

## OptiPrep™ Mini-Review MS11

## Lipid rich detergent-resistant membranes from non-mammalian sources – a bibliography

The companion OptiPrep™ Mini-Review MS08 “Lipid rich detergent-resistant membranes from mammalian cells, tissues and organelles” contains a brief summary of the methodology for the isolation of these plasma membrane domains in addition to the complete reference list of the published papers. Strategies used for invertebrate cells, plant cells, algae, fungi and protozoa are broadly similar. This Mini-Review is thus confined to the provision of a bibliography of published papers concerned with this diverse group of organisms.

A detailed description of the OptiPrep™ methodology (see Application Sheet S32) can be found on the OptiPrep™ Applications flash-drive or on the following website: [www.axis-shield-density-gradient-media.com](http://www.axis-shield-density-gradient-media.com) (click on “Methodology”, then “Organelles and Subcellular Membranes”) and scroll down the Index.

Papers have been divided into **organism or cell type (listed alphabetically)** and additionally, when required, into **research topic**. Within each group papers are listed alphabetically according to **first author**. When a paper reports the study of more than one cell type, reference to that paper will appear under multiple cell headings. A paper may also appear under two or more research topic headings.

- ◆ Part(s) of the titles are highlighted in blue to facilitate identification of particular research topic(s)

### 1. Amphibia

**Bates, R.C.**, Fees, C.P., Holland, W.L., Winger, C.C., Batbayar, K., Ancar, R., Bergren, T., Petcoff, D. and Stith, B.J. (2014) *Activation of Src and release of intracellular calcium by phosphatidic acid during Xenopus laevis fertilization* Dev. Biol., **386**, 165-180

### 2. Bacteria

#### *Borrelia burgdorferi*

**Coleman, J.L.**, Toledo, A. and Benach, J.L. (2016) *Borrelia burgdorferi HtrA: evidence for twofold proteolysis of outer membrane protein p66* Mol. Microbiol., **99**, 135–150

**LaRocca, T.J.**, Crowley, J.T., Cusack, B.J., Pathak, P., et al (2010) *Cholesterol lipids of Borrelia burgdorferi form lipid rafts and are required for the bactericidal activity of a complement-independent antibody* Cell Host Microbe **8**, 331–342

**Toledo, A.**, Crowley, J.T., Coleman, J.L., LaRocca, T.J., et al (2014) *Selective association of outer surface lipoproteins with the lipid rafts of Borrelia burgdorferi* mBio, **5**: e00899-14

**Toledo, A.**, Pérez, A., Coleman, J.L. and Benach, J. L. (2015) *The lipid raft proteome of Borrelia burgdorferi* Proteomics, **15**, 3662–3675

#### *Escherichia coli*

**Guzman-Flores, J.E.**, Alvarez, A.F., Poggio, S., Gavilanes-Ruiz, M. and Georgellis, D. (2017) *Isolation of detergent-resistant membranes (DRMs) from Escherichia coli* Anal. Biochem., **518**, 1-8

### 3. Chicken embryo

**Long, J.**, Tokhunts, R., Old, W.M., Houel, S., Rodriguez-Blanco, J., Singh, S., Schilling, N., Capobianco, A.J., Ahn, N.G. and Robbins, D.J. (2015) *Identification of a family of fatty-acid-speciated sonic hedgehog proteins, whose members display differential biological properties* Cell Rep., **10**, 1280–1287

### 4. Coccolithoviruses

**Rose, S.L.**, Fulton, J.M., Brown, C.M., Natale, F., Van Mooy, B.A.S. and Bidle, K.D. (2014) *Isolation and characterization of lipid rafts in Emiliana huxleyi: a role for membrane microdomains in host-virus interactions* Environ. Microbiol., **16**, 1150–1166

### 5. Drosophila melanogaster

**Eroglu, C.**, Brügger, B., Wieland, F. and Sinning, I. (2003) *Glutamate-binding affinity of Drosophila metabotropic glutamate receptor is modulated by association with lipid rafts* Proc. Natl. Acad. Sci. USA, **100**, 10219-10224

- Fernandez-Funez, P.**, Casas-Tinto, S., Zhang, Y., Gómez-Velazquez, M., et al (2009) *In vivo generation of neurotoxic prion protein: role for Hsp70 in accumulation of misfolded isoforms* PLoS One, **5**:e1000507
- Hebbar, S.**, Lee, E., Manna, M., Steinert, S., et al (2008) *A fluorescent sphingolipid binding domain peptide probe interacts with sphingolipids and cholesterol-dependent raft domains* J. Lipid Res. **49**, 1077-1089
- Hoehne, M.**, de Couet, H.G., Stuermer, C.A.O. and Fischbach, K-F. (2005) *Loss- and gain-of-function analysis of the lipid raft proteins reggie/flotillin in Drosophila: they are posttranslationally regulated, and misexpression interferes with wing and eye development* Mol. Cell. Neurosci., **30**, 326-338
- Rietveld, A.**, Neutz, S., Simons, K. and Eaton, S. (1999) *Association of sterol- and glycosylphosphatidylinositol-linked proteins with Drosophila raft lipid microdomains* J. Biol. Chem., **274**, 12049-12054
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- Zhai, L.**, Chaturvedi, D. and Cumberledge, S. (2004) *Drosophila Wnt-1 undergoes a hydrophobic modification and is targeted to lipid rafts, a process that requires porcupine* J. Biol. Chem., **279**, 33220-33227

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- Loza-Huerta, A.**, Vera-Estrella, R., Darszon, A. and Beltrán, C. (2013) *Certain Strongylocentrotus purpuratus sperm mitochondrial proteins co-purify with low density detergent-insoluble membranes and are PKA or PKC-substrates possibly involved in sperm motility regulation* Biochim. Biophys. Acta, **1830**, 5305–5315
- Vacquier, V.D.**, Loza-Huerta, A., García-Rincón, J., Darszon, A. and Beltrán, C. (2014) *Soluble adenylyl cyclase of sea urchin spermatozoa* Biochim. Biophys. Acta, **1842**, 2621–2628

## 7. Fish and fish embryo

- Adachi, T.**, Sato, C. and Kitajima, K. (2007) *Membrane microdomain formation is crucial in epiboly during gastrulation of medaka* Biochem. Biophys. Res. Commun., **358**, 848-853
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- Zehmer, J.K.** and Hazel, J.R. (2003) *Plasma membrane rafts of rainbow trout are subject to thermal acclimation* J. Exp. Biol., **206**, 1657-1667

## 8. Fungi

### 8-1. Candida albicans

- Aeed, P.A.**, Sperry, A.E., Young, C.L., Nagiec, M.M., et al (2004) *Effect of membrane perturbants on the activity and phase distribution of inositol phosphorylceramide synthase; development of a novel assay* Biochemistry, **43**, 8483-8493
- Insenser, M.**, Nombela, C., Molero, G. and Gil, C. (2006) *Proteomic analysis of detergent-resistant membranes from Candida albicans* Proteomics, **6**, Suppl. 1., S74-S81
- Martin, S.W.** and Konopka, J.B. (2004) *Lipid raft polarization contributes to hyphal growth in Candida albicans* Eukary. Cell, **3**, 675-684
- Ragni, E.**, Calderon, J., Fascio, U., Sipiczki, M., et al (2011) *Phr1p, a glycosylphosphatidylinositol-anchored  $\beta(1,3)$ -glucanoyltransferase critical for hyphal wall formation, localizes to the apical growth sites and septa in Candida albicans* Fungal Genet. Biol., **48**, 793–805
- Wang, L.**, Jia, Y., Tang, R-J., Xu, Z., Cao, Y-B., Jia, X-M. and Jiang, Y-Y. (2012) *Proteomic analysis of Rta2p-dependent raft-association of detergent-resistant membranes in Candida albicans* PLoS One, **7**: e37768

### 8-2. Saccharomyces cerevisiae

#### ABC transporters

- Rockwell, N.C.**, Wolfger, H., Kuchler, K. and Thorner, J. (2009) *ABC transporter Pdr10 regulates the membrane microenvironment of Pdr12 in Saccharomyces cerevisiae* J Membr. Biol., **229**, 27–52

#### Acyl chains

- Gaigg, B.**, Toulmay, A. and Scheiter, R. (2006) *Very long-chain fatty acid-containing lipids rather than sphingolipids per se are required for raft association and stable surface transport of newly synthesized plasma membrane ATPase in yeast* J. Biol. Chem., **281**, 34135-34145
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Kishimoto, T., Yamamoto, T. and Tanaka, K. (2005) *Defects in structural integrity of ergosterol and the Cdc50p-Drs2p putative phospholipid translocase cause accumulation of endocytic membranes, onto which actin patches are assembled in yeast* Mol. Biol. Cell, **16**, 5592-5609

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Lauwers, E., Grossmann, G. and André, B. (2007) *Evidence for coupled biogenesis of yeast Gap1 permease and sphingolipids: essential role in transport activity and normal control by ubiquitination* Mol. Biol. Cell **18**, 3068-3080

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Büttner, S., Delay, C., Franssens, V., Bammens, T., et al (2010) *Synphilin-1 enhances  $\alpha$ -synuclein aggregation in yeast and contributes to cellular stress and cell death in a Sir2-dependent manner* PloS One **5**: e13700

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Ana, B., Chen, Y., Li, B., Qin, G. and Tian, S. (2014) *Ca<sup>2+</sup>-CaM regulating viability of Candida guilliermondii under oxidative stress by acting on detergent resistant membrane proteins* J. Proteom., **109**, 38-49

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Souza, C.M., Schwabe, T.M.E., Pichler, H., Ploier, B., et al (2011) *A stable yeast strain efficiently producing cholesterol instead of ergosterol is functional for tryptophan uptake, but not weak organic acid resistance* Metab. Eng., **13**, 555-569

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Padilla-López, S., Jiménez-Hidalgo, M., Martín-Montalvo, A., Clarke, C.F., et al (2009) *Genetic evidence for the requirement of the endocytic pathway in the uptake of coenzyme Q6 in Saccharomyces cerevisiae* Biochim. Biophys. Acta **1788**, 1238-1248

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Kashiwazaki, J., Yamasaki, Y., Itadani, A., Teraguchi, E., et al (2011) *Endocytosis is essential for dynamic translocation of a syntaxin 1 orthologue during fission yeast meiosis* Mol. Biol. Cell, **22**, 3658-3670

#### Ergosterol

Bagnat, M. and Simons, K. (2002) *Cell surface polarization during yeast mating* Proc. Natl. Acad. Sci. USA, **99**, 14283-14188

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- Yoko-o, T.**, Ichikawa, D., Miyagishi, Y., Kato, A., Umemura, M., Takase, K., Ra, M., Ikeda, K., Taguchi, R. and Jigami Y. (2013) *Determination and physiological roles of the glycosylphosphatidylinositol lipid remodelling pathway in yeast* Mol. Microbiol., **88**, 140-155

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### Growth properties

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### Na<sup>+</sup>/H<sup>+</sup> antiport

- Mitsui, K.**, Hatakeyama, K., Matsushita, M. and Kanazawa, H. (2009) *Saccharomyces cerevisiae Na<sup>+</sup>/H<sup>+</sup> antiporter Nha1p associates with lipid rafts and requires sphingolipid for stable localization to the plasma membrane* J. Biochem., **145**, 709–720

### Oxidative stress

- Ana, B.**, Chen, Y., Li, B., Qin, G., et al (2014) *Ca<sup>2+</sup>-CaM regulating viability of Candida guilliermondii under oxidative stress by acting on detergent resistant membrane proteins* J. Proteom., **109**, 38–49

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