

E. gracilis MSVVRRCFQRALRPLGQRAYS LQHARSIVPGVPTLEVTGKVT PPFKEFSAGR--PSLMTKPQG VKPIEE
E. longa -----MTRPLGAKPI-----AE
L. infantum -----MLRKVAPRPYKTMVRRM-----ATTDA
T. cruzi -----MLRKITTPYKISVRRT-----TST
T. brucei -----MLRKVTSYKVSIRRT-----AAS
N. gruberi -----MLLSS
R. americana -----
M. californiana -----MLRSLSTLSRFARSAAPTAEKAAASAK-----PAAAAM
U. maydis -----MSLFNVSNGRLRTALRPSVASSSRVAAFST--TAAARLATPTSDNVG
N. crassa -----MAALRSSARVFAAASRPAPFRPVVAARGMANLADG-----ATQSQQA
M. ovata -----VRTPVT SIVARLASTAATTAAP-----ALKTQAA
M. musculus -----MAATVGVS LKRGFPAAVLGRVGLQ-----FQACRGAQT
P. parva -----MLATLSKRATSIVRPGALSAFISTSSSEA-----LAAPSKP
C. reinhardtii -----MLPSLLTNARRGAQAALQPGFLSAFISTTSESLNAAATATASKPAPSRP
A. thaliana -----MASGLIGRLVGT KPSKLATAARLIPARWTSTGAEA-----ETKASS
B. hominis -----MFARSLSSLKVAVRGSVVLQI SAMNFS-----TGFKIG
G. theta -----SVTKAVVGAQASSFHSSASLS-----LKLQPE
P. tetraurelia -----MLQRLSAVIRRP MFHWGTHHDSNDATKRLFDTVSSTVKGIQQIN YVVEHDPKL
P. falciparum -----MLKKYELKGMNINL NKKLCNNKSRNDIQAYTYIQKRFNNGSINKEFEMKKQVEQINKV
B. natans -----MMASLLSTTF SKRLVGGMRAVARNG-----APRPS
R. prowazekii -----MVELRLPSNSVVKKGREH-----K
E. coli -----

E. gracilis VPERLPDQAI IQIGRWDPDIN--DFRMDTFVYE--KG-PFMVLDILIAIKAHQDPTLTFRNSCCREGVCGS
E. longa VPERKPEEAI IQIGRWDPDIN--DFRMDTFVYE--KG-PFMVLDILIAIKAHQDPTLTFRNSCCREGVCGS
L. infantum AAEPHAKKAVLQLVRFDPETN--SSRVESYEYD-KHH-EYMVLDLLIAVKAHQDPTLAFRNSCCREGVCGS
T. cruzi APEATSKKAILRLIRFDPTTN--RQRIESYEYD-KQH-EYMVLDLITAVKAHQDPTLAFRNSCCREGVCGS
T. brucei VTAADSKKAILRLIRFDPETN--KQRVESYEYD-KHH-DYMVLDLITAVKAHQDPTLAFRNSCCREGVCGS
N. gruberi FPVDSNALIQYKVFYRYPFIN-SEPWVQLYFISNEAH-SSMLLDNLFYLNKNEKDESLSYRRSCREGICGS
R. americana MNTKKEKIML FKVYRWNPDKK-EKPHISTYSVLDLNSC-GPMVLDALIKIKNEQDSTLTFRRSCREGVCGS
M. californiana PTKKAPDVRRFQIYRWNPDKN-EKPRLQSYDVMDSQC-GPMVLDVLIKIKNEVDPTLTFRRSCREGICGS
U. maydis SSGKPQHLKQFKIYRWNPDKPSEKPRLQSYTLDLNQT-GPMVLDALIKIKNEIDPTLTFRRSCREGICGS
N. crassa SSEQSPKLKTFQIYRWNPDTPTKPRMQSYTLDLNKT-GPMVLDALVRIKNELDPTLTFRRSCREGICGS
M. ovata STEKAPRIKTFKIYRWNPDKPNDKPHYDEFKIDLNKC-APMVLDALIKIKNEIDPTLTFRRSCREGVCGS
M. musculus AAAAAPKIKKFAIYRWNPDKTGDKPRMQTYEVDLNKC-GPMVLDALIKIKNEVDSTLTFRRSCREGICGS
P. parva AVAKAPLYKEFQIYRWNPDSK-EKPKYASYQVDINNC-GPMMLDVL LKVKDEQDQTL SLRRSCREGICGS
C. reinhardtii PLAKPLYKEFQIYRWNPDSK-EKPKYASYQVDINNC-GPMMLDVL LKIKDEQDQTL SLRRSCREGICGS
A. thaliana GGGRGSNLKTFQIYRWNPDKN-GKPELQNYQIDLKDC-GPMVLDALIKIKNEIDPSLTFRRSCREGICGS
B. hominis PDGKIPSYKLFSLFRYNPAKD-IKPHYEKYVIDLNDC-GTMVLDALFKIKNEQDTLAFRRSCREGICGS
G. theta ANVEGKRIKYFQIYRWNPDKS-SRPTMATYPINLSEC-GPMVLDALIKIKNEQDSTLTFRRSCREGICGS
P. tetraurelia TVEEKAKMKQFLIYRYDPADEDFPKYVSYVYDLKKI-PPMYLDALLYIKDNYDSSL SLRRSCREGICGS
P. falciparum NGEVVKRKKKFSIFRYNPNTNK-KRPQMETFEVDIDNC-GPMVLDVLIKIKDEIDSTLSFRRSCREGICGS
B. natans FYRRAMSTKTFEYIYRWNPDEG-GEPKMQSYDLDLKEC-GPMVLDALIKIKNEVDPTLTFRRSCREGICGS
R. prowazekii AQQKMLKPRKVKVYRYDPLD-ENPTIDSF EIDL SKT-GPMVLDALIKIKNEIDSTLTFRRSCREGICGS
E. coli -----MRLEFSIYRYNPDVD-DAPRMQDYTLEAEGRDMMLLDALIQLK-EKDPSLSFRRSCREGVCGS

E. gracilis CAMNINGSNL LACITPV-----TDET-VVFP L TQMPILRDLVVD FRWF FQKQVELVQNSTPKPNKALFR
E. longa CAMNINGSNL LACITPV-----TDET-VVFP L TQMPILRDLVVD FRWF FQKQVELVQNSTPKPNKAMFR
L. infantum CAMNINGINS LACITFA-----QQVT-TVAP L PNFVVIKDFVVD LRHF FQYAYIRPFVRNANLHRSQ
T. cruzi CAMNINGINS LACITFS-----QQVT-TVG L PNFVVIKDFVVD LRHF FRQYAYIRPFVRNTNLDRSR
T. brucei CAMNINGVNS LACITFS-----QQVT-TVG L PNFVVIKDFVVD LRHF FRQYAYIRPFVRNVNLDRSR
N. gruberi CAMNINGENALACL YIMKEHLNVLNNEV-RIF L P L P M P V K D L I V C M K H F Y L Q Y K S I N P F L K N S I S Y V -

R. americana CAMNIDGNTLACIKSI----DTNKKEM-KIYPLPHMHIKDLVPLSNFYAQYKSIIEP WMKTTTEKKLD-
M. californiana CAMNIDGNTLACLRAV-----DQKSMKIYPLPHMAVIKDLVPLDTNFYRQHASVQPYLKYKTEPAP-
U. maydis CAMNIDGNTLACLRI----DKQNDT-KIYPLPHMYIVKDLVPLDQFYKQYRSIEPFLKSNNTPSE-
N. crassa CAMNINGNTLACLRI---PADNSAEM-KIYPLPHTYVVKDLVPLDLYFYKQYKSIKPYLQRDTPSPD-
M. ovata CAMNIDGNTLACIRPI----DPTTPVS-KIYPLPHMYVVKDLVPLDLYFYEQYKSIDPFLRTKGKPTD-
M. musculus CAMNINGGNTLACTRRI---DTDLSKVS-KIYPLPHMYVVKDLVPLSNFYAQYKSIIEPYLKKKDESQE-
P. parva CAMNINGNTLACLCKV-D--RDPGQIT-KVAPLPHMFVVKDLVVDMANFYSQYKSIKPYLQRNQEPAN-
C. reinhardtii CAMNIDGSNTLACLCKV-N--RDPGHVG-KVAPLPHMFVVKDLVVDMANFYAQYKSIKPYLQKKEAAKG-
A. thaliana CAMNIDGNGLACLTKI----QDEASET-TITPLPHMFVIKDLVVDMTNFYNQYKSIIEPWLKRKTPASV-
B. hominis CAMNIDGENGLACLTKI----VPGSATTTIRPLPHMFVIKDLIPDMTNFYEQYASIKPWLQKSKVDT-
G. theta CAMNIDGSNTLACLARI----DTSSSKT-KIYPLPHMYVVKDLVVDMTNFY AQYKTIIEPWLQKEGNEGKI
P. tetraurelia CSMNCNGLHKLACIHAI-D--TDLTQPA-YITPLGHMFVVKDLVVDMTNFYTQYKTIIDPYLKRKTPKEG-
P. falciparum CAMNINGKNGLACLTEV-N--RDKKEIT-EIQPLPNLYVMKDLVPLDTNFYNQYKSIDPWLKRKTKKEK-
B. natans CAMNIDGGNGLACLSKI----EDNGKPT-KIYPLPHMEVIKDLVPLDNNFYQYKSIKPYLQPAESSPK-
R. prowazekii CAMNIDGNTLACIKPI----EDISGDI-KIYPLPHMKVVKDLVPLDMSHFY AQYESIEPWLKNDSPAPS-
E. coli DGLNMNGKNGLACITPI-SALNQP GKKI-VIRPLPGLPVIKDLVVDMGQFYAQYEKIKPYLLNNGQNPP-

E. gracilis MEAVKQRYLDTVKALESNAKAVTP-----
E. longa MEALKQRYLDTVKALDSNAKAVTP-----
L. infantum VDSIVERYHSVARVLSGVSPSEGAMEKAQEELASVQKRETTVAALLRIA-----DAAVDAGNATQALS
T. cruzi VENIERYDLRKHVIHGVS PHGIPTSDSDVPRGGNVETE VVGLLRLLDAIS-----EAGNVTHLVST
T. brucei LDNIVERYKTITKVIHGVP SDD-----EAQLAQLESKS GAQTDVMALLQLLDVAVCESGNVTHLIRT
N. gruberi -----SSYLTKLLTLGFNTSMLLTLPKKNENIQFD RYLLNGL---YECILCACCSTSCPSYWWNKDRY
R. americana -----K E FYQSRN-----DREKLDGL---YECVLCACCSTSCPSYWWNSDKY
M. californiana -----GVSNLQSEE-----QRAKLNGL---YECVLCACCSTSCPSYWWNGDKY
U. maydis -----G E H LQSPE-----ERRRLDGL---YECILCACCSTSCPSYWWNQDEY
N. crassa -----GKEYRQSKA-----DRKKLDGL---YECILCACCSTSCPSYWWNSEEY
M. ovata -----G K E F K Q T I T-----DRKKLDGM---YECVLCACCSTSCPSYWWNSDKY
M. musculus -----G K Q Q Y L Q S I E-----DREKLDGL---YECILCACCSTSCPSYWWNGDKY
P. parva -----G S E Y Y Q S K E-----DRLKLDGM---YECILCACCSTSCPSYWWNSDKY
C. reinhardtii -----Q E F Y Q S K E-----SRAKLDGL---YECILCACCSTSCPSYWWNSDKY
A. thaliana -----P A K E I L Q S K K-----DRAKLDGM---YECILCACCSTSCPSYWWNPESY
B. hominis -----N Y E C E N L Q S Y E-----DRQKLDGL---YECILCACCSTSCPSYWWHPDKY
G. theta KDDNGNFKENYMSKK-----DRDVL DGM---YECILCACCSTSCPSYWWNSEKY
P. tetraurelia -----N K E Y I Q S V E-----DRKLDGL---YECVLCACCSTSCPSYWWHPDRY
P. falciparum -----G Q K E F Y Q S I E-----DRKKLDGL---YECIMCASCSTSCPSYWWNP EY
B. natans -----A Q D G E Y L Q T K E-----DRKLDGM---YECILCACCSTSCPSYWWNGDKY
R. prowazekii -----N S E R L Q S I K-----DREKLDGL---YECILCACCSTSCPSYWWNGDKY
E. coli -----A R E H L Q M P E-----QREKLDGL---YECILCACCSTSCPSFWWNPKDF

E. gracilis -----
E. longa -----
L. infantum LEKVEQQGVVLDSTKVTEMIERALKNFAATSK-----
T. cruzi LEELEAKGVQLDQAKVKELIETTLRKHGERTK-----
T. brucei LEALQERGMQLDQGVKALIEETLQNYKKRKLGA-----
N. gruberi L G P A I L L Q S Y R W L I D S R D D F F F S R L G Q L D --- D V Y K V G R C H S I L N C V S C C P K G L N P A E A T I N N I K L L I N L
R. americana L G P A V L L Q A Y R W I V D S R D Q G T R E R L Q Y L E --- D P F K L Y R C H T I L N C T K T C P K H L N P A Q A I A K I K Q N I T L
M. californiana L G P A I L L X A Y R W I A D S R D Q S T R E R L E S L D --- D A F K L Y R C H T I M N C S R T-----
U. maydis L G P A V L M Q A Y R W M A D S R D D F G E E R R Q K L E --- N T F S L Y R C L T I M N C S R T C P K N L N P G K A I A Q I K K D M A V
N. crassa L G P A I L L Q S Y R W L A D S R D E R T A E R K D A L N --- N S M S L Y R C H T I L N C T R T C P K G L N P G L A I A N I K K E L A F
M. ovata L G P A A L M Q A Y R W V A D T R D E F T K E R L E K L K --- D P F S V Y R C H T I M N C A K T C P K H L N P G K A I A E L K K K L A T
M. musculus L G P A V L M Q A Y R W M I D S R D D F T E E R L A K L Q --- D P F S V Y R C H T I M N C T Q T C P K G L N P G K A I A E I K K M M A T

<i>P. parva</i>	L	G	P	S	V	L	L	A	A	R	W	I	I	D	S	R	D	D	A	T	K	E	R	I	A	Q	L	D	-	-	-	-	D	A	F	K	L	F	R	C	K	T	I	M	N	C	A	T	V	C	P	K	G	L	N	P	G	K	A	T	A	K	L	K	Q	S	V	A	R	
<i>C. reinhardtii</i>	L	G	P	A	V	L	L	A	A	R	W	I	I	D	S	R	D	D	M	T	S	E	R	M	K	E	V	D	-	-	-	-	D	A	Y	K	L	Y	R	C	K	T	I	M	N	C	A	T	V	C	P	K	G	L	N	P	G	K	A	I	N	K	I	K	Q	S	L	A	K	
<i>A. thaliana</i>	L	G	P	A	A	L	L	H	A	N	R	W	I	S	D	S	R	D	E	Y	T	K	E	R	L	E	A	I	D	-	-	-	-	D	E	F	K	L	Y	R	C	H	T	I	L	N	C	A	R	A	C	P	K	G	L	N	P	G	K	Q	I	T	H	I	K	Q	L	Q	R	-
<i>B. hominis</i>	L	G	P	S	I	L	Q	Q	A	Y	R	W	I	A	D	S	R	D	E	M	T	E	E	R	L	K	D	L	D	-	-	-	-	D	T	Y	K	L	Y	R	C	H	A	I	M	N	C	T	H	A	C	P	K	N	L	N	P	G	R	S	I	H	K	I	K	H	A	L	H	H
<i>G. theta</i>	L	G	P	A	V	L	M	Q	A	Y	R	W	I	C	D	S	R	D	Q	N	T	K	K	R	M	E	M	L	D	-	-	-	-	D	T	Y	K	L	Y	R	C	H	T	I	M	N	C	T	K	T	C	P	K	S	L	N	P	G	L	A	I	A	R	L	K	R	K	L	V	T
<i>P. tetraurelia</i>	L	G	P	A	V	L	M	Q	A	Y	R	W	I	V	D	S	R	D	E	Y	T	D	E	R	L	E	K	L	A	-	-	-	-	E	D	V	K	V	E	D	C	N	I	G	M	C	S	F	T	C	P	K	G	L	D	P	Q	R	S	M	N	H	L	M	K	L	I	E	E	
<i>P. falciparum</i>	L	G	P	A	T	L	M	Q	A	Y	R	W	I	V	D	S	R	D	E	Y	T	K	E	R	L	M	E	V	N	-	-	-	-	D	T	M	K	L	Y	R	C	H	G	I	M	N	C	T	M	C	C	P	K	G	L	D	P	A	K	A	I	K	D	M	K	N	L	V	Q	E
<i>B. natans</i>	L	G	P	A	V	L	M	Q	A	Y	R	W	I	A	D	S	R	D	G	D	T	Q	A	R	L	E	N	L	D	-	-	-	-	D	S	F	K	L	Y	R	C	K	T	I	F	N	C	T	N	T	C	P	K	G	L	N	P	G	R	A	V	Q	Q	I	K	K	A	I	H	D
<i>R. prowazekii</i>	L	G	P	A	I	L	L	Q	A	Y	R	W	I	A	D	S	R	D	D	N	T	G	A	R	L	E	A	L	E	-	-	-	-	D	P	F	K	L	Y	R	C	H	T	I	M	N	C	T	K	T	C	P	K	G	L	N	P	A	K	A	I	G	R	V	K	N	L	I	A	E
<i>E. coli</i>	I	G	P	A	G	L	L	A	A	Y	R	F	L	I	D	S	R	D	T	E	T	D	S	R	L	D	G	L	S	-	-	-	-	D	A	F	S	V	F	R	C	H	S	I	M	N	C	V	S	V	C	P	K	G	L	N	P	T	R	A	I	G	H	I	K	S	M	L	L	Q

<i>E. gracilis</i>	-----
<i>E. longa</i>	-----
<i>L. infantum</i>	-----
<i>T. cruzi</i>	-----
<i>T. brucei</i>	-----
<i>N. gruberi</i>	NTK-----
<i>R. americana</i>	LT-----
<i>M. californiana</i>	-----
<i>U. maydis</i>	GAPKASERPIMASS-----
<i>N. crassa</i>	-----
<i>M. ovata</i>	V-----
<i>M. musculus</i>	YKEKRALA-----
<i>P. parva</i>	GSAV-----
<i>C. reinhardtii</i>	GSPV-----
<i>A. thaliana</i>	-----
<i>B. hominis</i>	MH-----
<i>G. theta</i>	G-----
<i>P. tetraurelia</i>	YKERKIASATL-----
<i>P. falciparum</i>	NFSEDTIKEHSQYIKSKMEKTK
<i>B. natans</i>	GEH-----
<i>R. prowazekii</i>	RHGV-----
<i>E. coli</i>	RNA-----