

E. gracilis -----
E. longa -----
L. infantum -----
T. cruzi -----
T. brucei -----
N. gruberi ----- MLLSSFPVDSNALIQY
R. americana ----- MNTKKEKIMLF
M. californiana ----- MLRSLSTLSRFARSAAPTAEKAAASAK----- PAAAAMPTKKAPDVRRF
U. maydis ----- MSLFNVSNGRLRTALRPSVASSSRVAAFST-- TAAARLATPTSDNVGSSGKPQHLKQF
N. crassa ----- MAALRSSARVFAAASRPFRPVVAARGMANLADG----- ATQSQQASSEQSPKLKTF
M. ovata ----- VRTPVTSIVARLASTAATTAEEPA----- LKTQAASTEKAPRIKTF
M. musculus ----- MAATVGVSLKRGFPAAVLGRVGLQFQA----- CRGAQAAAAAPKIKKF
P. parva ----- MLATLSKRATSIVRPGALSAFISTSSEA----- LAAPSKPAVAKAPLYKEF
C. reinhardtii ----- MLPSLLTNARRGAQAALQPGFLSAFISTTSESLNAAATATASKPAPSRPPLAKPPLYKEF
A. thaliana ----- MASGLIGRLVGTKPSKLATAARLIPARWTSTGAEA----- ETKASSGGGRGSNLKTF
B. hominis ----- MFARSLSSLKVAVRGSVVLQISAMNFS----- TGFKIGPDGKIPSYKLF
G. theta ----- SVTKAVVGAQASSFHSSASLS----- LKLQPEANVEGKRIKYF
P. tetraurelia ----- MLQRLSAVIRRPWFHGHGTHHDSNDATKRLFDTVSSTVKGIQQINYVVEHDPKLTVEEKAKMKQF
P. falciparum MLKKYELKGMNINLNKKLCNNKSRNDIIQAYTYIQKRFNNGSINKEFEMKKQVEQINKVNGEVVKKRKKKF
B. natans ----- MMASLLSTTFKRLVGGMRAVARN----- GAPRPSFYRRAMSTKTF
R. prowazekii ----- MVELRLPSNSVVK----- KGREHKAQQKMLKPRKV
E. coli ----- MRLEF

E. gracilis -----
E. longa -----
L. infantum -----
T. cruzi -----
T. brucei -----
N. gruberi KVF^RY^DP^FI^N-S^EP^WV^QL^YF^IS^NE^AH^SS^ML^L-D^NL^FY^LK^NE^KD^ES^LS^YR^RS^CR^EG^IC^GS^CA^MN^IN^GE^NA^L
R. americana K^VY^RW^NP^DK^K-E^KP^HI^ST^YS^VD^LN^SC^GP^MV^L-D^AL^IK^IK^NE^QD^ST^LT^FR^RS^CR^EG^VC^GS^CA^MN^ID^GT^NT^L
M. californiana Q^IY^RW^DP^EK^N-E^KP^RL^QS^YD^VD^MS^QC^GP^MV^L-D^VL^IK^IK^NE^VD^PT^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GT^NT^L
U. maydis K^IY^RW^NP^DK^PS^EK^PR^LQ^SY^TL^DL^NQ^TG^PM^VL-D^AL^IK^IK^NE^ID^PT^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GV^NT^L
N. crassa Q^IY^RW^NP^DT^PT^EK^PR^MQ^SY^TL^DL^NK^TG^PM^VL-D^AL^VR^IK^NE^LD^PT^LT^FR^RS^CR^EG^IC^GS^CA^MN^IN^GT^NT^L
M. ovata K^IY^RW^NP^EK^PN^DK^PH^YD^EF^KI^DL^NK^CA^PM^VL-D^AL^LK^IK^NE^ID^PT^LT^FR^RS^CR^EG^VC^GS^CA^MN^ID^GE^NT^L
M. musculus A^IY^RW^DP^DK^TG^DK^PR^MQ^TY^EV^DL^NK^CG^PM^VL-D^AL^IK^IK^NE^VD^ST^LT^FR^RS^CR^EG^IC^GS^CA^MN^IN^GG^NT^L
P. parva Q^IY^RW^NP^DS^D-E^KP^KY^AS^YQ^VD^IN^NC^GP^MM^L-D^VL^LK^VK^DE^EQ^DQ^TL^SL^RR^SC^RE^GI^CG^SC^AM^NI^NG^TN^TL^L
C. reinhardtii Q^IY^RW^NP^DS^D-E^KP^KY^AS^YQ^VD^IN^NC^GP^MM^L-D^VL^LK^IK^DE^EQ^DQ^TL^SL^RR^SC^RE^GI^CG^SC^AM^NI^DG^SN^TL^L
A. thaliana Q^IY^RW^NP^DN^P-G^KP^EL^QN^YQ^ID^LK^DC^GP^MV^L-D^AL^IK^IK^NE^MD^PS^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GC^NG^L
B. hominis S^LF^RY^NP^AK^D-I^KP^HY^EK^YV^ID^LN^DC^GT^MV^L-D^AL^FK^IK^NE^QD^TT^LA^FR^RS^CR^EG^IC^GS^CA^MN^ID^GE^NG^L
G. theta Q^IY^RW^DP^DQ^S-S^RP^TM^AT^YP^IN^LS^EC^GP^MV^L-D^AL^LK^IK^NE^QD^ST^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GS^NT^L
P. tetraurelia L^IY^RY^DP^AD^EN^DF^PK^YV^SY^YV^DL^KK^IP^PM^YL-D^AL^LY^IK^DN^YD^SS^LS^LR^RS^CR^EG^IC^GS^CM^NC^NG^LH^KL^L
P. falciparum S^IF^RY^NP^TN^K-K^RP^QM^ET^FE^VD^ID^NC^GP^MV^L-D^VL^IK^IK^DE^ID^ST^LS^FR^RS^CR^EG^IC^GS^CA^MN^IN^GK^NG^L
B. natans E^IY^RW^NP^DE^G-G^EP^KM^QS^YD^LD^LK^EC^GP^MV^L-D^AL^IK^IK^NE^VD^PT^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GG^NN^L
R. prowazekii K^VY^RY^DP^DL^D-E^NP^TI^DS^FE^ID^LS^KT^GP^MV^L-D^AL^IK^IK^NE^ID^ST^LT^FR^RS^CR^EG^IC^GS^CA^MN^ID^GT^NT^L
E. coli S^IY^RY^NP^DV^D-D^AP^RM^QD^YT^LE^AD^EG^RD^MM^LL^DA^LI^QL^K-E^KD^PS^LS^FR^RS^CR^EG^VC^GS^DG^LN^MN^GK^NG^L

E. gracilis ----- MALRLSRRLLSANPKHHSKLYHYFRVANHQGSSLNTWEVYDETTGGYKYIVDLKVPSS
E. longa ----- YHYFRVANHLQGSSFNTWEVYDETTGGYKYLVDLKVYSS
L. infantum ----- MPSAPLPGQLANYSSPLYMYRHLTKNSTAKTPQLYTAKDNSKTAMHLL-
T. cruzi ----- MPSAPLTGEVARYSSPLFMYRRIIKNAAPKPETVFTAKDNSKTAHFVLT
T. brucei ----- MPAAPLPGEVAKFCSPLYMHKRILRAAAPKPPTVFTAKDNSKTAHFVVT
N. gruberi ACLYIMKEHLNVLNNEVRTFPLPHMPVVKDLIVCMKHFYLYQKSIINPFLKNSISYV-----SSYLT

R. americana ACIKSI-D--TNKKEM-KIYPLPHMHIIKDLVPLDLSNFYAOYKSIEP WMKTTEKKLD-----KEFYQ
M. californiana ACLRAV-D--QKSM---KIYPLPHMAVIKDLVPLDLTNFYRQHASVQPYLYKYKTEPAP-----GVSNLQ
U. maydis ACLCRI-D--KQNDT--KIYPLPHMYIVKDLVPLDLTQFYKQYRSIEPFLKSNNTPSE-----GEHLQ
N. crassa ACLCRI-P--ADNSAEMKIYPLPHTYVVKDLVPLDLTLFYKQYKSIKPYLQRDTPSPD-----GKEFRQ
M. ovata ACIRPI-D--PTTPVS-KIYPLPHMYVVKDLVPLDLTLFYEYKSIDPFLRTKKGKPTD-----GKEFKQ
M. musculus ACTRRI-D--TDLSKVSKIYPLPHMYVIKDLVPLDLSNFYAOYKSIEPYLKKKDESQE-----GKQQYLQ
P. parva ACLCKV-D--RDPGQITKVA PLPHMFVVKDLVVDMANFYSQYKSIKPYLQRNQEPAN-----GS EYYQ
C. reinhardtii ACLCKV-N--RDPGHVGKVA PLPHMFVVKDLVVDMANFYAOYKSIKPYLQKKEAAG-----Q EFYQ
A. thaliana ACLTKI-Q--DEASET-TITPLPHMFVIKDLVVDMTNFYNQYKSIEPWLKRKTPASV-----PAK EILQ
B. hominis ACLTKI-V--PGSATT-TIRPLPHMFVIKDLIPDMTNFYEYQASIKPWLQKKSVDVT-----NYEC ENLQ
G. theta ACLARI-D--TSSSKT-KIYPLPHMYVVKDLVPLDMTNFYAOYKTI EPWLQKEGNEGKIKDDNGNFKENY M
P. tetraurelia ACIHAI-D--TDLTQPAYITPLGHMFVVKDLVVDMTNFYTQYKTIDPYLKRKTPKEG-----NKEYIQ
P. falciparum ACLTEV-N--RDKKEITEIQPLPNLYVMKDLVPLDLTNFYNQYKSIDPWLKRKTKKEK-----GQKEFYQ
B. natans ACLSKI-E--DNGKPT-KIYPLPHMEVIKDLVPLDLSNFYQYKSIKPWLQPAESSPK-----AQDGEYLQ
R. prowazekii ACIKPI-E--DISGDI-KIYPLPHMKVVKDLVPLDMSHFYAOYESIEPWLKNDSPAPS-----NS ERLQ
E. coli ACITPI-SALNQP GKIVIRPLPGLPVIRDLVVDMGQFYAOYEKIKPYL LNNGQNPP-----AREHLQ

E. gracilis NGNTATKAQPAIVQWHGFKMTHPSVVAQFMDLTDVLCGSC TAACPSYWWNDVFFGPAAMVQAWRWLWE
E. longa TNNVTSKSPAIVQWHGFKMTHPSVVAQFMELTDVLCGSC TAACPQYWWNDVFFGPAAMVQAWRWLWE
L. infantum -TRRAANANYTVNRWYLKEKVDSSNRMRLEGLYECVLCASCTGSCPQYWWNREHFLGPAVLLQSYRWLVE
T. cruzi QRPFGGNNPYAVSRWYLKEKVHSSNRNRLEGLYECVLCASCTGSCPQYWWNREQFLGPAVLLQSYRWLIE
T. brucei QRPGFATTPYTVSRWYLKEKVHSSNRNRLEGLYECVLCASCTGSCPQYWWNRELF LGPAVLLQSYRWLIE
N. gruberi TKLLTLGFNTSMLLTLPKKENIQFDRYLLNGLYECILCACCSTSCPSYWWNKDRYLGPAILLQSYRWLID
R. americana SRN-----DREKLDGLYECVLCACCSTSCPSYWWNSDKYLGPAVLLQAYRWIAD
M. californiana SEE-----QRAKLNGLYECVLCACCSTSCPSYWWNGDKYLGPAILLXAYRWIAD
U. maydis SPE-----ERRRLDGLYECILCACCSTSCPSYWWNQDEYLGPAVLMQAYRWIAD
N. crassa SKA-----DRKLDGLYECILCACCSTSCPSYWWNSEEYLGPAILLQSYRWLAD
M. ovata TIT-----DRKLDGMYECVLCACCSTSCPSYWWNSDKYLGPAALMQAYRWIAD
M. musculus SIE-----DREKLDGLYECILCACCSTSCPSYWWNGDKYLGPAVLMQAYRWIAD
P. parva SKE-----DRLKLDGMYECILCACCSTSCPSYWWNSDKYLGPSVLLAAYRWIID
C. reinhardtii SKE-----SRAKLDGLYECILCACCSTSCPSYWWNSDKYLGPAVLLAAYRWIID
A. thaliana SKK-----DRAKLDGMYECILCACCSTSCPSYWWNPESYLGPAALHANRWISD
B. hominis SYE-----DRQKLDGLYECILCACCSTSCPSYWWHPDKYLGPSILQAYRWIAD
G. theta SKK-----DRDVLGMYECILCACCSTSCPSYWWNSEKYLGPVLMQAYRWIAD
P. tetraurelia SVE-----DRKLDGLYECVLCACCSTSCPSYWWHPDRYLGPAVLMQAYRWIAD
P. falciparum SIE-----DRKLDGLYECIMCASCSTSCPSYWWNPEYLLGPATLMQAYRWIAD
B. natans TKE-----DRKLDGMYECILCACCSTSCPSYWWNGDKYLGPAVLMQAYRWIAD
R. prowazekii SIK-----DREKLDGLYECILCACCSTSCPSYWWNGDKYLGPAILLQAYRWIAD
E. coli MPE-----QREKLDGLYECILCACCSTSCPSFWWNPKDFIGPAGLLAAYRFLID

E. gracilis QHNDLETFQEKVKQLTNGTVTIEFCHNIGNCVQVCPKNIQVDRVMNSIRMLASLN-----
E. longa QHNDLETFQEKVKQLTNGTVSIEFCHNIGNCVQVCPKNIQVDQVMNSIRMLASLN-----
L. infantum PLDRD--FDERVRFETG-NLVNMFCHNIFNCSITCPKFLNPGLASKEIKRLSSPSAKRVGPAIEMEPVTS
T. cruzi PLDRD--YDSRVKMFHEG-PLVNFCHNIFNCSITCPKFLNPAYASKEIKRMSSPVTPRVPPPLDAKIIKE
T. brucei PLDRD--FDSRVKMFHEG-PLVNFCHNIFNCSITCPKFLNPGMASKEIKRLSSPATLRVGPPLLEDAKVAS
N. gruberi SRDDF--FFSRLGQLDDV-YKVGRCCHSILNVCVSCPKGLNPAEATNNIKLLINLNTK-----
R. americana SRDQG--TRERLQYLEDP-FKLYRCHTILNCTKTCPKHLNPAQAIKIKQITLLT-----
M. californiana SRDQS--TRERLESDDA-FKLYRCHTIMNCSRT-----
U. maydis SRDDF--GEERRQKLENT-FSLYRCHTIMNCSRTCPKLNPNPKAIAQIKKDMAVGA PKASERPIMASS--
N. crassa SRDER--TAERKDALNNS-MSLYRCHTILNCTRTCPKGLNPGLAIANIKKELAF-----
M. ovata TRDEF--TKERLEKLDLP-FSVYRCHTIMNCAKTCPKHLNPGKAI AELKKLATV-----
M. musculus SRDDF--TEERLAKLQDP-FSVYRCHTIMNCTQTCPKGLNPGKAI AETKKMMATYKEKRALA-----

<i>P. parva</i>	SRDDA--TKERIAQLDDA-FKLFRC	KTIMNCATVCPKGLNPGKAI	AKLKQSVARGSAV-----
<i>C. reinhardtii</i>	SRDDM--TSERMKEVDDA-YKLYRC	KTIMNCATVCPKGLNPGKAI	INKIKQSLAKGSPV-----
<i>A. thaliana</i>	SRDEY--TKERLEAIDDE-FKLYRC	HTILNCARACPKGLNPGKQI	THIKQLQR-----
<i>B. hominis</i>	SRDEM--TEERLKDLDDT-YKLYRC	HAIMNCTHACPKNLNPGRSI	HKIKHALHHMH-----
<i>G. theta</i>	SRDQN--TKKRMEMLDDT-YKLYRC	HTIMNCTKTCPKSLNPGLA	IARLKRKLVTVG-----
<i>P. tetraurelia</i>	SRDEY--TDERLEKLAED-VKVEDC	QNIIGMCSFTCPKGLDPQRS	MNHLMKLIEEYKERKIASATL----
<i>P. falciparum</i>	SRDEY--TKERLMEVNDT-MKLYRC	HGIMNCTMCCPKGLDPAKAI	KDMKNLVQENFSEDTIKEHSQYIKS
<i>B. natans</i>	SRDGD--TQARLENLDDS-FKLYRC	KTI FNCTNTCPKGLNPGRA	VQQIKKAIHDGEH-----
<i>R. prowazekii</i>	SRDDN--TGARLEALEDP-FKLYRC	HTIMNCTKTCPKGLNPAKAI	GRVKNLIAERHGV-----
<i>E. coli</i>	SRDTE--TDSRLDGLSDA-FSVFRC	HSIMNCVSVCPKGLNPTRA	IIGHIKSMMLQRNA-----

<i>E. gracilis</i>	-----
<i>E. longa</i>	-----
<i>L. infantum</i>	GKEAGKRSLAQM
<i>T. cruzi</i>	-----
<i>T. brucei</i>	KY-----
<i>N. gruberi</i>	-----
<i>R. americana</i>	-----
<i>M. californiana</i>	-----
<i>U. maydis</i>	-----
<i>N. crassa</i>	-----
<i>M. ovata</i>	-----
<i>M. musculus</i>	-----
<i>P. parva</i>	-----
<i>C. reinhardtii</i>	-----
<i>A. thaliana</i>	-----
<i>B. hominis</i>	-----
<i>G. theta</i>	-----
<i>P. tetraurelia</i>	-----
<i>P. falciparum</i>	KMEKTK-----
<i>B. natans</i>	-----
<i>R. prowazekii</i>	-----
<i>E. coli</i>	-----