

970 980 990 1000 1010 1020 1030 1040 1050 1060 1070 1080

T. gondii ---SEEPPLADVTVQVSEVLLQGHYKQEFSTSLMLDFLKGKPEQGPGLQTRILLEVNLLH-SPOVATETIFQEMELTHFDRAKIAALCEKVLGSLQRALELYTDADIKRVMQSG---
P. falciparum ---ENNISFDINKIYDILLSKKKLQEATSILLDYLDKDNKPEHKHLQTKIFEFNLYH-NVQIAETIFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
P. berghiei ---DNNIQDLIGKIVDYLLNNNNKLQEATSILLDYLDKDNKPEHKHLQTKIFEFNLYH-NVQIAETIFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
P. yoelii ---DNNIQDLIGKIVDYLLNNNNKLQEATSILLDYLDKDNKPEHKHLQTKIFEFNLYH-NVQIAETIFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
P. chabaudi ---DNNIQDLIGKIVDYLLNNNNKLQEATSILLDYLDKDNKPEHKHLQTKIFEFNLYH-NVQIAETIFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
P. knowlesi ---ENNIPFDINNIIIDYLLSKKKLQEATSILLDFLDKDNKPEHKHLQTKIFEFNLYH-NVQVATETLFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
P. vivax ---ENNIPFDINNIIIDYLLSKKKLQEATSILLDFLDKDNKPEHKHLQTKIFEFNLYH-NVQVATETLFQMDIFTYYDKNRIAYLCEKGLYQRALENYTNINDIKRVTIKSACFCQKGNISN
T. annulata VIVENVLLCNIIIEIMEKLEIMKMLKEMNEILLDYLDKEDLEIHEKLTQRLQLVNIN-DKRIIEELKLDILTKFNKNYIAKLCEKEDNELYSLKYNDITNIRKILIKGIY-----
B. bovis -----PLCDVGSVAEILIKHNKLQELTKILLEYLKNRVEHAALQTRILLEVNLLQ-QPRVADMILQNLVLTDFDRAYIARLCEKEDMFDMAIQHNSFFVKKRLIKAGG-----
N. caninum ---AEPPLADVNVQIVDVLQQRKQEFSTSLMLDYLSKNKPEQGPGLQTRILLEVNLLH-SPOVATETIFQMDLTHFDRAKVAALCEKAGLQRALELYTDADIKRVMQSG-----
C. muris LPHGLELAIDKISIVDIFISHGHYKEITSILLDYLDKNNRPEDAALQTKIFELNLLY-APQVATETLFQMDIFTYYDKHAIASLCEKAGLFCERLENYTDMDIRRLISLSCG-----
C. parvum ---AESLDLNDIKTSVVEIFVSHSRYSKEITSILLDHLKANKPEDSALQTKILLEVNLLH-APQVATETLFQMDIFTYYDKHAIASLCEKAGLFCERLENYTDMDIRRLISLSCG-----
C. hominis ---AESLDLNDIKTSVVEIFVSHSRYSKEITSILLDHLKANKPEDSALQTKILLEVNLLH-APQVATETLFQMDIFTYYDKHAIASLCEKAGLFCERLENYTDMDIRRLISLSCG-----
T. thermophila ---TNPSTNVHQIAEIFGQAGKFKEMSAFLVDCMKQNRPEDGFWQTKVLEWNIIN-EPNIVDPFIDLTQWQYNNRLRIAQLCEKQQLYQRALENYSDIKDIRRVLNT-----
S. pombe ---SNPSINLEKIVDIFMSQNLVQQAFAFLLDALKDNDPEHSHLQTRILLEVNLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALELYDKPADIKRVTIKSACFCQKGNISN
S. cerevisiae ---PETASQIDIEKIADLFFSQNHQIQGTSLLDALKGDTPDQKGLVLEVNLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALENYTDMDIRRLISLSCG-----
C. merolae ---DTADHAADVLFQRMVQEAATSYLLDMVRDEPQGGDLQTKVLEINLLHAPQVADAILQEMTHFDKQRIAVLCEKAGLQRALELYTDADIKRVMQSG-----
D. discoideum ---EEGGPYIDANQVVELFSANMIQETSINFLFAILDGRDPDQKGLVLEVNLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALELYTDADIKRVMQSG-----
A. thaliana ---MEGGCPVDYNTITDQLFQNLRIEATAFLLDVLKPNLPEHAFLQTKVLEINLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALELYTDADIKRVMQSG-----
D. melanogaster ---EEE-PLADINQIVDIFMESHMVQQAFAFLLDALKHNRPAEGALQTKILLEVNLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALELYTDADIKRVMQSG-----
H. sapiens ---DEE-PLADITQIVDFMEYNLIQCTAFLLDALKNNRPSSEGLQTRILLEVNLLH-APQVADAILGNQMFTHFDRAVIASLCEKAGLQRALELYTDADIKRVMQSG-----

1090 1100 1110 1120 1130 1140 1150 1160 1170 1180 1190 1200

T. gondii ---KISQEFQTFQFFGNLPPDASLEILDM---RSS-SQNLQAVVAIKFHGQIG---
P. falciparum TTTTTTTSNMGDGHFDMNNVSKKISIEWIKNYFSTLSDSVCCQLLDFDM---KGS-KINMEVVISICVQYNNKIG---
P. berghiei NLSGEGGSNMS-----LHGGSLEWIKNYFSTLSDSVCCQLLDFDM---KGN-KVNIIEIISICVQYNNKIG---
P. yoelii NLSGEGGSNMS-----LHGGSLEWIKNYFSTLSDSVCCQLLDFDM---KGN-KVNIIEIISICVQYNNKIG---
P. chabaudi NLSGEGGSNMS-----LHGGSLEWIKNYFSTLSDSVCCQLLDFDM---KGN-KVNIIEIISICVQYNNKIG---
P. knowlesi NMEPSLPNR-----AISIDWIKKYFSTLSDSVCCQLLDFDM---KGN-KINMEVVISICVQYNNKIG---
P. vivax ---MDGSLPNR-----GISIDWIKKYFSTLSDSVCCQLLDFDM---KGN-KINMEVVISICVQYNNKIG---
T. annulata -----FLSQNIINQTLTFNIQDSLYFLQQLH-----NEYIGISGGVGVDSREFEFGEGEF---
B. bovis ---MNRRAVLEKSMKMSPEALNVLREML-----DSABISNDHVVSCALTMHNNIG---
N. caninum ---KISQEFQTFQFFGNLPPDASLEILDM---RSS-SQNLQAVVAIKFHGQIG---
C. muris ---SLNSDWLANYLKSLPRTFECLEKLLSVCRNQ---GGNINSGSGIG---LMSTN---TSDSGSLTNTNINSLQNLQVCIRKNDNIG---
C. parvum ---SLNTDWLANYLKSLPRTFECLEKLLSVCRNQ---GGNINSGSGIG---LMSTN---TSDSGSLTNTNINSLQNLQVCIRKNDNIG---
C. hominis ---SLNTDWLANYLKSLPRTFECLEKLLSVCRNQ---GGNINSGSGIG---LMSTN---TSDSGSLTNTNINSLQNLQVCIRKNDNIG---
T. thermophila ---HMIQPAWLNVYFSNVQTDWALACMDLL-----KHN-RQNLPLVVEACAKNYQKFT---
S. pombe ---NLLNPEWLMNYFSRFSDEVDYDLREML-----RSLNRLQNLQIVQIATRYSDLVG---
S. cerevisiae ---NALPDLWLVGYFGKLNVEQSLACLKALM-----DNNIQQLQIVVQVATKFSDLIG---
C. merolae ---HAIQPEYFLSIFANLSPDDSLLELLEL-----TNDLRQNLQIVVQVATRYSDLVG---
D. discoideum ---HMEVQALVEFFGTSLSEWAMECMKDL-----RTNRLQNLQIVVQVATRYSDLVG---
A. thaliana ---HMLNAEWLVSPFTSLVSEDLSECLKAML-----TANRLQNLQIVVQVATRYSDLVG---
D. melanogaster ---HMLNAEWLVSPFTSLVSEDLSECLKAML-----TANRLQNLQIVVQVATRYSDLVG---
H. sapiens ---HLLNPEWLVNYFSGSLVEDSEDLSECLKAML-----SANTRLQNLQIVVQVATRYSDLVG---

1210 1220 1230 1240 1250 1260 1270 1280 1290 1300 1310 1320

T. gondii ---TKLVEMEFKFSYEGVFFYFLGSLIAFSSDPE-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. falciparum ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. berghiei ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. yoelii ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. chabaudi ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. knowlesi ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
P. vivax ---IKKINKFEENKNYEGIFYFVSNIILNLPNLIVKGN-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
T. annulata ---EKKFDEKNRKVEKVDLENTIINICLILYNKLEKLTNILNKLFLYKFFKLKQOE-----DLEDINE
B. bovis ---TMQVQLFERSASSDVLFSFLR---ALPVISGSAE-----STEQNA
N. caninum ---TKLVEMEFKFSYEGVFFYFLGSLIAFSSDPE-----NDNLSN-----NSLSTYNNMDEBASILLTSDICSTQPSY-ETANLKLEDBVHY
C. muris ---IENITLFEQQNLWEGIYVVSGLNTAYLGGVDSATSG-----IIGNTTT---GPSISTNNLSHNNKSTSIQGSFSSQS-F
C. parvum ---IENITLFEQQNLWEGIYVVSGLNTAYLGGVDSATSG-----IIGNTTT---GPSISTNNLSHNNKSTSIQGSFSSQS-F
C. hominis ---IENITLFEQQNLWEGIYVVSGLNTAYLGGVDSATSG-----IIGNTTT---GPSISTNNLSHNNKSTSIQGSFSSQS-F
T. thermophila ---VQSCIKCFSEVSGFDGVTFLSQIINSTEKDD---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
S. pombe ---AQRIEMFEKFTFEGLYLYLGLSVNITDEPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
S. cerevisiae ---PSTLIKLFEDYNATGLYLYLGLSVNITDEPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
C. merolae ---PSRLIDLFKHCQCEGMYLYLGLSVNITDEPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
D. discoideum ---PEAIIAMEFSRLYEGLYLYLGLSVNITDEPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
A. thaliana ---VDAIKLFEQFSYEGLYLYLGLSVNITDEPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
D. melanogaster ---NKALIDLEFGFSYDGLFYFLSSIVNFSQDPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF
H. sapiens ---TQSLIELEFSEFSKFEGLFYFLSSIVNFSQDPE---LIQDSGTQNRGAGVVLGSGRLPSNNTGSVNGGTGSFSTF---

1330 1340 1350 1360 1370 1380 1390 1400 1410 1420 1430 1440

T. gondii VHFYIEAAAKLNHTQEVERVCRE-SKCYEPQVRKEFLKQAKLPDPRLIYVCDLHGVTLEAEYLFK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. falciparum IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. berghiei IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. yoelii IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. chabaudi IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. knowlesi IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
P. vivax IMFKYIEACVKINNIQELDRICKDNKAKYNPEQIKNFKLCKLSDPRPLIYVCDIHNYIEELAEYLYK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
T. annulata IIRYMKLCIEYNDILENLLY-NNFNFLFAKELIKNSQSLSTFFIICICYRLNIIQELLLFNFYDVLVLAQPDNTNNTNLTSTIGVTVVPGIKDTTTFVGASTVGTVEKELILKD
B. bovis IVYTFIKCCIDRNMEDDLERICK-SNVYDGVVRKDLQSAIPLNPKSLIIVCHKLGEALTEYLY---RGMEKATIEVTVNIPG---GVATVSTFLD
N. caninum VHFYIEAAAKLNHTQEVERVCRE-SKCYEPQVRKEFLKQAKLPDPRLIYVCDLHGVTLEAEYLFK---NSLLKYIEVIVKVNPN---NAHKVIGVLLDLDAS-
C. muris IFKYYIEASINLGGQVQEAERICRDFPQSYEPQVIEYFKIKMSDLRLIIVWCDLHHRVEELISLYLH---MSLYKIQVYALKINPS---QTPVLVIGTLDLDGS-
C. parvum IFKYYIEASVHLGGQVQEAERICRDFPQSYEPQVIEYFKIKMSDLRLIIVWCDLHHRVEELISLYLH---MSLYKIQVYALKINPS---QTPVLVIGTLDLDGS-
C. hominis IFKYYIEASVHLGGQVQEAERICRDFPQSYEPQVIEYFKIKMSDLRLIIVWCDLHHRVEELISLYLH---MSLYKIQVYALKINPS---QTPVLVIGTLDLDGS-
T. thermophila IFKYYIEAATKCNQRLVIEQVIEKANCYDQVVKVDLFLGLRIQDQKPLIFLDIHKYIEDELTAFLYQ---NNFLNYIQVYALKINPS---AAPVLVIGTLDQEC-
S. pombe VVYKYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
S. cerevisiae VVYKYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
C. merolae VVYKYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
D. discoideum VVYKYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
A. thaliana IFKYYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
D. melanogaster IFKYYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD-
H. sapiens VHFYIEAAAKMKQYREIERIVKD-NNVYNPEVKVNFILKANLEQLPLIVICDRDFVHMEILYLYK---SQNLKFIETVQVQVNP---KTAQVVGALLDMDCD---

1450 1460 1470 1480 1490 1500 1510 1520 1530 1540 1550 1560

T. gondiiEDFIRNLLQSVRGGCS--AQQLVDEFKRNRLRLLLQWLEARVAEGNQEPAVHNALAKIYIDTNRDAESFLTKNAYYDSLVGVKGYCEERDPLHAYT
P. falciparumEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
P. bergheiEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
P. yoeliiEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
P. chabaudiEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
P. knowlesiEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
P. vivaxEDFLLNLLNNIKNISN--IGNLIIEAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDLNDKPEFLKNNNFYDKRMIGKYCEDLDPLHAYT
T. annulata IKILLEMNPKLLTEVLIILELESEELINKILINITNITL-LKEIILKIEERHQLIILKPFLEMKCKEIN-EPILHTALMKIYITLGENPEDYILNNKYVKEEETANYCQDIDQLLSLL
B. bovisLSASEHVHSILENLHDPNG--MKALIQIADERHQLIMLRDWEKRVEEGHKETEIHATALAKIRVSSQKDAEQFLSTNKIYDRSITIGRFCEERDPLMAYL
N. caninumEDFIKNLLQSVRGGCS--AQQLVDEFKRNRLRLLLQWLEARVAEGNQEPAVHNALAKIYIDTNRDAENFLTKNAYYDSLVGVKGYCEERDPLHAYT
C. murisEDLVKSLLQEIKTGLSSFSFGLIQQAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDMNRDPENFLKTNPFYDVKLIGDYCEDRDPLYAYI
C. parvumEDLVKSLLQEIKTGLSSFSFGLIQQAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDMNRDPENFLKTNPFYDVKLIGDYCEDRDPLYAYI
C. hominisEDLVKSLLQEIKTGLSSFSFGLIQQAEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDMNRDPENFLKTNPFYDVKLIGDYCEDRDPLYAYI
T. thermophilaERQIILQIAGKLIIPQCYEPLIEEFKRNRLRVLESWLEGRCEGNIQPAIHNALAKIKIDTNQDPEFLQNNQFYDAKVVGFCEERDPLHAYI
S. pombeEELVQNLLMSVVGQVP--VDELVEEVEERNRLKLLPYLESLLQSGSQDRAIYDALAKIYIDSNNNPEVFLKENNFYDTITVGVKGYCEERDPLHAYI
S. cerevisiaeEAFISQLLSQSVLQVP--INELTTEVEKRNRLKILLPFLQSLSQIQDQAVYNALAKIYIDSNNSQDQITLDVGVHGYCEDLDPLHAYI
C. merolaeVDVVYKSLMSIKSLVP--TEAVTQVLEERQKLKMLQLLEALVAEGSKDRAVHTALAKIYVDANINPEHFLTEFNEFYDARIVGVNFCERRDPLHAYI
D. discoideumEDVLRNLLMSVRNMCPC--ADSLVEQVEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDSNKNPEAFLLHNGFYDSKVGVKGYCEERDPLHAYI
A. thalianaEDFIKGLILSVRSLLP--VEPLVAEKEKRNRLRLTQFLEHVSSEGSDVHVNALAKIYIDSNNNPEHFLTNNPFYDVKVGVKGYCEERDPLHAYI
D. melanogasterEDIIKNNLILVVGQFS--TDELVEEVEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDSNNNPEHFLTNNPFYDVKVGVKGYCEERDPLHAYI
H. sapiensEDVIKNLLILVVRGQFS--TDELVAEVEKRNRLKLLPWLERSRNEGYNIELHNALAKIYIDSNNNPEHFLTNNPFYDVKVGVKGYCEERDPLHAYI

1570 1580 1590 1600 1610 1620 1630 1640 1650 1660 1670 1680

T. gondiiAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
P. falciparumAYERSNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
P. bergheiAYERSNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
P. yoeliiAYERSNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
P. chabaudiAYERSNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
P. knowlesiVYKSNNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
P. vivaxVYKSNNGCDEELIYITTSKNGLFRLQARYLISRSQSLIWKVVLDETNKY-----RKNIVDQVIGSTLIESNN-ADEITVTYKAFIEKKLSSEILIELEKIVLHNS--EFSN
T. annulata IYKHN--SMYEHFIKFSKHLQYKSLYQFLKESNIKFYQYYSNCNDMK-----EIKLCIENCN-SIEISVLIKFLLSENLEDLILLEGLLNQ--EFTN
B. bovisVYSEA--QLDSDVLRLCIGNGFYKMLAAYALKRSSPSLWHDIFSETSGLDDDD-----NRKHVCEELVILAPDSSN-ASEISCALKALLDAGMNEEVIALLEQLLNQ--EFTN
N. caninumAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
C. murisAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
C. parvumAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
C. hominisAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
T. thermophilaAYKRAWGACDEQVELVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRQALDQVSSALPESSS-ADEVSAAYNAPINAQLPHEILIELEKIVLHNS--DFSN
S. pombeAYEK--GGNDTEIINLCNENSMFQLARYLKRSDSNLWSEVL-QDSAY-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
S. cerevisiaeAYEK--GGNDTEIINLCNENSMFQLARYLKRSDSNLWSEVL-QDSAY-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
C. merolaeAYAH--GACDDVLRVTSDHGLWEQARYLVERQAPPELWAYVIREENPH-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
D. discoideumAYKR--GLCDVELIVRTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
A. thalianaAYRR--GQCDEELINVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
D. melanogasterAYER--GLCDRELIATVCEENSLFSLARYLVERQAPPELWAYVIREENPH-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN
H. sapiensAYER--GQCDEELINVTNKNGLFRLQARYLVERQAPPELWAYVIREENPH-----RRPLDQVIATVPESSD-PEAVSIVVKALMEVDPLPSQILIELEKIVLHNS--SFSN

1690 1700 1710 1720 1730 1740 1750 1760 1770 1780 1790 1800

T. gondiiKNLQNLILITAMKAD-----SSRIIDVYNRLHNYDGAIAQVAMEY--GLREAAFTTYIKRGLGCEAA
P. falciparumKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
P. bergheiKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
P. yoeliiKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
P. chabaudiKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
P. knowlesiKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
P. vivaxKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
T. annulata SNLQNLILITAMKAD-----SSRIIDVYNRLHNYDGAIAQVAMEY--GLREAAFTTYIKRGLGCEAA
B. bovisSNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
N. caninumKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
C. murisKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
C. parvumKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
C. hominisKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
T. thermophilaKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
S. pombeKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
S. cerevisiaeVALQGLLLLSAIKYE-----PTKVSSYIEKLDNYDDEIAPICIEH--DLKEEAFETDYKHEMGRAL
C. merolaeTSNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
D. discoideumKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
A. thalianaKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
D. melanogasterKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA
H. sapiensKNLQNLILITAMKAD-----SKKVMYINRLDNFSGGPQIAEVAEY--KLREAAFTTYIKRGLGCEAA

1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920

T. gondiiDITLK-----IDSTEST
P. falciparumSVLLDKILYNKNQKNKHEFSHSDSTVYYSNNNNKDNIFGKNKSDNENDEYLKQFTQNNSYREKYG--YNNNDISNSNNNNIHLHPEFNNEKFSSTLHNYED-----IDSTEST
P. bergheiSVLLDNILFNNKRNKQKMSANARRKKTEFALFN-----TINDYSGNDSGGLYNVTNFGSALSSSYNEKRDGVSSYIGSNEAFRN-----YSGQLSEFEENSKKEQMEKEEKL
P. yoeliiSVLLDNILFNNKRNKQKMSANARRKKTEFALFN-----TINDYSGNDSGGLYNVTNFGSALSSSYNEKRDGVSSYIGSNEAFRN-----YSGQLSEFEENSKKEQMEKEEKL
P. chabaudiSVLLDNILFNNKRNKQKMSANARRKKTEFALFN-----TINDYSGNDSGGLYNVTNFGSALSSSYNEKRDGVSSYIGSNEAFRN-----YSGQLSEFEENSKKEQMEKEEKL
P. knowlesiSVLLDKILHVNH-KSAYPCFESGASSSV-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
P. vivaxSVLLDKILQVNN-KGAYNPEFSRASSSV-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
T. annulata NQLLILHKSSTEGTKVEVKRGARSEEVKVTKSES-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
B. bovisEALL-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
N. caninumDITLK-----IDSTEST
C. murisEILLQARGES-KDSTESNDNLGSDSPE-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
C. parvumETLLMISKLELLKNEGIEIDGQGSFEMK-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
C. hominisETLLMISKLELLKNEGIEIDGQGSFEMK-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
T. thermophilaEVLNNI-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
S. pombeKVLVEDI-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
S. cerevisiaeKVLVEDI-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
C. merolaeSVLIDQK-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
D. discoideumDVLITH-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
A. thalianaNVLLDNV-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
D. melanogasterQVLIDQV-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI
H. sapiensQVLIEHI-----YNSDDYVVKQLGEGGSYGQYQDR--ADNLFSGSND-----VSGSLCESDS--HDAQETI

1930 1940 1950 1960 1970 1980 1990 2000 2010 2020 2030 2040

T. gondii SAEEGSEADLERAVEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE DAYDALVDLFLMARRKIT VKDQVIDSELVYAYAKTD RLE

P. falciparum CDLSNRYEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

P. berghei TNVEKYEEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

P. yoelii TNIEENYEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

P. chabaudi TNIEENYEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

P. knowlesi LDARLYEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

P. vivax LDARLYEDDLNRAIEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

T. annulata GPSTVTTEKILKIMKYSEEINNMIFWFLGKIVLENNKIKESINCYLKSNNFTHHHEIKLKLMMNNQNNQINNQNNEDELLFLWLETKNIK PTSELIDILLHLAKLR FLO

B. bovis STTADVLEEAHEVYQSLDKSELWFLGRAYLGEKKVAQIDAYVRSGLSDHQRKHACSN EPELFLQWLSNGRALK KSRDLDTYLLCLADRG DID

N. caninum SAEEGSEADLERAVEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE DAYDALVDLFLMARRKIT VKDQVIDSELVYAYAKTD RLE

C. muris MSLDRAASYADKINTPELWSQIGTAQLDGLIRIPDAIESYLKADDPNSYSEVIELASRA GYELIKYLLMARSK MHEPDVDSALLIAYAKTN QLT

C. parvum SIEKLANMDLSKVQDFASVYCNDSVNDVILGQYQLKISRTKADVDFIKSENTDRYLRIIEHCLSV KAYRELLGYLQVRRRLKDSRTSKDPIVDTLAYCMSKLE LLQ

C. hominis SIEKLANMDLSKVQDFASVYCNDSVNDVILGQYQLKISRTKADVDFIKSENTDRYLRIIEHCLSV KAYRELLGYLQVRRRLKDSRTSKDPIVDTLAYCMSKLE LLQ

T. thermophila DDIPRAAEYAKRVNNPEVWSKIANAYLDRSQITEADISYIKAKDHTMYLQVISAABEID CKFDQLIKYLLMAREN IKDAQIDNALVFAYAKTE KIT

S. pombe VSLDRAQDYAEITVEQPEVWSRRAKALDGIPIPAIESYLKADDPNSYSEVIELASRA GYELIKYLLMARSK MHEPDVDSALLIAYAKTN QLT

S. cerevisiae MSLDRAASYADKINTPELWSQIGTAQLDGLIRIPDAIESYLKADDPNSYSEVIELASRA GYELIKYLLMARSK MHEPDVDSALLIAYAKTN QLT

C. merolae KDIVMAHEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

D. discoideum GSIERAHEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

A. thaliana RSIERAVEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

D. melanogaster NNLERANEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

H. sapiens GNLDRAYEFAQRCEADVNRKLGRAQLRQKVRDAIESFLKAGDGDVKEVVAFAAABE NFYEHLITYLNTLREQNS LKDLVLDSELYAYAKLK RTN

2050 2060 2070 2080 2090 2100 2110 2120 2130 2140 2150 2160

T. gondii EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. falciparum EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. berghei EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. yoelii EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. chabaudi EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. knowlesi EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

P. vivax EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

T. annulata HFNFLINSSVTVTGTGTGTEVTGTVVPSSTTIGASTVTEGKGANSTAMECPTPTPTTNTKTIIGITGDPVTDLSNISIDNMKIDLMIVGNELIKLGLYMAEIQVFIKNNYKIAICYI

B. bovis KFEKVLNG QHSADVGVGSKLMSESRKYREAVLIISSIPNFAKALALCHV

N. caninum EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

C. muris ELQNFLLQG INTVQLQRIQDRMLDEGLFKYSIIFQYQALPNYSRLTTCYI

C. parvum DLQSFLLQG INTVQLQRIQDRMLDEGLFKYSIIFQYQALPNYSRLTTCYI

C. hominis DLQNFLLQG INTVQLQRIQDRMLDEGLFKYSIIFQYQALPNYSRLTTCYI

T. thermophila DLENFTSN SNSVDYQVRGDCRYDEKHVEAKLFTATKNNAKIASCLV

S. pombe EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

S. cerevisiae EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

C. merolae QLEELLAS PQSADLDVGDRLFAEQRYKAARKLYASLPYAKLASCFV

D. discoideum EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

A. thaliana EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

D. melanogaster EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

H. sapiens EMDAFLSG TANTANVQVGDRLFAEQRYKAARKLYASLPYAKLASCFV

2170 2180 2190 2200 2210 2220 2230 2240 2250 2260 2270 2280

T. gondii RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. falciparum RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. berghei RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. yoelii RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. chabaudi RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. knowlesi RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

P. vivax RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

T. annulata RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

B. bovis RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

N. caninum RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

C. muris RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

C. parvum RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

C. hominis RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

T. thermophila RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

S. pombe RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

S. cerevisiae RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

C. merolae RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

D. discoideum RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

A. thaliana RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

D. melanogaster RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

H. sapiens RLEDFASVDAARAKANKPTKWEVAFALSKG ELKCAHAALSLIVHDPHLSLIEREYQLCFKELIELLEQLGQ GERTHVGLYTELGLVYATYESSKIMDYIRQ HSGK

2290 2300 2310 2320 2330 2340 2350 2360 2370 2380 2390 2400

T. gondii VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. falciparum VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. berghei VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. yoelii VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. chabaudi VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. knowlesi VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

P. vivax VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

T. annulata VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

B. bovis VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

N. caninum VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

C. muris VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

C. parvum VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

C. hominis VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

T. thermophila VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

S. pombe VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

S. cerevisiae VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

C. merolae VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

D. discoideum VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

A. thaliana VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

D. melanogaster VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

H. sapiens VNIPRLIRACERQSLWKEAVLYLHMNDYEQAANCLIMH-PAAWSEHLFVQILQKVSNSDVFYRAISFYLEYHPLQLCLLLKSLDK KLDHSRVQVHRKA

