

Table 1 Neutral lipid metabolism enzymes and LD-associated proteins

Gene	Enzyme	Molecular mass (kDa)	Isoelectric point	Molecules per cell ^a	Location ^b	Transmembrane domains	Phosphorylation sites ^c
Neutral lipid synthesis enzymes							
<i>SCT1 (GAT2)</i>	Glycerol-3-P/dihydroxyacetone-P acyltransferase	85.7	7.27	1,050	ER	4	Few
<i>GPT2 (GAT1)</i>	Glycerol-3-P/dihydroxyacetone-P acyltransferase	83.6	10.3	3,100	ER, lipid droplets	4	Several
<i>AYR1</i>	Acyl DHAP reductase	32.8	9.92	3,670	ER, lipid droplets	None	None
<i>SLC1</i>	LysoPA/Acylglycerol-3-P acyltransferase	33.8	10.41	ND ^d	ER, lipid droplets	1	None
<i>ALE1 (SLC4, LPT1, LCA1)</i>	LysoPA/Acylglycerol-3-P acyltransferase	72.2	10.3	ND	ER	7	Several
<i>PHM8</i>	LysoPA phosphatase	37.7	5.14	195	Cytoplasm, nucleus	None	None
<i>LOA1 (VPS66)</i>	LysoPA acyltransferase	33.8	10.5	6,630	ER, lipid droplets	1	None
<i>PAH1 (SMP2)</i>	PA phosphatase	95	4.68	3,910	Cytoplasm, ER	None	Several
<i>DGK1 (HSD1)</i>	DAG kinase	32.8	9.48	784	ER	4	Few
<i>DGA1</i>	Acyl-CoA diacylglycerol acyltransferase	47.7	10.39	907	ER, lipid droplets	1	Few
<i>LRO1</i>	Phospholipid diacylglycerol acyltransferase	75.3	6.67	ND	ER	1	Few
<i>ARE1 (SAT2)</i>	Acyl-CoA sterol acyltransferase	71.6	8.27	ND	ER	9	Several
<i>ARE2 (SAT1)</i>	Acyl-CoA sterol acyltransferase	74.0	7.71	279	ER	9	Several
Neutral lipid turnover enzymes							
<i>LDH1</i>	Triacylglycerol lipase, hydrolase	43.3	6.51	ND	Lipid droplets	None	None
<i>TGL1 (YKL5)</i>	Triacylglycerol lipase, steryl ester hydrolase	63.0	6.83	1,470	ER, lipid droplets	1	Several
<i>TGL2</i>	Acylglycerol lipase	37.5	8.41	ND	Mitochondria	None	None
<i>TGL3</i>	Triacylglycerol lipase, lysoPA acyltransferase	73.6	8.50	3,210	Lipid droplets	1	Few
<i>TGL4 (STC1)</i>	Triacylglycerol lipase, Ca ⁺⁺ dependent phospholipase A2, lysoPA acyltransferase	102.7	8.05	195	Lipid droplets	None	Several
<i>TGL5 (STC2)</i>	Triacylglycerol lipase, lysoPA acyltransferase	84.7	9.84	358	Lipid droplets	1	Several
<i>YEH1</i>	Steryl ester hydrolase	66.5	6.33	7,770	Lipid droplets	1-2	None
<i>YEH2</i>	Steryl ester hydrolase	62.4	8.91	1,630	Plasma membrane	1	Few
<i>YJUS</i>	Monoacylglycerol lipase	35.6	8.5	2,140	Lipid droplets, ER	None	None
Lipid droplet-associated proteins^d							
<i>ATF1</i>	Alcohol-O-acetyltransferase	61.0	6.94	1,990	Lipid droplets	None	None
<i>AYR1</i>	Acyl DHAP reductase	32.8	9.92	3,670	ER, lipid droplets	None	None
<i>BSC2</i>	Unknown function	26.6	5.10	922	Lipid droplets	1	None
<i>COY1</i>	Unknown function, similarity to mammalian CASP	77.5	5.93	2,650	Lipid droplets, Golgi	1	Several
<i>CPR5 (CYP5)</i>	Peptidyl-prolyl <i>cis-trans</i> isomerase (cyclophilin)	25.3	5.40	ND	Lipid droplets, ER	1	1
<i>CSR1 (SFH2)</i>	Phosphatidylinositol transfer protein	47.5	6.61	9,600	Lipid droplets, cytoplasm	None	1
<i>CST26 (PSI1)</i>	Stearyl-CoA acyltransferase, phosphatidylinositol-specific	45.5	10.15	2,010	Lipid droplets, ER	Four	None
<i>EHT1</i>	Acyl-coenzymeA ethanol O-acyltransferase	51.3	7.83	2,550	Lipid droplets, ER	None	None
<i>ENV9</i>	Unknown function, similarity to oxidoreductases	37.5	8.35	967	Lipid droplets	1	None
<i>ERG1</i>	Squalene epoxidase	55.1	6.45	65,400	Lipid droplets, ER	2	None
<i>ERG27</i>	3-Keto sterol reductase	39.7	8.90	ND	Lipid droplets	None	1
<i>ERG6 (ISE1, LIS1, SED6, VID1)</i>	Δ ²⁴ -Sterol C-methyltransferase	43.3	5.60	53,800	Lipid droplets, ER	None	Few
<i>ERG7</i>	Lanosterol synthase	83.5	6.59	2,190	Lipid droplets, ER	None	None

(continued)

Table 1, continued

Gene	Enzyme	Molecular mass (kDa)	Isoelectric point	Molecules per cell ^a	Location ^b	Transmembrane domains	Phosphorylation sites ^c
<i>FAA1</i>	Fatty acyl-CoA synthetase	77.8	7.58	7,470	Lipid droplets, ER	None	None
<i>FAA4</i>	Fatty acyl-CoA synthetase	77.2	6.52	31,200	Lipid droplets, ER	None	None
<i>FAT1</i>	Fatty acid transporter and fatty acyl-CoA synthetase	77.1	8.47	16,900	Lipid droplets, ER	3	None
<i>GTT1</i>	Glutathione S-transferase	26.8	6.65	ND	Lipid droplets, ER	None	None
<i>HFD1</i>	Hexadecenal dehydrogenase	60.0	6.73	2,930	Lipid droplets, mitochondria	1	1
<i>KES1 (LPB3, OSH4, BSR3)</i>	Member of the oxysterol binding protein family	49.5	5.92	32,200	Lipid droplets, cytoplasm	None	None
<i>LDB16</i>	Unknown function	29.0	8.07	149	Lipid droplets	2	1
<i>LOA1 (VPS66)</i>	LysoPA acyltransferase	33.8	10.5	6,630	Lipid droplets, ER	1	None
<i>NUS1</i>	Putative prenyltransferase	42.6	6.94	ND	Lipid droplets, ER ^e	1	None
<i>OSW5</i>	Unknown function	16.4	9.94	922	Lipid droplets	2	1
<i>PD11 (MFP1, TRG1)</i>	Protein disulfide isomerase	58.2	4.22	ND	Lipid droplets, ER (lumen)	None	None
<i>PDR16 (SFH3)</i>	Phosphatidylinositol transfer protein	40.7	8.16	15,400	Lipid droplets, cytoplasm	None	2
<i>PET10</i>	Unknown function	31.2	8.85	2,160	Lipid droplets	None	None
<i>RRT8</i>	Unknown function	39.6	10.66	ND	Lipid droplets	5	None
<i>SLC1</i>	LysoPA/Acylglycerol-3-P acyltransferase	33.8	10.41	ND	Lipid droplets, ER	1	None
<i>SNA2</i>	Unknown function	9.2	6.50	20,400	Lipid droplets	2	1
<i>SNX41</i>	Sorting nexin	70.7	7.02	1,800	Lipid droplets, cytoplasm	None	None
<i>SRT1</i>	<i>Cis</i> -prenyl transferase	40.2	10.30	ND	Lipid droplets	1	None
<i>SSO1</i>	t-SNARE	33.1	5.06	450	Lipid droplets, vesicles	1	1
<i>TDH1 (GLD3)</i>	Glyceraldehyde-3-phosphate dehydrogenase, isozyme 1	35.8	8.59	120,000	Lipid droplets, cytoplasm	None	Several
<i>TDH2 (GLD2)</i>	Glyceraldehyde-3-phosphate dehydrogenase, isozyme 2	35.8	6.96	121,000	Lipid droplets, cytoplasm	None	Several
<i>TDH3 (GLD1, HSP35, HSP36, SSS2)</i>	Glyceraldehyde-3-phosphate dehydrogenase, isozyme 3	35.7	6.96	169,000	Lipid droplets, nucleus, cytoplasm	None	Several
<i>TGL1 (YKL5)</i>	Triacylglycerol lipase, steryl ester hydrolase	63.0	6.83	1,470	Lipid droplets, ER	1	Several
<i>TGL3</i>	Triacylglycerol lipase, lysoPA acyltransferase	73.6	8.50	3,210	Lipid droplets	1	Few
<i>TGL4</i>	Triacylglycerol lipase, Ca ⁺⁺ dependent phospholipase A2, lysoPA acyltransferase	102.7	8.05	195	Lipid droplets	None	Several
<i>TGL5</i>	Triacylglycerol lipase, lysoPA acyltransferase	84.7	9.84	358	Lipid droplets	1	Several
<i>UBX2 (SEL1)</i>	Bridging factor involved in ER-associated protein degradation (ERAD)	66.8	5.22	12,600	Lipid droplets, ER	None	None
<i>USE1 (SLT1)</i>	SNARE	28.1	5.01	973	Lipid droplets, ER	1	None
<i>YEH1</i>	Steryl ester hydrolase	66.5	6.33	7,770	Lipid droplets	1-2	None
<i>YIM1</i>	Unknown function	41.6	7.98	6,540	Lipid droplets, ER	None	None
<i>YJUS</i>	Monoacylglycerol lipase	35.6	8.5	2,140	Lipid droplets, ER	None	None
<i>YPT7 (AST4, VAM4)</i>	Rab family GTPase	23.0	4.62	5,530	Lipid droplets, cytoplasm	None	None
<i>YOR059c</i>	Putative lipase	51.1	9.81	1,210	Lipid droplets	1	None

Much of the information in this table may be found in the *Saccharomyces* Genome Database. ND, not determined.

^a Ghaemmaghami et al. (2003).

^b Habeler et al. (2002); Grillitsch et al. (2011); Kumar et al. (2002); Huh et al. (2003); Natter et al. (2005); Athenstaedt et al. (1999).

^c Based on PhosphoGrid (<http://www.phosphogrid.org>) and PhosphoPed (<http://www.phosphopep.org>) Databases.

^d Grillitsch et al. (2011); Natter et al. (2005); Athenstaedt et al. (1999).

^e Prein et al. (2000).