**Table S1. List of 274 Giardia ESPs**

Note the proteins are ordered according to their genomic locations when they are under the same category.

|  |  |
| --- | --- |
| Cytoskeleton |  |
| Actins |  |
| GL50803\_8589 | Suppressor of actin 1 |
| GL50803\_16299 | Sda1, severe depolymerization of actin |
| GL50803\_15113 | Actin |
| GL50803\_40817 | Actin related protein |
| Microtubule related |  |
| GL50803\_14048 | EB1 |
| Tubulins |  |
| GL50803\_5462 | Delta tubulin |
| GL50803\_136021 | Beta tubulin |
| GL50803\_136020 | Beta tubulin |
| GL50803\_101291 | Beta tubulin |
| GL50803\_103676 | Alpha-tubulin |
| GL50803\_6336 | Epsilon tubulin |
| GL50803\_112079 | Alpha-tubulin |
| GL50803\_114218 | Gamma tubulin |
| Kinesins |  |
| GL50803\_16945 | Kinesin-13 |
| GL50803\_4371 | Kinesin-8 |
| GL50803\_15134 | Kinesin-6 like |
| GL50803\_16224 | Kinesin-related protein |
| GL50803\_102455 | Kinesin-6 |
| GL50803\_6262 | Kinesin-3 |
| GL50803\_102101 | Kinesin-3 |
| GL50803\_112846 | Kinesin-3 |
| GL50803\_16456 | Kinesin-2 |
| GL50803\_112729 | Kinesin like protein |
| GL50803\_11442 | Kinesin-related protein |
| GL50803\_10137 | Kinesin-9 |
|  |  |
| GL50803\_16650 | Kinesin-4 |
| GL50803\_16425 | Kinesin-5 |
| GL50803\_8886 | Kinesin-14 |
| GL50803\_17333 | Kinesin-2 |
| GL50803\_14070 | Kinesin-like protein |
| GL50803\_17264 | Kinesin like protein |
| GL50803\_7874 | Kinesin-16 |
| GL50803\_16161 | Kinesin-16 |
| GL50803\_15962 | Kinesin-7 |
| GL50803\_13797 | Kinesin-14 |
| GL50803\_6404 | Kinesin-9 |
| GL50803\_13825 | Kinesin-1 |
| **Membrane proteins** |  |
| Cell adhesion |  |
| GL50803\_16882 | Bystin |
| GL50803\_92673 | CHL1-like protein |
| Clathrin related |  |
| GL50803\_102108 | Clathrin heavy chain |
| GL50803\_15339 | Adaptor protein complex large chain subunit BetaA |
| GL50803\_89622 | Mu adaptin |
| GL50803\_21423 | Beta adaptin |
| GL50803\_17304 | Alpha adaptin |
| GL50803\_8917 | Mu adaptin |
| GL50803\_3256 | EH domain binding protein epsin 2 |
| GL50803\_5328 | Sigma adaptin |
| GL50803\_16364 | Gamma adaptin |
| GL50803\_91198 | Sigma adaptin |
| GL50803\_14373 | Dynamin |
| Endocytosis |  |
| GL50803\_42048 | ABC transporter |
| ER and Golgi |  |
| GL50803\_88082 | Coatomer beta subunit |
| GL50803\_11953 | Coatomer alpha subunit |
| GL50803\_4502 | ER lumen protein retaining receptor |
|  |  |
| GL50803\_17065 | Sec24 |
| GL50803\_17164 | Sec24-like |
| GL50803\_9593 | Coatomer beta' subunit |
| GL50803\_15413 | RER1-like protein-retention of ER proteins |
| GL50803\_17192 | Protein transport protein Sec7 |
| GL50803\_29487 | Protein disulfide isomerase PDI1 |
| Lipid attachments |
| GL50803\_10019 | Phospholipid-transporting ATPase IA, putative |
| GL50803\_137725 | Phospholipid-transporting ATPase IIB, putative |
| GL50803\_101810 | Phospholipid-transporting ATPase IIB, putative |
| GL50803\_17082 | Rab geranylgeranyltransferase |
| Vacuole |
| GL50803\_100864 | Vacuolar protein sorting 26, putative |
| GL50803\_23833 | Vacuolar protein sorting 35 |
| GL50803\_8559 | Vacuolar ATP synthase 16 kDa proteolipid subunit |
| GL50803\_10530 | Vacuolar ATP synthase 16 kDa proteolipid subunit |
| GL50803\_13000 | Vacuolar ATP synthase subunit d |
| GL50803\_14961 | Vacuolar ATP synthase subunit H |
| GL50803\_15598 | Vacuolar ATP synthase 16 kDa proteolipid subunit |
| **Nucleus** |
| DNA polymerase |
| GL50803\_6980 | DNA pol/primase, large sub |
| Histones |
| GL50803\_3367 | Histone H3 |
| GL50803\_135002 | Histone H4 |
| GL50803\_135003 | Histone H4 |
| GL50803\_14212 | Histone H3 |
| GL50803\_20037 | Histone H3 |
| GL50803\_135231 | Histone H3 |
| GL50803\_27521 | Histone H2A |
| GL50803\_121045 | Histone H2B |
| GL50803\_121046 | Histone H2B |
| GL50803\_135001 | Histone H4 |
| GL50803\_14256 | Histone H2A |
| Histone-associated |  |
| GL50803\_14753 | Histone acetyltransferase type B subunit 2 |
| GL50803\_10666 | Histone acetyltransferase GCN5 |
| GL50803\_17263 | Histone methyltransferase MYST1 |
| GL50803\_2851 | Histone acetyltransferase MYST2 |
| LIM related |
| GL50803\_9162 | Nuclear LIM interactor-interacting factor 1 |
| GL50803\_14905 | Nuclear LIM interactor-interacting factor 1 |
| GL50803\_4063 | Nuclear LIM interactor-interacting factor 1 |
| GL50803\_4235 | Nuclear LIM interactor-interacting factor 1 |
| Ribonucleoproteins |
| GL50803\_16173 | U3 small nucleolar ribonucleoprotein protein IMP4, putative |
| GL50803\_17112 | U3 small nucleolar ribonucleoprotein protein IMP4, putative |
| RNA enzymes |
| GL50803\_5661 | RNA binding protein |
| GL50803\_6054 | RNA binding putative |
| GL50803\_24860 | Nonsense-mediated mRNA decay protein 3 |
| GL50803\_10840 | DNA-directed RNA polymerases I and III 16 kDa polypeptide |
| GL50803\_14763 | Exonuclease |
| GL50803\_24133 | 5'-3' exoribonuclease 2 |
| GL50803\_17325 | Pumilio-family RNA-binding protein, putative |
| GL50803\_113365 | 5'-3' exoribonuclease 2 |
| GL50803\_14702 | RRNA biogenesis protein RRP5 |
| Topoisomerase |
| GL50803\_16285 | Topoisomerase I-related protein |
| Transcriptional factors |  |
| GL50803\_8209 | CCR4-NOT transcription complex, subunit 7 |
| GL50803\_8427 | Transcriptional repressor NOT4Hp, putative |
| GL50803\_7231 | CCAAT-binding transcription factor subunit A |
| GL50803\_4125 | Transcription factor IIIB 70 kDa subunit BRF |
| GL50803\_10606 | CCR4-NOT transcription complex, subunit 7 |
| Transcriptional transactivators |  |
| GL50803\_5347 | Myb 1-like protein |
| GL50803\_8722 | Myb 1-like protein |
| Zinc fingers |  |
| GL50803\_8619 | Zinc finger domain |
| GL50803\_9529 | Zinc finger domain |
| GL50803\_6733 | Zinc finger domain |
| GL50803\_1908 | DHHC-type zinc finger domain-containing protein |
| GL50803\_16928 | Zinc finger domain |
| GL50803\_96562 | Zinc finger domain |
| Protein synthesis and breakdown |  |
| Large ribosomal proteins |  |
| GL50803\_8462 | Ribosomal protein L27 |
| GL50803\_14622 | Ribosomal protein L13 |
| GL50803\_19436 | Ribosomal protein L7 |
| GL50803\_16387 | Ribosomal protein L18a |
| Small ribosomal protein |  |
| GL50803\_10367 | Ribosomal protein S24 |
| GL50803\_6135 | Ribosomal protein S17 |
| GL50803\_14329 | Ribosomal protein S7 |
| Ribosome biogenesis protein |  |
| GL50803\_102722 | Ribosome biogenesis protein BMS1 |
| GL50803\_16718 | Partner of Nob1 |
| GL50803\_3589 | Ribosome biogenesis protein Brix |
| GL50803\_8361 | SOF1 protein |
| Translation factors |  |
| GL50803\_13561 | Translation elongation factor |
| GL50803\_8708 | Eukaryotic translation initiation factor 1A |
| GL50803\_93275 | Translational activator GCN1 |
| GL50803\_13661 | Eukaryotic translation initiation factor 3 subunit 2 |
| Proteasome associated |  |
| GL50803\_16823 | Non ATPase subunit MPR1 of 26S proteasome |
| GL50803\_7896 | 26S proteasome non-ATPase regulatory subunit 7 |
| **Signalling system** |  |
| 14-3-3 protein |  |
| GL50803\_6430 | 14-3-3 protein |
| Calmodulins |  |
|  |  |
| GL50803\_13652 | Calmodulin |
| GL50803\_6744 | Centrin |
| GL50803\_13231 | Calmodulin |
| GL50803\_5333 | Calmodulin |
| GL50803\_104685 | Caltractin |
| Cell cycle related |
| GL50803\_102890 | BUB3 |
| GL50803\_11044 | Mob1-like protein |
| GL50803\_5772 | CDC72 |
| GL50803\_4008 | Mob1-like protein |
| GL50803\_3977 | G2/mitotic-specific cyclin B |
| GL50803\_9778 | Tem-1-like protein |
| GL50803\_17103 | Orc1/CDC6 |
| GL50803\_15248 | Spindle protein, putative |
| GL50803\_13667 | Notchless |
| GTP-binding proteins | |
| GL50803\_13109 | RabA |
| GL50803\_12157 | RabB |
| GL50803\_16636 | Rab2b |
| GL50803\_1695 | Rab11 |
| GL50803\_16979 | Rab32, putative |
| GL50803\_7569 | GTP-binding protein Sar1 |
| GL50803\_13478 | ARL1 |
| GL50803\_13930 | ARF3 |
| GL50803\_7562 | ARF2 |
| GL50803\_15567 | Rab2a |
| GL50803\_22454 | ARF GAP |
| GL50803\_11495 | Rab GDI |
| GL50803\_940 | RabD |
| GL50803\_2834 | ARF GAP |
| GL50803\_8497 | RabF |
| GL50803\_8496 | Rac/Rho-like protein |
| GL50803\_4192 | ARL2 |
| GL50803\_15869 | GTP-binding nuclear protein RAN/TC4 |
| GL50803\_17561 | ARF GAP |
| GL50803\_9558 | Rab1a |
| Kinases and phosphatases |  |
| GL50803\_11554 | Kinase, NEK |
| GL50803\_5554 | Kinase, NEK-frag |
| GL50803\_5553 | Kinase, NEK |
| GL50803\_10313 | Kinase |
| GL50803\_3414 | 5'-AMP-activated protein kinase, gamma-1 subunit |
| GL50803\_87928 | Kinase, NEK |
| GL50803\_14044 | Kinase, NEK |
| GL50803\_9365 | Kinase, NEK |
| GL50803\_14648 | Kinase, NEK-frag |
| GL50803\_14650 | Ser/Thr phosphatase 2C, putative |
| GL50803\_32398 | Protein phosphatase PP2A regulatory subunit B |
| GL50803\_9117 | CAMP-dependent protein kinase regulatory chain |
| GL50803\_115572 | Kinase, Wee |
| GL50803\_17406 | Phosphoinositide-3-kinase, class 3 |
| GL50803\_137730 | Kinase |
| GL50803\_11740 | Ser/Thr phosphatase 2C, putative |
| GL50803\_103838 | Kinase, ULK |
| GL50803\_2538 | Kinase, NAK |
| GL50803\_16443 | Protein phosphatase 2A B' regulatory subunit Wdb1 |
| GL50803\_113456 | Kinase, VPS15 |
| GL50803\_9293 | Protein phosphatase 2C-like protein |
| GL50803\_4079 | Protein phosphatase PP2A regulatory subunit B |
| GL50803\_12095 | Kinase, NEK-frag |
| GL50803\_14404 | Phosphatase |
| GL50803\_17335 | Kinase, CMGC SRPK |
| GL50803\_36783 | Kinase, NEK |
| GL50803\_10612 | Phosphotyrosyl phosphatase activator protein, putative |
| GL50803\_15112 | Dual specificity phosphatase, catalytic |
| GL50803\_96616 | Kinase, CMGC CDKL |
| GL50803\_7588 | Serine/threonine protein phosphatase 7 |
| GL50803\_21502 | Kinase, putative |
| GL50803\_21116 | Kinase, CMGC CMGC-GL1 |
| GL50803\_137695 | Kinase, CMGC DYRK |
| GL50803\_4288 | Ser/Thr phosphatase 2C, putative |
| GL50803\_5999 | Kinase, NEK |
| Phosphatidylinositols kinases and phosphatases | |
| GL50803\_11897 | Phosphatidylinositol-4-phosphate 5-kinase, putative |
| GL50803\_14975 | Phosphatidylinositol-glycan biosynthesis, class O protein |
| GL50803\_14855 | Phosphoinositide-3-kinase, catalytic, alpha polypeptide |
| GL50803\_9077 | Inositol 5-phosphatase 4 |
| GL50803\_35180 | GTOR |
| GL50803\_16558 | Phosphatidylinositol 4-kinase |
| GL50803\_14787 | Type II inositol-1,4,5-trisphosphate 5-phosphatase precursor |
| Ubiquitins |
| GL50803\_7110 | Ubiquitin |
| GL50803\_8843 | Ubiquitin |
| Ubiquitin conjugation enzymes |  |
| GL50803\_15162 | Ubiquitin-conjugating enzyme E2-17 kDa |
| GL50803\_5921 | Ubiquitin-conjugating enzyme E2-28.4 kDa |
| GL50803\_3171 | UBCE14 |
| GL50803\_3978 | Ubiquitin-conjugating enzyme E2-17 kDa |
| GL50803\_31576 | Ubiquitin-conjugating enzyme E2-21.2 kDa |
| GL50803\_4083 | Ubiquitin-conjugating enzyme E1 |
| GL50803\_6524 | Ubiquitin-conjugating enzyme E2-28.4 kDa |
| GL50803\_3994 | Ubiquitin fusion degradation protein 1 |
| GL50803\_15252 | Ubiquitin-conjugating enzyme E2-17 kDa 3 |
| GL50803\_8638 | Ubiquitin-conjugating enzyme E2-28.4 kDa |
| GL50803\_12950 | Ubiquitin-conjugating enzyme E2-17 kDa |
| GL50803\_27055 | Ubiquitin-conjugating enzyme E2-17 kDa 3 |
| GL50803\_24068 | UBC3 |
| GL50803\_2876 | UBC2, putative |
| Ubiquitin proteases |  |
| GL50803\_16090 | Ubiquitin carboxyl-terminal hydrolase 4 |
| GL50803\_5533 | DUB-1 |
| GL50803\_14460 | Ubiquitin carboxyl-terminal hydrolase 4 |
|  |  |
| GL50803\_8189 | Ubiquitin carboxyl-terminal hydrolase 14 |
| GL50803\_17386 | Ubiquitin-protein ligase E3A |
| **Others** |
| GL50803\_7533 | Angio-associated migratory cell protein |
| GL50803\_88438 | ATPase |
| GL50803\_9528 | Methyltransferase like 2 |
| GL50803\_15531 | Periodic tryptophan protein 1, putative |
| GL50803\_113143 | Lipopolysaccharide-responsive and beige-like anchor protein |
| GL50803\_10822 | WD-40 repeat protein family |
| GL50803\_17502 | Mannosyltransferase |
| GL50803\_9382 | Prenyltransferase |
| GL50803\_27747 | Flavohemoprotein B5+B5R |
| GL50803\_7287 | Small glutamine-rich tetratricopeptide repeat-containing protein |
| GL50803\_17294 | Degreening related gene dee76 protein |
| GL50803\_7030 | Prefoldin subunit 3, putative |
| GL50803\_6835 | Brix domain containing protein |
| GL50803\_13616 | Glycine-rich protein |
| GL50803\_94653 | Periodic tryptophan protein 2-like protein |
| GL50803\_11204 | Plant adhesion molecule 1 |
| GL50803\_8819 | Protein required for cell viability |
| GL50803\_10755 | Splicing factor 3A subunit 2 |
| GL50803\_3993 | Polyadenylate-binding protein, putative |
| GL50803\_14174 | Glutamate-rich WD-repeat protein |
| GL50803\_15487 | WD-40 repeat protein |
| GL50803\_16920 | WD-containing protein |
| GL50803\_16202 | Axoneme central apparatus protein |
| GL50803\_16572 | N-terminal acetyltransferase complex ARD1 subunit, putative |
| GL50803\_17353 | G beta-like protein GBL |
| GL50803\_17013 | Isoprenylcysteine carboxyl methyltransferase |
| GL50803\_16264 | WD-40 repeat protein |
| GL50803\_21512 | S-adenosylmethionine-dependent methyltransferase, putative |
| GL50803\_16957 | WD-40 repeat protein family |
| GL50803\_33762 | WD-40 repeat protein |
| GL50803\_16863 | Caffeine-induced death protein 1-like protein |
| GL50803\_27310 | Stress-induced-phosphoprotein 1 |
| GL50803\_88581 | Synaptic glycoprotein SC2 |
| Hypothetical proteins |  |
| GL50803\_103074 | Hypothetical proteins |
| GL50803\_137754 | Hypothetical proteins |
| GL50803\_16734 | Hypothetical proteins |
| GL50803\_17068 | Hypothetical proteins |
| GL50803\_16805 | Hypothetical proteins |
| GL50803\_32531 | Hypothetical proteins |
| GL50803\_33022 | Hypothetical proteins |
| GL50803\_22338 | Hypothetical proteins |
| GL50803\_15280 | Hypothetical proteins |
| GL50803\_112258 | Hypothetical proteins |