

A genomic survey of the fish parasite *Spiroucleus salmonicida* indicates genomic plasticity among diplomonads and significant lateral gene transfer in eukaryote genome evolution

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Additional file 2

Genes identified in the *Spiroucleus salmonicida* genome survey.

Clone	L _{aa} [†]	C [‡]	TM [§]	LGT [¶]	Protein	Classification
gSpZar1039gT3	164				synovial sarcoma, X breakpoint 2 interacting protein	Cellular Processes; Cell Communication; Adherens junction
SpESTDH110	200				cingulin	Cellular Processes; Cell Communication; Tight junction
SpESTC112	197				Rab GTPase	Cellular Processes; Cell Communication; Tight junction
SpESTC208	205				Rab GTPase	Cellular Processes; Cell Communication; Tight junction
SpESTC44	211				Rab GTPase	Cellular Processes; Cell Communication; Tight junction
SpESTC106	203				Rab GTPase	Cellular Processes; Cell Communication; Tight junction
SpESTZap199	73				Rab GTPase	Cellular Processes; Cell Communication; Tight junction
SpESTC67	197		TM		cAMP-dependent protein kinase regulator	Cellular Processes; Cell Growth and Death; Apoptosis
gSpZar984gT3	204				cell cycle arrest protein BUB2	Cellular Processes; Cell Growth and Death; Cell cycle
gSpZap189bT7	172				cell division control protein CDC54	Cellular Processes; Cell Growth and Death; Cell cycle
gSpTor126bT7	229				cyclin-dependent kinase	Cellular Processes; Cell Growth and Death; Cell cycle
gSpZap342bT7	134				cyclin-dependent kinase	Cellular Processes; Cell Growth and Death; Cell cycle
gSpZar649bT7	247				cyclin-dependent kinase	Cellular Processes; Cell Growth and Death; Cell cycle
SpESTZap1774	165				cyclin-dependent kinase 2	Cellular Processes; Cell Growth and Death; Cell cycle
gSpZar325gT3	205				minichromosome maintenance protein MCM2	Cellular Processes; Cell Growth and Death; Cell cycle
gSpZal621bMF	247				minichromosome maintenance protein MCM3	Cellular Processes; Cell Growth and Death; Cell cycle
gSpTor508bT7	165				ser/thr/tyr protein kinase RAD53	Cellular Processes; Cell Growth and Death; Cell cycle
SpESTC69	171				serine/threonine-protein kinase HSL1	Cellular Processes; Cell Growth and Death; Cell cycle
SpESTC88	218				ATP-binding protein involved in chromosome partitioning	Cellular Processes; Cell Growth and Death; Cell division
gSpTor587bT7	191				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpZap14gT3	192				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpZar1022bT7	204				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpZar333gT3	187				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpZar828gT3	234				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpTor651gT3	245				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
SpESTZap1222	251				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
SpESTZap839	209				chromosome segregation protein	Cellular Processes; Cell Growth and Death; Cell division
gSpZap25bT7	127				actin, beta/gamma, cytoplasmic	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpTor118gT3	212				actinin, alpha	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpTor1552bT7	214	C			integrin, beta	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpTor874bT7_2	172	C			integrin, beta	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpZap165gT3	178	C			integrin, beta	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
SpESTZap1171	210	C			integrin, beta	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpZar519gT3	70				slingshot	Cellular Processes; Cell Motility; Regulation of actin cytoskeleton
gSpTor1229bMF	253	C			gurken receptor precursor (torpedo)	Cellular Processes; Development; Dorsal-ventral axis formation
SpESTDH444	187				adaptor protein complex medium subunit	Cellular Processes; unclassified
gSpTor930gT3_2	108				cyst wall protein	Cellular Processes; unclassified
gSpTor1317bMF	207				cysteine protease	Cellular Processes; unclassified
gSpZar78bT7	110				cysteine protease	Cellular Processes; unclassified
SpESTC243	225				cysteine protease	Cellular Processes; unclassified
SpESTDH301	233				cysteine protease	Cellular Processes; unclassified
SpESTZap1687	216				dynactin	Cellular Processes; unclassified
Sp3orf4	746				dynammin-like protein	Cellular Processes; unclassified
gSpTor128bMF	178				dynein	Cellular Processes; unclassified
gSpTor141bMF	153				dynein	Cellular Processes; unclassified
gSpTor135gT3	230				dynein	Cellular Processes; unclassified
gSpTor169bT7	249				dynein	Cellular Processes; unclassified
gSpTor186bT7	235				dynein	Cellular Processes; unclassified
gSpTor186gT3	220				dynein	Cellular Processes; unclassified
gSpTor238gT3	210				dynein	Cellular Processes; unclassified
gSpTor253bT7	189				dynein	Cellular Processes; unclassified
gSpTor253gT3	235				dynein	Cellular Processes; unclassified
gSpTor569bT7	201				dynein	Cellular Processes; unclassified
gSpTor982bT7	215				dynein	Cellular Processes; unclassified
gSpZal387bMF	143				dynein	Cellular Processes; unclassified
gSpZap275bT7	97				dynein	Cellular Processes; unclassified
gSpZap451bT7	183				dynein	Cellular Processes; unclassified
gSpZap451gT3	160				dynein	Cellular Processes; unclassified
gSpZap513gT3	200				dynein	Cellular Processes; unclassified
gSpZap79bT7	164				dynein	Cellular Processes; unclassified
gSpZap806gT3	180				dynein	Cellular Processes; unclassified
gSpZar528gT3	198				dynein	Cellular Processes; unclassified
gSpZar684gT3	193				dynein	Cellular Processes; unclassified
SpESTC151	108				dynein	Cellular Processes; unclassified
SpESTC185	233				dynein	Cellular Processes; unclassified
gSpZap349gT3	197				guanidine dissociation inhibitor (GDI)	Cellular Processes; unclassified
SpESTDH002	72				histone	Cellular Processes; unclassified
SpESTDH406	194				histone acetyltransferase	Cellular Processes; unclassified
SpESTC285	240				peptidylprolyl isomerase	Cellular Processes; unclassified
SpESTZap1298	230				phosphotyrosyl phosphatase activator protein	Cellular Processes; unclassified
1322213	395				tubulin	Cellular Processes; unclassified
SpESTC312	448				tubulin	Cellular Processes; unclassified
SpESTZap1216	190				tubulin	Cellular Processes; unclassified
SpESTZap1633	219				Tubulin tyrosine ligase	Cellular Processes; unclassified
SpESTC172	245				annexin	Environmental Information Processing
SpESTC206	293				annexin	Environmental Information Processing

SpESTC56	293		annexin	Environmental Information Processing
gSpZa608bMF	94		GTP-binding protein; COG0012 and pfam06071	Environmental Information Processing
gSpZap37gT3	200		GTP-binding protein	Environmental Information Processing
SpESTDH259	175		GTP-binding protein	Environmental Information Processing
gSpZa472bMF	111		protein C inhibitor	Environmental Information Processing
gSpZap444bT7	114		olfactory receptor	Environmental Information Processing; Ligand-Receptor Interaction; G-protein coupled receptors
gSpZap528bT7	43		olfactory receptor	Environmental Information Processing; Ligand-Receptor Interaction; G-protein coupled receptors
gSpZap596gT3	38		olfactory receptor	Environmental Information Processing; Ligand-Receptor Interaction; G-protein coupled receptors
SpESTC238	214		gamma-aminobutyric acid (GABA) A receptor, epsilon	Environmental Information Processing; Ligand-Receptor Interaction; Neuroactive ligand-receptor interaction
gSpTor556bT7	84	TM	Na+/H+ exchanger/antiporter; pfam00999	Environmental Information Processing; Membrane Transport
gSpZap219gT3	174		ABC-2 type transport system ATP-binding protein	Environmental Information Processing; Membrane Transport; ABC transporters, ABC-2 and other types
Sp1orf1	223	TM	ATP-binding cassette, subfamily C (CFTR/MRP), member 1	Environmental Information Processing; Membrane Transport; ABC transporters, eukaryotic
Sp1orf2	1514	TM	ATP-binding cassette, subfamily C (CFTR/MRP), member 5	Environmental Information Processing; Membrane Transport; ABC transporters, eukaryotic
gSpZar394bT7	78		simple sugar transport system ATP-binding protein	Environmental Information Processing; Membrane Transport; ABC transporters, prokaryotic
gSpZar824bT7	120		sulfonate/nitrate transport system ATP-binding protein	Environmental Information Processing; Membrane Transport; ABC transporters, prokaryotic
SpESTZap1389	238	TM	LG2 drug:H+ antiporter-2, DHA2 family	Environmental Information Processing; Membrane Transport; Major facilitator superfamily (MFS)
gSpTor1167gT3	132	TM	sugar porter, SP family	Environmental Information Processing; Membrane Transport; Major facilitator superfamily (MFS)
gSpTor978bT7	164	TM	Ca2+ transporting ATPase, plasma membrane	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpTor978gT3	161		Ca2+ transporting ATPase, plasma membrane	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpZap127bT7	183	TM	Ca2+ transporting ATPase, plasma membrane	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpTor39bT7	85		calmodulin	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
Sp1orf5	147		Calmodulin	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
SpESTZap862	171	TM	Calmodulin	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpTor927gT3_2	192		cyclin B	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
SpESTZap933	152		cyclin-dependent kinase 1	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpZap949gT3	141		guanine nucleotide binding protein (G protein), alpha 15	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpZa266bMF	81		peptidylprolyl isomerase D (cyclophilin D)	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
SpESTDH065	160		peptidylprolyl isomerase D (cyclophilin D)	Environmental Information Processing; Signal Transduction; Calcium signaling pathway
gSpZar353bT7	112		extracellular signal-regulated kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTDH126	240		extracellular signal-regulated kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap854	230		extracellular signal-regulated kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar658bT7	189		inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap869	183		misshapen/NIK-related kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap978	241		misshapen/NIK-related kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap536bT7	112		mitogen and stress response kinase 1	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap1011gT3	138		mitogen-, stress activated protein kinases	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar938bT7	208		mitogen-, stress activated protein kinases	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar494gT3	200		mitogen-activated protein kinase kinase kinase 13	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpTor797bT7	132		mitogen-activated protein kinase kinase kinase 2	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpTor951gT3_2	235		mitogen-activated protein kinase kinase kinase 2	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpTor707gT3	162		mitogen-activated protein kinase kinase kinase 9	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar667gT3	173		mitogen-activated protein kinase kinase kinase kinase 1	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpTor1559bT7	132		p21-activated kinase 1	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTDH364	181		p21-activated kinase 1	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar828bT7	133		p38 MAP Kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar201bT7	146	TM	p90 ribosomal S6 kinase	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap793bT7	151		protein kinase A	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap816gT3	108		protein kinase A	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap368	189		protein kinase A	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap819	188		protein kinase C	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap837bT7	153		protein phosphatase 1A (formerly 2C)	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTC175	232		protein phosphatase 1A (formerly 2C)	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap256gT3	121		protein phosphatase 1B (formerly 2C)	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTC153	111		protein phosphatase 1B (formerly 2C)	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar560gT3	236		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTC209	215		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTC270	367		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap1875	214		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap191	161		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap54	225		protein phosphatase 5	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZar609bT7	149		RAP1, member of RAS oncogene family	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTC180	195		Rho superfamily, small GTP binding protein Rac	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
SpESTZap52	208		serine/threonine kinase 4	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap77gT3	196	C	tumor necrosis factor receptor superfamily, member 1A	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpZap289bT7	105		v-akt murine thymoma viral oncogene homolog	Environmental Information Processing; Signal Transduction; MAPK signaling pathway
gSpTor570bT7	222	C	jagged	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpTor757bT7	125	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpTor957gT3_2	223	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpZap443bT7	117	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpZap601gT3	148	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpZar633gT3	210	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
SpESTC104	226	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
SpESTZap901	190	C	Notch	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpZap337gT3	175	TM	p300/CBP-associated factor	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpZar604bT7	92		p300/CBP-associated factor	Environmental Information Processing; Signal Transduction; Notch signaling pathway
gSpTor764bT7	142		type III PIP kinase	Environmental Information Processing; Signal Transduction; Phosphatidylinositol signaling system
gSpZap650gT3	219		casein kinase 1	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTZap333	244		casein kinase 1	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpTor256gT3	115		glycogen synthase kinase 3 beta	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpZar932bT7	194		glycogen synthase kinase 3 beta	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpTor88bT7	76		protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpTor951bT7_2	92		protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTC129	194		protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTC201	235		protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTDH019	106		protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway

SpESTZap135	130		subunit protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTZap1619	220		subunit protein phosphatase 2 (formerly 2A), catalytic subunit	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpZap320gT3	83		subunit protein phosphatase 2 (formerly 2A), regulatory subunit B	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpTor487bT7	184		Rho-associated, coiled-coil containing protein kinase	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
SpESTC234	289		RuvB-like protein 1 (pontin 52)	Environmental Information Processing; Signal Transduction; Wnt signaling pathway
gSpZap222bT7	132		hect domain ubiquitin protein ligase E3 component	Genetic Information Processing; Folding, Sorting and Degradation; Genetic Information Processing; Folding, Sorting and Degradation
gSpZap912bT7	91		hect domain ubiquitin protein ligase E3 component	Genetic Information Processing; Folding, Sorting and Degradation; Genetic Information Processing; Folding, Sorting and Degradation
SpESTZap2092	172		hect domain ubiquitin protein ligase E3 component	Genetic Information Processing; Folding, Sorting and Degradation; Genetic Information Processing; Folding, Sorting and Degradation
SpESTZap279	202		20S proteasome subunit alpha1	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC101	170		20S proteasome subunit alpha3	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTZap1656	169		20S proteasome subunit alpha7	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
gSpTor2gT3	100		20S proteasome subunit beta1	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC215	228		20S proteasome subunit beta5	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC166	188		20S proteasome subunit beta6	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTZap889	129		20S proteasome subunit beta7	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC119	165		26S proteasome regulatory subunit N11	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC146	209		26S proteasome regulatory subunit N8	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTZap1256	211		26S proteasome regulatory subunit T2	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
gSpZap532gT3	88		26S proteasome regulatory subunit T4	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
SpESTC107	233		26S proteasome regulatory subunit T5	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
gSpTor154bT7	159		26S proteasome regulatory subunit T6	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
gSpZap115gT3	176		proteasome alpha subunit	Genetic Information Processing; Folding, Sorting and Degradation; Proteasome
gSpZap497gT3	166		Mg-dependent DNase	Genetic Information Processing; Folding, Sorting and Degradation; Protein export
SpESTZap2118	155	TM	preprotein translocase SecY subunit	Genetic Information Processing; Folding, Sorting and Degradation; Protein export
SpESTZap2097	94		signal recognition particle, subunit SRP19	Genetic Information Processing; Folding, Sorting and Degradation; Protein export
gSpTor27gT3	139		ATP-dependent Zn protease, cell division protein	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
15990567	512		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
gSpZar636gT3	130		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC121	201		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC170	209		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC73	341		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTDH392	191		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTZap392	225		chaperonin GroEL (Hsp60)	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
23306653	657		heat shock protein 70, Hsp70 family	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
gSpZal522bMF	164		heat shock protein 70, Hsp70 family	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC184	221		heat shock protein 70, Hsp70 family	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC236	230		heat shock protein 70, Hsp70 family	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTZap1064	205		heat shock protein 70, Hsp70 family	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC148	303		Heat shock protein 90; pfam00183	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC18	183	LGT	membrane protease subunit HflK	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
gSpZar958bT7	125	LGT	membrane protease subunit HflK	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
gSpZap739gT3	111		prefoldin alpha subunit	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC227	228		protein disulfide-isomerase	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTC258	220		protein disulfide-isomerase	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTZap295	92		protein disulfide-isomerase	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTZap885	95		protein disulfide-isomerase	Genetic Information Processing; Folding, Sorting and Degradation; Protein folding and associated processing
SpESTZap970	223		ubiquilin 1	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
gSpZar929bT7	165		ubiquitin-activating enzyme E1	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
gSpTor755bT7	81		ubiquitin-conjugating enzyme	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
SpESTDH402	166		ubiquitin-conjugating enzyme	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
SpESTZap86	125		ubiquitin-conjugating enzyme	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
gSpZap808gT3	130		ubiquitin-conjugating enzyme E2	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
gSpZap913gT3	102		ubiquitin-conjugating enzyme E2	Genetic Information Processing; Folding, Sorting and Degradation; Ubiquitin mediated proteolysis
gSpTol292bMF	186		DNA polymerase	Genetic Information Processing; Replication and Repair; DNA polymerase
SpESTDH269	187		DNA polymerase	Genetic Information Processing; Replication and Repair; DNA polymerase
gSpZap446bT7	163		DNA polymerase alpha, subunit A	Genetic Information Processing; Replication and Repair; DNA polymerase
gSpZap813gT3	197		DNA polymerase delta, subunit A	Genetic Information Processing; Replication and Repair; DNA polymerase
gSpZap553gT3	47	C	DNA polymerase IV	Genetic Information Processing; Replication and Repair; DNA polymerase
gSpZap842bT7	83		ATP-dependent DNA helicase RecQ	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTC164	225		ATP-dependent RNA helicase DeaD	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTZap741	217		ATP-dependent RNA helicase DeaD	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpTor801bT7	152		ATP-dependent RNA helicase RhlB	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpTor162gT3	185		ATP-dependent RNA helicase SrmB	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTZap1984	120		ATP-independent RNA helicase DbpA	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTC43	188	LGT	DNA glycosylase	Genetic Information Processing; Replication and Repair; Other replication, recombination

gSpZap869bT7	149		DNA mismatch repair protein MutS	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpZar426bT7	126		DNA repair protein Rad51	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTDH274	130		DNA-(apurinic or pyrimidinic site) lyase	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpZal070bMF	156		exodeoxyribonuclease I	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTZap438	181		exodeoxyribonuclease III	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpTor235gT3	214		exonuclease SbcC	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTC237	234		exonuclease SbcC	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
SpESTZap1967	102		flap endonuclease-1	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpTor13gT3	195	TM	helicase	Genetic Information Processing; Replication and Repair; Other replication, recombination and repair factors
gSpZar813gT3	226		DNA topoisomerase II	Genetic Information Processing; Replication and Repair; Replication complex
gSpZap319gT3	109		transcription initiation factor TFIID subunit D4	Genetic Information Processing; Transcription; Basal transcription factors
gSpZap288bT7	167		DNA-directed RNA polymerase I subunit A1	Genetic Information Processing; Transcription; RNA polymerase
gSpZar356gT3	122		DNA-directed RNA polymerase I subunit A2	Genetic Information Processing; Transcription; RNA polymerase
gSpZal444bMF	121		DNA-directed RNA polymerase II subunit A	Genetic Information Processing; Transcription; RNA polymerase
gSpTor153bT7	222		DNA-directed RNA polymerase II subunit B	Genetic Information Processing; Transcription; RNA polymerase
gSpTor153gT3	120		DNA-directed RNA polymerase II subunit B	Genetic Information Processing; Transcription; RNA polymerase
gSpZar943bT7	108		DNA-directed RNA polymerase II subunit J	Genetic Information Processing; Transcription; RNA polymerase
gSpTor141bT7	231		DNA-directed RNA polymerase III subunit C1	Genetic Information Processing; Transcription; RNA polymerase
gSpTor141gT3	227		DNA-directed RNA polymerase III subunit C1	Genetic Information Processing; Transcription; RNA polymerase
gSpZap239bT7	162		DNA-directed RNA Polymerase III subunit C5	Genetic Information Processing; Transcription; RNA polymerase
gSpTor660gT3	69		DNA-directed RNA polymerase subunit N	Genetic Information Processing; Transcription; RNA polymerase
gSpZar21gT3	229		tRNA-dihydrouridine synthase 3	Genetic Information Processing; Translation; Other translation factors
SpESTZap366	197		tRNA-dihydrouridine synthase A	Genetic Information Processing; Translation; Other translation factors
SpESTC286	214		large subunit ribosomal protein L10Ae	Genetic Information Processing; Translation; Ribosome
SpESTC287	204		large subunit ribosomal protein L10e	Genetic Information Processing; Translation; Ribosome
SpESTC303	169		large subunit ribosomal protein L11e	Genetic Information Processing; Translation; Ribosome
SpESTC283	177		large subunit ribosomal protein L12e	Genetic Information Processing; Translation; Ribosome
SpESTC296	191		large subunit ribosomal protein L13Ae	Genetic Information Processing; Translation; Ribosome
SpESTZap1021	192		large subunit ribosomal protein L13e	Genetic Information Processing; Translation; Ribosome
SpESTC250	124		large subunit ribosomal protein L14e	Genetic Information Processing; Translation; Ribosome
SpESTC302	201		large subunit ribosomal protein L15e	Genetic Information Processing; Translation; Ribosome
SpESTC229	162		large subunit ribosomal protein L17e	Genetic Information Processing; Translation; Ribosome
SpESTC187	167		large subunit ribosomal protein L18Ae	Genetic Information Processing; Translation; Ribosome
SpESTC291	178		large subunit ribosomal protein L18e	Genetic Information Processing; Translation; Ribosome
SpESTC256	175		large subunit ribosomal protein L19e	Genetic Information Processing; Translation; Ribosome
SpESTC244	156		large subunit ribosomal protein L21e	Genetic Information Processing; Translation; Ribosome
SpESTC168	110		large subunit ribosomal protein L22e	Genetic Information Processing; Translation; Ribosome
SpESTC68	133		large subunit ribosomal protein L23e	Genetic Information Processing; Translation; Ribosome
SpESTZap1971	126		large subunit ribosomal protein L24	Genetic Information Processing; Translation; Ribosome
SpESTDH056	95		large subunit ribosomal protein L24e	Genetic Information Processing; Translation; Ribosome
SpESTC15	145		large subunit ribosomal protein L27Ae	Genetic Information Processing; Translation; Ribosome
SpESTC95	124		large subunit ribosomal protein L27e	Genetic Information Processing; Translation; Ribosome
SpESTC297	106		large subunit ribosomal protein L30e	Genetic Information Processing; Translation; Ribosome
SpESTC232	100		large subunit ribosomal protein L31e	Genetic Information Processing; Translation; Ribosome
SpESTC194	130		large subunit ribosomal protein L32e	Genetic Information Processing; Translation; Ribosome
SpESTC160	110		large subunit ribosomal protein L34e	Genetic Information Processing; Translation; Ribosome
SpESTZap1267	89		large subunit ribosomal protein L35Ae	Genetic Information Processing; Translation; Ribosome
SpESTC310	127		large subunit ribosomal protein L35e	Genetic Information Processing; Translation; Ribosome
SpESTC220	86		large subunit ribosomal protein L37Ae	Genetic Information Processing; Translation; Ribosome
SpESTZap1647	76		large subunit ribosomal protein L37e	Genetic Information Processing; Translation; Ribosome
SpESTZap673	111		large subunit ribosomal protein L3e	Genetic Information Processing; Translation; Ribosome
SpESTC306	126		large subunit ribosomal protein L40e	Genetic Information Processing; Translation; Ribosome
SpESTC274	104		large subunit ribosomal protein L44e	Genetic Information Processing; Translation; Ribosome
SpESTC309	109		large subunit ribosomal protein L44e	Genetic Information Processing; Translation; Ribosome
SpESTC131	207		large subunit ribosomal protein L4e	Genetic Information Processing; Translation; Ribosome
SpESTC290	240		large subunit ribosomal protein L5e	Genetic Information Processing; Translation; Ribosome
gSpTor643gT3	121		large subunit ribosomal protein L7Ae	Genetic Information Processing; Translation; Ribosome
SpESTC314	227		large subunit ribosomal protein L7Ae	Genetic Information Processing; Translation; Ribosome
SpESTZap830	116	TM	large subunit ribosomal protein L7Ae	Genetic Information Processing; Translation; Ribosome
SpESTC216	210		large subunit ribosomal protein L7e	Genetic Information Processing; Translation; Ribosome
SpESTC163	164		large subunit ribosomal protein L8e	Genetic Information Processing; Translation; Ribosome
SpESTC20	133		large subunit ribosomal protein L9e	Genetic Information Processing; Translation; Ribosome
SpESTZap665	171		large subunit ribosomal protein L9e	Genetic Information Processing; Translation; Ribosome
SpESTC304	244	TM	large subunit ribosomal protein LP0	Genetic Information Processing; Translation; Ribosome
SpESTC205	103		large subunit ribosomal protein LP1	Genetic Information Processing; Translation; Ribosome
SpESTZap844	118		small subunit ribosomal protein S10e	Genetic Information Processing; Translation; Ribosome
SpESTC277	148		small subunit ribosomal protein S11e	Genetic Information Processing; Translation; Ribosome
SpESTZap1447	119		small subunit ribosomal protein S12e	Genetic Information Processing; Translation; Ribosome
SpESTC262	152		small subunit ribosomal protein S13e	Genetic Information Processing; Translation; Ribosome
SpESTZap1202	136		small subunit ribosomal protein S14e	Genetic Information Processing; Translation; Ribosome
SpESTC313	127		small subunit ribosomal protein S15Ae	Genetic Information Processing; Translation; Ribosome
SpESTC299	133		small subunit ribosomal protein S16e	Genetic Information Processing; Translation; Ribosome
SpESTC288	113		small subunit ribosomal protein S17e	Genetic Information Processing; Translation; Ribosome
SpESTC292	150		small subunit ribosomal protein S18e	Genetic Information Processing; Translation; Ribosome
SpESTC240	143		small subunit ribosomal protein S19	Genetic Information Processing; Translation; Ribosome
SpESTC183	131		small subunit ribosomal protein S19e	Genetic Information Processing; Translation; Ribosome
SpESTZap828	107		small subunit ribosomal protein S20e	Genetic Information Processing; Translation; Ribosome
SpESTDH098	74		small subunit ribosomal protein S21e	Genetic Information Processing; Translation; Ribosome
SpESTC294	139		small subunit ribosomal protein S23e	Genetic Information Processing; Translation; Ribosome
SpESTC241	126		small subunit ribosomal protein S24e	Genetic Information Processing; Translation; Ribosome
SpESTC211	91		small subunit ribosomal protein S25e	Genetic Information Processing; Translation; Ribosome
SpESTC264	100		small subunit ribosomal protein S26e	Genetic Information Processing; Translation; Ribosome
SpESTC218	130		small subunit ribosomal protein S27Ae	Genetic Information Processing; Translation; Ribosome
SpESTC224	77		small subunit ribosomal protein S27e	Genetic Information Processing; Translation; Ribosome
SpESTC193	63		small subunit ribosomal protein S28e	Genetic Information Processing; Translation; Ribosome
SpESTC62	47	C	small subunit ribosomal protein S29e	Genetic Information Processing; Translation; Ribosome
SpESTC279	230		small subunit ribosomal protein S2e	Genetic Information Processing; Translation; Ribosome
SpESTZap358	74		small subunit ribosomal protein S30e	Genetic Information Processing; Translation; Ribosome
SpESTC284	240		small subunit ribosomal protein S3Ae	Genetic Information Processing; Translation; Ribosome
SpESTC308	204		small subunit ribosomal protein S3e	Genetic Information Processing; Translation; Ribosome
SpESTC255	210		small subunit ribosomal protein S4e	Genetic Information Processing; Translation; Ribosome
SpESTC298	188		small subunit ribosomal protein S5e	Genetic Information Processing; Translation; Ribosome
SpESTC272	225		small subunit ribosomal protein S6e	Genetic Information Processing; Translation; Ribosome
SpESTDH084	138		small subunit ribosomal protein S7e	Genetic Information Processing; Translation; Ribosome
SpESTC278	167		small subunit ribosomal protein S8e	Genetic Information Processing; Translation; Ribosome
SpESTC261	165		small subunit ribosomal protein S9e	Genetic Information Processing; Translation; Ribosome
SpESTC311	224		small subunit ribosomal protein S9e	Genetic Information Processing; Translation; Ribosome

gSpTor722bT7	143		elongation factor EF-1 alpha subunit	Genetic Information Processing; Translation; Translation factors
gSpZar859bT7	68		elongation factor EF-1 alpha subunit	Genetic Information Processing; Translation; Translation factors
SpESTC305	435		elongation factor EF-1 alpha subunit	Genetic Information Processing; Translation; Translation factors
SpESTZap1479	234		elongation factor EF-1 alpha subunit	Genetic Information Processing; Translation; Translation factors
32B16837	224		elongation factor EF-1 beta subunit	Genetic Information Processing; Translation; Translation factors
SpESTDH009	104		elongation factor EF-2	Genetic Information Processing; Translation; Translation factors
gSpZap36gT3	148		peptide chain release factor eRF subunit 1	Genetic Information Processing; Translation; Translation factors
SpESTZap940	218		translation initiation factor eIF-2 beta subunit	Genetic Information Processing; Translation; Translation factors
gSpZap92bT7	179		translation initiation factor eIF-2 gamma subunit	Genetic Information Processing; Translation; Translation factors
gSpTor822bT7_2	220		translation initiation factor eIF-2B epsilon subunit	Genetic Information Processing; Translation; Translation factors
SpESTC57	185		translation initiation factor eIF-3 subunit 2	Genetic Information Processing; Translation; Translation factors
gSpTor973gT3	105		translation initiation factor eIF-4A	Genetic Information Processing; Translation; Translation factors
gSpZap278bT7	141		translation initiation factor eIF-4A	Genetic Information Processing; Translation; Translation factors
gSpZap373gT3	191		translation initiation factor eIF-4A	Genetic Information Processing; Translation; Translation factors
SpESTC84	235		translation initiation factor eIF-4A	Genetic Information Processing; Translation; Translation factors
SpESTZap768	228		translation initiation factor eIF-4A	Genetic Information Processing; Translation; Translation factors
SpESTC301	148		translation initiation factor eIF-5A	Genetic Information Processing; Translation; Translation factors
gSpZap490gT3	91		translation initiation factor eIF-6	Genetic Information Processing; Translation; Translation factors
gSpTor308bT7	168		translation initiation factor IF-2	Genetic Information Processing; Translation; Translation factors
gSpTor587gT3	239		translation initiation factor IF-2 unclassified subunit	Genetic Information Processing; Translation; Translation factors
gSpZap790gT3	160		CCTbeta	Genetic Information Processing; unclassified
SpESTZap1495	230		CCTtheta	Genetic Information Processing; unclassified
gSpZar107bT7	111		clathrin	Genetic Information Processing; unclassified
34148554	326		coatamer-like protein beta subunit	Genetic Information Processing; unclassified
SpESTZap1250	145		exoribonuclease	Genetic Information Processing; unclassified
gSpTor1287bT7	135		N2,N2-dimethylguanosine tRNA methyltransferase	Genetic Information Processing; unclassified
gSpZap780gT3	136		Ribosomal RNA adenine dimethylase	Genetic Information Processing; unclassified
gSpTor397gT3	214		snoRNA binding protein	Genetic Information Processing; unclassified
SpESTZap1982	222		snoRNA binding protein	Genetic Information Processing; unclassified
SpESTZap276	247	TM	sulfurase	Genetic Information Processing; unclassified
SpESTZap1340	107	LGT	tRNA (5-methylaminomethyl-2-thiouridylate) - methyltransferase	Genetic Information Processing; unclassified
34148556	174		vacuolar protein sorting 26-like	Genetic Information Processing; unclassified
27982008	623	LGT	alanyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTDH287	214	LGT	aminoacylhistidine dipeptidase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTZap149	259	LGT	aminoacylhistidine dipeptidase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTC149	412	LGT	aminoacylhistidine dipeptidase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTC143	444		asparaginyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTC26	192		aspartyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Alanine and aspartate Metabolism
SpESTC31	172	LGT	5'-methylthioadenosine nucleosidase	Metabolism; Amino Acid Metabolism; Arginine and proline Metabolism
SpESTC83	385	LGT	arginine deiminase	Metabolism; Amino Acid Metabolism; Arginine and proline Metabolism
SpESTC221	314	LGT	ornithine carbamoyltransferase	Metabolism; Amino Acid Metabolism; Arginine and proline Metabolism
gSpZar652bT7	94		ornithine decarboxylase	Metabolism; Amino Acid Metabolism; Arginine and proline Metabolism
27981826	299	LGT	prolyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Arginine and proline Metabolism
gSpTol076bMF	117		cysteinylyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Cysteine Metabolism
gSpTor417bT7	243		glutaminylyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Glutamate Metabolism
SpESTDH021	95		glycyl-tRNA synthetase, class II	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpZap391gT3	101	TM	L-serine dehydratase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpZar602gT3	218	LGT	sarcosine oxidase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpZap30gT3	172	LGT	sarcosine oxidase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpZar953bT7	62		sarcosine oxidase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpZar496gT3	78		seryl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
SpESTDH141	104		seryl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
27982357	303	LGT	threonine dehydratase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
gSpTor190gT3	223		threonyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Glycine, serine and threonine Metabolism
SpESTZap946	122	LGT	histidinol-phosphatase (PHP family)	Metabolism; Amino Acid Metabolism; Histidine Metabolism
gSpZap859bT7	183		histidyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Histidine Metabolism
gSpZar416gT3	174		histidyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Histidine Metabolism
gSpZap345gT3	178		lysyl-tRNA synthetase, class II	Metabolism; Amino Acid Metabolism; Lysine biosynthesis
SpESTC19	205		lysyl-tRNA synthetase, class II	Metabolism; Amino Acid Metabolism; Lysine biosynthesis
Sp7orf3	480		histone-lysine N-methyltransferase	Metabolism; Amino Acid Metabolism; Lysine degradation
gSpZap292gT3	159	TM	methionyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Methionine Metabolism
SpESTZap947	94		methionyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Methionine Metabolism
SpESTZap902	196		tyrosyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Phenylalanine, tyrosine and tryptophan biosynthesis
gSpZar1005bT7	100		tryptophanyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Tryptophan Metabolism
SpESTZap1526	182		tryptophanyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Tryptophan Metabolism
SpESTC86	198		alanine aminotransferase - aspartate/tyrosine/aromatic aminotransferase; COG0436	Metabolism; Amino Acid Metabolism; unclassified
gSpTor628bT7	200		isoleucyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Valine, leucine and isoleucine biosynthesis
SpESTZap2033	183		leucyl-tRNA synthetase	Metabolism; Amino Acid Metabolism; Valine, leucine and isoleucine biosynthesis
27982171	352		branched-chain amino acid aminotransferase	Metabolism; Amino Acid Metabolism; Valine, leucine and isoleucine degradation
gSpZar678bT7	154		branched-chain amino acid aminotransferase	Metabolism; Amino Acid Metabolism; Valine, leucine and isoleucine degradation
27982840	124		glucosamine-6-phosphate isomerase	Metabolism; Carbohydrate Metabolism; Aminosugars Metabolism
27983037	234		glucosamine-6-phosphate isomerase	Metabolism; Carbohydrate Metabolism; Aminosugars Metabolism
gSpTor1448bT7	117		glucosamine-6-phosphate isomerase	Metabolism; Carbohydrate Metabolism; Aminosugars Metabolism
SpESTZap1594	245		N-acetylglucosamine kinase	Metabolism; Carbohydrate Metabolism; Aminosugars Metabolism
gSpZar522gT3	149		UDP-N-acetylglucosamine pyrophosphorylase	Metabolism; Carbohydrate Metabolism; Aminosugars Metabolism
gSpZal255bMF	77		malate dehydrogenase	Metabolism; Carbohydrate Metabolism; Citrate cycle (TCA cycle)
gSpZar147bT7	45		malate dehydrogenase	Metabolism; Carbohydrate Metabolism; Citrate cycle (TCA cycle)
SpESTC228	228		malate dehydrogenase	Metabolism; Carbohydrate Metabolism; Citrate cycle (TCA cycle)
gSpZap180bT7	113		phosphomannomutase	Metabolism; Carbohydrate Metabolism; Fructose and mannose Metabolism
SpESTZap1908	224		Phosphomannomutase; pfam02878, COG1109	Metabolism; Carbohydrate Metabolism; Fructose and mannose Metabolism
gSpZap60gT3	212		pyrophosphate-fructose-6-phosphate 1-phosphotransferase	Metabolism; Carbohydrate Metabolism; Fructose and mannose Metabolism
gSpZap424gT3	180		beta-galactosidase	Metabolism; Carbohydrate Metabolism; Galactose Metabolism
SpESTZap1666	216		beta-galactosidase	Metabolism; Carbohydrate Metabolism; Galactose Metabolism
gSpTor1113bT7	47		UDP-glucose 4-epimerase	Metabolism; Carbohydrate Metabolism; Galactose Metabolism
Sp7orf2	306		UDP-glucose 4-epimerase	Metabolism; Carbohydrate Metabolism; Galactose Metabolism
SpESTZap1567	240		acetyl-CoA synthetase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
27983189	880	LGT	alcohol dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
27983404	397	LGT	alcohol dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTDH325	235	LGT	alcohol dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTZap588	229	LGT	alcohol dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
gSpZap84gT3	122	LGT	alcohol dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTZap1364	88		alcohol dehydrogenase (NADP+)	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTZap998	152		aldose 1-epimerase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTC268	226		enolase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
23266714	327	LGT	fructose-bisphosphate aldolase, class II	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTZap404	235	LGT	glucokinase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
18030018	507	LGT	glucose-6-phosphate isomerase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
1263024	297		glyceraldehyde 3-phosphate dehydrogenase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTC202	258		phosphoglycerate kinase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
gSpTol047bMF	193	LGT	phosphoglycerate mutase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
SpESTC266	339		phosphoglycerate mutase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis

SpESTC275	213	LGT	pyruvate kinase	Metabolism; Carbohydrate Metabolism; Glycolysis / Gluconeogenesis
gSpTor696gT3	153		hydrogenase	Metabolism; Carbohydrate Metabolism; Glyoxylate and dicarboxylate Metabolism
gSpTor983gT3	146	LGT	phosphoglycolate phosphatase	Metabolism; Carbohydrate Metabolism; Glyoxylate and dicarboxylate Metabolism
gSpTor707bT7	144		phosphatidylinositol 3-kinase	Metabolism; Carbohydrate Metabolism; Inositol phosphate Metabolism
gSpZap388gT3	197		phosphatidylinositol 4-kinase	Metabolism; Carbohydrate Metabolism; Inositol phosphate Metabolism
SpESTC177	187		type I PIP kinase	Metabolism; Carbohydrate Metabolism; Inositol phosphate Metabolism
SpESTC118	236		dTDP-glucose 4,6-dehydratase	Metabolism; Carbohydrate Metabolism; Nucleotide sugars Metabolism
SpESTZap89	232		aldehyde reductase	Metabolism; Carbohydrate Metabolism; Pentose and glucuronate interconversions
gSpTor589bT7	122		L-arabinose isomerase	Metabolism; Carbohydrate Metabolism; Pentose and glucuronate interconversions
SpESTZap1761	186		UTP--glucose-1-phosphate uridylyltransferase	Metabolism; Carbohydrate Metabolism; Pentose and glucuronate interconversions
27982678	138		deoxyribose-phosphate aldolase	Metabolism; Carbohydrate Metabolism; Pentose phosphate pathway
SpESTDH419	204		ribokinase	Metabolism; Carbohydrate Metabolism; Pentose phosphate pathway
SpESTC23	142	LGT	ribose 5-phosphate isomerase B	Metabolism; Carbohydrate Metabolism; Pentose phosphate pathway
SpESTC198	341		ribose-phosphate pyrophosphokinase	Metabolism; Carbohydrate Metabolism; Pentose phosphate pathway
SpESTZap360	197	LGT	transketolase	Metabolism; Carbohydrate Metabolism; Pentose phosphate pathway
gSpZal591bMF	58		acetyl-CoA carboxylase carboxyl transferase subunit alpha	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpZap797bT7	131	LGT	acetyl-CoA synthetase (ADP-forming)	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpZap472bT7	164	LGT	hydroxyacylglutathione hydrolase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
SpESTZap1028	202	LGT	hydroxyacylglutathione hydrolase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
SpESTZap934	199		lactoylglutathione lyase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpZap625gT3	181	TM	malate dehydrogenase (oxaloacetate-decarboxylating)	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
5911348	1182		putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpTor106bT7	281		putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpTor106gT3	211		putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpTor1241bT7	130		putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
SpESTC94	190	LGT	putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
SpESTZap870	181		putative pyruvate-flavodoxin oxidoreductase	Metabolism; Carbohydrate Metabolism; Pyruvate Metabolism
gSpZar1013gT3	238		1,4-alpha-glucan branching enzyme	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpZar359gT3	151		4-alpha-glucanotransferase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpZal497bMF	122		beta-phosphoglucomutase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpZap573bT7	140		beta-phosphoglucomutase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
SpESTC136	183		beta-phosphoglucomutase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpZap510gT3	134	LGT	glycogen(starch) synthase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
SpESTDH093	134		glycogen(starch) synthase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpTor1138gT3	97		starch phosphorylase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
gSpZap151gT3	78		starch phosphorylase	Metabolism; Carbohydrate Metabolism; Starch and sucrose Metabolism
SpESTC145	175	TM	V-type H+-transporting ATPase 16kDa proteolipid subunit	Metabolism; Energy Metabolism; ATP synthesis
SpESTC212	171	TM	V-type H+-transporting ATPase 16kDa proteolipid subunit	Metabolism; Energy Metabolism; ATP synthesis
SpESTC245	173	TM	V-type H+-transporting ATPase 16kDa proteolipid subunit	Metabolism; Energy Metabolism; ATP synthesis
SpESTC248	199	TM	V-type H+-transporting ATPase 21kDa proteolipid subunit	Metabolism; Energy Metabolism; ATP synthesis
SpESTC247	488		V-type H+-transporting ATPase subunit A	Metabolism; Energy Metabolism; ATP synthesis
SpESTC79	212		V-type H+-transporting ATPase subunit AC39	Metabolism; Energy Metabolism; ATP synthesis
gSpTor19gT3	163		V-type H+-transporting ATPase subunit B	Metabolism; Energy Metabolism; ATP synthesis
SpESTC71	99		V-type H+-transporting ATPase subunit G	Metabolism; Energy Metabolism; ATP synthesis
SpESTC113	198		aspartate aminotransferase	Metabolism; Energy Metabolism; Carbon fixation
30692540	200		peroxidase	Metabolism; Energy Metabolism; Methane Metabolism
SpESTC281	196		peroxidase	Metabolism; Energy Metabolism; Methane Metabolism
SpESTC239	273	LGT	carbamate kinase	Metabolism; Energy Metabolism; Nitrogen Metabolism
gSpZap126bT7	170	LGT	cystathionine beta-lyase	Metabolism; Energy Metabolism; Nitrogen Metabolism
gSpZap126gT3	185	LGT	cystathionine beta-lyase	Metabolism; Energy Metabolism; Nitrogen Metabolism
SpESTC259	128	LGT	cytochrome c biogenesis protein CcmG, thiol:disulfide interchange protein DsbE	Metabolism; Energy Metabolism; Nitrogen Metabolism
32480570	446		glutamate dehydrogenase (NADP+)	Metabolism; Energy Metabolism; Nitrogen Metabolism
20530910	634	LGT	glutamate synthase (NADPH) small chain	Metabolism; Energy Metabolism; Nitrogen Metabolism
27983817	477	LGT	hydroxylamine reductase	Metabolism; Energy Metabolism; Nitrogen Metabolism
gSpTor500gT3	90		L-asparaginase	Metabolism; Energy Metabolism; Nitrogen Metabolism
gSpTol313bMF	193	LGT	tryptophanase	Metabolism; Energy Metabolism; Nitrogen Metabolism
SpESTC204	242	LGT	tryptophanase	Metabolism; Energy Metabolism; Nitrogen Metabolism
gSpTor227bT7	219	TM	H+/K+-exchanging ATPase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpTor604bT7	217	TM	H+/K+-exchanging ATPase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpZap62bT7	197	TM	H+/K+-exchanging ATPase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpZap8gT3	190		H+/K+-exchanging ATPase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpTor671gT3	191		NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpZal229bMF	105	LGT	NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
SpESTC219	319	LGT	NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
SpESTDH113	217	LGT	NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
11127702	467	LGT	NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
gSpTor1143gT3	172	LGT	NADH dehydrogenase	Metabolism; Energy Metabolism; Oxidative phosphorylation
SpESTC115	206	LGT	cysteine synthase	Metabolism; Energy Metabolism; Sulfur Metabolism
SpESTZap1933	223	TM	LGT cysteine synthase	Metabolism; Energy Metabolism; Sulfur Metabolism
SpESTC190	144		sulfite reductase, alpha subunit (flavoprotein); COG0369	Metabolism; Energy Metabolism; Sulfur Metabolism
SpESTC233	146		sulfite reductase (NADPH) flavoprotein alpha-component	Metabolism; Energy Metabolism; Sulfur Metabolism
gSpZar995gT3	136		Acyl-CoA-dependent ceramide synthase	Metabolism; Glycan Biosynthesis and Metabolism; Glycosphingolipid Metabolism
Sp3orf8	381	TM	UDP-N-acetylglucosamine--dolichyl-phosphate-N-acetylglucosaminophosphotransferase	Metabolism; Glycan Biosynthesis and Metabolism; N-Glycan
gSpTol251bMF	131		dolichyl-diphosphooligosaccharide--protein glycosyltransferase	Metabolism; Glycan Biosynthesis and Metabolism; N-Glycan biosynthesis
gSpZap856bT7	149		neuraminidase	Metabolism; Glycan Biosynthesis and Metabolism; N-Glycan degradation
gSpZap856gT3	156		neuraminidase	Metabolism; Glycan Biosynthesis and Metabolism; N-Glycan degradation
gSpZap471gT3	148	LGT	fatty acid desaturase	Metabolism; Lipid Metabolism; Androgen and estrogen Metabolism
SpESTC37	216	TM	3-oxo-5alpha-steroid 4-dehydrogenase	Metabolism; Lipid Metabolism; Bile acid biosynthesis
SpESTZap110	165	LGT	NAD(P)H dehydrogenase (quinone)	Metabolism; Lipid Metabolism; Biosynthesis of steroids
27983595	710	LGT	long-chain fatty-acid-CoA ligase	Metabolism; Lipid Metabolism; Fatty acid Metabolism
gSpTor1293bT7	153		long-chain fatty-acid-CoA ligase	Metabolism; Lipid Metabolism; Fatty acid Metabolism
gSpTor244bT7	159		long-chain fatty-acid-CoA ligase	Metabolism; Lipid Metabolism; Fatty acid Metabolism
gSpZap134gT3	129		long-chain fatty-acid-CoA ligase	Metabolism; Lipid Metabolism; Fatty acid Metabolism
gSpZar537gT3	134		long-chain fatty-acid-CoA ligase	Metabolism; Lipid Metabolism; Fatty acid Metabolism
gSpTor97gT3	134		glycerol kinase	Metabolism; Lipid Metabolism; Glycerolipid Metabolism
SpESTZap1131	164		triacylglycerol lipase	Metabolism; Lipid Metabolism; Glycerolipid Metabolism
gSpTor1417bT7	149	TM	CDP-diacylglycerol--glycerol-3-phosphate 3-phosphatidyltransferase	Metabolism; Lipid Metabolism; Glycerophospholipid Metabolism
SpESTZap2148	243	LGT	glycerol-3-phosphate dehydrogenase	Metabolism; Lipid Metabolism; Glycerophospholipid Metabolism
SpESTZap1753	205		phosphatidylserine decarboxylase; pfam02666.	Metabolism; Lipid Metabolism; Glycerophospholipid Metabolism
gSpTor927gT3	196	TM	LGT phosphatidylserine synthase	Metabolism; Lipid Metabolism; Glycerophospholipid Metabolism
SpESTC27	297		NAD diphosphatase	Metabolism; Metabolism of Cofactors and Vitamins; Nicotinate and nicotinamide Metabolism
SpESTZap1290	183		pantothenate kinase	Metabolism; Metabolism of Cofactors and Vitamins; Pantothenate and CoA biosynthesis

Sp8orf2	518			phosphopantothenoylcysteine decarboxylase	Metabolism; Metabolism of Cofactors and Vitamins; Pantothenate and CoA biosynthesis
SpESTDH423	105			riboflavin kinase	Metabolism; Metabolism of Cofactors and Vitamins; Riboflavin Metabolism
SpESTC199	167			4-methyl-5(b-hydroxyethyl)-thiazole monophosphate biosynthesis	Metabolism; Metabolism of Cofactors and Vitamins; Thiamine Metabolism
SpESTDH245	161			4-methyl-5(b-hydroxyethyl)-thiazole monophosphate biosynthesis	Metabolism; Metabolism of Cofactors and Vitamins; Thiamine Metabolism
SpESTDH050	146			3-demethylubiquinone-9 3-methyltransferase	Metabolism; Metabolism of Cofactors and Vitamins; Ubiquinone biosynthesis
gSpZar919bT7	227		LGT	tripeptide aminopeptidase	Metabolism; Metabolism of Other Amino Acids; Glutathione Metabolism
SpESTDH279	90			Cysteine desulfurase (Nifsp in yeast); COG1104	Metabolism; Metabolism of Other Amino Acids
gSpZap418bT7	162			5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap1020	202			5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor224gT3	91	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZal311bMF	129	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap178gT3	160	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap35gT3	178	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap46gT3	188	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap882bT7	145	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap910bT7	115	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar313bT7	192	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
Sp6orf1	363	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC46	180	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap1999	177	C		5'-nucleotidase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC154	173		LGT	adenine phosphoribosyltransferase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTol186bMF	190			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor1000bT7_2	130			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor1115gT3	187			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor1519bT7	218			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor657bT7	160			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap189gT3	186			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap289gT3	199			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap313gT3	203			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap56gT3	193			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap613bT7	108			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap626gT3	188			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap748gT3	170			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap846bT7	187			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap88bT7	141			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar174bT7	101			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar493gT3	160			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar538gT3	114			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar597gT3	205			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar607gT3	119			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar878gT3	243			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar999bT7	203			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap140	175			adenosinetriphosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZap101gT3	148			adenylate cyclase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC235	203			adenylate kinase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap1939	160			ADP-ribose pyrophosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC251	228		LGT	deoxyguanosine kinase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC254	207		LGT	deoxyguanosine kinase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor745bT7	188		TM	guanylate cyclase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC75	196			hypoxanthine phosphoribosyltransferase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor125bT7	164		LGT	myosin ATPase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC48	236			myosin ATPase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpZar989gT3	245			nucleoside-diphosphate kinase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTC203	147			nucleoside-diphosphate kinase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap1122	132			nucleoside-triphosphate pyrophosphatase	Metabolism; Nucleotide Metabolism; Purine Metabolism
SpESTZap518	214			phosphoribosylformylglycinamidase cyclo-ligase	Metabolism; Nucleotide Metabolism; Purine Metabolism
gSpTor95gT3	138			polyribonucleotide nucleotidyltransferase	Metabolism; Nucleotide Metabolism; Purine Metabolism
27982526	517		LGT	CTP synthase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
gSpTor189bT7	84			CTP synthase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
gSpZap129bT7	165			CTP synthase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
SpESTZap137	127			cytidine deaminase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
SpESTC213	186			cytidylate kinase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
gSpZar448gT3	186			pseudouridylate synthase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
SpESTZap864	182			pseudouridylate synthase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
SpESTC217	305			thioredoxin reductase (NADPH)	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
Sp5orf1	616			uridine kinase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
SpESTC192	220			uridine kinase	Metabolism; Nucleotide Metabolism; Pyrimidine Metabolism
27984028	401		LGT	A-type flavoprotein	Metabolism; unclassified
SpESTZap2025	189		LGT	A-type flavoprotein	Metabolism; unclassified
SpESTC196	228		LGT	carotenoid isomerase	Metabolism; unclassified
gSpZap998gT3	191		LGT	carotenoid isomerase	Metabolism; unclassified
gSpTor315gT3	210			deoxyhypusine synthase	Metabolism; unclassified
SpESTC267	192		LGT	rubrythrin	Metabolism; unclassified
SpESTC282	210		LGT	rubrythrin	Metabolism; unclassified

422 GSSs		47	17	conserved hypothetical protein	
105 GSSs	105	18		conserved hypothetical protein	
1 GSS				conserved hypothetical protein	
12 ORFs in contigs		4		conserved hypothetical protein	
3 ORFs in contigs	3	2		conserved hypothetical protein	
173 ESTs		28		conserved hypothetical protein	
14 ESTs	14	1		conserved hypothetical protein	
2 ESTs				conserved hypothetical protein	
13 ORFs in contigs		4		hypothetical protein	

- 1) Indicates the length of the putative amino acid sequence.
- 2) Indicates cysteine-rich (>10%) proteins that were excluded from the phylogenomic analysis.
- 3) Indicates proteins with one or more transmembrane (TM) helices predicted by TMHMM server version 2.0 (<http://www.cbs.dtu.dk/services/TMHMM/>).
- 4) Indicates proteins encoded by genes with a putative LGT origin (see Additional files 3-6 for details).