

>STC4 (Genbank ID:KAH0582448)

MVQFRIPDLLSCLPACIKATNADNDILQAGLVVIDQCHLTDHYKKDLKRAQIPHLAIR
AFPGSDLKYLRICVEYLIAAFLLDRLTDKPATAAQAQEWADIYKQYFRKTLQGTKGP
INQYLTKKCDIYPQAFSKTFEKTGPAEIKYLTSHMSNTIKDPYWSCLVENNILLADGM
AKEAVDRENPGTEM DLETYIKVRRDTIGARQLFDLGRWIELNITPETLTHPDIVRMEE
QFIDLISLANDLYSYKKEYLAKDAKHNYLTIALRDPTADLHENDLQGAINYTYDKFCQ
VLTDLQKQKVLPRFGKSEEAKVDKYFWLMMNVVIGTIQWSLECERYGHFVDVDGP
NQGDVVFNL

>STC9 (Genbank ID:KAH0583476)

MFRFDHPSSFILQNICDITGAVFELKENPLREQANTAVLKWFKGFNVYDKAQGEKFIN
AGRFDIFAALSFPEADIEHLTTCLAFFLWAFSTDDLSDGEYQSKPEKVRRGHEISCSILH
DDSAPQPSYPYAGMLWDLLRRLRANGKSGMYKRFKQAFLDWSSSQVQQSLNRNLDRI
PPVDEFILMRRTIGAAALVEAMVEYSLDLIPSFVWEHPVIIGMSQVTSDIMTWPNDLC
SFNKEQADGDNQNFVQVLCVLAHNLNLQEAVDLLTKMIADRVQDYVKLKKRLPSFGP
DIDPAVHKYVDALEQFVQGCVVWYSSPRYFPDIDPRGKSKAEIHLLSKPISSDPVQMH

>STC15 (Genbank ID:KAG5341349)

MSAATSQLLPSALATKIILPDLVAHCDFTLRYNRHRKQITRETKRWLFKGGNLNGKKR
DAFHGLKAGLLTAMTYPDAAYPQLRVCNDFLTFLHLDNLSDMDNRGTRSTADV
LNSLYHPHTYYGPERVGKMTDRDYKRMIVTASPGAQQRFIETFDFFFQSVTQQAIDRA
NGVIPDLESYIALRRDTSGCKPCWALIEYANNLNIPDEVMEHPHIVSLGEAANDLVTWS
NDIFSYNVEQSKGDTHNMIPVVMNEEGLDLQSAIDFVGNMCRQSIDRFVEDRTNLP
WGPEIDKDVAVYVNGLADWIVGSLHWSFESERYFGKTGREVKANRVVNLLPRRA

>Cop1 (Genbank ID:XP_001832573)

MVNLWYWQGGQGNISKSIGPPSQTYTKSVLREQSMTFRMLALQSGLKSAASDHVSTSG
SGILRFLSRILPANTTRRCSACCTEMSSLDATIHVPLNFEDKKIVLPDLVSHCNFKLRVSR
HRKRITGETKRWLFKGDNLVGPARNKYHGLKAGLLTAMTYPDAAYPQLRLCNDFLT
LFHIDNLSDMDNRGTWSTANEVNLNSLYHPYTYHGQARVGRMTRDYWRRMILTASP
GSQQRFIETFDFFFQSVTQQAIDRLTGEIPDLESYIALRRDTSGCKPCWALIEYANNLDLP
DEVMDHPVVRSLGEAANDLVTWSNDIFSYNVEQSKGDTHNMIPVVMHQEGLDLQSA
VDFVGEMLDHTSTCCGLESPLWLTPPLRIRRNAPRLYRVFL

>Cop2 (Genbank ID:XP_001836556)

MPSPAGALPKSFILPDLVNDCPFPLRVNPLCDEVGRLSEQWFLRHANYSPPRAVAFMA
LKAGELTAACYPDADAFHLRVSDDFMNFLFNADDWLDDFDIEDTYGLANCTVRALR
DPVNFITDKRAGLMTKSYFSRFLKTAGPRCTERFIQTLALYFESVVTQKQARNNGTLPD
LESYITIRRNNSGCKPCYALIEFCAGIDLPDEVINHPIIQSLEDASNDLIAWSNDIFS
NREQSRHDSFNMVSIVMHQKGFALQEAVNFVGELCKKAMERFQADKRNLPSWGPEIDGE
VAMYVDGLQNWIVGSLNWSIDGTERYFGKDGPGIKKHRKVLFPKRPLKTPAVRVLA

>Cop3 (Genbank ID:XP_001832925)

MSTPSSSLTTDESPASFILPDLVSHCPFLRYHPKGDEVAKQTVHWLDSNCPDLTAKERK
AMYGLQAGELTGICYPYTTPERLRVADFLNYLFHLDNISDGMMTRETAVLADVMM
NALWFPEDYRPTKGQAAEELNPGKLARDFWSRCIPDCGPGTQARFKETFGSFFEAVNI
QARARDEGVIPDLESYIDVRRDTSGCKPCWVLEIYALGIDLPDFVVEHPVIAALNQGTN
DLVTWSNDIFSYNVEQSKGDTHNMIIILMEHHGHTLQSAVDYVGSQCQQTINTFCENK
QQLPSWGPEIDDMVAKYVQGLEDWIVGSLHWSFQTRRYFGDEGQEIKQHRLVKLLTV

APPPPPPTPPQSSDADTKKQKVKAQDGKGPVSDEEVWALVRAEQSKGSILESFGF
LTTLSRIFFGYF

FAYSH

>Cop4 (Genbank ID:XP_001836356)

MRPTARQFTLPDLFSICPLQDATNPWYKQAAAESRAWINSYNIFTDRKRAFFIQGSNEL
LCSHVYAYAGYEQFRTCCDFVNLLFVVDEISDDQNGQDARATGRIFVNMARDAHWD
DGSILAKITHEFRERFVRLAGPKTVRRFADLCESYTD CVAREAE LRERNQVLGLNDFIA
LRRQNSAVLLCYSLVEYILGIDLDDEVYEDPTFAKAYWAACDFVCWANDVYSYDMEQ
AKGHTGNNVVTVLMKEKDLSLQEASDYIGRECEKQMRDYLEAKSQLLQSTDLPQEAV
RYIEALGYWMVGNLVWSFESQRYFGAQHERVKATHVVHLRPSSVLEASCDSDSDSDC

>Cop5 (Genbank ID:XP_001834007)

MVGSYTGKVIHVPALLESWPWPAAINPLYEQVQEESTSWFRKFDLYRDRKKQAIHDHL
DTAKFGASVCPKADYALLRLATDYLHLGFWIDYFFDTSPSDVIRQLTESIAHLLSGDPR
LDSSSPQSHIACMEILRDFRKRIETFNPSQEDLRRFVKEYRGFLEAELTQAIDHENKVIRD
IESYLSIRRSTIAIRGIALGLALGIPQEILDDPYTDTLTNACLDMVIIQNDAYSWNVEQV
RKADGHNIITVLMKQRDIDVQEAYEHAAQLHRETQEHFLELHAKRPDWGNEGSIQAF
FDGLGEFVRGVDEWSSMCLGEHALSVGAGFLK

>Cop6 (Genbank ID:XP_001832549)

MPAALPYNVSRDNKWDIKKIIQDFFKRCVPHYQVIPYDTELWNA CLKRAKEKGY PVE
PDSPMSLYRSFKVGVVITRTSYGHIQDYEILIWVATFTAFVTYADDAFQEDIQHLHSFAR
TFLQNEKHEHPVLEAFAQLRESSIRFSHFVANTVVSSALRFMMSIALEFEGQNVSVSTE
AREYPGYIRILSGLSDIYALFAFPMDLPRSTYIQAPEQIDYINGTNDLLSFYKEELDCETV
NFISAAATSQQVSKLEVLRNAAEKAAYSVDVVNVLPYPEALAAWKSFARGFCYFHT
SSPRYRLGEMFHDFEHDLVCKCASCTEI

>AcTPS4 (JGI ID:M_Fcontig40411)

MSAQQFTLPDLLAVCPKDATNPHYAQA AAESTAWVKSYNIFDARKLAFL LQGSSELL
VSHAYPYAPYEQFRTCCDFVNLLFVVDEVSDQNGKDARRTGEVYLNVMRYPDWDD
GSALAKMTREFKQRLLA FAGPNSYRRFLMHCDYVNAVAREAEYRERGEVLDIDAFQ
TLRRENSAIRLCFGLFEFALGIDLPDFVFQDPHFMTLYWSAADMVCWSNDVYSYNME
QAKGHTGNNIVTVLMRQK SIGLQEAADLVGAHFSA LMGRFVETKKQLPSFGAAALD
DAVAKYVAAMEHWVIGNLEWSFESQRYFGAEHTRVKATRVVVLSPADEN

>AcTPS5 (JGI ID:M_Fcontig40579)

MAVTPAPVNGSDSTKEIILKFPDFISIPYPLRCHPQEREVSRQSEEWLLSMANFSEKQR
AKFLTLNAGLLSGWCYIDCTFDEL RVCTDFMNFLFTLDDWTDEFDTTGTRGLAECVM
NTLYFPD TYKSDTAAHRLTKSFWERM RATAGPGCQQRLLSTLD TYFQAIMQQAADRG
SRNIPDLEEYILLRRDTSGCKTGFAFIEYAANIDL PDEVIEHPIKAMSDSTNDLVSWAND
VLSYNAEQSRGDTHNLV CVLMHQNNVDRQEAIEQAGELWRKTLDYFECHKALPSW
GPEIDRAVALYVQGLDDWIIANA EWSFETERYFGKEGPTVKKTRQIPLL

>AcTPS9 (JGI ID:M_Fcontig47706)

MSSPSSFVLPDLHAVTPFKGSFNPHYPEAAAESSEWVNSYKVLSDKKRAFFLQGGSELL
CAHAYPYAGYQQFRTTCDFVNLLFTVDEISDDQNGKGAYETGLTFYNAMSNPAYDDG
TVLCKMTKEFTARLLEHCGPQTYRRFIKHCKDYIEAVAVEADLRERGEVLDLEAYQTLR
RENSAVRFCFGLAGYALGIDLPDEVVEHPAFMAMHLSTVDMVCWSNDLYSYNMEQA
MGHTGNNVITVLMQHKGLDLQGAADYTG VHF KGLIDTFLDAKRSLPSWGP KLDGEV

AQYAMAMETWVIGNLNWSFETQRYFGHARHEIKRTRVVQLYPRRIVEESSDEE
DN

>CpSTS1 (Genbank ID:LC436345.1)

MPAAIPKFYTLPTDLRNWPWKREISPYRQCQAESVAWLESFRPFSPKAQVAFNKCDFS
LVSALCFPKGSPYNLRSVCDLMHTFFTLDEYTDYLDLEGVKTLCATMDAIRNPDKPR
PEGEHFIGEVARQFWARARVNATPACEERFVKSWRTYLNVIQQAERRDAKYICTMEE
YLHARRDNIGSDPSFALLEITLEVDLPHEVMEHPTIVALARDTTDMIVLANDMCSYKK
EIIADDANYNAVTVVMHNNHNTNVDGGIQWISDYHDTIVDHFLRLREDVRLKQNGFPS
WGARIDREVEAYVEGLGLWIRGHDEWNFGSGRYFGDEGLEVQKSRIVECTVSADPFTP
FLIQEEEEVDENAA

>CpSTS2 (Genbank ID:LC436346.1)

MMQFYLPALVEQCPIEGGTNPHEYQGAESRAWINGYNVFTDRKRAFFILGSNELLCS
HVVYAGSEEFRTSCDFVNVLFIFDELSDEQTGKDALETGQIFLNAMKDERWDDRSKF
SSMTKEFRKRFLRRSGPRGTARFLKHWEYCAAVIREAELREMDEVLDLEDFINLRREN
SAVRLCYGLIEYCYGIDLPEAVYEDSTFMDIYWAAVDLVCWTNDVYSYDMEQSKGIAG
NNIVTVLMNRNMSLQQASNYIGQHCETLMDRFVSSQVRLPSWGPVVDREVRLYIQG
LGAWIKGNLDWSFETQRYFGPMHEEVKSTRLVTLRPRERIEECSDSDSDFE

>CpSTS3 (Genbank ID:LC436347.1)

MVATTASTQPDHFVLPDLVSHCSFPLVYHTDGDRIAAQSVNWLDNSNCPDLNAKQRVA
LRGLQAGELTAFICYNTCTPERLRVVSDFMNYLFHLDNISDGMMTRETDLADVVMN
ALWFSKGKYMPTKEQSADENLPGKLARDFWARCIPDAGPGCQARFKETLELFFEAVNIQ
ARARDDDDVVPDLESYIDVRRDTSGCKPCWALIEYALDIDLPDFVVEHPHIEALNQSTND
LVTWSNDIFSYNVEQSRGDTNMMIVILMKYHGHTLQSAVDYVGDLCQKTIDDFQANR
QKLPSWGAEVDEMVRQYVVGGLQDWIVGSLHWSFQTHRYFGADGANVKKNRIVKLL
PLKA

>CpSTS4 (Genbank ID:LC436348.1)

MESNQHLRIPHTLTAWPWPRTLNPPYQTVKAESSAWLESFKAFFDPAQAGFNSCDF
NLLASLAYPLASKEHLRTGCDLMNLFVIDEYTDIEDEVHAAMVASVTMDALRNPFPK
RPRGEIIIIGEIRQFWARTVPTITEASHRRFIETFDTYLQSVVVQARDRSKQHRSIQDYL
HMRRDNIGAKPSFAILELSLDLPDYVMSSHPSIQTATVTAIDMLIIGNDLCSFRNEHARG
DDTHNILTARHEFGQGLGHAVNWIESYNKSLRRSFLSAIERVPSWGEEIDTQVAEYLY
GLANWVRANDCWSFESHRYFGKHGREIQVHRVVDLACGHPECVQDNEVEKPAT
KGLLYEVEKKTYVGPLQVNTKDPIAFRSDFPLSARPKDITSTPTRLTCVALLCTLSTFIGW
LVKL

>CpSTS5 (Genbank ID:LC436349.1)

MVATTASTQPDHFVLPDLVSHCSFPLVYHTDGDRIAAQSVNWLDNSNCPDLNAKQRVA
LRGLQAGELTAFICYNTCTPERLRVVSDFMNYLFHLDNISDGMMTRETDLADVVMN
ALWFSKGKYMPTKEQSADENLPGKLARDFWARCIPDAGPGCQARFKETLELFFEAVNIQ
ARARDDDDVVPDLESYIDVRRDTSGCKPCWALIEYALDIDLPDFVVEHPHIEALNQSTND
LVTWSNDIFSYNVEQSRGDTNMMIVILMKYHGHTLQSAVDYVGDLCQKTIDDFQANR
QKLPSWGAEVDEMVRQYVVGGLQDWIVGSLHWSFQTHRYFGADGANVKKNRIVKLL
PLKA

>CpSTS6 (Genbank ID:LC436350.1)

MLTTPYFTIPDLRNWPWKRVLNPHQKVCCEEAADWMRSCGAFTPKSQNAFDRCSF

GLLGSLAYPRLGRDGLRIACDLMNMFFVIDEYSDVASGREARLQADIVMDALYNPLVP
RPVGEWIGGEVTRQFWANAIKTATPSSQRRFVRNFQRYVDAVVQQAQDREAHCIRDV
KSYFILRRQTIGAIPSLDLLTLEMDLEDEVLDHPHAKLLELCVDMILIGNDLYSYNVEQA
RGDDTHNFVRIVKDERKCNLNDALRWISDYHDLADEFLNLMHNLPSFGSKLIDEQV
KTYVDGLGNWVRANECWSFESERYFGKKGKLYQKSRRVRLLPSSIALQGQNIDPQAA
VEISDLPAAGIIV

>CpSTS7 (Genbank ID:LC436351.1)

MTTSGFRIPNLVVAWPWLRAVNPHMDQTSQNSSSWLENFHAYPPATQENFNRCDFGL
LAALTYPIASKEHLRTGTDFMNLFFIDEITEIGDETFTSEVLYIAMDALRNP SKLRPKGE
HVVGEITRQFWERSIPHITATSHRRFVCALEYLKSNNVQARDRSSQHIRRIEYFSTRR
DNIGTKPAFVLELGLDIPDCVMTHPSIQSAVTSLTDMLIANDVFSFKVEHSRDDAN
NVLKVVMCELRCNLARAIEWADERNQQRLRTTFLSSIAEVPSWGGQVDIQVSEYLYGLA
NWVRANECWSFESQRYFGTHGPTVQKDRWVSLDCGHPQCITGGTTTPRTSYRPLYVG
MLGIATYALSQYGLMSRATLLRR

>CpSTS8 (Genbank ID:LC436352.1)

MSNTFIVLPNLEETVYSAFPDHGLNPHYDAVCPHSRAWIKSYSDPIFGPKMRDFMEKC
DFELFAAYICPRASPEALRTSMDIGNLLWLYDEYTD AEDSVTVKKA EAIVVRTLQDRSF
DDGSWICRLVKEFLDLHVRKKAGPNVSRRFVGHFVDYVVRVSDEATQRRERHEVLDIEA
YVERRRESGAIRLTFDLIESGLHIDL PQYVHEDPAFIAGYNATMDLACWVNDVYSYNM
EQAKGHEASNILTVLMKYEHLDLQAAVEYVAKHCEVLAAQFIEAHANLLARS DPNFS
EDAARVLDALGDAVIGNDRWSFETERYFGKDYKAVKQSRIVKLAGRAEGKHALRN

>CpSTS9 (Genbank ID:LC436353.1)

MTVLQFVFSVFTSSKPQTFFLPRLDET FKVLPNNGLNPHFSTVRPQSRAWIKQYDGEVC
GPKMRAFMDNCNFELS NAYTYPYAEPAGLRAAMDLTN ILWLYDEYTD TEDGASAERA
AVIVNRALKEPGFNDG SWICRMMQDFRRRHIDKAGPDVARRFITNFCNYVDRVAREA
ILREKNEVLDIPSYILFRRETS AVKTCFDIVEYCLGLNLPQYVHDDPVFVSGYNAAMD LV
FWANDLFSYNMEQAKGHSGANIVTVIMKSKRVDLQTAADFVAGYCEALTAQLLEAK
QILSSRSDPAYSKDAVRVLEAFGDWVRGNDDWSFATERYFGKENNAVRESRIVVVRAP
FDETVKLVE

>CpSTS10 (Genbank ID:LC436354.1)

MAPSYQLPDLPSLSRSFELRANPACKITTKASEASLIESKSTNGSHVLSSLERERLAAMK
VGLLAAICFPGSDPTQLRLLTDFLTTLV LATTRVKYATLSPQVLTYWTTVDDNDGVWSL
VHHD MFNCLKEPLERLASKANQNWKARFGSSVKSFR IACSSVTEDMDILDPEIETYL
SMNRDLSGLSMIFDLFELTQNLTLTVTDE TITRTLDKLKV LATDIVSCSVDVAAFN YDQ
ARGNEKNLISLLMRHKRLSVQGALNYAGTLIKQYIDAFMAEERSLLDPTPSPPSNGSSLI
PSWIPFTPLVASATAIPPSTPPDPVSKADLT VYVQMLRDCIVGT LNWIYETDLYFGKKGE
EIRTFGWIFLSPKVQNNDSEREVP GDNVLP

>CpSTS11 (Genbank ID:LC436355.1)

MSQKSPSTFRIPDLEAIFSAFPDEGTSPYYDDVLPEARAWIKLYQDQVYGPKMTEFIDRC
KIELITYYVHPVASRSCVRAMMDLHNLFWLYDEATDVQSGQTAQETAKVVRNSLTSPE
FNDG SWLCEMLQDFRKRHLDGVRSSSFVARFIEHFCFYTDRVADEAIYREKQRVLDIPS
YMAFRRETA AAVRVVMDTVEYCAEELPRTVLDDPVFQVAYDAALDLA FG TNDIHSYN
MEQSKDHSGANVITVIMKERGLDVQGAMDYFGGYCEALTAQFLDAKRKIEKREGQE
WKDAVLILDGYTHFLT GQVRWGFATERYFGKKNKEVQETRVELRAPFVDHVDLAD

>CpSTS12 (Genbank ID:LC436356.1)

MESLPVTLVLPRLDDIFDDLNNVNNPNYSIACPASRLWIEQYGTQIYGPKMQAFMNN
CNFELSTTYTYPYADAKRLRATMDLVNWLWLYDEYTDASGAHAKEMASIVYQALSGQ
QVAANSWVGCMMDQDFYRQHIEKAGPNTSRRFVDHFCRYAQQVGEEASLREQRQILN
MHEYIDFRRETSGVRSCFDLVEYCLGIDLQFVHDDPIFTMGYNAAMDLVFWVNDLYS
YNMEQAKGHGAANVVTVMKSKSLGLQAAVDHLADACEVLTAQFLEAKSRLSKHPE
SIFSKEAVKVLDAYGDWVRGNEEWSFVTERYFGKENKAVRQSRMVKIKTPFGEMAPFS
GRKNYL

>CpSTS13 (Genbank ID:LC436357.1)

MPQDPPTTFRIPDLETIFSVPDEGTNPHYDDVFPEAREWILRCKVELLTCYIYPSASKSR
LRSMMDLYNLFWIYDETTDVQTGQEAKETAQVVRNALTNPDFSDDSWLCAILQDFRR
RNLDGIMSPGFVLRFDHFCDYANGVADEALFREKDLMLDIQEYLKFRREAAAVRVVL
DSVEYCLDLELEQNVMDDPVFQMAYNAAALDLAFGTNDIQSYNMEQAKQHKGANIIS
VIMRARTLDLQGAMDYFGGYCQALTAQFLDAKCIIEKRVDRPEWKDAVRILEGYGCFL
AGQVRWGFTTTERYFGKKNKEVESTKVVELRAPFVDHVHISD

>CpSTS14 (Genbank ID:LC436358.1)

MNVMNTPITTATMPVSPPCPNPDPTFQTRLSARWHPSTAEIVPKVRQYIVQNWPSSE
ESKRRYLTGNAEDGVMYAFPGVKNDRIEAVTTWLALHFLIDDYILESVSDSAASGLDP
GKKKEAIQRLFGIMRRLVRPNVNNPVEVMVDHVASSFLSCSSEDEVAQRHARQILESTI
QFITAAENGDKATAMGDLNSYLAYRMVEAGVFLSLDLAFWGGEIYIPSHISNDPQIRS
FFKLVSDDLVLVNDIYSYKVEQDRSEGVGGAFAVSVLMRSKHVDAQDAMGIIKTQLT
TLEEATLEEAAVLRDRYAEEKGEEVEVDKMIQTILEMMAGNCEWSKFCGRYNSSPVSD
EASVGTDRALEQGTLS

>CpSTS15 (Genbank ID:LC436359.1)

MSSHRPTQQPNPLVDPPDFVSKFLAHDREDRDEIITSVQAYFLAHWDWPSPTRKAWYS
KADLEDWTTLMCPAGPSERAWAFTAYVTFWFLYDDLMEIMGPEELGSSIPRIARILHGE
EGLEDMTTPEFILKEICLKINTIAPGKRIFEATLVYMKAATAKQERLQSLTLGFDAYLYR
MLDAACWLTLEGAYWVQEITPEHLKTEKIWLQELSLFHGILINDLFSYRKEVKASSQ
EVQDHDKTLYNGLVILMQSYQFTLLEALEEMKKKIWDYEDFMAVLDDVRETHKSSA
EDREFIERLAVALMDVIGGNVAWSACCGRYNRL

>CpSTS16 (Genbank ID:LC436360.1)

MPLPVTFRPLDLSSIFSIFPDLGINSHYECTYPESREWIAQYHTGVYGPKNRDFMERGKI
ELLGAYTYPYASKERLRFVMDLHNVSWLFDDESDVKTGQQAGVTAVVFRRALIDPEFN
DGSWLCHMLKDFRQRHLDNVMSHAFVEMFIRDFIGYADGMSAEACYRDLNKKVLDIA
GYVKLRREAGAVRLALHSVEYCLEKELPSYVREDPAFVIAYNGALDLGYIVNDIHSYN
MEQSKGHGHHAANIVTVFMEAQNIGLQAAMDYAGGFCHGLVLQILEAKELLAARSD
PVFSNDAVKVIEGCINFFKGQDIWDFESERFFGKSKDAVRKTKVVNLRALFEDSVNLNE

>CpSTS17 (Genbank ID:LC436361.1)

MNSDLQSTLASLDTTYTCRFRARYHAKSEQVMTVVQDYFVKRWPWRSEQAKQLYIKT
NLEEATCICFPTTLDDRIETVVTWFCYMHILDDIIEGLEANKATKLVDRLSNIILGTLDPD
PEDRLGVMAADVCSRFLGENDGEEKHGLDIISECKLLRHTSSADSKLQSLSTYDTFIE
WRELDVGLWFSTSLFLWGCGLYMRLHMSNDPEVRQLLRVSGRHIAVANDLFSYRVEAL
RAGQTSQILLNTIAIIAKEKQVDPQTAMNMTKQRLSEMEEVEVLIGKLRDRYTGEEGE
LIERLFVVCKGMMAGNCEWSSICFRYNGAQRAVA

>CpSTS18 (Genbank ID:LC436362.1)

MVHWNHPPTFVLRNICDITGRVFELKENPRIAEANS AVLKWF EQFN VYDKKKADKFL
NVGKFDIFAALSFPEADLEHLTTCLIFFLWAFATDDLSDEGEFQS QPDQVQHGHDISCSI
LDDDDAPQPDYPYAAMLWDLRLRLRSTGHMGM YKRFKQAF LDFSSSQVQQSTNRNV
DRIPPVDEFILMRRKTIGAALVEAMVEYSLDL DIPSYVWEHPVIVGMSQATSDIMTWPN
DLCSFNKEQADGDYQNLV CVLQHNHGLELQE AIDLLTKMISDRVQDYVDLKNQLPSF
GPDVDPALHTYLTALEQFVQGT VVWYYSSPRYFRHLDPRGKPEVLIHLFPKTDAPTLPV
VVQEKS RPFIEREIYLP AKRLLGVFVNYVAITVFGYSVYRLYGDS

>Hfas94a (Genbank ID:MK287936.1)

MSAQQYIIPDLLANWPWQ RVSNSMLDEV RDEAN EWVMSLGLFEP AQFKKFRACDFN
LLASFIGPLESKEHLRVACDLMNFYFAFDEYTDVASREEAMKIAQGVM DAFKTRSAEPS
SSKITEMARQFFRRTVDVVGEDSPAINQFITDFD TYTTAVIQEADDRAEGTIRNVADYFT
LRRETCGAKPSFSFFALGLNMPTEVF EHLIMSTVECATDLIAIVNDMHSYGLERARGL
DGHNVVTSIMYEHQLDLQ GALYWL AGYAEDTIAKFFSEKERLPSWGRAVDLSVQE FV
DRLGRCVRGYDAWSYETNRYYGNC G VQIRQTRRITLPGNDSGYITKKEMGV SIA

>Hfas94b (Genbank ID:MK287937.1)

MSYAPTVEELKQWEKGPNPELLFGNSFPLARDHPDWQKLEQENDQWVEENWQFDD
KELREYLMSSKLGPFSSMCFPFGEREKL LWICRLVTLLFC LDEDLDRHVNHLHLLPILKAL
TAGSRKPENNYAELAI DKCWRAIERTSTPSTFRQFVQITHEYFDSHGQIPYENFDQYVG
ARRTNVGAYFMWACLRYAAGIDLTDEELAHPLIKRLEDIAGFHIAFTNDLISYTK EFLT
DTATNNILTLLQRNDGLTPAEAEAKIRRELKKSEDDYQVAAKEVLNHPVLGKNKAIRK
LVLNIPYGMGGNAWWSLITKRYNVDPVNHPLPQVKIHIDPSMPYHPDAVAFLDNGSK
KALTTKGAKSFLSSWT VWF GALL

>Hfas255

This sequence is not available.

>Hfas344 (Genbank ID:MK287938.1)

MSQSQFTIPDLLASWPRAKNPALDQNL EDEANAWVASLELFEP RQLDKFKACQFNLL
ASLVGPIEGRDSL RISC DLMNFYFAFDEYTDV VSGDEVMMIVADVIQAFRDRESPEGSSK
IKEMARQFFQRTIALVGEDTQ GIDHFIADFEAYAKSVVQEADDRVQGIVRNVEEYFILR
RDTCCGKPSFSFFGLGLCIPKEVFDHPVMQSLTESATDLIAMINDMHSYALEHARGLD
GHNVITAIMHEHSVDLQGA FYWLSGHASKTVSKFLNDRKNLPSWGS DIDKAVNEYID
RMARCVRGYDAWSYETNRYYGKNGLEVQKSRKIMLQHRELEMGYITRDQLIGAA

>Hypsu1_138665 (JGI ID: Hypsu1_138665)

MALSNSNSTTATVTLPD TLRFWPWQRHINPHYSACKKASSEWCESFKAFSPQAQRAF
NKCDFNGCRIGCDLMNLFFIIDEHTDIASAETARTQANIIMEAIRDPEMPRSENEWVG
GKAAQQFWLNATKSATPSAHRRFIDAFQMYMDAVVQQAADRSKNYVRDIDDYFVVR
RDTIGAKPSFAICELYLNLPDSVMEHPVIMKLTEL CIDVIIIIGNDLCSYKVEHEHGDDGH
NLITVVMNQFKITPQEAMNYISDLHDKLAVQFLDEWKNIPTFGGPLDLEV RTYCHGLG
NWVRANDSWSFESERYFGKRGIEIQTTRQIEMNIQSHL

>Agr1 (JGI ID: MN146024)

MCASATRPQPSASNNVKKIILPDLVSHCTFKLRHNRHRKQVTTETKKWLFKDGNLLG
QKERAYHGLKCGLLTSMCYPDAGYPQLRVVNDFLT YLFHLDNLSDEMDNRGTTTTAD
EVLNSLYHPHTWRSSARVGKMTRDFYKRLVLTASPGAQQRFIETFDFFFQSVTQQALDR
ASGVIPDLESYISLR RDTSGCKPCWAMIEYANNLDIPDEVMDHPIIRSLGEATNDLVTWS

NDIFSYSVEQSKGHTHNMIPVVMYQEGLDLQAAVDFVGDMMCRQSINRFVEEKARLPS
WGPKIDQDVAIYVQGLADWIVGSLHWSFETERYFGKSGRQVKASRIVDLLPRQRLP

>Agr2 (JGI ID: MN146025)

MVWDFVLSLFHSLLAFAFQTLTSLTGSFLFNNKMAPAPNPAPVTFILPDLEKTFNSLPD
DGLNPHHDVACAESREWFAKYNKKVLGAQMQUEFFRRCKFELITSYTPYPVDKEGLRA
TMDWHNHLWFFDEVTDDETGTGKDAHKSIIITIRTLREPDFDDGSSLCRMVRDFRLSHLSR
AGPECTRRFLEHCDVAFHAGAVEAELREKGEVLSIEGYLKLRRETSGARTCFDMAEYL
MDIDL PQDMYDDPVFQKGYIAALDLIFLANDLYSYNMEQAKGHNGANVLTVMKET
KLNLSAADYVGVLCCEKLIKQFQEAQSTLENRLAKEKNPAKAAALKDAIRSLVGYGH
WVRGNVEWSFETERYFGKKNKEIKKSRVVTLTPTNSVNRALKA

>Agr3 (JGI ID: MN146026)

MNASPFLNESSPTRPTSFLVLPDLVSHCKFPLSYHPNGDEIAQESVDWLDSSCPDLTAKQ
RRALRVLQSGELTAYCYNQATSPERLRVVSDFLTFLHLDNISDGMMTRETDLADV
MNAFWFTDKYMPTRGPGKEQLDEELNPGKLARDFWSRAIADCGVGVQARFKETMG
LFFEAVNIQARMRDEDTIPDLESYIDVRRDTSGCKPSWVLIEYALGIDLDPDHVVDHPIM
QALNQGTNDLVTWSNDIFSYNVEQSRGDTNMMIVILMEYHGHTLQSAVDYVGELCA
QTIDTFCENKERLPSWGPEIDDMVARYVKGLQDWIVGSLHWSFQTQRYFGKDGLDIK
KHRFVKLLPLEAAK

>Agr4 (JGI ID: MN146027)

MSALPSQFKLPDLLSTCPLKDGTPAYKKAASRAWIGSYNMFADRKRAFFIQGQNE
LLCSHVYCYAGYEQLRTTCDFVNLLFVVDVSDVDEQSGEDARATGQVFVNAMKYADW
HDGSKLAKLTKDFRVRFLRLAGPKNVARFVALCESYTACVGKEAELRESGQVLGVKEFI
PLRRQNSAVLLCFSLVEYILGIDLDDEVYRDENFLNAYWAACDHVCWANDVYSYDME
QSKGLSNNNIVTVLMEENHTSLQDTSYIGEKCAEFVQIYLTSSKRLSPSLGPDAAALFLE
SIGSWMVGNLAWSFETSRYFGSRHLEVKETGIVILRPRELPEDGSSSDSDEE

>Agr5 (JGI ID: MN146028)

MASSLLEPSLAALVILLASVSLSRKKRPAPEPQGLSVLGNLFDIPKRASSIYLALGKP
YNTLTKRAVSQQLQGYTPGSHIDATSHSPRVFRLPNLEETFSVFPDHGLNPNTSARTDS
RAWINQYTKVVC GPKMVAFMNNCEFELSNSHCYPYAGYKGLKATMDLTNWLWYDE
YTDTGSGAEAVKAAGIVARALREPDYDDGTWVCRMMKSFKQNHIDKAGPGVARRFI
DNFCNYVEVVGREAELREKNEVLDIPNYVTFRRETSAVRTCFDLVEYCLDLDPQYVH
DDPVFISGYNAGMDLVFWANDLVSYNMEQSKGHSGANVVTVMKSKGVDLQTAVDF
LGGYCEALTAQLLEAKRILQARSDAAYS RDVVR LMDAFGDWVRGNVAWSFETERYFG
KENKRVKETLLVELKEPFVGALALKE

>Agr6 (JGI ID: MN146029)

MPGSANWTADRFYIPDTLANWPWPRAINPAYEECKAASAAWCEKYGAFSARAQKAF
NLCDFNLLASLAYAGLPADVNRVGC DLMN LFFVVD EHTDAMDARSVQDWVDIVVD
ALHHPHTPRPAGEPKVGEIARTFWENGICMGPTAQR RFVETFTTYLQSVVTQAQDR
DKHLFRDVDSYMEVRRDTIGAKPSFALLEHDMELPDDVFYHPLLEKLREWAIDMLILG
NDLCSYNVEQSRGDDGHNIIRLAMLQENTNVHGALRFVSKMHDDLAEKFLSNYQG
MPSFTPQIDAWVTRYIDGLGNWVRANDSWSFESWRYFKGDVLRVQAERWVELLPAP
KDELTPA

>Agr7 (JGI ID: MN146030)

MSFFKSSQPTIYIPDTLRNWPWPREINPHYEECKRESAAWVEKFGAFSAKAQKAFNKC

DFNLLASLAWSRVNRDGCGRIGCDLMNLFFVFDEWSDVSDAEETRRMADIIMDALYDP
HKPRPTGEWVGGEVTRQYWLNAIRTATPSAQKRFIKAFKLYTDSVVQQSADRDKHLIR
DIDSYFEVRRDTIGAKPSFAINEVHMNLPDYVMEHPVIKNLTAYCIDMLCIGNDLCSYN
VEQSRGDDGHNLTIVMHQLNLDVQGAFDWIGKLHDELVDKFLEEYKNVPTFKDKQ
VTKECAEYAFGLGNWVRGNDQWSFESERYFRKDGMRVLTERTTVLLPKKREPPPKPL
DEDPIYSALPWWGWTALFGFLATAFTFSARQLSTRISANLIA

>Agr8 (JGI ID: MN146031)

MSEQQYTLPDLLQNWPNRHLSPYYEEAKRESSAWVESFKPFDQDQGQRAFDAYLLAS
LTYSHGSREFVRLGCDLMNFYFVYDEYTDVSDSAVADRLANIVIDAMRNPENSSQSGD
HLLGKMTKHFWRALAMAPAGSPCFEHFITTSETYLRAVTQEAEDRANKRVRKVDDY
LRLRRDTCGARPTLALIEFGLNLPNEVVRHPSLVALTEAAVDLIILVNDMHSYVRELS
GHENHNLITAIMLEHRLNRQDAFHWLGSCHSRVVDQFLSDLDELPSWGEPTDSGVRD
YINGLGQWVRGNDWSTESKRYYGEDGETIRQERLVTTRSGESNYIKFGQVGVQDSVR
IQPIEAN

>Agr9 (JGI ID: MN146032)

MTAAPLTFTLPDLLANFPWKRNLSYYPECKTESSAWTESFHPFDDEGLKGFNLCDFN
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GELLVGEMARDFWIRASGYVSPDAHCLTHFLRDFDTYTAADVREADDRAKRVYRTFE
DYLIRRDSSGCLPSFALCEFGDLPEEAYHHPRMAALREQSTDIAIGNDIDSYAMEKA
RGLELHNSVELIINEHGLDVQGAINWLERYAAGVHASFLDNVANMPSWGEDVDRRV
KMYIDGLAQWVRGNDWTFESGRYFGDKGLEVQKTRVMSLLPASKVSLRSRPKAVG
HVPKKLLRYFRYSTMYFFGFHVLAK

>Agr10 (JGI ID: MN146033)

MSLNFFLRRYTVFPWSRKLQYYHDAKRESSAWTESFHPFDEDL
SKAALTFCITALLASLAYFLRQKEIVRLGCDLMNIFYVFDECADIADKEGASQIRDVVM
DDLHRPEKTCPGGEILPGEMVKYVLLCPEIPETYINTKSFGFAPQSSSPQPHIVCATLS
RISMPTQQQWFNVKRTIGPNVFLARSATVLPYAETHTFYHPRMIALREQAPFLDINSYP
MKVRGLVQGSINWLEGYAAGVQAAAFLDNIANLPSCAKEVESRVNIYVNELAQWAR
GNDDWTFESGRYFGDRGPENQSDIPTSSNR

>Agr11 (JGI ID: MN146034)

MQIILPDILQTWAYARLLNPHYDGAKLESSLWIHPLVAKLFDQK
GQKAFQNDYTSLLASLMYSHQGVPSRRCDMMNLFVYDEYTDVVSPEIAHRLSKIV
VDAMKNSDEMSPCGEHPIGDKAKEFWRLATTLLPATGSNSDVCKSRFINLTEEYLN
TVEARDRNEGTHSVKEYLTMRRATSGAGLMLALIEFELDPKAVLEHKFVQALEEITY
RTVSSGQANHNLTIVVMHENPGLSLQGAFDWLGSYAAGVVECFQTNVRNLPSFCDVE
GPACESVDGTLQERVDKYISGLGQAVRAEDDWAFETTRYYGEDGPKVRETRVLVIRPV
KRITRRHLLQSLEIKYSMVRG

>Pro1 (JGI ID: AGR34199)

MSQRIFLPDTLANWQWPRHLNPHYAEVKKASA AWAKSFRAFQTKAQEAFDRCDFNL
LASFAYPLADEARLRSGCDLMNLFFVIDEYSDVSTEEVRAQKDIVMDAIRNTEKPRPA
GEWIGGEVSRQFWDLAKKTASTQAQKRFDTFDEYLESVVQQAADRNNSHVRGIESYL
EVRRTIGAKPSFALLEFDMQLPDEVINHPVIKELEKSCIDMLCLGNDVVSYNLEQAR
DDDGHNIVTIAMNELRTDVAGAMIWVDEYHKQLESRFMENFKKVPRWGGPIDLQVA
RYCDGLGNWVRANDQWSFESERYFGKKGPEIIQRRWITLMPKMVSEELGPQIVDGFH

L

>Galma_104215 (JGI ID: Galma_104215)

MNTTTRTFYLPRLDTFSVFPDNLNPHYAECRIQSQAWIDKYYKIVCGPKMRAYMD
HCKFELITAYTYPYASSDGLRKTMDLANILWLYDEFTDTLSGKDATNAAAIIVRTLRE
FDDGSWICHMMRDFYAAHIEKFGNVSRRFIDHFCQYVEGTGTEAKHREKDHVLDIN
AYIIMRRAASAVLTAFDLAEYCLGIDL PQYVHDDPAFISGYNAGLDLVFLDNDLFSYDM
EQAKGHCTTNITVVMKSKRIDLQSAFDFTAGYCESLTQQLIAAQISLASRTDPVFSNN
AVKCLEAIANWVKGSDGWSFATERYFGKQNVIVKETRAVEMRKSQDI AVLKE

>Omp1(JGI ID: 1311)

MANPYAVWNAGQSGTWHGQAVNFDPPPSIFGALPFVSRVEEFPALTFSFTAYNPSILNC
IVLGPNNSPQFRVVTDPAMPGYTLLKTMDERSSALVEWQQPPKIEIRGAVLKQPTSNFL
RLSPNRRYRIMVIGDQEFMWLPDQSSVCVSLSTFDAMPLARISRNGNSISLEVTQTAIRA
GLLNTCVVTTVLLQCGRSID

>Omp3(JGI ID: 4636)

MAIENTIASAPASTPAKQLDTPDHFILPDLVSHCTFPLVYHSNGDAVAAQSVKWLDTN
CPDLNDKRRKALYGLQAGELTAYCYNTAPDQRLRVVSDFMNYLFHLDNISDGMMTK
DTDALSDAVMNALWFTEWYRPTTKSDYVQPD EELNAGKLARDFWHRCIQDAGPGC
QARFKETLELFFEAVNIQAKARDAGVIPDLESYIDVRRDTSGCKPCWALIEYGLGIDLPD
YVAEDPIIKSLNQSTNDLVTWSNDIFSYNVEQSRGDTHNMIVILMLYHGHNLQSAIDYV
GDLCRQTIDDFKENRKIPSWGPEVDDIVKQYVQGLQDWIVGSLHWSFMTRYFGKQ
GQEVKKNRYVKLLPVGEEANKW

>Omp4(JGI ID: 1447)

MYIFCSQVVSGLNKFTEFKMSSAPTRFLLPDLLSACPLKGSVNPYYKEAGAESSAWINSY
DIFTDRKRAFFVQGCNELLVAHTYPYAGYEEFRTCCDFINLVFLDEVSDEQSGSDARF
TGEVFLNALRNPENDDTSKLSKISKEFRARYFKRAGPRTAERFLQHCQDYIDCVTREAE
LRERGEVLDLPSFTALRRENSAIRICFLFEYALGFDLPQEVFDDPTFMEYWAAADLV
CWANDVYSYNKEQAQGHGGNNIVTVLMKAKDLDLQAACDYIGVYCEELMGRYLSA
KARLPSWGPEVDAAVAQYVEASGHWVRGNLDWSFETQRYFGAQHAEIKETRLVTLTP
AIPEDFSDTGSESE

>Omp5a(JGI ID: 2392)

MSPDPTRIVLPDFLAACPFE SSTKNPHLKAAGAESSAWVNSHVVFNDRKRAAFMQDI
YELLVAYAFPWADYEDFRTMCDFINLLFVLDELSDDQNGKDAGYTGKLFMDAMRNID
NGDTSELTELCREFKARYSKRVSPQVNERFLQHLQSYTDCVAQEADLRERGEILDLESY
VALRRENSAIRPCFDLVEYIIDFDIPQEVIDHPVFSEMYWASVDLVCWSNDVYSYNVEQ
AKGHGGSNVVTVLMKEKNLDLQAACDYVG VYYEELMDRYLSAKARLPSWGPEIDA
AVGKYILAEAQFVRGNLDWSFDSPRYFGPQHDQVKKTGIVTLTPAPKKFGSDSGSESE

>Omp5b(JGI ID: 2393)

MSPAPSRIVLPDFFASCPFESSTINPHFKAAGAESSAWVNSHVVFNDRKRAALMQNSY
ELLVAYAFPWASYEDFRTLCDFINLLFVFDEVSDDQNGKDAGYTSKIFMDAMRNIDNG
DHSELLCKEFKARFSRRLSPQVNERFLQHLQSYTDCVAQEADLRERGEILDLESYVILRR
ENSAVRPCFDLVEYIMDFDIPQEVLDHPVFSEMYWASVDLVCWSNDVYSYNVEQAKG
HRGSNVVTVLMNEKNLDLQAACDYVG VYYYQELMDRYLSAKARLPSWGPEIDAAVG
KYVLAEAQFVRGNLDWSFDTPRYFGPQRDQIKKSRIVTLTPAPKKFGSDSGSESE

>Omp6(JGI ID: 4774)

MIAKNSEIDRFYIPDTLANWPWPRHLNPAYPEAKKASAAWLRSFNAFNERSQKAFDL
CDFNLLASLAFPLADLYCLRSGCDLMNCFIFDEYSDVADPQTVRQQADIIMDAIRNP
HVPRPRGEFIGGEAHRQFWERAMQGATPTAQRRFIDTYQQYTDVVQQATDRADNH
IRDVEGYFTVRRDTIGAKPSFTLLEFTMDIPDEVMGHPVIKDLSLWCIDMLIIGNDLCSY
NVEQAHGDDLHNLVTIVMNQYNLDLPGAMEWIGKFHDDIADKFLDTFAKLPSWGPE
IDPQIRRYVDGLGNWVRGNDSWSFESWRYFRGKGPEIEKTRWVDLMPTEEATITPKYE
SDSNA

>Omp7(JGI ID: 2271)

MPETFYLPDCLANWKWKRALNPNYPEVKAASSEWLRSFKAFFPKAQEAYDRCDFNL
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PVGEWVGGEVTRQFWELAIKTASPQSQRFIETFDITYTKSVVQQAADRTQHYVRTVDE
YLEVRRDTIGAKPSFAILELTMDIPDEVIHHPTIERLAILAIDMILLGNDTASNYEQARG
DDNHNMVTIVMHQYKTDIQGALSWIEKYHKELEEEFMQLYNSLPKWGGQIDVDIAR
YVDGLGNWVRASDQWGFESERYFGTKAPEIQKTRWVTLMPKKRAEGVGPEIVDISEL

>Omp8

MKGEPQEDLFLDALARILLDAPRYYGRLATNIIVTATLDFFTGLFLELQARDMTFNEDL
HNFAVFCRNLTGIAHAYAVFMFPRDVPFTVYVRSLELKTIDINYVNDIMSFYKDRAEET
DNLASILRQVHPSMTKHQVLQKIVDDAVEADVRARKILADYQPALDAYEHFRKGYAM
FHVSSGRYRLDELFSYIRFE

>Omp9(JGI ID: 3258)

MSQILHLLWSKFSTSLPSTVTIGSDPQTLQLVHSPAPNVNANALEIYKIVDNFLSRCGIRL
ESTPLDVEFYNECKKTLLSHYIGIHDSDKVSESWFKRYLSVGVITTNAYGHLDNKLTKI
YIALYTALATCFDDVFEKNVDHMSGFNERFMKALPQGDVFLDAFAKVLLDAPRYFGR
LASNIIVTSTLDFITSMSVDVLTGKMKFNQNLHNFAMACRNMSGIAYTYAPFIFPKEVP
FAIYAQCLPDMRIYINHVNDVLSFYKEDKAGETENLASILGQVHPSMTKYQIVQGLAD
DAAEADLRVRTVLSQYQPALDAYNCFRQGYVSFHASSGRYRLDELFSFVEPEPIV

>Omp10(JGI ID: 3981)

MRNFLSQCQIPLQRGVPLDPTFHQECANVLIEDYLKPSAAVTLENLPMLSSFNPFLLTL
GVRMASTGYAHLTHTPTRVYVALFTALLVCLDDIFPENVELMCGFNERFIKNETQGEPI
LDAVAGLLRSTSKYFMSLSSNLIVTSALNYVTSLSDQGLHSIKATEHSRNFARLCRNMS
GIPEAFAAFVFPPEVPFTAYIQCFPDLYTYANYVNDVLSFYKEDIAGETENLVSILAQTQP
NSSRYQVLQQLADEAAAANANIRDILSDQKSILDAYDAFRVGVFVQFHIDSPRYRLAELF
PCIDG

>GME9210(Genbank ID:KX281945.1)

MPLSSSVVAFRLPDTLGCWPWRRCLNTHYVEAKQDSASWLESFHPFGPKAQRAFNKC
DFTNCVQGVTTSSSSSTLMSRTRRRSSSRTSSWTHCETLTSLVLQENLSWAKSLGSW
ARTIKVASEPSQRRFIETFDYQCQSVVQQAADRSQNHRLRDVESYLENRRENIGAKPSFA
LLELDMNLPDEVIEHPTIVNLTTWAIDMIILGNHCLVQRGAGAWRRRTQRRDHRHAS
LQRRRAGCHGPHRRVAPEAGGPVPHQLQQAADVGTDRASAVHPGHRKLGTRERR
MEFREREVLWIERTRDRAESLGNPTPSGLRGEACGC

>GME3634(Genbank ID: KX281943.1)

MAVTPANVASPDSQEIVLKFPDFISIPYPLRCHVQEREVSRQSEEWLLSMANFSEKQRS
KFLTLNGGLLSGMCYIDCTFDELRVCTDFMNFLLTDDWTDEFDTTGTRGLAECVMN
TLYWPHSYQADTAAHRLTKSFWVRMKQTAGPGCQQRLMSTLDITYFQAIMQQAADR

GSHNIPELEEYILLRRDTSGCKIGFAFIEYAANIDLPPDDVIEHPPIKAMADATNDLVS
WANCPCFVQRTVTRRHAQPRLC SHGSEPRPAGCDRAGGRAMGEDPPLVLRVPQERPFV
GLRDRPCRRSVHPGARRLDYRERRVELRDGALLWQGRASREEDAAGYTASGPYSC
>GME3638(Genbank ID: KX281944.1)

MRARSFILPDLVSDCPYTLRCNSNCEAVARASEAWMLEDANLSPKRRDAFLRLRGGEL
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GHERVQALLRSHRIRRGYGPSRPRRPSSNNHRPRAGSQRVYIMVERSLLVQRRASAGH
TQHDCGDHARGRAQLARSRLGRSLQALHSALRGKPSHAAIVGSGD*RGSRQVCARP
PGLDGRCPPELRLHRTLFRGRPCDQEARCRDTTTAEVFI
>Cun3817

MVMYKRNATFNDGPVTQIQDIPSISSLFFTMVNLQRPFPSPRFVLRDLTAVTEPVFKLRTN
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FSFDDLSDGEFQSKPDRVQVGVDISMEVLNHPPEPPKFKYAAMLHVDWRRFRSTAS
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ALDIVTKMLATRVDDYAKFKAQLPSEGAEVDQELAAYEKALEHYVQGTWVYYESPRY
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>Cun5155

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GDDEHNLTTVMMHEHECSLTDALWISDLHDSIANTFLSVMKTVPSFGDLVIDEQVAI
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>Cun3157

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VLCTMTKQFQERLFPRMGPCYERFVDHVENYINAFVKHAEYREKNVLDMASYEIL
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AMGHTTNIMTVLMKAKNVDLQGAADYVGEYFKVLMDRFFDHKSKLPFFGPDMDP
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>Cun3158

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ETLRLRLNSAIRLCFGLFEFVLGVLDLPDEVFDDPAFLNLYNAAADMVCWNDVYSYNME
QAKGHSGNNILTVLMQAKNIDLQTASDLVGDHFAELMRRFLEGKRALPSNGLATDTA
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>Cun0773

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STPIIELAKNLYDRFFQTAAPGCAERFVRSMDIYLDGVVEQADCREKGSILDTESYTILRR
KTSGVWPCFALIEFAARIDLPDAVVEHPLIRSMEEATNDWISWINDILSYSKEQADKDA

HNLIIVIMNQYTLDLQSAVDLAGSHCFDCITKFEDNRKALPSWGEEIDREVDLYVQGL
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>Cun7050

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MNTLYHPYSYSPVSPEGKLIQDFWRRLIPTASPGSQQRFNRTMDFFFQAVTQQALDRA
NGVVPDLDSYIALRRDTSGCKPCWALIEFAYNLDLPNEVMEHPTIVALGEATNDLVTW
NDIFSYNVEQSKGDTHNMIVVMMRQEGLDLQSAVDFVGDLCCKQSIDRFIEQRAHLPS
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>Cun0716

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YIPTRRDTSGCKPCFALIEFAADIDLPEVVEHPTIAALEEATNDLITWNDIFSFNVEQSR
GDTHNMIIIVAMRERGLDLQDAVDFVGELCKQSIDRFEHDLTVPSWGPEIDRDVRTYI
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>Cun0759

MARSTEALPDLVSHCPYPLRINPLCDIVTQKSEEWILNEAKYTPEKRIRFLNTKAGILTA
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AAGRLTKSYFGRYLQTSQPRCAERFIDTMDLYLKSVAQQAADRDDGRTPDLETYIGLR
RDTSACRPFALMEFVAGIDLPEVAEHPLIRSMEDATNDLVSWNDIFSYNKEQSRGDT
HNLVAVIMEERKLDLQSAMDFAGELCHQSISKFEADRRSLPSNGKEIDRDVQLYVQGL
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MFFTVLVGSFLGNMKEGLSSPLRVPRP

>Cun3574

MSPKRFPDLVSHCPYQLRIHPDCDTVNKTSEEWIMKDITFTPDLRKRFLDIKAGVLT
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IAGRLIADFFRRELQTSQPHCAQRFIDTMDLYLDSVGRQAADRIEERTPDLESYIALRRD
TSACKTCFALMEFANGLDLPDEVSEHPLIREMEDATNDLVSWNDIFSNDKEILIEDTHN
IVAVIMEDKKLNLQSAVDYAGDLCNNCIARFDEARKQLPSWGPEIDREVQLYGQGLQ
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>Cun5765

no function

>Cun6114

no function

>Cun7487

no function

>Cun0802

no function

>Cun9106

no function

>PpSTS01(JGI ID: Posp1_60326)

MSSAPSTSAPTIVIPDLVSHCTIPVRCNRHWKQASVESKRWLFRGGNLSDRKRDAFH
GLKAGYLTSMCYPLAGYPQLRVSCDFMNYLFHLDNISDEMNDRGTHGTAVSVLDALY

QPHMHPTSRVGKMTKDYWVRLIQTASPGAQQRFIETFDMMFFQAVTQQAMDRANGVI
PDLESYIAIRRDTS GCKPCWALIEYANNLDLPWEIMDHPIIRGLGEAANDLVTWSNDIF
SYNVEQSKGDTHNMIVVVQNQQGLDLQSAVNFGDLCKQSIDRFHYLRENLP SWGP
ELDREVEIYVDGLADWITGSLKWSFESERYFGKAGLEVKKTRV VALLPRRA

>PpSTS03(JGI ID: Posp11_99496)

MGSISSTPSQKSPVFPTPSLLPSDIVAVRPEGDEAKVLKFPDLVKSIPFPLRLNPNYIRFVSAE
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EFDTAGTKGLEEAVMNTLYHPDTYVSDTVAARTARSWWTRMLKTVGPRCRQRFVETL
GFYFKAILQQAADRSSKTIPDLETYISLRRDTS GCKTG FALIEYAAGIDL PNEVVDHPHIIQ
SLLDATNDCVSWANDILSYNREQSRGDTHNLVPVIMQTVGIDRQA AIDYAGDLCNK S
VAHFLEGKAALPSWGKEVDVQVEQYVQGLEDWIIANA EWSFMTERYFGKDGP KIRK
GLQVSLLPVVGFD

>PpSTS06(JGI ID: Posp11_45581)

MTVIADTSRCFILPDLISYCQFPLRCNPHRDAAQSSTSWLINNYPGMSPEQLVEVRRLD
ADTLASYCYPDCDVERLRVASDFLAILFHLDDITDTMEEGGTEQLEGTIMDAFRSEGKL
DQREDEPRVRVPAKDLWTRFIRNAKPCVQTRLRDNIALFFKTAREEARDRERGVLLDL
ESYINMRRGTSACLSCFALTEYSIGIELPQYVVD DPIVQALNQSANDLVSWSNDIYSFNN
EQAHGHIHNMIVILMKSQGLGMQDAIDYVSDLFKQTIDGFMENTQLLP SWGA AVDAD
VRLYVQGLQDWVVGNLHWSFATERYFGKRGAEIKATRVVELLPKKPV S

>PpSTS08(JGI ID: Posp11_59374)

MLYLPDTMSAWPWQRAINPYFNEVKAASNSWFKSFRAFSPASQKAFDKCDFCLLAAL
AYPRARKEHLRTGCDLMNLFFVIDEYTDVEDANVCRDMVDIVIDALRRPHDPRPEGE
VVLGEIARQFWARAIETASPTSQRRFLETFIAYLESVVLQAADRDCDAEHTVQTYLAQR
RDNIGSYPSYAVLELALDIPDDIFYHPAMNELSLYATEMLIIDNDLVSYNREQASGDTNN
ILFVIMRQFNCSLDHAMAWAAAYHSQLEARFMDAFKRMP SWGLEIDSQVEEYCQGIA
NWPRGND CWSFESGRYFGDKGREVQKTRCVPLLPKKERDTS LRQQDVVITSL

>PpSTS10(JGI ID: Posp11_98072)

MPSTPRQFVL PDLFPLVPFKGSTNPHYVKA AESSAWINSYNVFTDRKRAFFIQGSNEL
LVSH TYPYAGYEQFRTCCDFVNLLFV VDEV SDEQNGKDARHTGNVYLKAMRDPEWN
DGSVLAKMTKEFRARLLQYAGPGCYARFLKH CEDYVEAVAKEAEYRECGVVLDMASF
ETLRRENSAIRLCFGLFEYCLGVDLPEYVFEDPTFM TLYWAAADMVCWSNDVYSY NM
EQAKGIGGNNIVTVLMQAKGIDVQAACDAVGEHCKLLMERYLDAKEKLPSWG PSVD
DAVAGYVQAMEHWIIGNLEWSFETQRYFGAVHAEVKATRVVMLRPREIDED

>PpSTS14(JGI ID: Posp11_101549)

MSDQPKMIYLPETMANWPWPRIYNPHYEEVKAESDAWFKGFKPFTKQSQVAFDKCD
FGRLASLAYPWASKEHLRTGCDLMNVFFMIDEYTDVECASVVRGMVDIVIDVINNPH
KPRPEGESLLGEITRQFWERA IKAATPSSQKH FIEAFTDY LNSVVEQAADRDN NHIRT V
DSYLKTRRENIGARPSYFPAELGLNLPDEAFYHPVVT ELSYNIAELIILDNDIASYNKEQ
ATGDDRHNILTIVMLQFNIDLEAAMTWVASYHKDVENKFLDGMKKLP SFGPVVDKEL
EEYILALAIWPRTNDCWNFESGRYFGSKGLQVQKTRYVPLLPKV KTDPTLKQKQV VVS
LVDL

>Fompi1(JGI ID: 84944)

MSRRYQTSRFSPSAKGKTSLYTSPGDLRALFHRFSLYAGVQLESFTSPKMMQIEVPV ML
NLKESSMPMNSTVLEDCTAAVAKDAIVQFLRRLGAVLRPSFGNNRDLEERVKEITKTW

PFEHRIHPHITTGVVMANTTIAYLSDLDARAAVAAYTALITALDDPDIFHASGAQNFAQ
MLCDGSALRDDGVLGQMARVLADMGNHFPPFGTSAIIAATLRWCNGELISNPANPFC
LRPLSKAFADYQRGLTGVPEAYAAFVGWCKADFPVETDYIHVFPDICFFLNHTNDILSFY
KETLDGESDSYIHARARLTGKSVTDTLYEVMDEVITTTTERIRKHFGEGRMRNAWDRIE
AGYVWFHTGNPRYRLHELVDTEYMPMY

>GL26009

MAVTPASANASDSTKEIILKFPDFITPIPYPLRCHVQERQVSRESEEWLLSMANFSEQQR
AKFLTLNAGLLSGWCYIDCTFDELRVCTDFMNFLFTLDDWTDEFDTTGTRGLAECVM
NTLYFPDITYQSDTAAYRLTKSFWDRMRATAGPGCQQRLMSTLDITYFQAIMQQASDRG
SRNIPDLEEYILLRRDTSGCKTGFTFIEYAANIDLPEVVEHPIIKAMSDSTNDLVSWAN
DVLSYNAEQSRGDTHNLVCLMHQNNVDRQEAIEQAGALWEKTLNWFECRKAVP
SWGPEVDRAVAMYIQGLDDWIIANAIEWSFETERYFGKEGHTVKKTRQIALLPQRAHA

>GIST56 (Genbank ID: UDP19923)

MSVEQLRPFPTHFRLKDLAAISGRVFEFKLNPHEKEAAKATYAWFDGRNVYHGLKKK
RFLSHRFDYAGMSFPDADVSHLETICIAFFLWAFSFDLSDGALQSKPEAHQVGVDIS
MEVLRNPTAPPPNFPYAAMLHDIWRRFRETASPGACNRFFRAVESWMNSQVEQARN
RATDEIPSVVEFIILRRRTIGGPIVEAMVEYSLDLQIPEHVWDHPILQEMSKAVIDIMTWP
NDLCSFNKEQADGDFQNLVFCIMIERDCDLQTAVDVLTEMLSQRVVDYERYRAQLPSF
GPEVDAELARYNKAMEQYTQGTVVWYHSPRYFRGQEVGTIPEIVVPVYERTTPAPEE
PTAPASKSARSAPANLAPSSSKEVGLLVNAPTQHNRSLLSLVACLCLCASFISFPSFPL
NPRLVLSI

>GS14272 (Genbank ID: PIL24516)

MAIAASKPKPTPDHFVLPDLVSHCNFPLAYHPHGDDIAAESVRWLDEGCPELSPRGRK
ALYGLQAGELTATERLRVVSDFMNYLFHLDNISDGMMMRKGTEELADSVMNALWFPD
RYMPTACDGKEQPADEVSAKGLARDYWTRCTRDAKPGPQARFKENLELFFEAVYQQ
ARDRDTKLIPDLDSYISVRRDTSGCKPVFDLIEYAMDIDLPEHVVRHPVIQALNQGAN
LVTDIFSYNVEQARGDTHNMIVILMELRGFDLQTSVDFVGELCRQTIDTFMENQQNV
SFGPRLDRDVALYIQGLQDWIVGSLHWSFMTERYFGKSGAEVKKHRI

>GS11330

MLATLSPFASGVHYPVVPITEETKDPLAAVKVLIRDFLDRSDYRSPGSPCDQELRRKLT
ELSAWPSDIKPTLVAKIMDGSCVYAETTYAHTTHEHRYFIALYTACLMYVDDLGERNLD
AVKRFTSRFAKGEHQPDPIQLRLAELLGRAHDLWTQFGADAIAGTLDAVTAMYIEFTT
QGMVVKPSATRFPPYLRTRAGLGPPYIHVFMNDWRATPESYLQVLPSVVHSDIGADS
LLWRLSFYKEELAGETNNYVHLRTSAEQSSAANVLRHLVEEVLESAGTMDMLTSGDSE
LAALWQRYMQGYLEFSLKAKLQSGDA

>GS02363(Genbank ID: PIL35634)

MAVTPASANTQDSTKEIILNFPDFISPIPYPLRCHPQEREVSRESEEWLLSMANFSEQQR
AKFLTLNAGLLSGWCYIDCTFDELRVCTDFMNFLFTLDDWTDEFDTTGTRGLAECVM
NTLYFPETYSSDTAAYRLTKSFWERMNRATAGPGCQQRLMSTLDITYFQAIMQQASDRGS
RNIPDLEEYILLRRDTSGCKTGFAFIEYAANIDLPEVIEHPIIKAMSDSTNDLVSWAN
VLSYNAEQSRGDTHNLVCLMNQNGVDRQEAIEQAGALWEKTLNWFECRKAVPS
WGAEVDRAVALYIQGLDDWIIANAIEWSFETERYFGKEGHTVKKTRQVALLPQRRA

>GsST543(Genbank ID: PIL26225)

MSVEQLRPFPTHFRLKDLAAISGRVFEFKLNPHEREAAEATHAWFDSRNVYHGLKKK

RFLSHRFDSYAGMSFPDADVSHLETCIAFFLWAFSFDDLSDGALQSKPEAHQVGVDIS
MEVLRNPDAPPPNFPYAAMLHDIWRRFRATASPGACNRFFHAVESWMNSQVEQARN
RATDEIPSVEEFIILRRRTIGGPIVEAMVEYSLDLHIPEQVWDHPVLQEMSKAVIDIMTW
PNDLCSFNKEQADGDFQNLVFCIMIERDCDLQTAVDVLTEMLSQRVIDYERHRAQLPS
FGPEVDAELARYNKAIEQYTQGTVVWYYHSPRYFRGQEVTGIPEIVVPVYERTTPAPEE
PTPSASKSARSAPANVSPSLSKQAGLFVNTPVQHNARLSLLLVLVACLLCASFVSFSPF
PLNPRLVLS

>GsST545a(Genbank ID: UDP19925)

MSIEQLHPLPSHFRLKDLAAITGRVFELRLNPQEREAATAAHAWFDSHHVYQDLNKH
RFISHAFDSYAGMAFPDADVSHLETCITFFLWAFSFDDLSDGTFQSNPQAHQAQAVDIS
MKVLRNPAAPPPDFPFAAMLHDIWSRFRATASSGACNRPVHFYRLFLLLILNHISRFFR
AVEGWMRSQVEQIRNRAIDEIPSVNDFIILRRQTIGGPIVESMIEYSLDLRIPEDVWDHPI
LQDMSNALIDLMTWPNDLCSFNKEQADGDFQNLVFCIMIEQDCPLQTAVDILTDMLS
QRLVDYEELKAQLPSFGPEVDAELTRYIKAIEHYTQGTVVWYYSSPRYFRGQAVSGIPEI
VVPVYEKSASMQDITLTPTAKASKPAPVVKHSPWVKADSSFVHTHVVLQCMYIYLLVL
VAFVVVVLVSVNKITFMI

>GsST545b(Genbank ID: UDP19925)

MSIEQLHPLPSHFRLKDLAAITGRVFELRLNPQEREAATAAHAWFDSHHVYQDLNKH
RFISHAFDSYAGMAFPDADVSHLETCITFFLWAFSFDDLSDGTFQSNPQAHQAQAVDIS
MKVLRNPAAPPPDFPFAAMLHDIWSRFRATASSGACNRFFRAVEGWMRSQVEQIRNR
AIDEIPSVNDFIILRRQTIGGPIVESMIEYSLDLRIPEDVWDHPILQDMSNALIDLMTWPNDL
CSFNKEQADGDFQNLVFCIMIEQDCPLQTAVDILTDMLSQRLVDYEELKAQLPSFGP
EVDALTRYIKAIEHYTQGTVVWYYSSPRYFRGQAVSGIPEIVVPVYEKSASMQDITLTPT
TAKASKPAPVVKHSPWVKADSSFVHTHVVLQCMYIYLLVLVAFVVVVLVSVNKITFMI

>A8411

MSSTKIGKVAPFPPLPGQPWPPARNHPRWKELYRLHDEWLMKHWPFSSSEKKRARIPF
MNLAGFSTWCAPASDFDRMVWGGRIAGIFFLADDYIDSGKMLDRIPGFKKAATGEGP
LHPEDRAEICHDIVFRAIKETSHPRTRQLTQCTHEWWDNSNIHEPFRNLDQYLATRRV
NIAMYFANAYFRYCLDINLTDEQVNHPLMREAEGIVSDHVGLTNDLFSYAKEYLTSQSD
DTNVLRLMLQDFEGLTYEQAKDVTTKIRQKEQDFIPAGLAVLNDPELGKDPVHRWI
ANLPYCMGGNNAWSQESGRYNIGDVP GAPPFSLSFEAEATPEDEVDDTEESALRD
AVFNVEVIPEPDTLDIDAIESKGVRTKTQASIPPSLQLMNIPQSRVQHVGVRAIASSQR
TGSDDNSLILKAVASLVRSYEIDVQTVGKVMYIYLNNSNIPVHAADLVHLLSQSEIEVNIS
NGDSSALLLDAITHVESNTWDARNVITVAVTKQSVVTMLVGNAPIVMEPVVRGVFTD
NHTQKLFPSYFTALQKSYESYLKRLRVSLSKEIDLNEATGAASVFDYMLTDHPEKLAEL
LFRVSPCLSKDDNALPMHPRDFQKKVVFNGPDNGSIYDGLVCLVDAPSYEFFEKRIAI
FSESNNGTSTFFCLRAVSDTKYMRDTLKA VGGVPRRT

>ShST51

MESVREHIPRLQHFLGEIGYRHTTPAPTLDLHAHHHHWIHHVLGPMTSWTVAKLNA
LEDSSSTIFERAYPLSDAEMKFVLA KLTAIAIFLDDSLDEETYDDIGNFAHRVYLGEAQP
TGVLTLYHQGIQELSKMHEGDAVFRGLAVAPWITFIDACMLEKRLTDFDSKL RVSPRDL
GYQRLRNSTDFTSLRAPKATPSEVEVSFPIFLRHKSGIGEAYAAAIFKSSRYQELPLSRFVK
SMPDMIYYIELVNDLMSFYKEQLAGETANLIHLQHQS WKGGQGTGPYGSWTLLDTFS
RLCDETRDAAFRVDELLRLDECEKIANGELRGEEVGLSPMDVTMAAQWREFRDGYVS

WHLECQRYKLDFIKLSTFE

>ShSTS3(JGI ID: 122776)

MSTAKPEIPPMESFPPINVYPREA EIIKYCNNYVAEHFPFNND AEVKHFNGMEIPAYAC
RVVSFARDHEKMRKVSILIVFYFIFDDWVDKNGMKLKDSTVMALLPPPSEVPIKPPQA
GKMTLSDISAELYGAVRDDMPKADYDRMVNDMMEYLRVQRMAPGYNTLQELDLR
SGEVGVYVLFRIIYAMELSVSGKELDDPLVKRAQVLGSEAGVLRNEASSYVKEVNEGS
GAHNVITKLQEWSGCTEKEAMKQVLDAIEKRQEELREMCLKVTEAPHLSEDCKTFVK
TIPYIVAGNTWWHHHSTRYAEGREVTVP

>ShSTS4(JGI ID: 52743)

MSETKVGKVAPFPPLPGAPYPPVRNHPRWKELYRLHDEWMMKYWPFSSSEKKRARIPF
MNLAGFSTWCAPAADFDRMVWGARIAGIFFLADDYIDSGKMLDRIPGFKAAATGTGP
LHKEDQAEICHDIVFRAIKATSHPRTFDQLTKCTHEWWDSNIHEPFQNLQYLAVRRV
NIAMYFANAYFRYTL DINLTDEQVNHPLMREAEGIVSDHVGLTNDFFSYLKEKMTNSD
DTNIIRILMDHEHLSYEEAKTVIEKKIRQKEQDFIGAGMAVLNDPELGKDREIYRWIAN
LQYCMGGNLAWSQESGRYNVGVIDGISFPSLSYAAEPTPEDEVDDTEESRLRELIFNV
KDIPPPDFTIDDDAIFMTNPHSHLQDNVPLPRPENVGIIGLEVYFPKRCISIDALED
FDGVAKGKYTIGLGQQYLAFDREDINSFALS AVSSLLEKYNIDPRSIGRLDVGTTIDKS
KSVKTTLMDLFAASGNHDVEGIDSKNACYGSTAAVLNAVNWIESSSWDGRYAIVFAG
DIAIYAEGPARPVGGAGAVALLIGPDAPLVLEPTHGSYMAN TYDFYKPRMESEYPVVD
GPSSVTYITALDESFKAYQRKVQEGSSRDVPPPYANGANGKASATKSVKLSDFDYSVF
HSPYGLVQKAYGRLTYHDFVAHPTAPVYRDLPTDILSKDASATLTDKSVEKTFAAASA
SMYKQVVTPSLNISNRCGNMYTGSLYGGLASLLTSIPSYELFDKRISMFA YGSGCASTFFA
IKVRGDTSHIKAKLDLERRLAEMDVRPCEDYVVALKLREETHNAPSYIPNDS DAGLWP
GSYRLEAVDGKYRRSYTVTH

>ShSTS5(JGI ID: 161672)

MELSSLRPFPA SFVLPNLANITRQAFNLKLNPHSQSANSAMKSWFKSFHVYDEQKSRE
FLEAGKFDLYAALSFPDADLQHLETCLAFFFWAFSTDDLSD EGDLSQSKPEEVQVGVDIS
TSALSSHAPTS LDFPYAAMLQSLFNRIKTTATKGASERFIQAFKDWSSSQVMQSRNRSK
LLLPSVEDFILMRRNTIGAALVEAMIEYSLDLDLPDYVFRDPVVIAMSEATTDIMTWP
NDLCSFNKEQADGDYQNLVCC LMAQYDLGLQDAVDRLVGMISTRVRDYITLKEQLPLF
GAEVDTMLRKYHAAL EHYVQGTIVWYYSSPRYFHGEQIIEKESTRIILFSKASSKDCS

>ShSTS7(JGI ID: 167646)

MPHSTVHSHTLISDDSVLLFPDLISY CAYPLRVNPNYGRSVADD SERWLLNGAHLSDKKR
KAFLRLRAGDLASMCYPDASAKSLRVVADYMN YLFKLDDWTDEFEAEDVDGMRDC
VLAALRDPLHYETDKAVGKLAKSFFGRFVQHGGPLR TKRFIDTMVLFFRAVRQQALD
RTYDDIPDLESYIALRRDTSGCKPCFALIEFAGGYDLPDAVVEHPSIQILQDATNDLVTW
SNDIFSYNVEQSRGDTHNMVVVLMHEQGLAVQE AIDAVADLCERSIDTFEQTRRSLPS
WGPIVDSNVESYIDGLQNWII GSLHWSFLTERYFGKDRRDV KRKLFVKLLAKRC

>ShSTS8(JGI ID: 146390)

MPAIIRQFILPDLFALSSAFP DATNPHWKRACTESRDWVNSYRVFSDEERRAFFTQGQS
ELLCSHAYPYAGYE QFRTCCDFINLLFVLDEISDEQTADGAWATGRIFLQVLQDPEWDD
GSKVAQMTRDLRARVVSTGVKPH TFRRLVHMC RDYIASVVEEAGLRERGEVL DIESYIE
LRRNNSAVLTCFALIPYILGIDLPDEVVNDPNFSALNLA AVDMVCWANDIYSYDMEQA
KGLEGNNIMTVLTEMHGLTMQD ASDYVGEQYKALMDLFLDNQAALRSFGPSVDAD

VRRYVDAVRHWPRGNLSWSFETPRYFREKREEIENTRVVILRPRPEPKMKSQN

>ShSTS10(JGI ID: 111121)

MGATSTTQIPHSTSLESYILPDLLRLSSPFKASMNPHWATTASESSAWFSSYSIFSdqELTE
FAVCKVELLVAYAYPHANYETFRtCCDFMNLIFAIDEISDMQNGEDAGETGDVFLNAL
RDAEWTDGSALAEMTRDFRARFLRSAGPQSFRRLKvSEdYIDCVtKEAGYRERSQILD
MESFKHLRRDnSGVPLMLGLLEYTLGIDLPDVVFEDtALSRIYWAaVDMVWWANDV
YSYKVEQAKGLAGNNILSVLMAAKNIDLQDASDYVGdVYAGLMKEYTEAKAELVSKS
FGSKELDAAVKKYVDKMENWPIGNLEWSFASMRYFGSQSGEIKRTRTVMLRPQDVL

>ShSTS11(JGI ID: 128017)

MAAPESSAWVSSYNLFSDRKRTDFITGSNELLVSHTYPhADYDAFRtCCDFVnLLFVID
EISDDQSGKAARRTGEVYLNAMRDPEWTDGSDLAKMTQQFRARFLRSVGpQSFRRFL
RHSEdYIDCvAKEAEYRERGQVLDMDsFKSLRRENSAIRLCFGLFEFTLGIDLPDSVFED
ETFMKMYWASADMVCWANDVSYNVEQAKGHSGNNIVTVLMAARDIDMQAASDY
VGEYYAELMEEYMTAKAELASKSFGSRDLDEDVWKYVNAMENWPIGNLEWSFKTNR
YFGTLHDEVKRTRLVVIKPRKVvV

>ShSTS12(JGI ID: 111127)

MQTPPSCESYILPDLLHISQPFKASTNPHWLKAAPESSAWVSSYRIFTDRKRMEFILGSN
ELLASHTYPQANYDTFRtCCDFINLLFVIDEISDDQSGEGARLTGKVFLNAMRDPECTD
GSILAKMTRDFRARLLQSIGAQSFRRFLKILEdYIESVtKEAEYREHGyVLDMEQFKILR
RQNSAVRCAFGMVEHTLGIDLDPDVVFEDATFMKVYWAaIDMVWCANVNMFPpPGY
LIQDVYSYSMELAKGDNHSANNIMSVFMAANGVSLQAASDYVGRHYARLMEEYLSA
RAELASKSFGSQELDSdVLKYIDAMENWPIGNIEWSFKTSRYFGPQNDEVKQTLVVKL
KPQEVPA

>ShSTS13(JGI ID: 50042)

MPDLFTAwpWKTTRNPLYLEAKADSDGWLATFGDFFQKYKDCILDCDGKRLRCAGD
VNTLLFVVDdILDYEDDATVKERMRLMDAMENPFKPRPDGEWIVGEMTRQFWERTI
KVSNTLSQERFMEGVRDCMAGMVRESLARKASRQHDSIHGFLKTRRDSAGCNLVFAL
SELEVAVPAEAMKHSQIRELIAIIQDISCIANDTFsYRREQSRGRTEdNIITVVMNNLGTD
IPGAIDWVENHHKELMKEFIEKHDKVPKWGEPTDSKVKNYIESLAGWVWANARWSF
ECRRYMGDEGMEIMEKSRWVRAIPKERI

>ShSTS15(JGI ID: 64702)

MVRSPVSDKFCIPDTLASWPYPRILNPHYAEeKAASAAWTKGFGAFGPKAQDAFDRC
DFKRCRSGCDLMNLFFVIDEHSDTHGEETVRKMkdVVMdAIRNPHKPRPNDEWIGG
EIARQFWERAMCYASEISQRRFIDTFDEYLESVVDQAADRDSARIRDIESYINIRNTIGA
KPSFVIMEQGMDIPDNVFEneVFQRLRMATIDMLCLGNDIVSYNIEQARGDDSHNIVR
IVMNELDTDVPRAMDWVAQRHTQLEREFFtALSELPTWGEPIDGWVKEYVYGLGNW
VRANDQWSFESQRYFGTKGMEIMKSRWLSVLPKVRPAEVGPQLVDQSL

>ShSTS16(JGI ID: 73029)

MAVATSVATPVPTPAYsAGRAPAKEKKIYLPDTLAEWpWPRAINPHYAEAKEESQAWA
ASFNAFSPKAQHAFNRCDFNLLASLAYPLATKHGCRSGCDLMNLFFVIDEYSdIAPVE
EVRQQKDIVMDALRNPHKPRPEGEWVGGEVARQFWALTITNAsAQSQKHFIETfDEY
LDSVVQQAEDRSESRIrdIQSYIDVRRNTIGAKPSFALLELDMDLPDEVLAHPTIQSLSL
ATIDMLCLGNDIVSYNLEQARGDASHNIITIVMNELNLDVNGAMRWVGDFHKQLEK
QFFeAFNNLPKWGNAELDAQIAVYCDGLGNWVRANDQWSFESERYFGARGLEIMET

KTLAMMPIQRTEALGPQLVDDSI

>ShSTS17(JGI ID: 69906)

MSQTYTIPDTLANWPPWKRKINQHYEEVKMESASWARSFHAFSPQAQDAFDRCDFKR
LRTGCDLMNLFVIDEHSDDLSSVADAETQAQIIMNALMNPEKPRPHGEWVGGEVARQ
YWELAIKTATPKSQRRFVAAFDDYMNNAVQQAKDRTHSTIRDIDSYMEVRRKTIGAWP
SFALLELDMDLPEDFMDHPVMHELHVLSISMICLGNVSDIAPLPSDIVSWNLEQSRGD
DTHNIVRIVMNQLDTDINGAMAWVEMYHKELEVKFMDIFTKSQEWNKSMNKDISRY
VEGLGNWVRANDQWSFESKRYFGDRGLEIMSKRTVSMMPKRNDVLNGTQLDIGPVI
VDGSIL

>ShSTS18(JGI ID: 25180)

PRHINPHYQEVKKASAAWAESFGAFNPKAQHAYNACDFKRLRTGCDLMNMFFVFDE
YSDVSSPKDVIQQAIIIMDALRNPYAPRPDDEWVGGEVTRQFWKRAIKTATAGAQRFF
IDAFESYTQSVVQQAQKDRHHGFIIRDVDSYLEMRRETIGAKPSFVVLQMDMTLPDEVLA
HPVIQQLSALSTDMICLGNRRLIQILWTVQDICSYNVEQARGDDLHNIITIAMNQFDIDI
AGAMDWVVKYHAKLERKFLYLYNNGLPWSWGKELDPQVERYVCGL

>HS-HMGS

MSETKVGKVAPFPPLPGAPYPPVRNHPRWKELYRLHDEWMMKYWPFSSSEKKRARIPF
MNLAGFSTWCAPAADFDRMVWGARIAGIFFLADDYIDSGKMLDRIPGFKAAATGTGP
LHKEDQAEICHDIVFRAIKATSHPRTFDQLTKCTHEWWDSNIHEPFQNLQYLAVRRV
NIAMYFANAYFRYTLNLTDEQVNHPLMREAEGIVSDHVGLTNDFFSYLKEKMTNSD
DTNIIRILMDHEHLSYEEAKTVIEKKIRQKEQDFIGAGMAVLNDPELGKDREIYRWIAN
LQYCMGGNLAWSQESGRYNVGVIDGISFPSLSYAAEPTPEDEVVDDTEESRLRELIFNV
KDIPPPDFTIDDDAIFMTNPHSHLQDNVPLPRPENVGIIGLEVYFPKRCISIDALEDFD
GVAKGKYTIGLGQQYLAFTDDREDINSFALSAVSSLLEKYNIDPRSIGRLDVGTTETLIDKS
KSVKTTLMDLFAASGNHDVEGIDSKNACYGSTAAVLNAVNWIESSSWDGRYAIVFAG
DIAIYAEGPARPVGGAGAVALLIGPDAPLVLEPTHGSYMANITYDFYKPRMESEYPVVD
GPSSVTITYITALDESFKAYQRKVQEGSSRDVPPPYANGANGKASATKSVKLSDFDYVSF
HSPYGLKVQKAYGRLTYHDFVAHPTAPVYRDLPTDILSKDASATLTDKSVEKTFAAASA
SMYKQVVTPSLNISNRCGNMYTGSLYGGLASLLTSIPSYELFDKRISMFAYGSGCASTFFA
IKVRGDTSHIKAKLDLERRLAEMDVRPCEDYVVALKLREETHNAPSYPNDSDAGLWP
GSYRLEAVDGKYRRSYTVTH

>Hetan2_454193(JGI ID: Hetan2_454193)

MAQKIYIPDTLANWKWPPHLNPHYPEVKRESAAWLASFAGFSPKAQDAFDRCDFNL
LASFAYPLAKKEHLRSGCDLMNLFVIDEYSDVAEAEDEVQRQADIVMDALRNPHKPR
PKGEWVGGEVTRQFWELAIKTAS PQSQKRFIATFDITYTQSVVQQAADRTHSYIRDIKSY
FEVRRNTIGAKPSFALLELEMDLPDKVIEHPHQDLTIDMLHLGNDIASYNLEQARG
DDSHNIVTIAMNQLKTDVAGAMKWVDNHHKELERKFNFESFEKLPKWGEPIQSQVAR
YVDGLGNWVRANDQWSFVSERYFGKKGPEIMKSRWVTLLPKERTEDIGPQVVDSSL

>BvCS(Genbank ID: KU668561.1)

MSTASSPSLVASEIDSPHHSRTSSPSTLSPTLSFILPDLVSHCNFPLTYHPAGDEQAAASL
AWMLSFVPHFTPKKVAAMNGLQAGELTAYCYHDCPPERLRVDDFMNYLFHLDNIS
DGMMAKNTTQLADWVMNAFEWPEKFQPTVNADGEVVEEIAAVKLARDYWSRCIQ
QAKPGVQQRFKSSMNMFQAVEQQTNDRDQGQVVPDLESYIDMRRDTS GCKPVFDLIE
YALGFELPEEVVDHPVIKALNQDANDLVTWSNDVFSYNVEQARGDTHNMICIFMEH

DGCTLQEAI DRV GGLCKQTIDAFVENKARVPSFAHLGPEVDAWTTGYVQGLQDWIVG
SLHWSFMTKRYFQEAGAEVKKTRFVKLLPIEEGRHKHIPPIYASAMVAATA

>Sphst_47084(JGI ID: Sphst_47084)

MPLLSCSQTFRLPPLHETFSVFPDNLNPNYNACRAQSRAWISKY NVQVCGPKMRAF
MDNCNFELSNAYVYPYAQPAGLRATMDLANILWLYDEY TDMQTGEDAAKAAVTVSK
TLLNPEYDDDDTWICHMMRDFYVNIHQKCRPNVAHRFIENFCRYTEVVGTEAKLREKN
EVL DIPGYVALRREISAVRTC FDLVEYCLDLDFPDYVHKDPIFVIGYNAAMD LFWWAND
LFSYNSEQAKGHAAANVVTVIMTSKKMNLQSTVDFIAGFCEALTFQLLDAKRALSLH
EDPTFSRDAVRCL EAFGDWVRGND AWSFATTRYFGPENKIVKETRIVKLKAPVEESVAL
KE

>Copu2(Genbank ID: XP_007771895)

MSTMDPSEFILPDFFATCPFAFGRTNPHADVVIPEAHAWIVKHVPFVDRKRDEFIQDGF
QDLMPHCYPWAGKETLR TMCYLNLLFLVDDLTD DMNSDEARGFGESFIRVLNDPAV
HDSSQVMQATREFRSRITGTGVTESRWFG RFLAIFKLYINAVCAEAEDRENKRILD LDTF
TVARRENSAVMVFFAITEYALGIDL PDAVYEDPTFLRVYADSADMVILVNDVFSYNREQ
AKGLDGNNNITVLMQTLDDLQA AVDHVGEMFSQKMEGCMRGRAMLP SWGVKVD
ADVERFFDALDQWVVG NLEWSSQSPRYLGPEHEEIMRTRRVLRKVETEIE

>Copu3(Genbank ID: XP_007765978)

MSATPAPTEFILPNLFSVCPLTFGRSNPYDEV IPEARAWIAKYNPFVDSKRAEFVQGCN
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DTSLIAQMTREFRARVAERAKPGCLRRFIALCGTYVEAVCVEAELREQRVL DLRSFILL
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>Copu5

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>Copu9

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>PCSTS01

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VTWSNDIFSYNVEQSKGDTHNMIVVVMQQDGLDLQSAVDFVGDLCQQSIDRFVYER
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>PCSTS02

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>PCSTS03

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>PCSTS04

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>PCSTS06

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>PCSTS08

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>PCSTS11

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>Denbi1_659367(JGI ID:Denbi1_659367)

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>SiTPS(JGI ID: 77541)

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>Denbi1_816208(JGI ID: Denbi1_816208)

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