiling of mammalian COPII and COPI vesicles* Cell Rep., **26**, 250–265

Cytokinesis
Neto, H., Kaupisch, A., Collins, L.L. and Gould, G.W, (2013) *Syntaxin 16 is a master recruitment factor for cytokinesis* Mol. Biol. Cell, **24**, 3663-3674

Endosome maturation and processing
Gireud-Goss, M., Reyes, S., Wilson, M., Farley, M., Memarzadeh, K., Srinivasan, S., Sirisaengtaksin, N., Yamashita, S., Tsunoda, S. et al (2018) *Distinct mechanisms enable inward or outward budding from late endosomes/multivesicular bodies* Exp. Cell Res., **372**,1–15

Huotari, J., Meyer-Schaller, N., Hubner, M., Stauffer, S., et al (2012) *Cullin-3 regulates late endosome maturation* Proc. Natl. Acad. Sci. USA, **109**, 823–828

Li, Q., Spencer, N.Y., Oakley, F.D., Buettner, G.R. and Engelhardt, J.F. (2009) *Endosomal Nox2 facilitates redox-dependent induction of NF-κB by TNF-α* Antioxid. Redox Signal., **11**, 1249–1263

Perini, E.D., Schaefer, R., Stöter, M., Kalaidzidis, Y. and Zerial, M. (2014) *Mammalian CORVET Is required for fusion and conversion of distinct early endosome subpopulations* Traffic, **15**, 1366–1389

Growth factors
Chin, L-S., Raynor, M.C., Wei, X., Chen, H-Q., et al (2001) *Hrs interacts with sorting nexin 1 and regulates degradation of epidermal growth factor receptor* J. Biol. Chem., **276**, 7069-7078

Yakymovych, I., Yakymovych, M., Zang, G., Mu, Y., Bergh, A., Landström, M. and Heldin, K.H. (2015) *CIN85 modulates TGF β signaling by promoting the presentation of TGF β receptors on the cell surface* J. Cell Biol., **210**, 319–332

Interleukin-1 receptor complex
Li, Q., Harraz, M.M., Zhou, W., Zhang, L.N., et al (2006) *Nox2 and Rac1 regulate H_2O_2-dependent recruitment of TRAFg to endosomal interleukin-1 receptor complexes* Mol. Cell. Biol., **26**, 140-154

Lipid droplets
Velikkakath, A.K.G., Nishimura, T., Oita, E., Ishihara, N., et al (2012) *Mammalian Atg2 proteins are essential for autophagosome formation and important for regulation of size and distribution of lipid droplets* Mol. Biol. Cell, **23**, 896-909

Multivesicular bodies
Gireud-Goss, M., Reyes, S., Wilson, M., Farley, M., Memarzadeh, K., Srinivasan, S., Sirisaengtaksin, N., Yamashita, S., Tsunoda, S. et al (2018) *Distinct mechanisms enable inward or outward budding from late endosomes/multivesicular bodies* Exp. Cell Res., **372**,1–15

Notch signalling
Tagami, S., Okochi, M., Yanagida, K., Ikuta, A., et al (2008) *Regulation of Notch signaling by dynamic changes in the precision of S3 cleavage of Notch-1* Mol. Cell. Biol., **28**, 165-76

Rab GTPase
Meyers, J.M. and Prekeris, R. (2002) *Formation of mutually exclusive Rab11 complexes with members of the family of Rab11-interacting proteins regulates Rab11 endocytic targeting and function* J. Biol. Chem., **277**, 49003-49010

Proikas-Cezanne, T., Gaugel, A., Frickey, T. and Nordheim, A. (2006) *Rab14 is part of the early endosomal clathrin-coated TGN microdomain* FEBS Lett., **580**, 5241-5246
Urbanska, A., Sadowski, L., Kalaidzidis, Y. and Miaczynska, M. (2011) *Biochemical characterization of APPL endosomes: the role of annexin A2 in APPL membrane recruitment* Traffic, **12**, 1227–1241

ROS
Mumbengegwi, D.R., Li, Q., Li, C., Bear, C.E., et al (2008) *Evidence for a superoxide permeability in endosomal membranes* Mol. Cell. Biol., **28**, 3700-3712
***Salmonella*-containing vacuole**
Santos, J.C., Duchateau, M., Fredlund, J., Weiner, A., Mallet, A., Schmitt, C., Matondo, M., Hourdel, V., Chamot-Rooke, J. and Enninga, J. (2015) *The COPII complex and lysosomal VAMP7 determine intracellular Salmonella localization and growth* Cell. Microbiol., **17**, 1699−1720

Syntaxins
Neto, H., Kaupisch, A., Collins, L.L. and Gould, G.W, (2013) *Syntaxin 16 is a master recruitment factor for cytokinesis* Mol. Biol. Cell, **24**, 3663-3674

Virus internalization and interactions
Ding, W., Zhang, L.N., Yeaman, C. and Engelhardt, J.F. (2006) *rAAV2 traffics through both the late and the recycling endosomes in a dose-dependent fashion* Mol. Ther., **13**, 671-682
Ganti, K., Massimi, P., Manzo-Merino, J., Tomaić, V., Pim, D., Playford, M.P., Lizano, M., Roberts, S., Kranjec, C., Doorbar, J. and Banks, L. (2016) *Interaction of the human papillomavirus E6 oncoprotein with sorting nexin 27 modulates endocytic cargo transport pathways* PLoS Pathog., **12**: e1005854
Su, W-C., Chen, Y-C., Tseng, C-H., Hsu, P.W-C., et al (2013) *Pooled RNAi screen identifies ubiquitin ligase Itch as crucial for influenza A virus release from the endosome during virus entry* Proc. Natl. Acad. Sci. USA, **110**, 17516–17521

Cardiac tissue
KATP channel
Hund, T.J. and Mohler, P.J. (2011) *Differential roles for SUR subunits in KATP channel membrane targeting and regulation* Am. J. Physiol. Heart Circ. Physiol., **300**, H33–H35
Yang, H.Q., Foster, M.N., Jana, K., Ho, J., Rindler, M.J. and Coetzee, W.A. (2016) *Plasticity of sarcolemmal KATP channel surface expression: relevance during ischemia and ischemic preconditioning*. Am. J. Physiol. Heart Circ. Physiol., **310**, H1558–H1566

CHO cells
β-amyloid precursor protein
Huttunen, H.J., Puglielli, L., Ellis, B.C., MacKenzie Ingano, L.A. and Kovacs, D.M. (2009) *Novel N-terminal cleavage of APP precludes Aβ generation in ACAT-defective AC29 cells* J. Mol. Neurosci., **37**, 6-15

Coatamer COPI protein
Daro, E., Sheff, D., Gomez, M., Kreis, T., et al (1997) *Inhibition of endosome function in CHO cells bearing a temperature-sensitive defect in the coatomer (COPI) component ∈-COP* J. Cell Biol., **139**, 1747-1759

GLUT8 transporter
Augustin, R., Riley, J. and Moley, K.H. (2005) *GLUT8 contains a [DE]XXXL[LI] sorting motif and localizes to a late endosomal/lysosomal compartment* Traffic, **6**, 1196-1212

LDL receptor
Sugii, S., Reid, P.C., Ohgami, N., Du, H. et al (2003) *Distinct endosomal compartments in early trafficking of low density lipoprotein-derived cholesterol* J. Biol. Chem., **278**, 27180-27189

NCAM
Westphal, N., Loers, G., Lutz, D., Theis, T., Kleene, R. and Schachner, M. (2017) *Generation and intracellular trafficking of a polysialic acid carrying fragment of the neural cell adhesion molecule* NCAM to the cell nucleus Sci. Rep., **7**: 8622

Corneal epithelial cells

Clathrin-mediated

Argueso, P., Guzman-Aranguez, A., Woodward, A. and Pintor, J.J. (2011) *Inhibition of mucin O-glycosylation promotes endocytosis and nanopartical uptake in corneal epithelial cells* Invest. Ophthalmol. Vis. Sci., **52**, E-Abstr. 4394

COS-7 cells

Amyloid β-precursor protein

Takasugi, N., Araya, R., Kamikubo, Y., Kaneshiro, N., Imaoka, R., Jin, H., Kashiyama, T., Hashimoto, Y. Kurosawa, M. et al (2018) *TMEM30A is a candidate interacting partner for the β-carboxyl-terminal fragment of amyloid-β precursor protein in endosomes* PLoS One, **13**: e0200988

Calmodulin

Cao, Q., Zhong, X.Z., Zou, Y., Murrell-Lagnado, R., Zhu. M.X. and Dong, X-P. (2015) *Calcium release through P2X4 activates calmodulin to promote endolysosomal membrane fusion* J. Cell Biol., **209**, 879–894

Parkinson's disease

Yoshida, S., Hasegawa, T., Suzuki, M., Sugeno, N., Kobayashi, J., Ueyama, M., Fukuda, M., Ido-Fujibayashi, A., Sekiguchi, K. et al (2018) *Parkinson's disease-linked DNAJC13 mutation aggravates alpha-synuclein-induced neurotoxicity through perturbation of endosomal trafficking* Hum. Mol. Genet., **27**, 823–836

Sialidase

Lukong, K.E., Seyrantepe, V., Landry, K., Trudel, S., et al (2001) *Intracellular distribution of lysosomal sialidase is controlled by the internalisation signal in its cytoplasmic tail* J. Biol. Chem., **276**, 46172-46181

Transferrin receptor

Shen, X., Xu, K-F., Fan, Q., Pacheco-Rodriguez, G., et al (2006) *Association of brefeldin A-inhibited guanine nucleotide-exchange protein 2 (BIG2) with recycling endosomes during transferrin uptake* Proc. Natl. Acad. Sci. USA, **103**, 2635-2640

Cytokinesis

Chen, X-W., Inoue, M., Hsu, S. and Saltiel, A.R. (2006) *RalA-exocyst-dependent recycling endosome trafficking is required for the completion of cytokinesis* J. Biol. Chem., **281**, 38609-38616

Dendritic cells

Phagosomes

Romao, S., Gasser, N., Becker, A.C., Guhl, B., Bajagic, M., Vanoaica, D., Ziegler, U., Roesler, J., Dengjel, J., Reichenbach, J. and Münz, C. (2013) *Autophagy proteins stabilize pathogen-containing phagosomes for prolonged MHC II antigen processing* J. Cell Biol., **203**, 757–766

Endothelial cells

Growth factor receptors

Lampugnani, M.G., Orsenigo, F., Gagliani, M.C., Tacchetti, C. et al (2006) *Vascular endothelial cadherin controls VEGFR-2 internalization and signaling from intracellular compartments* J. Cell Biol., **174**, 593-604

Enterocytes

Intestinal chylomicron output

Siddiqi, S. and Mansbach II, C.M. (2015) *Dietary and biliary phosphatidylcholine activates PKCξ in rat intestine* J. Lipid Res., **56**, 859–870

Glial/glioma cells

Proteoglycans

Podyma-Inoue, K.A., Moriwaki, T, Rajapakshe, A.R., Terasawa, K. and Hara-Yokoyama, M. (2016) *Characterization of heparan sulfate proteoglycan-positive recycling endosomes isolated from glioma cells* Canc. Genom. Proteom., **13**, 443-452

Virus processing

Querbes, W., O'Hara, B.A., Williams, G. and Atwood, W.J. (2006) *Invasion of host cells by JC virus identifies a novel role for caveolae in endosomal sorting of noncaveolar ligands* J. Virol., **80**, 9402-9413

Green monkey kidney (Vero) cells

Toxins

McKenzie, J., Johannes, L., Taguchi, T.and Sheff, D. (2009) *Passage through the Golgi is necessary for Shiga toxin B subunit to reach the endoplasmic reticulum* FEBS J., **276**, 1581–1595

Majoul, I.V., Bastiaens, P.I.H. and Soling H-D (1996) *Transport of an external Lys-Asp-Glu-Leu (KDEL) protein from the plasma membrane to the endoplasmic reticulum: studies with cholera toxin in Vero cells* J. Cell Biol., **133**, 777-789

HEK cells

Adhesion/growth regulatory galectins

Kutzner. T.J., Higuero. A.M., Susmair, M., Kopitz, J., Hingar, M., Diez-Revuelta, N., Caballero, G.G.C., Kaltner, H., Lindner, I. et al (2020) *How presence of a signal peptide affects human galectins-1 and -4: Clues to explain common absence of a leader sequence among adhesion/growth regulatory galectins Biochem. Biophys. Acta – Gen. Subjects*, **1864**: 129449

Amyloid β protein

Liu, L., Lauro, B.M., Ding, L., Rovere, M., Wolfe, M.S. and Selkoe, D.J. (2019) *Multiple BACE1 inhibitors abnormally increase the BACE1 protein level in neurons by prolonging its half-life* Alzheimers Dement., **15**, 1183-1194

Autophagy

Gui, X., Yang, H., Li, T., Tan, X., Shi, P., Li, M., Du, F., Chen, Z.J. (2019) *Autophagy induction via STING trafficking is a primordial function of the cGAS pathway* Nature **567**, 262-285

Kumar, S., Gu, Y., Abudu, Y.P., Bruun, J-A., Jain, A., Farzam, F., Mudd, M., Anonsen, J.H. et al (2019) *Phosphorylation of syntaxin 17 by TBK1 controls autophagy initiation* Dev. Cell, **49**, 130–144

Luo, G., Sun, Y., Feng, R., Zhao, Q. and Wen, T. (2018) *ARL3 subcellular localization and its suspected role in autophagy* Biochimie, **154**, 187-193

Nnah,I.C., Wang, B., Saqcena, C., Weber, G.F., Bonder, E.M., Bagley, D., De Cegli, R., Napolitano, G. et al (2019) *TFEB-driven endocytosis coordinates MTORC1 signaling and autophagy* Autophagy, **15**, 151-164

β-Catenin

Layton, M.J., Faux, M.C., Church, N.L., Catimel, B., et al (2012) *Identification of a Wnt-induced protein complex by affinity proteomics using an antibody that recognizes a sub-population of β-catenin* Biochim. Biophys. Acta, **1824**, 925–937

Clathrin-mediated

Idkowiak-Baldys, J., Becker, K.P., Kitatani, K. and Hannum, Y.A. (2006) *Dynamic sequestration of the recycling compartment by classical protein kinase C* J. Biol. Chem., **281**, 22321-22331

Neel, N.F., Lapierre, L.A., Goldenring, J.R. and Richmond, A. (2007) *RhoB plays an essential role in CXCR2 sorting decisions* J. Cell Sci., **120**, 1559-1571

Dendritic cell factor

Chen, Y., Feng, R., Luo, G., Guo, J., Wang, Y., Sun, Y., Zheng, L. and Wen, T. (2018) *DCF1 subcellular localization and its function in mitochondria* Biochimie, **144**, 50-55

Dopamine transporter

Keith, D.J., Wolfrum, K., Eshleman, A.J. and Janowsky, A. (2012) *Melittin initiates dopamine transporter internalization and recycling in transfected HEK-293 cells* Eur. J. Pharmacol., **690**, 13–21

GLUT8 transporter

Augustin, R., Riley, J. and Moley, K.H. (2005) *GLUT8 contains a [DE]XXXL[LI] sorting motif and localizes to a late endosomal/lysosomal compartment* Traffic, **6**, 1196-1212

Immune receptors

Qi, R., Singh, D. and Kao, C.C. (2012) *Proteolytic processing regulates toll-like receptor 3 stability and endosomal localization* J. Biol. Chem., **287**, 32617–32629

Neimann-Pick disease

Kim, H., Chun, Y., Che, L. Kim, J., Lee, S. and Lee, S. (2017) *The new obesity-associated protein, neuronal growth regulator 1 (NEGR1), is implicated in Niemann-Pick disease Type C (NPC2)-mediated cholesterol trafficking* Biochem. Biophys. Res. Comm., **482**, 1367-1374

Notch signalling

Tagami, S., Okochi, M., Yanagida, K., Ikuta, A., et al (2008) *Regulation of Notch signaling by dynamic changes in the precision of S3 cleavage of Notch-1* Mol. Cell. Biol., **28**, 165-76

Pericentrion

El-Osta, M.A., Idkowiak-Baldys, J. and Hannun, Y.A. (2011) *Delayed phosphorylation of classical protein kinase C (PKC) substrates requires PKC internalization and formation of the pericentrion in a phospholipase D (PLD)-dependent manner* J. Biol. Chem., **286**, 19340–19353

Phosphatidylinositol

Sbrissa, D., Ikonomov, O.C., Fu, Z., Ijuin, T., et al (2007) *Core protein machinery for mammalian phosphatidylinositol 3,5-bisphosphate synthesis and turnover that regulates the progression of endosomal transport* J. Biol. Chem., **282**, 23878-23891

mRNA, mi-RNA targetting

Barman, B. and Bhattacharyya, S.N. (2015) *mRNA targeting to endoplasmic reticulum precedes Ago protein interaction and microRNA (miRNA)-mediated translation repression in mammalian cells* J. Biol. Chem., **290**, 24650–24656

Bose, M., Barman, B., Goswami, A., Bhattacharyya, S.N., (2017) *Spatiotemporal uncoupling of microRNA-mediated translational repression and target RNA degradation controls microRNP recycling in mammalian cells* Mol. Cell. Biol., **37:** e00464-16

Rab GTPase

Urbanska, A., Sadowski, L., Kalaidzidis, Y. and Miaczynska, M. (2011) *Biochemical characterization of APPL endosomes: the role of annexin A2 in APPL membrane recruitment* Traffic, **12**, 1227–1241

Somatostatin receptor 2

Olsen, C., Memarzadeh, K., Ulu, A., Carr, H.S., Bean, A.J. and Frost, J.A. (2019) *Regulation of somatostatin receptor 2 trafficking by C-tail motifs and the retromer* Endocrinology, **160**, 1031–1043

Stotmatin

Mairhofer, M., Steiner, M., Salzer, U. and Prohaska, R. (2009) *Stomatin-like protein-1 interacts with stomatin and is targeted to late endosomes* J. Biol. Chem., **284**, 29218-29229

Tau protein

Simón, D., García-García, E., Royo, F., Falcón-Pérez, J.M. et al (2012) *Proteostasis of tau. Tau overexpression results in its secretion via membrane vesicles* FEBS Lett., **586**, 47–54

Virus internalization

Su, W-C., Chen, Y-C., Tseng, C-H., Hsu, P.W-C., et al (2013) *Pooled RNAi screen identifies ubiquitin ligase Itch as crucial for influenza A virus release from the endosome during virus entry* Proc. Natl. Acad. Sci. USA, **110**, 17516–17521

HeLa cells (see "Carcinoma cells")

Hepatocytes

Autophagosomes/phagosomes

Berg, T.O., Fengsrud, M., Stromhaug, P.E., Berg, T., et al (1998) *Isolation and characterization of rat liver amphisomes* J. Biol. Chem., **273**, 21883-21892

Fengsrud, M., Erichsen, E.S., Berg, T.O., Raiborg, C. et al (2000) *Ultrastructural characterization of the delimiting membranes of isolated autophagosomes and amphisomes by freeze-fracture electron microscopy* Eur. J. Cell Biol., **79**, 871-882

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Sætre, F., Hagen, L.K., Engedal, N. and Seglen, P.O. (2015) *Novel steps in the autophagic-lysosomal pathway* FEBS J., **282**, 2202–2214
Szalaia, P., Korseberg Hagen, L., Sætre, F., Luhr, M., Sponheim, M., Øverbye, A., Mills, I.G., Seglen, P.O. and Engedal, N. (2015) *Autophagic bulk sequestration of cytosolic cargo is independent of LC3, but requires GABARAPs* Exp. Cell Res., 333, 21-38

Lipid droplets
Schulze, R.J., Weller, S.G., Schroeder, B., Krueger, E.W., et al (2013) *Lipid droplet breakdown requires Dynamin 2 for vesiculation of autolysosomal tubules in hepatocytes* J. Cell Biol., **203**, 315–326

miRNA / siRNA
Ghosh, S., Bose, M., Ray, A. and Bhattacharyya, S.N. (2015) *Polysome arrest restricts miRNA turnover by preventing exosomal export of miRNA in growth-retarded mammalian cells* Mol. Biol. Cell, **26**, 1072-1083
Xu, Y., Ou, M., Keough, E., Roberts, J., et al (2014) *Quantitation of physiological and biochemical barriers to siRNA liver delivery via lipid nanoparticle platform* Mol. Pharmaceutics, **11**, 1424-434

Reactive oxygen species
Oakley, F.D., Abbott, D., Li, Q. and Engelhardt, J.F. (2009) *Signaling components of redox active endosomes: the redoxosomes* Antioxid. Redox Signal., **11**, 1313–1333

Hepatoma/hepatocarcinoma cells
Alpha-1-antitrypsin deficiency
Khodayari, N., Marek, G., Lu, Y., Krotova, K., Wang, R.L. and Brantly, M. (2017) *Erdj3 has an essential role for Z variant alpha-1-antitrypsin degradation* J. Cell. Biochem., **118**, 3090–3101

Lipid droplets
Li, Z., Schulze, R.J., Weller, S.G., Krueger, E.W., Schott, M.B., Zhang, X., Casey, C.A., Liu, J., Stöckli, J., James, D.E. and McNiven, M.A. (2016) *A novel Rab10-EHBP1-EHD2 complex essential for the autophagic engulfment of lipid droplets* Sci. Adv., **2**: e1601470
Schott, M.B., Rasineni, K., Weller, S.G., Schulze, R.J., Sletten, A.C., Casey, C.A. and McNiven, M.A. (2017) *β-Adrenergic induction of lipolysis in hepatocytes is inhibited by ethanol exposure* J. Biol. Chem., **292**, 11815–11828

Lysosomal acid lipase
Grumet, L., Eichmann, T.O., Taschler, U., Zierler, K.A., Leopold, C., Moustafa, T., Radovic, B., Romauch, M. Yan, C. et al (2016) *Lysosomal acid lipase hydrolyzes retinyl ester and affects retinoid turnover* J. Biol., Chem., **291**, 17977–17987

mRNA, mi-RNA
Mukherjee, K., Ghoshal, B., Ghosh, S., Chakrabarty, Y., Shwetha, S., Das, S. and Bhattacharyya, S.N. (2016) *Reversible HuR-microRNA binding controls extracellular export of miR-122 and augments stress response* EMBO Rep., **17**, 1184-1203
Wang, Y., Lam, W., Chen, S-R., Guan, F-L., Dutchman, G.E., Francis, S., Baker, D.C. and Cheng, Y-C. (2016) *Tylophorine analog DCB-3503 inhibited cyclin D1 translation through allosteric regulation of heat shock cognate protein 70* Sci. Rep., **6**: 32832

Transferrin receptor
Manunta, M., Izzo, L., Duncan, R. and Jones, A.T. (2007) *Establishment of subcellular fractionation techniques to monitor the intracellular fate of polymer therapeutics II: Identification of endosomal and lysosomal compartments in HepG2 cells combining single-step subcellular fractionation and fluorescent imaging* J. Drug Target., **15**, 37-50

Virus interactions
Abdul, F., Ndeboko, B., Buronfosse, T., Zoulim, F., et al (2012) *Potent inhibition of late stages of hepadnavirus replication by a modified cell penetrating peptide* PLoS One, **7**: e48721
Shaikh F.Y., Utley, T.J., Craven, R.E., Rogers, M.C., et al (2012) *Respiratory syncytial virus assembles into structured filamentous virion particles independently of host cytoskeleton and related proteins* PLoS One, **7**: e40826

HepG2 cells

Hepatitis B virus production

Inoue, J., Ninomiya, M., Umetsu, T., Nakamura, T., Kogure, T., Kakazu, E., Iwata, T., Takai, S., Sano, A. et al (2019) *Small interfering RNA screening for the small GTPase Rab proteins identifies Rab5B as a major regulator of hepatitis B virus production* J. Virol., **93:** e00621-19

Human lung adenocarcinoma epithelial cells

Su, W-C. and Lai, M.M.C. (2018) *Quantitative RT-PCR analysis of influenza virus endocytic escape* In Influenza Virus Methods and Protocols, Meth. Mol. Biol., **vol. 1836** (ed. Yamauchi, Y.) Springer Science+Business Media LLC, New York 2018, pp 185-194

Human osteosarcoma cells

Bryant, D., Liu, Y., Datta, S., Hariri, H., Seda, M., Anderson, G., Peskett, E., Demetriou, C., Sousa, S. et al (2018) *SNX14 mutations affect endoplasmic reticulum associated neutral lipid metabolism in autosomal recessive spinocerebellar ataxia 20* Hum. Mol. Genet., 27, 1927-1940

Human promyelocyte leukaemia cells

Xiong, Q., Lin, M., Huang, W., Rikihisa, Y. (2019) *Infection by Anaplasma phagocytophilum requires recruitment of low-density lipoprotein cholesterol by flotillins* mBIO **10**: e02783-18

Human skin fibroblasts

Nakasone, N., Nakamura, Y.S., Higaki, K., Oumi, N., Ohno, K. and Ninomiya, H. (2014) *Endoplasmic reticulum-associated degradation of Niemann-Pick C1: evidence for the role of heat shock proteins and identification of lysine residues that accept ubiquitin* J. Biol. Chem., **289**, 9714–19725

Hypothalamic neural cells

Yamasaki, T., Suzuki, A., Hasebe, R. and Horiuchi, M. (2018) *Retrograde transport by clathrin-coated vesicles is involved in intracellular transport of PrPSc in persistently prion-infected cells* Sci. Rep., **8**: 1224

Ileal brush border

Na^+-H^+ exchanger

Li, X. and Donowitz, M. (2008) *Fractionation of subcellular membrane vesicles of epithelial and nonepithelial cells by OptiPrep™ density gradient ultracentrifugation* In Methods Mol. Biol., **440**, Exocytosis and Endocytosis (ed. Ivanov, A.I.) Humana Press, Totowa, NJ, pp 97-110

Li, X., Zhang, H., Cheong, A., Leu, S., et al (2004) *Carbachol regulation of rabbit ileal brush border Na^+-H^+ exchanger 3 (NHE3) occurs through changes in NHE3 trafficking and complex formation and is Src dependent* J. Physiol., **3**, 791-804

Li, X. and Donowitz, M. (2014) *Fractionation of subcellular membrane vesicles of epithelial and non-epithelial cells by OptiPrep™ density gradient ultracentrifugation* In Exocytosis and Endocytosis, Methods in Molecular Biology, **1174** (ed. Ivanov, A,I.) Springer Science+Business Media New York 2014, pp 85-99

Jurkat cells

Transferrin receptor

Shakor, A.B.A., Atia, M.M., Kwiatkowska, K. and Sobota, A. (2012) *Cell surface ceramide controls translocation of transferrin receptor to clathrin-coated pits* Cell. Signal., **24**, 677–684

Keratinocytes

Clathrin-mediated

Guzman-Aranguez, A., Woodward, A.M., Pintor, J. and Argüeso, P. (2012) *Targeted disruption of core 1 β1,3-galactosyltransferase (C1galt1) induces apical endocytic trafficking in human corneal keratinocytes* PLoS One, **7**: e36628

Kidney

Aquaporin

Procino, G., Barbieri, C., Carmosino, M., Rizzo, F., et al M. (2010) *Lovastatin-induced cholesterol depletion affects both apical sorting and endocytosis of aquaporin-2 in renal cells* Am. J. Physiol. Renal Physiol., **298**, F266–F278

Megalin (LDL receptor gene family)
Zou, Z., Chung, B., Nguyen, T., Mentone, S., Thomson, B. and Biemesderfer, D. (2004) *Linking receptor-mediated endocytosis and cell signaling* J. Biol. Chem., **279**, 34302-34310

Myosin VI
Biemesderfer, D., Mentone, S.A., Mooseker, M. and Hasson, T. (2002) *Expression of myosin VI within the early endocytic pathway in adult and developing proximal tubules* Am. J. Physiol., Ren. Physiol**.**, **282**, F785-F794

LD9 cells

Prion protein
Graham, J.F., Agarwal, S., Kurian, D., Kirby, L., et al (2010) *Low density subcellular fractions enhance disease-specific prion protein misfolding* J. Biol. Chem., **285**, 9868–9880

Liver (rodent)

Late endosomal/lysosomal/mitochondrial sorting
Lim, J.M., Lim, J.C., Kim, G. and Levine, R.L. (2018) *Myristoylated methionine sulfoxide reductase A is a late endosomal protein* J. Biol. Chem., 7355–7366
Pribasnig, M.A., Mrak I., Grabner, G.F., Taschler, U., Knittelfelder, O., Scherz, B., Eichmann, T.O., Heier, C., Grumet, L. et al (2015) *α/β Hydrolase domain-containing 6 (ABHD6) degrades the late endosomal/ lysosomal lipid bis(monoacylglycero)phosphate* J. Biol. Chem., **290**, 29869–29881
Neogalactosylalbumin uptake
Billington, D., Maltby, P.J. Jackson, A.P. and Graham, J.M. (1998) *Dissection of hepatic receptor-mediated endocytic pathways using self-generated gradients of iodixanol (OptiPrep)* Anal. Biochem., **258**, 251-258

Sialidase
Lukong, K.E., Seyrantepe, V., Landry, K., Trudel, S., et al (2001) *Intracellular distribution of lysosomal sialidase is controlled by the internalisation signal in its cytoplasmic tail* J. Biol. Chem., **276**, 46172-46181

Lung cells

Su, W-C. and Lai, M.M.C. (2018) *Quantitative RT-PCR analysis of influenza virus endocytic escape* In Influenza Virus Methods and Protocols, Meth. Mol. Biol., **vol. 1836** (ed. Yamauchi, Y.) Springer Science+Business Media LLC, New York 2018, pp 185-194
Yuan, L., Kenny, S.J., Hemmati, J., Xu, K. Schekman, R. (2018) *TANGO1 and SEC12 are copackaged with procollagen I to facilitate the generation of large COPII carriers* Proc. Natl. Acad. Sci. USA **115**, E12255–E12264

Lymphocytes, leukeamia and lymphoma cells

***Anaplasma* infection/Beclin-1**
Niu, H., Xiong, Q., Yamamoto, A., Hayashi-Nishino, M.et al (2012) *Autophagosomes induced by a bacterial Beclin 1 binding protein facilitate obligatory intracellular infection* Proc. Natl. Acad. Sci. USA, **109**, 20800–20807

Antigen processing
Vaithilingam, A., Lai, N.Y., Duong, E., Boucau, J., et al (2013) *A simple methodology to assess endolysosomal protease activity involved in antigen processing in human primary cells* BMC Cell Biol., **14**: 35
Cysteine proteases
Kung Sutherland, M.S., Sanderson, R.J., Gordon, K.A., Andreyka, J., Cerveny, C.G., Yu, C., Lewis, T.S., Meyer, D.L., Zabinski, R.F., Doronina, S.D., Senter, P.D., Law, C-L., Wahl, A.F. (2006) *Lysosomal trafficking and cysteine protease metabolism confer target-specific cytotoxicity by peptide-linked anti-CD30-auristatin conjugates* J. Biol. Chem., **281**, 10540-10547

Granzyme B
Baginska, J., Viry, E., Berchem, G., Poli, A., et al (2013) *Granzyme B degradation by autophagy decreases tumor cell susceptibility to natural killer-mediated lysis under hypoxia* Proc. Natl. Acad. Sci. USA, **110**,17450–17455

Interferon receptor (Type-1)
Payelle-Brogard, B. and Pellegrini, S. (2010) *Biochemical monitoring of the early endocytic traffic of the type I interferon receptor* J. Interferon Cytokine Res., **30**, 89-98

Lymphoma-targetting antibody-polymer conjugates

Berguig, G.Y., Convertine, A.J., Shi, J., Palanca-Wessels, M.C., et al (2012) *Intracellular delivery and trafficking dynamics of a lymphoma-targeting antibody-polymer conjugate* Mol. Pharm., **9**, 3506–3514

Lytic granules

Tuli, A., Thiery, J., James, A.M., Michelet, X., et al (2013) *Arf-like GTPase Arl8b regulates lytic granule polarization and natural killer cell–mediated cytotoxicity* Mol. Biol. Cell, **24**, 3721-3735

Macrophages

Derlin-dependent proteins

Schaheen, B., Dang, H. and Fares, H. (2009) *Derlin-dependent accumulation of integral membrane proteins at cell surfaces* J. Cell Sci., **122**, 228-2239

Leishmania-infected

Chakrabarty, T. and Bhattacharyya, S.N. (2017) *Leishmania donovani restricts mitochondrial dynamics to enhance miRNP stability and target RNA repression in host macrophages* Mol. Biol. Cell, **28**, 2091-2105

Leucine-rich repeat kinase2

Schapansky, J., Nardozzi. J.D., Felizia, F. and LaVoie, M.J. (2014) *Membrane recruitment of endogenous LRRK2 precedes its potent regulation of autophagy* Hum. Mol. Genet., **23**, 4201–4214

Methodology

Gibbings, D.J. (2011) *Continuous density gradients to study argonaute and GW182 complexes associated with the endocytic pathway* In Argonaute Proteins: Methods and Protocols, Methods Mol. Biol., **725**, (ed. Hobman. T.C. and Duchaine, T.F.) Springer Science+Business Media, pp 63-76

miRNA

Chakrabarty, T. and Bhattacharyya, S.N. (2017) *Leishmania donovani restricts mitochondrial dynamics to enhance miRNP stability and target RNA repression in host macrophages* Mol. Biol. Cell, **28**, 2091-2105

Gibbings, D.J., Ciaudo, C., Erhardt, M. and Voinnet, O. (2009) *Multivesicular bodies associate with components of miRNA effector complexes and modulate miRNA activity* Nat. Cell Biol., 11, 1143-1149

Phagosomes

Romao, S., Gasser, N., Becker, A.C., Guhl, B., Bajagic, M., Vanoaica, D., Ziegler, U., Roesler, J., Dengjel, J., Reichenbach, J. and Münz, C. (2013) *Autophagy proteins stabilize pathogen-containing phagosomes for prolonged MHC II antigen processing* J. Cell Biol., **203**, 757–766

Toll-like receptors

Schapansky, J., Nardozzi. J.D., Felizia, F. and LaVoie, M.J. (2014) *Membrane recruitment of endogenous LRRK2 precedes its potent regulation of autophagy* Hum. Mol. Genet., **23**, 4201–4214

Yersinia pestis V antigen

DiMezzo, T.L., Ruthel, G., Brueggemann, E.E., Hines, et al (2009) *In vitro intracellular trafficking of virulence antigen during infection by Yersinia pestis* PLoS One, **4**:e6281

MCF-7 cells (human mammary epithelial tumor)

Redox-active endosomes

Shahin, W.S. and Engelhardt, J.F. (2019) *Isolation of redox-active endosomes (Redoxosomes) and assessment of NOX activity* In NADPH Oxidases: Methods and Protocols, Methods in Molecular Biology, **vol. 1982** (ed. Knaus, U.G. and Thomas L.), Springer Science+Business Media LLC New York, pp 461-472

MDCK cells

Transferrin receptor

Sheff, D.R., Daro, E.A., Hull, M. and Mellmann, I. (1999) *The receptor recycling pathway contains two distinct populations of early endosomes with different sorting functions* J. Cell Biol., **145**, 123-139

Virus internalization

Su, W-C., Chen, Y-C., Tseng, C-H., Hsu, P.W-C., et al (2013) *Pooled RNAi screen identifies ubiquitin ligase Itch as crucial for influenza A virus release from the endosome during virus entry* Proc. Natl. Acad. Sci. USA, **110**, 17516–17521

Monocytic cells

Autophagosomes

Kimura, T., Jia, J., Kumar, S., Choi, S.W., Gu, Y., Mudd, M., Dupont, N., Jiang, S., et al (2017) *Dedicated SNAREs and specialized TRIM cargo receptors mediate secretory autophagy* EMBO J., **36**, 42-60

Mouse embryo fibroblasts

Autophagy

Ganley, I.G., Wong, P-M., Gammoh, N. and Jiang, X. (2011) *Distinct autophagosomal-lysosomal fusion mechanism revealed by thapsigargin-induced autophagy arrest* Mol. Cell, **42**, 731–743
Gui, X., Yang, H., Li, T., Tan, X., Shi, P., Li, M., Du, F., Chen, Z.J. (2019) *Autophagy induction via STING trafficking is a primordial function of the cGAS pathway* Nature **567**, 262-285
Young, M.M., Takahashi, Y., Fox, T.E., Yun, J.K., Kester, M. and Wang, H-G. (2016) *Sphingosine kinase 1 cooperates with autophagy to maintain endocytic membrane trafficking* Cell Rep., **17**, 1532–1545
Zhang, M. and Ge, L. (2019) *Cell-free reconstitution of autophagic membrane formation* In Autophagy: Methods and Protocols, Methods in Molecular Biology, **vol. 1880** (ed. Ktistakis, N. and Florey, O.), Springer Science+Business Media LLC New York, pp 135-148

Insulin receptor

Pedersen, D.J., Diakanastasis, B., Stöckli, J., Schmitz-Peiffer, C. (2013) *Protein kinase Cε modulates insulin receptor localization and trafficking in mouse embryonic fibroblasts* PLoS One, **8**: e58046

Metal (copper) transporter

Öhrvik, H., Nose, Y., Wood, L.K., Kim, B-E., et al (2013) *Ctr2 regulates biogenesis of a cleaved form of mammalian Ctr1 metal transporter lacking the copper- and cisplatin-binding ecto-domain* Proc. Natl. Acad. Sci. USA, **110**, E4279-E4288
Öhrvik, H., Logeman, B., Turk, B., Reinhecke, T. l and Thiele, D.J. (2016) *Cathepsin protease controls copper and cisplatin accumulation via cleavage of the Ctr1 metal-binding ectodomain* J. Biol. Chem., **291**, 13905–13916

Sphinghosine kinase

Young, M.M., Takahashi, Y., Fox, T.E., Yun, J.K., Kester, M. and Wang, H-G. (2016) *Sphingosine kinase 1 cooperates with autophagy to maintain endocytic membrane trafficking* Cell Rep., **17**, 1532–1545

Nerve tissue/neurons (see also SH-SY5Y cells)

Growth factor receptors

Weible II, M.W., Ozsarac, N., Grimes, M.L. and Hendry, I.A. (2004) *Comparison of nerve terminal events in vivo effecting retrograde transport of vesicles containing neurotrophins or synaptic vesicle components* J. Neurosci. Res., **75**, 771-781

Neuronal signalling

Ammar, M.R., Thahouly, T., Hanauer, A., Stegner, D., Nieswandt, B. and Vitale, N. (2015) *PLD1 participates in BDNF-induced signalling in cortical neurons* Sci. Rep., **5**: 14778

Neuroblastoma cells

Alzheimer's disease

Burg, V.K., Grimm, H.S., Rothhaar, T.L., Grösgen, S., et al (2013) *Plant sterols the better cholesterol in Alzheimer's disease? A mechanistical study* J. Neruosci., **33**, 16072-16087
Grimm, M.O.W., Stahlmann, C.P., Mett, J., Haupenthal, V.J., Zimmer, V.C., Lehmann, J., Hundsdorfer, B., Endres, K., Grimm, H.S. and Hartmann, T. (2015) *Vitamin E: curse or benefit in Alzheimer´s disease? A systematic investigation of the impact of α-, γ- and δ-tocopherol on Aβ generation and degradation in neuroblastoma cells* J. Nutr. Health Aging, **19**, 646-654
Kim, N-Y., Cho, M-H., Won, S-H., Kang, H-J., Yoon, S-Y. and Kim, D-H. (2017) *Sorting nexin-4 regulates β-amyloid production by modulating β-site-activating cleavage enzyme-1* Alzheimer's Res. Ther., **9**: 4

vATPase

Kratzke, M., Candiello, E., Schmidt, B., Jahn, O. and Schu, P. (2015) *AP-1/σ1B-dependent SV protein recycling is regulated in early endosomes and is coupled to AP-2 endocytosis* Mol. Neurobiol., **52**, 142–161

Autophagosomes

Osaka, M., Ito, D. and Suzuki, N. (2016) *Disturbance of proteasomal and autophagic protein degradation pathways by amyotrophic lateral sclerosis-linked mutations in ubiquilin 2* Biochem. Biophys. Res. Comm., **472**, 324-331

Dopamine receptor

Wiesinger, J.A., Buwen, J.P., Cifelli, C.J., Unger, E.L., et al (2007) *Down-regulation of dopamine transporter by iron chelation in vitro is mediated by altered trafficking, not synthesis* J. Neurochem., **100**, 167-179

PrP^{Sc} transport in prion infected cells

Yamasaki, T., Suzuki, A., Hasebe, R. and Horiuchi, M. (2018) *Retrograde transport by clathrin-coated vesicles is involved in intracellular transport of PrPSc in persistently prion-infected cells* Sci. Rep., **8**: 1224

Src homology 3

Xin, X., Gfeller, D., Cheng, J., Tonikian, R., et al (2013) *SH3 interactome conserves general function over specific form* Mol. Systems Biol., **9**: 652

α-Synuclein

Dettmer, U., Ramalingam, N., von Saucken, V.E., Kim, T-E., Newman, A.J., Terry-Kantor, E., Nuber, S., Ericsson, M. et al (2017) *Loss of native α-synuclein multimerization by strategically mutating its amphipathic helix causes abnormal vesicle interactions in neuronal cells* Hum. Mol. Genetics, **26**, 3466–3481

Transferrin receptor

Wiesinger, J.A., Buwen, J.P., Cifelli, C.J., Unger, E.L., et al (2007) *Down-regulation of dopamine transporter by iron chelation in vitro is mediated by altered trafficking, not synthesis* J. Neurochem., **100**, 167-179

NRK cells

Caveolin

Pol, A., Lu, A., Pons, M., Peiro, S., et al (2000) *Epidermal growth factor-mediated caveolin recruitment to early endosomes and MAPK activation* J. Biol. Chem., **275**, 30566-30572

Nanotube formation

Su, Q.P., Du, W., Ji, Q., Xue, B., Jiang, D., Zhu, Y., Lou, J., Yu, L. and Sun, Y. (2016) *Vesicle size regulates nanotube formation in the cell* Sci. Rep., **6**: 24002

Osteosarcoma cells

Autophagy

Merrill, N.M., Schipper, J.L., Kames, J.B., Kauffman, A.L., Martin, K.R. and MacKeigan, J.P. (2017) *PI3K-C2a knockdown decreases autophagy and maturation of endocytic vesicles* PLoS One, **12**: e0184909

Proteomics

Geladaki, A., Britovšek, N.K., Breckels, L.M., Smith, T.S., Vennard, O.L., Mulvey, C.M., Crook, O.M., Gatto, L. and Lilley, K.S. (2019) *Combining LOPIT with differential ultracentrifugation for high-resolution spatial proteomics* Nat. Comm., **10**: 331

Pancreas

Pancreatitis

Mareninova, O.A., Yakubov, I., Gukovsky, I and Gukovskaya, A.S. (2018) *Disordering of endo-lysosomal system in pancreatitis* Circulation, **138**, Suppl.1, abstr.

PC12 cells

Neurotrophin receptor

Lin, D.C., Quevedo, C., Brewer, N.E., Bell, A., et al (2006) *APPL1 associates with TrkA and GIPC1 and is required for nerve growth factor-mediated signal transduction* Mol. Cell. Biol., **26**, 8928-8941

Receptors (various)

McCaffrey, G., Welker, J., Scott, J., van der Salm, L., et al (2009) *High-resolution fractionation of signaling endosomes containing different receptors* Traffic, **10**, 938–950

Growth factor receptors

Li, Y., Chin, L-S., Levey, A.L. and Li, L. (2002) *Huntingtin-associated protein 1 interacts with hepatocyte growth factor-regulated tyrosine kinase substrate and functions in endosomal trafficking* J. Biol. Chem., **277**, 28212-28221

Pryor, S., McCaffrey, G., Young. L.R. and Grimes, M.L. (2012) *NGF causes TrkA to specifically attract microtubules to lipid rafts* PLoS One **7**: e35163

Neurotrophin receptor

Fu, X., Zang, K., Zhou, Z., Reichardt, L.F., et al (2010) *Retrograde neurotrophic signaling requires a protein interacting with receptor tyrosine kinases via C2H2 zinc fingers* Mol. Biol. Cell, **21**, 36-49

Peritoneal mesothelial cells

Vacuolar trafficking

Oba-Yabana, I., Mori, T., Takahashi, C., Hirose, T., Ohsaki, Y., Kinugasa, S., Muroya, Y., Sato, E. et al (2018) *Acidic organelles mediate TGF-β1-induced cellular fibrosis via (pro)renin receptor and vacuolar ATPase trafficking in human peritoneal mesothelial cells* Sci. Rep., **8**: 2648

PS120 cells

Gradient methodology

Li, X. and Donowitz, M. (2008) *Fractionation of subcellular membrane vesicles of epithelial and non-epithelial cells by OptiPrep™ density gradient ultracentrifugation* In Methods Mol. Biol., **440**, Exocytosis and Endocytosis (ed. Ivanov, A.I.) Humana Press, Totowa, NJ, pp 97-110

SH-SY5Y cells

Parkinson's disease

Yoshida, S., Hasegawa, T., Suzuki, M., Sugeno, N., Kobayashi, J., Ueyama, M., Fukuda, M., Ido-Fujibayashi, A., Sekiguchi, K. et al (2018) *Parkinson's disease-linked DNAJC13 mutation aggravates alpha-synuclein-induced neurotoxicity through perturbation of endosomal trafficking* Hum. Mol. Genet., **27**, 823–836

T cells

TCR signaling

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