

Sec61 Alpha Subunit

1 10 20 30 40 50 60
-----MAKGSRLLDLLRPAMAILPEVAKPSKTVKFQEKVLWTAVALF
-----MAKGLRFLNLIKPALCVIPEVSSPDRRVPFKERVLTWLTISLF
-----MAKGLRFLNLIKPALCVIPEVSSPDRRVPFKERVLTWLTISLF
-----MVRFLNLIKPVMFLLPEVQSPDRKLPFKEKLLWTAVALF
-----MFLLEPVQSPDRKLPFKEKLLWTAVALF
-----MGKGCFFNQLF-----TKLVLFKEMLMWTTGMSLF
-----MGKGRVNLNIKPIMPILPEVKTPTKRVLFKEMLMWTTGMSLF
-----MTKQANWMLSLKPLMLAVLPEIEKPRRMPGIKERIMWTAVALF
-----MTKQANWMLSLKPLMLAVLPEIEKPRRVPGIKERIMWTAVALF
-----MTDILMKMSPILAFLEPVATPLRVVPIRERIMWTFVALF
-----MKNYMMMAQPILALLPEVSRPQRIPPIKERIMWTAVALF
-----MGFDILKSIRPVLELMPNVPRPNKKVPIRKRLFYTFASLA
--MLQFVKSQKRKTRGRGARMVATWLVLDPWARMPLPSVEKAPKTVRFTTKGLYTFLLALI
--MLQFVKSQKRKTRGRGARMVATWLVLDPWARMPLPSVEKAPKTVRFTTKGLYTFLLALI
--MLQFVKSQKRKTRERGARMVATWLVLDPWARMPLPSVEKAPKTVRFTTKGLYTFLLALI
MTCIQFVKSQKRKRRYKAEEMVATWLVLDPWARMPLPSVEKAPKSVRFTTKGLYTFLLALI

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

IYLVCCQIPVYGI RNASSSDPLYWMRVILASNRGTMELGISPVITAGLI IQLLSGARLI
VFLVCCQIPLYGVLSSKSSDPFYWVRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
VFLVCCQIPLYGVLSSKSSDPFYWVRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
VFLICCCQIPLYGIVTSKLSDDPFYWMRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
VFLICCCQIPLYGIVTSKLSDDPFYWMRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
IFLVCCQIPIYGAITNKSSDPFYWMRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
IFLVCCQIPIYGAITNKSSDPFYWMRVILASNRGTMELGISPIVTSMMVMQLLAGSKII
VFLICCCQVPVYGARPGNASDPFYWMRIVLASNKGTLMELGISPIVSASLIELELAGVRIL
VFLICCCQVPVYGARPGQASDPFYWMRVVILASNKGTLMELGISPIVTSASLVMELLVGVRIL
IFLVCCQVPVYGARPGQTSDDPFYWMRVVILASNKGTLMELGISPIVTSASLIMELLSGVKII
VYLICTLVPLVYGQKTAGDDPMQHLRLTASSKYSLMEFGISPIVTSGMILQFLCSFGLI
VYLTASQVPLYGLHSSIRKDPFLWLRISIFAGQRGSLMELGIGPTITSSFFLKILISSKVL
VYLTASQVPLYGLHSSIRKDPFLWLRISIFAGQRGSLMELGIGPTITSSFFLKILISSKVL
VYLTASQVPLYGLHSSIRKDPFLWLRISIFAGQRGSLMELGIGPTITSSFFLKILISSKVL
VYLTASQVPLYGLHASIRKDPFLWLRISIFAGQRGSLMELGIGPTITSSFFLKILISSKLL

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

DVDENSQEDQILLNGAQKF FGLIMTIVEAVAYVASGMYGDVDRDLGLVTALLIVLQLFVAG
DVDQSLKEDRALFQGAQKLFGLLITLGEAVAYVISGMYGDIRTIGAWNAILIIIIQLFFAG
DVDQSLKEDRALFQGAQKLFGLLITLGEAVAYVISGMYGDIRTIGAWNAILIIIIQLFFAG
DVDQSLKEDRTL FQGAQKLLGLLITLGEAIAYVISGIYGNISEIGTGHAI IIIIQLFFAG
DVDQSLKEDRTL FQGAQKLLGLLITLGEAIAYVVSIGIYGNISEIGTGHAI IIIIQLFFAG
DVDQSLKEDRDLYQAAEKLGLLVTLGEAVAYVVSIGIYGNISEIGTGHAI IIIIQLFFAG
DVDQSLKEDRDLYQAAEKLGLLVTLGEAVAYVVSIGIYGNISEIGTGHAI IIIIQLFFAG
TYDPNNERERAVFEGFQKMMGLVITAVEAVAYVSSGMYGDPSRIGVVMCGLIVLQLMVAT
TYDQNNRERERAVFEGFQKMMGLVITAVEAVAYVSSGMYGDPSRIGVVMCGLIVLQLMVAT
SYDINNKRERAVYEGVQKIVALFITIVEATAYVSSGMYGDVREIGVFMCGLIVLQLTFTAT
SYDVNDKREAVFEGIQKIALFITAVEAMAYVSSGMYGDVREIGTIMSGFIVLQMLLAT
NRNPSDEPEASALFDAAGKLLGLLITLGEAVAYVISGMYGDIRTIGAWNAILIIIIQLFFAG
PFDKNNEVESQVFNVRQNLIGFI FTFFQAVLYVLAGIYGSISQIGLFSAVAI IAQLTISS
PFDKNNEVESQVFNVRQNLIGFI FTFFQAVLYVLAGIYGSISQIGLFSAVAI IAQLTISS
PFDKNNEVESQVFNVRQNLIGFI FTFFQAVLYVLAGIYGSISQIGMFSAVAI IAQLTISS
PFDRSNEAESQAFNVRQNLIGFI FTFFQAVLYVLAGIYGSISQIGLFSAVAI IAQLTISS

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

IVCLLDELLELQKGYGLGSGISLFIATNICETIIWKSFSFSPSTINTGRGTEFEGAI IALFHM
VVVILLDELLELQKGYGLGSGISLFIATNICETI VWKAFSPTTINTGRGTEFEGAVIALFHL
VVVILLDELLELQKGYGLGSGISLFIATNICETI VWKAFSPTTINTGRGTEFEGAVIALFHL
VVVILLDELLELQKGYGLGSGISLFIATNICETI MWKSFSPTTINTDKGIEFEGAIISLIYC
VVVILLDELLELQKGYGLGSGISLFIATNICETI MWKSFSPTTINTDKGIEFEGAIISLIYC
VVVILLFDEMLQKGYGLGSGISLFIATNICETI LWKAFSPTTISTDKGTEFEGALISLFCY
VVVILLFDEMLQKGYGLGSGISLFIATNICETI LWKAFSPTTISTDKGTEFEGALISLFCY
MICILLDELLELQKGYGIGSGTSLFIATNVCDTIIWKAFFSPTINTGRGAEFEGAI IAFFHL
MICILLDELLELQKGYGIGSGTSLFIATNVCDTIIWKAFFSPTINTGRGAEFEGAI IAFFHL
MYCILLDELLELQNGWGLGAGTSLFIATNICDTIIWKCFSPTINTGRGSEFEGAI IAFFHL
LICILLDELLELQKGYGLGAGTSLFIATNICDTIIWKSFSPTINTGRGAEFEGAI IAFFHL
IVVILLDELLELQNGYIGSGISLFICTNICEMIMWRLFSFNHYSMGRGTEYGLVIAFFHY
ILVQVLDEMLENGWIGSGISLFTTANVCENIIWKSFSFRRIDRGNKGEFEGAVLA AVHY
ILVQVLDEMLENGWIGSGISLFTTANVCENIIWKSFSFRRIDRGNKGEFEGAVLA AVHY
ILVQVLDEMLENGWIGSGISLFTTANVCENIIWKSFSFRRIDRGNKGEFEGAVLA AVHY
ILVQVLDEMLENGWIGSGISLFTTANVCENIIWKSFSFRRIDRGNKGEFEGAI LA AVHY

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

LITRSDKVRALKEAFYRPNL PNITNLLATILVFLIVIVYFQGRVVELPLRSSRQ-SGSAGA
LFTKPKDISALREAFYRSHATNMTNLLATVFLVFLIVIVYFQGRVLDLAVKYQKV-RGQQGS
LFTKPKDISALREAFYRSHATNMTNLLATVFLVFLVFLIVIVYFQGRVLDLAVKYQKV-RGQQGS
LFTESNKSALKKAFYRTHAPNVNLLATILVFLVFLIVYIQGRVLDLAVKYQSV-RGQQGT
LFTESNKSALKKAFYRTHAPNVNLLATILVFLVFLIVYIQGRVLDLAVKYQSV-RGQQGT
FFTCKNKL SAFKEAFYRNHAPNVNLLATALIFVIVYIQGRVLDLAVKYQSM-RGQRGT
FFTCKNKL SAFKEAFYRNHAPNVNLLATALIFVIVYIQGRVLDLAVKYQSM-RGQRGT
LVSRDTKVRALKEAFYRPNLPNL TNIFSTAVVAVVVVFFQGRVPLMTKSKFN-GNDRQP
LVSRDTKVRALKEAFYRPNLPNL TNIFSTAVVAVVVVFFQGRVPLMTKSKFN-GNDRQP
LVSRDTKVRALKEAFYRPNLPNL TNIFSTAVVAVVVVFFQGRVPLMTKSKFN-GNDRQP
LVTRTDKVRALKEAFYRPNLPNL TNVFATVLLFAVVVFLQGRVPLMTKSRNA-AADRQP
LVSRSDKMRALKEAFYRPNLPNL TNIFATLVFAVVVFFQGRVPLMTKSRNA-AADRQP
LFTRNKLRALRDIVFRPQLPNLCQLFSTVIVFGACIYFDQIKINVGLETTVN-RARPEP
MFTQPNKLKAIKLAFFRDGLTNVMNIIATLVVFLVAIYIYLGQIKRNLRIQHAKAGPSVQQQ
MFTQPNKLKAIKLAFFRDGLTNVMNIIATLVVFLVAIYIYLGQIKRNLRIQHAKAGPSVQQQ
MFTQPNKLKAIKLAFFRDGLTNVMNIIATLVVFLVAIYIYLGQIKRNLRIQHAKAGPSVQQQ
MFTQPNKLKAIKLAFFRDGLTNLMNIIATLVVFLVAIYIYLGQIKRNLRIQHAKAGPSVQQQ

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

YPIRLFYTSNMP IILQ TALVSNLYFFSQLLYRRFKS-NMLVNILGQWQELDVG----GQS
FPIKLFYTSNIP IILQ TALVSNLYFFSQLLYRRFKS-NMLVNILGQWQELDVG----GQS
FPIKLFYTSNIP IILQ TALVSNLYFFSQLLYRRFKS-NMLVNILGQWQELDVG----GQS
YPIKLFYTSNIP IILQ TALVSNLYFFSQILYKRKFN-SILVNLLGQWQEVESSE----GTS
YPIKLFYTSNIP IILQ TALVSNLYFFSQILYKRKFN-SILVNLLGQWQEVESSE----GTS
YPIKLFYTSNIP IILQ TALVSNLYFFSQILYKRKFN-NLFANLLGQWQETD-H----GTS
YPIKLFYTSNIP IILQ TALVSNLYFFSQILYKRKFN-NLFANLLGQWQETD-H----GTS
YMIKLFYTSNMP IILQ TS SVVSNISFFSQILSRRFGNRNFLINLLGRWEERGYNGGGNGQL
YMIKLFYTSNMP IILQ TS SVVSNISFFSQILSRRFGNRNFLINLLGRWEERGYNGGGNGQL
YIIKLFYTSNMP IILQ TS SVVSNINFFSQILSRRFGQFNFLINLLGRWESRAYS--QSQQM
YMIKLFYTSNMP IILQ TS SVVSNINFFSQILSRRFGQHNFLINLLGRWESRAYS--QSQQM
FEIKLFYCSNTPLIIQSTILSQLAGFSRTIYFHWPESLATAQIFGVWRSHNGMS--YDYS
YPIRLLYASSTPMMIISTLTSNVFMISQAIWRRFGN-SIFTALLGTWAEVESRP---GQA
YPIRLLYASSTPMMIISTLTSNVFMISQAIWRRFGN-SIFTALLGTWAEVESRP---GQA
YPIRLLYASSTPMMIISTLTSNVFMISQAIWRRFGN-SIFTALLGTWAEVESRP---GQA
YPIRLLYASSTPMMIISTLTSNVFMISQAIWRRFGN-SIFTALLGTWAEVESRP---GQA

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

VPVGGIYYISPPGNL NEMLVDP IHAIIYIAFMLGSCALFSRIWINVSGSSPKDVARQLK
IPVGGIAYYISPPNSLVDVSDPIHTFFYISFVLISCALFSKWTWIEVSGSSAKDVAKQLR
IPVGGIAYYISPPNSLVDVSDPIHTFFYISFVLISCALFSKWTWIEVSGSSAKDVAKQLR
IPIGGIAYYISPPNSFADITNDP FHTLVYISFVLVACAFFSKTWIEVSGSSAKDVAKQLR
IPIGGIAYYISPPNSFADITNDP FHTLVYISFVLVACAFFSKTWIEVSGSSAKDVAKQLR
IPIGGIAYYISPPNSFADITNDP FHTLVYISFVLVACAFFSKTWIEVSGSSAKDVAKQLR
VPIGGIAYYLSPPSTFKDIINDPLHTLLYITFVLVSCAVFSKWTWIEISGSSARDVAKQLR
VPIGGIAYYLSPPSTFKDIINDPLHTLLYITFVLVSCAVFSKWTWIEISGSSARDVAKQLR
VPIGGIAYYLVPPATFYDLLADPIHAIFVYVFLVTSKAVFSRLWITISHTAPRDVAKQLA
FPVGGIAYYLVPPATFYDLLADPIHAIFVYVFLVTSKAVFSRLWITISHTAPRDVAKQLA
YPVGGIAYYLVPPATFYDMINDPVHAVLYIVFVILFSCATFSKLVVAISHTGPRDVAKRLV
FPVGGIAYYLVPPATFYDLLADPIHAIFVYVFLVTSKAVFSRLWITISHTGPRDVAKRLV
TPVSGIYYLVPPATFYDMINDPVHAVLYIVFVILFSCATFSKLVVAISHTGPRDVAKRLV
FPTGGLAWILASPYSLRSALFHPVHTLHVAITLVALSGLISRVMVEFSGEGAKEVAEMLE
FPTGGLAWILASPYSLRSALFHPVHTLHVAITLVALSGLISRVMVEFSGEGAKEVAEMLE
FPTGGLAWILASPYSLRSALFHPVHTLHVAITLVALSGLISRVMVEFSGEGAKEVAEMLE
FPTGGLAWILASPYSLRSALFHPVHTLHVAITLVALSGLISRVMVEFSGEGAKEVAEMLE

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

EQQLNIAGHRDPPKEMINTLNKYIPTAAAVGGMCI GALTIVADFLGAI GSGTGILLAVGI
DQQMIMKGYRDS--SLVQVLNRYIPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
DQQMIMKGYRDS--SLVQVLNRYIPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
DQQIGMRGRDTPS LTRVFNRYIPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
DQQIGMRGRDTPS LTRVFNRYIPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
DQRIGMVGHRDTPS LTKVFSRYVPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
DQRIGMVGHRDTPS LTKVFSRYVPTAAAFGGMCIGALTIIADFLGAI GSGTGILLAVTI
SQGRWLVAQARESEDDMTRLLEKYIPVAASFGLCVGALTIFADFLGAI GSGTGILLAVTI
SQGRWLVAQARESEDDMTRLLEKYIPVAASFGLCVGALTIFADFLGAI GSGTGILLAVTI
SEGRWLAQARESEDDMARLLEKYIPVAASFGLCVGALTIFADFLGAI GSGTGILLAVTI
AEGRWLAQARESEDDMARLLEKYIPVAASFGLCVGALTIFADFLGAI GSGTGILLAVTI
KQHLTLKGHREDQKREKTLKRYIPTAAALGGILVALLSFVADFLSAFGSGTGILLAVSI
TNGWCMPGYMTKG-ALQRELNRYIPTAALAGGLILGFVGF CADIFGAI GSGTGILLAATT
TNGWCMPGYMTKG-ALQRELNRYIPTAALAGGLILGFVGF CADIFGAI GSGTGILLAATT
TNGWCMPGYMTKG-ALQRELNRYIPTAALAGGLILGFVGF CADIFGAI GSGTGILLAATT
TNGWCMPGYMTKG-ALQRELNRYIPTAALAGGLILGFVGF CADIFGAI GSGTGILLAATT

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Trichomonas vaginalis G3
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B

IYQYFEMFAKQ QDELDIPFLSGQ-----
IFQYYEMFAKERESGNIVF-----
IFQYYEMFAKERESGNIVF-----
IYQFYEMLVKEQEKAASLF-----
IYQFYEMLVKEQEKAASLF-----
IYQYFEILVKEQERSGSLLYG-----
IYQYFEILVKEQERSGSLLYG-----
INQYFEILQEQEQDLYGFLKQKVA---
INQYFEILQEQEQDLYGFLKQKVA---
INQYDILREEGEDLYGNFIKRKVA---
INQYFEILQEQEQDLYGFLKQKVA---
INQFTAE LSKEMAGDGLIGILKNAAGAR
LVKMYEEFAKEGIQLSM-----
LVKMYEEFAKEGIQLSM-----
LVKMYEEFAKEGIQLSM-----
LVKMYEEFAKEGIQLSM-----

Ribosomal Protein L14p/L23e

1 10 20 30 40 50 60

| | | | | | |

Naegleria gruberi strain NEG-M -----MASKRATGGLGNKFRISTALPTAAVMNCADNSGAKNLYVIAVNQTQGRLNRLP
Giardia lamblia GS_B -----MASKRGRSG-GIGNKFRISCGLPVGAVINCADNSGAKSLNMIAVKNWKGHLNRF
Giardia lamblia WB_A1 -----MASKRGRSG-GIGNKFRISCGLPVGAVINCADNSGAKSLNMIAVKNWKGHLNRF
Giardia lamblia DH_A2 -----MASKRGRSG-GIGNKFRISCGLPVGAVINCADNSGAKSLNMIAVKNWKGHLNRF
Giardia lamblia Pig_E -----MASKRGRSG-GIGNKFRISCGLPVGAVINCADNSGAKSLNMIAVKNWKGHLNRF
Trichomonas vaginalis G3 -----MSKRGRG-TGQGTGFAMTAGLPVGAVINCCDNSGAKNMFIIISVRGHKGRNLRLP
Cryptosporidium hominis TU502 -----MKRGRGA-AGGAKMRITLGLNVGALINCCDNSGGKNLYIIAVKGTGSCLNRLP
Cryptosporidium parvum Iowa II YSLYLEKMKRGRGA-AGGAKMRITLGLNVGALINCCDNSGGKNLYIIAVKGTGSCLNRLP
Theileria annulata strain Ankara -----MKRGRGG-SGGNKL RVTLGLPVGALINCCDNSGGKNLYIIAVKGTGACLNRLP
Theileria parva strain Muguga -----MKRGRGG-SGGNKL RVTLGLPVGALINCCDNSGGKNLYIIAVKGTGACLNRLP
Plasmodium falciparum 3D7 -----MKRGRAG-TLKNKMRITLSLPVGALINCCDNSGGKNLYIIAVQGFSGCLNRLP
Plasmodium knowlesi strain H -----MKRGRAG-TLKNKMRITLSLPVGALINCCDNSGGKNLYIIAVQGFSGCLNRLP
Leishmania infantum JPCM5 -----MGKDQAN-VKGC FRVSVLALPVGAVVNCADNTGAKNLYVISVKGYHGRLNRLP
Leishmania major strain Friedlin -----MGKDQAN-VKGC FRVSVLALPVGAVVNCADNTGAKNLYVISVKGYHGRLNRLP
Trypanosoma brucei gambiense DAL972 -----MGKDKAN-VKGC FRVSLALPVGAVVNCADNTGAKNLYIISVKGYHGRLNRLP
Trypanosoma cruzi strain CL Brener -----MGKDKAN-VKGC FRVSLALPVGAVVNCADNTGAKNLYIISVKGYHGRLNRLP

Naegleria gruberi strain NEG-M AAGVGDMMATVKK-GKPELRKKVMPAVVIRQRKPWRRRDGTFFIYFEDNAGVIVNKGEM
Giardia lamblia GS_B KASVGDMLITVGRDGGKPELRKRVTPAVVVRQRKVVRRKDGWVIYFQDNAGVIINPKGEL
Giardia lamblia WB_A1 KASVGDMLITVGRDGGKPELRKRVTPAVVVRQRKVVRRKDGWVIYFQDNAGVIINPKGEL
Giardia lamblia DH_A2 KASVGDMLITVGRDGGKPELRKRVTPAVVVRQRKVVRRKDGWVIYFQDNAGVIINPKGEL
Giardia lamblia Pig_E KASVGDMLITVGRDGGKPELRKRVTPAVVVRQRKIWRRKDGWVIYFQDNAGVIINPKGEL
Trichomonas vaginalis G3 AASVSDLIVVTCKK-GKPALRKKVSMGVVVRQRAIWRKDGVVIGFQDNAGVIINDKGEM
Cryptosporidium hominis TU502 SASIGDMLLATVKK-GKPELRKKVWPAVIVRQRKAFRRPEGTFLYFEDNAGVIVNPKGEM
Cryptosporidium parvum Iowa II SASIGDMLLATVKK-GKPELRKKVWPAVIVRQRKAFRRPEGTFLYFEDNAGVIVNPKGEM
Theileria annulata strain Ankara SASVGDMLLATVKK-GRPDLRKKVLPAVIVRQRKAWRRREGYFIYFEDNAGVIVNPKGEM
Theileria parva strain Muguga SASVGDMLLATVKK-GRPDLRKKVLPAVIVRQRKAWRRREGYFIYFEDNAGVIVNPKGEM
Plasmodium falciparum 3D7 AASLDGMLLATVKK-GKPDRLRKKVLNAIICRQSKAWRRHEGYIYFEDNAGVIVNPKGEM
Plasmodium knowlesi strain H AASLDGMLLATVKK-GKPDRLRKKVLNAIITRQSKAWRRHEGYFIYFEDNAGVIVNPKGEM
Leishmania infantum JPCM5 SAALGDMVMCSVKK-GKPELRKKVLNAVIIRQRKSWRRKDGTVIYFEDNAGVIVNPKGEM
Leishmania major strain Friedlin SAALGDMVMCSVKK-GKPELRKKVLNAVIIRQRKSWRRKDGTVIYFEDNAGVIVNPKGEM
Trypanosoma brucei gambiense DAL972 AAALGDMVMASVKK-GKPELRKRVLNAVIIRQRKSWRRKDGTVIYFEDNAGVIVNPKGEM
Trypanosoma cruzi strain CL Brener AAALGDIVMASVKK-GKPELRKRVLNAVIIRQRKSWRRKDGTVIYFEDNAGVIVNPKGEM

Naegleria gruberi strain NEG-M KGSVAVAGPVAKECADMWPRIASSASCVV
Giardia lamblia GS_B KGSSITGPVAKEAADRWPKISTTAECVH
Giardia lamblia WB_A1 KGSSITGPVAKEAADRWPKISTTAECVH
Giardia lamblia DH_A2 KGSSITGPVAKEAADRWPKISTTAECVH
Giardia lamblia Pig_E KGSSITGPVAKEAADRWPKISTTAECVH
Trichomonas vaginalis G3 KGSAITGPVAKEAAELWPKVASVAPAVF
Cryptosporidium hominis TU502 KGSAITGPVGKECAELWPKVSAAPSIV
Cryptosporidium parvum Iowa II KGSAITGPVGKECAELWPKVSAAPSIV
Theileria annulata strain Ankara KGSAINGPVAKECAELWPKISAAAPSIV
Theileria parva strain Muguga KGSAINGPVAKECAELWPKISAAAPSIV
Plasmodium falciparum 3D7 KGSAITGPVARECAELWPKLSSAASAIV
Plasmodium knowlesi strain H KGSAITGPVARECAELWPKLSSAASAIV
Leishmania infantum JPCM5 KGSGIAGPVAKESADLWPKISTHAPAIV
Leishmania major strain Friedlin KGSGIAGPVAKESADLWPKISTHAPAIV
Trypanosoma brucei gambiense DAL972 KGSGIAGPVAKESADLWPKISTHAPAIV
Trypanosoma cruzi strain CL Brener KGSGIAGPVAKESADLWPKISSHAPAIV

SSU Ribosomal Protein_S2P

1 10 20 30 40 50 60

| | | | | | |

Naegleria gruberi strain NEG-M -MSLTKNAKSNILDLTPTDVQQLACECHKGTKNLETDQMKYVHGRSQKDGTHVINVAKT
Cryptosporidium hominis TU502 -----MPPAETRKLDIAKMI VCKTHIGTKNVEDKMLS YVYKRT-HEGIFLINLAKT
Cryptosporidium parvum Iowa II ----LYSNMPPAETRKLDIAKMI VCKTHIGTKNVEDKMLS YVYKRT-HEGIFLINLAKT
Plasmodium falciparum 3D7 ----MS-NKKGQSPKEESI AKMLICKVHIGTKNLENKMKRYVYTRA-KDGVHIINLAKT
Plasmodium knowlesi strain H ----MSTNKKVQSPKEESI AKMLICKVHIGTKNLENKMKRYVYTRA-KDGVHILNLAKT
Theileria annulata strain Ankara ----MAAPTS KLTPEDSIRMM LTA KVHIGTKNVENKMRKYVYSRT-QEGVHLINLAHT
Theileria parva strain Muguga ----MAAPTS KLTPEDSIRMM LTA KVHIGTKNVENKMRKYVYSRT-QEGVHLINLAHT
Leishmania infantum JPCM5 --MTAVESGSKVLRMKESDAQKLLAMRCHIGTRNQSSAMKKYIYGR T-AEGSHIIDLHMM
Leishmania major strain Friedlin --MSAVESGSKVLRMKESDAQKLLAMRCHIGTRNQSSAMKKYIYGR T-AEGSHIIDVHMM
Trypanosoma brucei gambiense DAL972 --MTSVSSGAKVLRMKESDVQKLLAMHCHLGTKNSSSAMKKYIHGR T-SDGTNIIDIHMT
Trypanosoma cruzi strain CL Brener --MTSVESGAKVLRMKEGDVQKLVAMHCHLGTKNRSNAMKKYIHSRT-KEGTNIIDLHMT
Trichomonas vaginalis G3 -----MSTAAAADREAVIKMMLAAKVYLGSTNLSFGMKPYVFTCR-KDGTHTVINLAMT
Giardia lamblia DH_A2 MSTEKTSQASKEYQLKEADVKKMLVATTHLGV RNIDRRMQFYIFDRQ-KDGT FVFNLQKV
Giardia lamblia WB_A1 MSTEKTSQASKEYQLKEADVKKMLVATTHLGV RNIDRRMQFYIFDRQ-KDGT FVFNLQKV
Giardia lamblia Pig_E MSTEKTSQASKEYQLKEADVKKMLVATTHLGV RNIDRRMQFYIFDRQ-KDGT FVFNLQKV
Giardia lamblia GS_B MSTEKTSQASKEYQLKEADVKKMLVATTHLGV RNIDRRMQFYIFDRQ-KDGT FVFNLQKV

Naegleria gruberi strain NEG-M HEKLLLAARVLVTIENPKDICAISSKQYGHRAVLKFGSYTGANYLAGKFTPGTFTNQVQA
Cryptosporidium hominis TU502 WEKIQIAARIIATIDNLDVVVVSQRPYGSRALPKFAQHTGAHAMVGRFTPGTLTNQITQ
Cryptosporidium parvum Iowa II WEKIQIAARIIATIDNLDVVVVSQRPYGSRALPKFAQHTGAHAMVGRFTPGTLTNQITQ
Plasmodium falciparum 3D7 YEKLQLAARIIVAINSPADVVVVSARPFGRSAVLKFAQYTGQAIAGRWTPGMLTNQIIQ
Plasmodium knowlesi strain H YEKLQLAARIIVAINNPADVVVVSARPFGRSAVLKFAQYTGQAIAGRWTPGMLTNQIIQ
Theileria annulata strain Ankara LEKLKVAARAI VTVSNPEE VVVVSARPYGSRAVLKFSHYVGSHP IAGR WIPGTLTNQITQ
Theileria parva strain Muguga LEKLKVAARAI VTVSNPEE VVVVSARPYGSRAVLKFSHYVGSHP IAGR WIPGTLTNQITQ
Leishmania infantum JPCM5 WEKLILAAARVIAAVENPKDVCVCSRLYGT RAIYKFSQHVGTSFHGGRFIPGTFTNQIQK
Leishmania major strain Friedlin WEKLILAAARVIAAVENPKDVCVCSRLYGT RAIYKFSQHVGTSFHGGRFIPGTFTNQIQK
Trypanosoma brucei gambiense DAL972 WEKLILAAARVIAAVENPDVTVCSTRLFGQRAIFKFSQLVGT SFLGGRFIPGTFTNQIQK
Trypanosoma cruzi strain CL Brener WEKLILAAARVIAAVENPDVTVCSTRLFGQRAIFKFSQLVGT SFLGGRFIPGTFTNQIQK
Trichomonas vaginalis G3 YEKIKLAARMIYAVEEPKDVLAISTKSGTRAVHKFAEFLGANYVEQRFTPGLFTNYSIK
Giardia lamblia DH_A2 WAKIVFAARILVTIDDPAEI AVVANRPDAQRSILKFKCYTHATAFPGRFIPGNFTNRMNP
Giardia lamblia WB_A1 WAKIVFAARILVTIDDPAEI AVVANRPDAQR AILKFKCYTHATAFPGRFIPGNFTNRMNP
Giardia lamblia Pig_E WAKIVFAARILVTIDDPAEI AVVANRPDAQR AILKFKCYTHATAFPGRFIPGNFTNRMNP
Giardia lamblia GS_B WAKIVFAARILVTIDDPAEI AVVANRPDAQR AILKFKCYTHATAFPGRFIPGNFTNRMNP

Naegleria gruberi strain NEG-M KFMEPRVLIVSDPRSDYQAIKEASKANIPVIAFADTDSPLKFVDIAIPVNNKNKNSIALM
Cryptosporidium hominis TU502 KFMEPRLLIVTDP RVDSQAVIESSYANIPVIALC DTDSP LQYVDVAIPCNNKGKESIALM
Cryptosporidium parvum Iowa II KFMEPRLLIVTDP RVDSQAVIESSYANIPVIALC DTDSP LQYVDVAIPCNNKGKESIALM
Plasmodium falciparum 3D7 KFTEPRLLIVTDPRTDAQSVKESAYANIPVIALCSDS PLEHVDIAIPCNNKGKESIALM
Plasmodium knowlesi strain H KFTEPRLLIVTDPRTDAQSVKESAYANIPVIALCSDS PLEHVDIAIPCNNKGKESIALM
Theileria annulata strain Ankara KFIEPRLLVATDPRTDAQSLKESYVSLPVIALC DTDSP LNYVDIAIPCNNKGKESIALM
Theileria parva strain Muguga KFIEPRLLVATDPRTDAQSLRESSYVSLPVIALC DTDSP LNYVDIAIPCNNKGKESIALM
Leishmania infantum JPCM5 KFVQPRVLLVTDPRTDHQAI REASLVNIPVIALC DTDAPLEYVDIAIPCNNRGIKSIGMM
Leishmania major strain Friedlin KFVQPRVLLVTDPRTDHQAI REASLVNIPVIALC DTDAPLEYVDIAIPCNNRGIKSIGMM
Trypanosoma brucei gambiense DAL972 KFMQPRVLLVTDPRTDHQALREASLVNIPVIAFC DTDAPLEFVDIAIPCNNRGRHSISMM
Trypanosoma cruzi strain CL Brener KFMQPRVLLVTDPRTDHQALREASLVNIPVIAFC DTDAPLEFVDIAIPCNNRGRYSISMM
Trichomonas vaginalis G3 NFCEPRLMIVCDPNTDSQAVHEAAYANIPCIALC DTD AHLDYVDCVIPCNTKNKNSMGLV
Giardia lamblia DH_A2 NYCEPRLLLVNDPVVDRQAILEASYVNIPTISLCNS DANLKFIDVAIPCNNKTPMSIGLI
Giardia lamblia WB_A1 NYCEPRLLLVNDPVVDRQAILEASYVNIPTISLCNS DANLKFIDVAIPCNNKTPMSIGLI
Giardia lamblia Pig_E NYCEPRLLLVNDPVVDRQAILEASYVNIPTISLCNS DANLKFIDVAIPCNNKTPMSIGLI
Giardia lamblia GS_B NYCEPRLLLVNDPVVDRQAILEASYVNIPTISLCNS DANLKFIDVAIPCNNKTPMSIGLI

Naegleria gruberi strain NEG-M YWMLAREVLR LKGVVSRKKEWDVKPDLFLHRDLDE-----KKEEREAKESQ--ETKVQAV
Cryptosporidium hominis TU502 YLLAREVNFLR GKTDK---WDMVDVFFWRDPEEYENSAIGADMELNDGMGVDIEGA AV
Cryptosporidium parvum Iowa II YLLAREVNFLR GKTDK---WDMVDVFFWRDPEEYENSAIGADMELNDGMGVDIEGA AV
Plasmodium falciparum 3D7 YWLLAQEVL YLKGVI PRSEPWNVMVDMFLWRDPEQFELKNLANEENTPTAP--HLIENQY
Plasmodium knowlesi strain H YWLLAQEVL YLKGTL PRSKPWNVMVDMFLWRDPEQFELKNLAI EETAPAAP--HLTENQF
Theileria annulata strain Ankara YWLLAREVLYLRDQLKRWMPWDVLDVTF FWRDPEQFEQK-PEETVNTHEED--LMASRPN
Theileria parva strain Muguga YWLLAREVLYLRDQLKRWMPWDVLDVTF FWRDPEQFEQK-PEETVNTHEED--LLTSRPT
Leishmania infantum JPCM5 YWLLAREVLR LRGTI VRSVPWEEKVDLFFYRDPN-----EAAEKA-----AAAAAA
Leishmania major strain Friedlin YWLLAREVLR LRGTI VRSVPWEEKVDLFFYRDPN-----EAAEKA-----AAAAAA
Trypanosoma brucei gambiense DAL972 YWLLAREVLR LRGTI PRSVPWEVKVDLFFYRDP E-----EALKQEE-----ATAAAE
Trypanosoma cruzi strain CL Brener YWLLAREVLR LRGTI PRSVPWDVKVDLFFYRDP E-----EALKHEE-----VNQAAA
Trichomonas vaginalis G3 MWLLTREVLR LRGALTRTQEWVLPDLFFYRDAAD--EAKIAEAL EAGEETVSEEGAI I
Giardia lamblia DH_A2 YWLLAREVLR LKGSISRTEEWDVKPDLFVALPEEIP-----DEEESD-----FYD
Giardia lamblia WB_A1 YWLLAREVLR LKGSISRTEEWDVKPDLFVALPEEIP-----DEEESD-----FYD
Giardia lamblia Pig_E YWLLAREVLR LKGSISRTEEWDVKPDLFVALPEEIP-----DEEESD-----FYD
Giardia lamblia GS_B YWLLAREVLR LKGSILRTEEWDVKPDLFVALPEEIP-----AEEESD-----FYD

Naegleria gruberi strain NEG-M VAAETTEEAEEYE--GEGGQTAEWGMDQ-----
Cryptosporidium hominis TU502 DSAAAAANEWGGVSGNWGGSAAD EWRNAP-----
Cryptosporidium parvum Iowa II DSAAAAANEWGGVSGNWGGSAAD EWRNAP-----
Plasmodium falciparum 3D7 AA EAPYDEWTKKE-EWNDNTNEDWKNPIA-AEEW-----
Plasmodium knowlesi strain H ATEAPYEEWKNKE-EWNDNANE EWNPIA-AEEW-----
Theileria annulata strain Ankara VPLHPLPDWSTVD-PSHANS-SDWKVMAAGHEEWG SFVDTRAQWQ
Theileria parva strain Muguga VPLHPLPDWSTVD-PAHANS-SDWKVMAAGHEEWG SFVDTRAQWQ
Leishmania infantum JPCM5 PAAEAEEGFGWVE----RNDN AWEA-----
Leishmania major strain Friedlin PAAEAEEGFGWVE----RNDN AWEA-----
Trypanosoma brucei gambiense DAL972 VHEEADEGYGWVE----RDN--TWEQ-----
Trypanosoma cruzi strain CL Brener PVAEVDEGFGWVE----RDNN-AWEQ-----
Trichomonas vaginalis G3 NAAVPKAEIKAGATNEEWENKQEWDA-----
Giardia lamblia DH_A2 DDEEEDEEF SAGN----GNLFDEY-----
Giardia lamblia WB_A1 DDEEEDEEF SAGN----GNLFDEY-----
Giardia lamblia Pig_E DDEEEDEEF SAGN----GNLFDEY-----
Giardia lamblia GS_B DDDEEDEFSTGN----GNLFDE-----

SSU Ribosomal Protein S15

1 10 20 30 40 50 60

| | | | | | |
-----MAMENDELKNLFTSALRRRIGK-G
-----MADTEQKKRTFRTYSYRGVLDKLLTMKLDEVVELLPARKRRKIARGC
-----TSTREKKMADTEQKKRTFRTYSYRGVLDKLLTMKLDEVVELLPARKRRKIARGC
----MASNITAERYEQLKKERTFHKFTYRGGLEIDPLLALSEEEFRALVHARARRNMNRH-
----MASNITAERYEQLKKERTFHKFTYRGGLEIDPLLALSEEEFKALVHARARRNMNRH-
----MASNITQERYDQLKKERTFHKFTYRGGLEIDPLLALTEEEFKALVHARARRRMNRH-
----MTSNITQERYEQLKKERTFHKFTYRGGLEIDPLLALSEEEFKTLVHARARRHMNRH-
-----MEDANKPKK-RTFRTFQYRGVLDKLLDLSQDELIKL FKARQRRKFQRG-
-----MEDANKPKK-RTFRTFHRYRGVELDKLLDLSQEELVKLFRARQRRKFKRG-
-----MDGANRDDRILKK-RTFRTFKYRGYELEKLLLEMPIEKLELLPARQRRRFSRG-
-----MVEEQGVQILKK-RTFRTFKYRGYELEKLLLEMPIDKLELLPARQRRRFSRG-
-----MADQVKTRRRGLAQPFRGVEVEKLATMKITDILPKLNARCRRRIGKHG
-----MTDQVKTRRRGLAQPFRGVEVEKLATMKITDILPKLNARCRRRIGKHG
-----MADQVKTRRRGLVQPNFRGVEVEKLATMKITDILPKLNARCRRRIGKHG
MDSYISFLEGTADQTKTRRRGLAQPFRGVEVEKLVTKITDILPKLNARCRRRIGKHG
-----MSASGKFAQRNYTYRGKTLDDL RAMELKDFVELLPTKRRRFISRS-

ISKKYKTLIEKAQKKRD--TAPYGEKPDVAVKTHLRDMIILPSMIGCVIGVYQGKDYVSVE
LNRRTAAFIAKLRKSKA--ECPMGEKPVAVRTHLRNMVILPEMVGSVAGVYNGKTYVTVE
LNRRTAAFIAKLRKSKA--ECPMGEKPVAVRTHLRNMVILPEMVGSVAGVYNGKTYVTVE
VDRRPPVLLKRLREAKK--HVKVGEKPKAVKTHLRDVVITPEMVGSVVAIYNGHQFNAVE
ADRRPPVLLKRLREAKK--HVKVGEKPKAVKTHLRDVVITPEMVGSVVAIYNGHQFNAVE
ADRRAPVLLKRLREAKK--NVKAGEKPKAVKTHLRDVVITPEMVGSVVGIYNGRQFNAVE
ANRRAPVLLKRLREAKK--DVKAGEKPRAVKTHLRDVVITPEMVGSVVGIYNGRQFNAVE
ISKKAKSLLKKIRKSKK--NCEPGEKPNPVPHLRNMTIIPEMVGSIVAVHNGKQYTNVE
ISKKEKSLLKLRKAKK--ECEVGEKPRAIPTHLRNMTIIPEMVGSIVAVHNGKQYNNVE
VKRQSLTLLNKLRAAKK--DLPYGQKPEPVKTHLRNMVVIPEMIGSIVGVHNGKQYINVE
VKRQSLTLLKLRRAAKK--DLPYGQKPEPVKTHLRNMVVIPEMIGSIVGVHNGKQYINVE
LSMKHLRFVNKLRLRRA--AQPS-QKPKIVRTHLRDMIIFPEMIGMTVSVYNGRQFIPVE
LSMKHLRFVNKLRLRRA--AQPS-QKPKIVRTHLRDMIIFPEMIGMTVSVYNGRQFIPVE
LSMKHLRFVNKLRLRRT--AQPS-QKPKIVRTHLRDMIIFPEMIGMTVSVYNGRQFIPVE
LSMKHLRFVNKLRLRRA--AQPS-QKPKIVRTHLRDMIIFPEMIGMTVSVYNGRQFIPVE
FDLKHVHLIEKLLKARQAVEGQAGVRPPVVKTHLRHVMVILPEFVDNVIGIYDGHVFFEVQ

IKPEMVGMLSDFSITYKPVKHKPGIGATSSSKFVPLK
IKPEMIGMYLGEFSITYKPVHKGPGVGSTSSSRFIPLK
IKPEMIGMYLGEFSITYKPVHKGPGVGSTSSSRFIPLK
IKGEMIGHYLGEFSMSYRPVLHGRPGVATHSSRFIPIK
IKGEMIGHYLGEFSMSYRPVLHGRPGVATHSSRFIPIK
IKGEMIGHYLGEFSITYKPVHGRPGVATHSSRFIPLK
IKGEMIGHYLGEFSITYKPVHGRPGVATHSSRFIPLK
IKPEMIGYYLGEFSITYKPTRHKGPGIGATHSSRFIPLK
IKPEMIGYYLGEFSITYKPTRHKGPGIGATHSSRFIPLK
IKPEMIGYYLGEFSITYKPVHKGPGIGATHSSRFIPLK
IKPEMIGYYLGEFSITYKPVHKGPGIGATHSSRFIPLK
IKPPMVGRALREYSMSYKIVSHGKVGIGATRSSKFVPLR
IKPPMVGRALREYSMSYKIVSHGKVGIGATRSSKFVPLR
IKPPMVGRALREYSMSYKIVSHGKVGIGATRSSKFVPLR
IKPPMVGRALREYSMSYKIVSHGKVGIGATRSSKFVPLR
IKPEMIGHVLADFAPSKKVVKHSKAGVGATRSSSATS

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B
Trichomonas vaginalis G3

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B
Trichomonas vaginalis G3

Naegleria gruberi strain NEG-M
Cryptosporidium hominis TU502
Cryptosporidium parvum Iowa II
Leishmania infantum JPCM5
Leishmania major strain Friedlin
Trypanosoma brucei gambiense DAL972
Trypanosoma cruzi strain CL Brener
Plasmodium falciparum 3D7
Plasmodium knowlesi strain H
Theileria annulata strain Ankara
Theileria parva strain Muguga
Giardia lamblia DH_A2
Giardia lamblia WB_A1
Giardia lamblia Pig_E
Giardia lamblia GS_B
Trichomonas vaginalis G3

SSU Ribosomal Protein S15P

1 10 20 30 40 50 60

| | | | | | |

Naegleria gruberi strain NEG-M ---MGRMHGAGNGKSQSVIPYRRSPPTWLKVTAEEVEDKIVKLARKGYTPSQIGAILRDS
Cryptosporidium hominis TU502 ---MGRVYGRGKGISSSAKPYRRRPPTWIKLKPSEAEDLITKLARKGLTPSQIGVTLRDS
Cryptosporidium parvum Iowa II RGKMGRVYGRGKGISSSAKPYRRRPPTWIKLKPSEAEDLITKLARKGLTPSQIGVTLRDS
Plasmodium falciparum 3D7 ---MGRMYGKGGKGISSSTLPYKRKQPSWLKQKPSEIEDAIIKLAKKGQTPSQIGATLRDN
Plasmodium knowlesi strain H ---MGRMYGKGGKGISSSTIPYKRKQPSWLKQKPSEIEDAIIKLAKKGQTPSQIGATLRDN
Theileria annulata strain Ankara ---MGRMYGKGGKGISSSSIPYGRKPPSWLKT KPFEVEEQIAKLAKKGQTPSQIGVSLRDS
Theileria parva strain Muguga ---MGRMYGKGGKGISSSSIPYGRKPPSWLKT KPFEVEEQIAKLAKKGQTPSQIGVSLRDS
Trichomonas vaginalis G3 ---MGRLHSQGGKGISSSTCFRRSAPHWLQLTAEKCVQMICDYAKKGVRPSQIGALLRDR
Giardia lamblia DH_A2 ---MGRMHKGGKGISRSaipYTRAPAPWnkYTPEDVCEQICKLAKKGTPPSRIGLILRDQ
Giardia lamblia WB_A1 ---MGRMHKGGKGISRSaipYTRAPAPWnkYTPEDVCEQICKLAKKGTPPSRIGLILRDQ
Giardia lamblia GS_B ---MGRMHKGGKGISRSaipYTRAPAPWnkYTAEDVCEQICKLARKGTPPSRIGLILRDQ
Giardia lamblia Pig_E ---MGRMHKGGKGISRSaipYTRAPAPWnkYTPEDVCEQICKLARKGTPPSRIGLILRDQ
Leishmania infantum JPCM5 ---MVRMHGNGRGKASSALPYRRTPPAWLKIASRNvVkmVCKSSRKGMMPSQIGMELRDS
Leishmania major strain Friedlin ---MVRMHGNGRGKASSALPYRRTPPAWLKIASRNvVkmVCKSSRKGMMPSQIGMELRDS
Trypanosoma brucei gambiense DAL972 ---MVRMHGNGHGKAASALPYRRTPPPTWLKSSSRDVIDAVCKLAKKGLSPSRIGMQLRDS
Trypanosoma cruzi strain CL Brener ---MVRMQGVGHGKSASSLPFCRTPPSWLKIASRDVIDAVCKLAKKGLTPSRIGMQLRDS

Naegleria gruberi strain NEG-M DGIGRVKSVTGKKILRMLKSNGLAPEIPEDLYQLIKKAVGIRKHLEKTRKDRKAKYQLIL
Cryptosporidium hominis TU502 HGIPMVQSLTGSKILRILKKNGLAPDIPEDLYFLIKRAVSIRKHLEKFRKDTAAKYRLIL
Cryptosporidium parvum Iowa II HGIPMVQSLTGSKILRILKKNGLAPDIPEDLYFLIKRAVSIRKHLEKFRKDTAAKYRLIL
Plasmodium falciparum 3D7 YGIPQVKSVTGNKILRILRAQGIATTIPEDLYFLIKKAVSMRKHLEKNKKDKDKCKFRLIL
Plasmodium knowlesi strain H YGIPQVKAVTGNKILRILRAHGVAATTIPEDLYFLIKKAVSMRKHLEKNKKDKDKCKFRLIL
Theileria annulata strain Ankara MAIPQVKAVTNNKILRILKAQGLAPEIPEDLYFLIKKAVSMRKHMEQNLNDKDSKFRILIL
Theileria parva strain Muguga MAIPQVKAVTNNKILRILKAQGLAPEIPEDLYFLIKKAVSMRKHMEHNLNDKDSKFRILIL
Trichomonas vaginalis G3 NGVGMVRAVTGVKVLRIKANGLAPALPEELYHLIKKATNVRKHLEHAKHDVDSKYRLIL
Giardia lamblia DH_A2 FAIGQVKNVTGSKIVRILKAKGLAPEIPEDLYCMIKKAVAIRKHLERSRRDKDSKFRILIL
Giardia lamblia WB_A1 FAIGQVKNVTGSKIVRILKAKGLAPEIPEDLYCMIKKAVAIRKHLERSRRDKDSKFRILIL
Giardia lamblia GS_B FAIGQVKNITGSKIVRILKAKGLAPEIPEDLYCMIKKAVAIRKHLERSRRDKDSKFRILIL
Giardia lamblia Pig_E FAIGQVKNVTGSKIVRILKAKGLAPEIPEDLYCMIKKAVAIRKHLERSRRDKDSKFRILIL
Leishmania infantum JPCM5 MGIAQVKNVTGRKILRILKHSLAPEIPEDLYFLVVKRATQMRKHLERHTTDRDTKYRLIL
Leishmania major strain Friedlin MGIAQVKNVTGRKILRILKHNGLAPEIPEDLYFLVVKRATQMRKHLERHTTDRDTKYRLIL
Trypanosoma brucei gambiense DAL972 MGIAQVKNVTGRKILRILKHKGMAPEIPEDLYCLIKRATQMRKHLERNTKDKDTKFRILIL
Trypanosoma cruzi strain CL Brener MGIAQVKNVTGRKILRILKHKGMAPEIPEDLYCLIKRATEMRKHLERNTKDRDTKFRILIL

Naegleria gruberi strain NEG-M CESKVHRLSRYKSTKVLAPNWKYESATAEALINA--
Cryptosporidium hominis TU502 VESRIHRLARYFKRSKQLPANWKYQAATASTLVA---
Cryptosporidium parvum Iowa II VESRIHRLARYFKRSKQLPANWKYQAATASTLVA---
Plasmodium falciparum 3D7 TESKIHRISRYKRRKLLPSNWKYQSSTASALIA---
Plasmodium knowlesi strain H TESKIHRISRYKRRKLLPSNWKYQSSTASALIA---
Theileria annulata strain Ankara VESRIHRLARYYKKRQLPATWKYQASTAGTLVA---
Theileria parva strain Muguga VESRIHRLARYYKKRQLPATWKYQASTAGTLVA---
Trichomonas vaginalis G3 IESRIHRLTRYKTRRVLAPNWKYNAQTASALVA---
Giardia lamblia DH_A2 VESRIHRLARYRQARRLPPTFRYKSDQAAALLATYA
Giardia lamblia WB_A1 VESRIHRLARYRQARRLPPTFRYKSDQAAALLATYA
Giardia lamblia GS_B VESRIHRLARYRQARRLPPTFRYKSDQAAALLATYA
Giardia lamblia Pig_E VESRIHRLARYRQARRLPPTFRYKSDQAAALLATYA
Leishmania infantum JPCM5 VESRIHRLARYYKRVKQLPPTWKYESSTASAMVA---
Leishmania major strain Friedlin VESRIHRLARYYKRVKQLPPTWKYESSTASAMVA---
Trypanosoma brucei gambiense DAL972 VESRIHRLARYYRRVKQLPPTWKYESSTASAMVA---
Trypanosoma cruzi strain CL Brener VESRIHRLARYYKRVKQLPPTWKYESSTASAMVA---

S-Adenosylmethionine Synthetase

1 10 20 30 40 50 60
| | | | | |
-----MSLSLPPSS-----ESFVKTILFSSESVTEGHPDKLCDQVSDAVLDAACL
-----MDSRRLSGNKSTYTDLQTTSEQFLFSSESVCSGHPDKLCDQISDAILDACL
-----MDSRRFSGNKSTYTDLQTTSEQFLFSSESVCSGHPDKLCDQISDAILDACL
-----MS-----VHSILFSSEHVTGHPDKLCDQVSDAVLDAACL
-----MS-----VHSILFSSEHVTGHPDKLCDQVSDAVLDAACL
-----MS-----VRQIFFTSEHVSEGHDPDKLCDQISDAILDACL
-----MS-----VRQILFSSEHVSEGHDPDKLCDQVSDAVLDAACL
-----MSQLKIK-----RGNFLFTSESVNEGHPDKICDQISDAILDACL
-----MNHLLKIK-----RGNFLFTSESVNEGHPDKVCDQISDAILDACL
-----MAVPNFINHT-----NGTFLFTSESVNEGHPDKLCDQISDSILDACL
-----MPLPKFINNT-----NGSFLFTSESVNEGHPDKLCDQISDSILDACL
-----MS-----QHLLFTSESVTEGHPDKMCDIISDTILDACL
-----MQIKMS-----PRTFLFTSEQVSEGHDPDKICDQISDRILDITL
-----MQIKMS-----PRTFLFTSEQVSEGHDPDKICDQISDRILDITL
-----MS-----PRTFLFTSEQVSEGHDPDKICDQISDRILDITL
VVPIKCKIKMT-----PRTFLFTSEQVSEGHDPDKICDQISDRILDITL

Naegleria gruberi strain NEG-M AVDPMSKIVACESCKTKGMVLFGEITSKANIDFQKIVRETVEKEIGFDDSSKGFDFYKTCNV
Cryptosporidium hominis TU502 EQDPESFVACETCTKTGFMVFEITTKANVNVERVVRETVEKEIGYDSEEKGLDYKTMVDV
Cryptosporidium parvum Iowa II EQDPESFVACETCTKTGFMVFEITTKANVNVERVVRETVEKEIGYDSEEKGLDYKTMVDV
Leishmania infantum JPCM5 AGDPFSKVACESCAKTKGMVMVFEITTKAVLDYQKIVRNTIKDIGFDSADKGLDYESC NV
Leishmania major strain Friedlin AGDPFSKVACESCAKTKGMVMVFEITTKAVLDYQKIVRNTIKDIGFDSADKGLDYESC NV
Trypanosoma brucei gambiense DAL972 EQDPLSKVACETCSKTGMVLFGEITTKAVLDYQKIVRNTIKDIGFDSADKGLDYESC NV
Trypanosoma cruzi strain CL Brener ASDPLSRVACETCSKTGMIMIFGEITTKAVLDYQKIVRNTIKDIGFDDGEGKGLDYRSCNL
Plasmodium falciparum 3D7 REDPYSKVACEVCAKNKIYIFIFGEITTKAVLDYQKIVRNTIKDIGYDDESKGLDYKTAEI
Plasmodium knowlesi strain H REDPEKVAECEVCAKNKIYIFIFGEITTKAVLDYQKIVRNTIKDIGYDDESKGLDYKTAEI
Theileria annulata strain Ankara EQDKESKVACEVCTTKDFVMVFEITTKAVLDYQKIVRNTIKDIGYDDESKGLDYKTAEI
Theileria parva strain Muguga EQDKDKSVKACEVCATKDFIMVFEISTFANVDYVEVVKSLKNVGYTSTALGIDSDDTVEV
Trichomonas vaginalis G3 AQDPLSKVACETCTKTGIVCLLGEITSNALHDYQKIVRNTIKDIGYDDESKGLDYKTAEI
Giardia lamblia DH_A2 AQDKIARVAADVAIKDNTVFLLEGEISTTAVVDYNQIVRDLREIGYEDEKTSDDWRTVEI
Giardia lamblia WB_A1 AQDKIARVAADVAIKDNTVFLLEGEISTTAVVDYNQIVRDLREIGYEDEKTSDDWRTVEI
Giardia lamblia Pig_E AQDKIARVAADVAIKDNTVFLLEGEISTTAVVDYNQIVRDLREIGYEDEKTSDDWRTVEI
Giardia lamblia GS_B AQDKVARVAADVAIKDNTVFLLEGEISTTAVVDYNQIVRDLREIGYEDAETSDDWRTVEI

Naegleria gruberi strain NEG-M LVAVEQQSPDISQCVMKDLGLENLGGAGDQGMFGYACNETSEMLPLSHLLASQLAKLKTQ
Cryptosporidium hominis TU502 IIKLEEQSNQIAGCVHVDKNVEDIGAGDQGMFGYATNETKELMPLTHVLATSITRELDY
Cryptosporidium parvum Iowa II IIKLEEQSNQIAGCVHVDKNVEDIGAGDQGMFGYATNETKELMPLTHVLATSITRELDY
Leishmania infantum JPCM5 LVAIEQQSPDI CQGLG--NFDSEDLGAGDQGMFGYATDETTLMPLTYELARGLAKKYSE
Leishmania major strain Friedlin LVAIEQQSPDI CQGLG--NFDSEDLGAGDQGMFGYATDETTLMPLTYELARGLAKKYSE
Trypanosoma brucei gambiense DAL972 LVAIEQQSPDIYQGLG--DFGGENLGGAGDQGMFGYATNETLMPLSYELARGLAMTYSE
Trypanosoma cruzi strain CL Brener LVAIEHQSPDIYQGLG--DFGGEGLGAGDQGMFGYATDETTLMPLTYELARGLAKKYSE
Plasmodium falciparum 3D7 KVSIDEQSPDIAQCCHENRSPELIGAGDQGMFGYATDETTLMPLTHYATLLGKRLTE
Plasmodium knowlesi strain H KIYIDEQSPDIAQCCHENRSPELIGAGDQGMFGYATDETTLMPLTHYATLLGKRLTE
Theileria annulata strain Ankara LVKFNLSQPEIANAVHVGKAKEQIGAGDQGMFGYATDETTPECVPLSHSLAVKLGQRLSY
Theileria parva strain Muguga LVKFLKLSQPEIANAVHVGKAKEHIGAGDQGMFGYATDETTPECVPLSHSLAVKLGQRLSY
Trichomonas vaginalis G3 MVSYSQSQSADIAQAHLNKAEEELGAGDQGMFGYATDETTKELFPLTHVLAHNLRKLTTE
Giardia lamblia DH_A2 INRISSQSPDIYQAVF---RQDELCAQDQGMIGYASQETKALMPATHLFANLLAMRLSR
Giardia lamblia WB_A1 INRISSQSPDIYQAVF---RQDELCAQDQGMIGYASQETKALMPATHLFANLLAMRLSR
Giardia lamblia Pig_E INHISSQSPDIYQAVF---RQDELCAQDQGMIGYASQETKALMPATHLFANLLAMRLSR
Giardia lamblia GS_B INRISNQSPDIYQAVF---RQDELCAQDQGMIGYASQETKALMPATHLFANLLAMRLTR

Naegleria gruberi strain NEG-M VRKSGE---LKWLRPDGKTQVTVEYKHSNGE---MIPKRVTITVLSQHDVSVTNDQIK
Cryptosporidium hominis TU502 IRMKGVSSRVGWL RPDGKAQVTVEYN--CKHG--VLIPKRITHTILVSVQHDIENEEIR
Cryptosporidium parvum Iowa II IRVKGVSSRVGWL RPDGKAQVTVEYN--CKHG--VLIPKRITHTILVSVQHDIENEEIR
Leishmania infantum JPCM5 LRRDGS---LEWARPDAKTQVTVEYDYDTREGKQVLT PKRVAVVLISAQHDHVTNDKIS
Leishmania major strain Friedlin LRRVGS---LEWARPDAKTQVTVEYDYDTREGKQVLT PKRVAVVLISAQHDHVTNDKIS
Trypanosoma brucei gambiense DAL972 LRRNGG---LPWARPDAKTQVTVEYDYDTREGKQVLT PKRVAVVLISAQHDHVTNDKIS
Trypanosoma cruzi strain CL Brener LRRNGT---LPWARPDAKTQVTVEYDYDTREGKQVLT PKRVAVVLISAQHDHVTNDKIS
Plasmodium falciparum 3D7 VRKLGII---LPYLGPDGKTQITIEYKNKGSCG--GHLEPLRVHTVLISTQHAEDIKYEQLK
Plasmodium knowlesi strain H VRKLGII---LPYLGPDGKTQITIEYKNKGSCG--GHLEPLRVHTVLISTQHSENIKYEQLK
Theileria annulata strain Ankara VRKNGY---LPYLRPDGKTQVTVEYRKYTN---GYIEPKRVDTIIVISSQHDPGVDFQVMK
Theileria parva strain Muguga VRKNSN---LSYLRPDGKTQVTVEYKHTN---GHIEPKRVDTIIVISTQHDPGVDFGVMK
Trichomonas vaginalis G3 VRKNGT---LPFLGPDGKTQVTVEYERTDG---HLKPLRITHTVLISTMHTDDVTLEKLR
Giardia lamblia DH_A2 VRKTGV---LPFLRPDSKTQVTIKYEEDPLTK--ELRPIFLDTL IISTMHAEI GNTALR
Giardia lamblia WB_A1 VRKTGV---LPFLRPDSKTQVTIKYEEDPLTK--ELRPIFLDTL IISTMHAEI GNTALR
Giardia lamblia Pig_E VRKTGV---LPFLRPDSKTQVTIKYEEDPLTK--ELRPIFLDTL IISTMHAEI GNTALR
Giardia lamblia GS_B VRKMGII---LTLRPDSKTQVTIKYEEDPLTK--ELRPVFLDTL IISTMHTTEVDNTTLR

Naegleria gruberi strain NEG-M TDIKKHVIQKVIPEKYLDS-----
Cryptosporidium hominis TU502 EFVLENVIKKVCPSDLMDK-----
Cryptosporidium parvum Iowa II EFVLENVIKKVCPSDLMDK-----
Leishmania infantum JPCM5 VDLMEKVIKAVIPANMLDA-----
Leishmania major strain Friedlin VDLMEKVIKAVIPANMLDA-----
Trypanosoma brucei gambiense DAL972 EDLVKKVINTTIPAKFLDE-----
Trypanosoma cruzi strain CL Brener KDLMEKVIKAVIPAHMLDA-----
Plasmodium falciparum 3D7 TDLMENVIKYVIPEKLLDN-----
Plasmodium knowlesi strain H SDLIENVVKYVIPEKMLDE-----
Theileria annulata strain Ankara EDIMKDVIMQVVPKHLLDE-----
Theileria parva strain Muguga EDIMKHVVMQVVPKLLLDE-----
Trichomonas vaginalis G3 VAVKEHVIDAVLPEKLVDD-----
Giardia lamblia DH_A2 TAIFKHVVIPTLKQLKEDEGLSLQVLLPGCEDGNLERFDYASWPIEDICRGHYNCKGSDQ
Giardia lamblia WB_A1 TAIFKHVVIPTLKQLKEDEGLSLQVLLPGCEDGNLERFDYASWPIEDICRGHYNCKGSDQ
Giardia lamblia Pig_E TAIFKHVVIPTLKQLKEDEGLSLQILLPGCEDGNPEMFDYANWPIEDICRGYKCGGNDQ
Giardia lamblia GS_B TAVFKHVVIPTLKQLKEDEGLNLQVLLPGCEDGNLEAFDYANWPIEDICRGHYGKCGADQ

Naegleria gruberi strain NEG-M --ETIYHINPSGRFVIGGPGDAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPTKVDRSASY
Cryptosporidium hominis TU502 --ETRILINPSGRFTIGGPAADAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPTKVDRSGAY
Cryptosporidium parvum Iowa II --ETRILINPSGRFTIGGPAADAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPTKVDRSGAY
Leishmania infantum JPCM5 --ETKYWLNPSGRFVRGGPHGDAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPSKVDRSAAY
Leishmania major strain Friedlin --ETKYCLNPSGRFVRGGPHGDAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPSKVDRSAAY
Trypanosoma brucei gambiense DAL972 --NTKYHLNPSGRFVIGGPGDAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPSKVDRSAAY
Trypanosoma cruzi strain CL Brener --DTKYHLNPSGRFVIGGPHGDAGLTGRKIIIVDTYGGWGAHGGGAFSGKDPSKVDRSAAY
Plasmodium falciparum 3D7 --ETLYYLNPSGK FVLGGPAADAGLTGRKIIICD TYGGWGAHGGGAFSGKDASKVDRSAAY
Plasmodium knowlesi strain H --ETLYYLNPSGK FVLGGPAADAGLTGRKIIICD TYGGWGAHGGGAFSGKDPSKVDRSAAY
Theileria annulata strain Ankara --KTKYLINPAGSFVLGGPASDSGLTGRKVIIVDTYGGWGAHGGGAFSGKDSTKVDRSGAY
Theileria parva strain Muguga --RTKYLINPAGSFVLGGPASDAGLTGRKVIIVDTYGGWGAHGGGAFSGKDSTKVDRSGAY
Trichomonas vaginalis G3 --KTILHINPGRFVIGGPLGDSGLTGRKIIIVDSYGGWGAHGGGAFSGKDPSKVDRSACY
Giardia lamblia DH_A2 PQYTKLLINPSDRFVIGGPKSDCGLTGRKVIADSYGSFGSHGGGAFSGKDASKVDRSGAY
Giardia lamblia WB_A1 PQYTKLLINPSDRFVIGGPKSDCGLTGRKVIADSYGSFGSHGGGAFSGKDASKVDRSGAY
Giardia lamblia Pig_E PQYTKLLINPSDRFVIGGPKSDCGLTGRKVIADSYGSFGSHGGGAFSGKDASKVDRSGAY
Giardia lamblia GS_B PQYTKLLINPSDRFVIGGPKSDCGLTGRKVIADSYGSFGSHGGGAFSGKDASKVDRSGAY

Naegleria gruberi strain NEG-M YSRVAKNIVA--AGLAKRCLIQVSYAIGICEPLSVHVFTEG--TAQNGLDLDDWKILD--IVK
Cryptosporidium hominis TU502 MARLVAKSIVF--SGLCSRCLVQVSYGIGIARPLSLYINTFG--TAKDGYNDTKLLE--IVN
Cryptosporidium parvum Iowa II MARLVAKSIVF--SGLCSRCLVQVSYGIGIARPLSLYINTFG--TAKDGYNDTKLLE--IVN
Leishmania infantum JPCM5 AARWIAKSIVA--GGLARRCLVQLAYAIGVAEPLSMHVETYG--TGKY--DDAKLLE--IVK
Leishmania major strain Friedlin AARWIAKSIVA--GGLARRCLVQLAYAIGVAEPLSMHVETYG--TGKY--DDAKLLE--IVK
Trypanosoma brucei gambiense DAL972 AARWIAKSLVA--AGLADRCLVQLSYAIGVAEPLNIHVDTY--TGKR--DDEYILG--IVQ
Trypanosoma cruzi strain CL Brener AARWIAKSLVA--GGLARRCLVQLAYAIGVAEPLNIHIETY--TGKY--DDGRILE--IVT
Plasmodium falciparum 3D7 YLRFIAKSLVA--NKFRRRLVQASYSIGIANPISLNVNSYG--TVSTGYTDYDLEQ--IIL
Plasmodium knowlesi strain H YLRYIAKSLVA--NKFRRRLVQASYSIGIANPISLNVNSYG--TASTGYTDYDLEQ--IIL
Theileria annulata strain Ankara YARFVAKSLVS--NGFCKRVIVQISYICIGTVDPISLYIDTYG--TVAKGYTDNDLRE--IVL
Theileria parva strain Muguga YARFVAKSLVL--NGFCKRVLVQISYICIGAVDPISLYIDTYG--TVAKGYTDNDLQK--IVL
Trichomonas vaginalis G3 AARWVAKSLVA--AGLCSRCLVQLSYAIGVAHPLSVFVDTY--TGKGY--TDEELVE--IIN
Giardia lamblia DH_A2 LARNIAMSLSLSPMNNICKRCMVQIGYAI GVAEPVSI FVEMYGSELKPEYADQQLIERAIR
Giardia lamblia WB_A1 LARNIAMSLSLSPMNNICKRCMVQIGYAI GVAEPVSI FVEMYGSELKPEYADQQLIERAIR
Giardia lamblia Pig_E LARNIAMSLSLSPMNNICKRCMVQIGYAI GVAEPVSI FVEMYGSELKPEYADQQLIERAIR
Giardia lamblia GS_B LARNIAMSLSLSPMNNVCKRCMVQLGYAIGVAEPVSI FVEMYGSELKPEYADQQLIEKAIR

Naegleria gruberi strain NEG-M KNFNFTPYNMIKELNLRPIYSKTSAYGHFGRSE-----FPWEQIKPLKLD-----
Cryptosporidium hominis TU502 KVFDLFRPGILIKQLNLSPIFKKTS SGGHFGFRSEKE----FLWEKPIILQ-----
Cryptosporidium parvum Iowa II KVFDLFRPGILIKQLNLSPIFKKTS SGGHFGFRSEEE----FLWEKPIILQ-----
Leishmania infantum JPCM5 QNFKLRPYDIIQELNLRPIY YETSRFGHFGRKDELGTGGFTWEV PPKMVE-----
Leishmania major strain Friedlin QNFKLRPYDIIQELNLRPIY YETSRFGHFGRKDESGTGGFTWEV PPKMVE-----
Trypanosoma brucei gambiense DAL972 KNFRLRPYDIIKELDLRPIYRQ TACFGHFGRVDTNGKGGFTWEV PPKLLEGLSDVQ----
Trypanosoma cruzi strain CL Brener KNFRLRPYDIIKELDLRPIYRQ TACFGHFGRVDTNGKGGFTWEV PPKLLEGLSDVQ----
Plasmodium falciparum 3D7 RNFDLRPGFIIQELKLT ETPVFSKTSAYGHFGREGD T----FTWEKIKDLSHEK-----NA
Plasmodium knowlesi strain H RNFDLRPGFII EELKLEKPIFNTSAYGHFGRESDNS----FTWEKIKDLTHEK-----NV
Theileria annulata strain Ankara RNFDFRVGYIIEDELKLRPI FFKTSVYGHFGREDSD----FLWERPKDLSHEKLSNNHNY
Theileria parva strain Muguga KNFDFRVGYIIEELMLKRP IFRKTSVYGHFGREDPD----FLWERPKDLSHEKLSNNHNL
Trichomonas vaginalis G3 KNFDFLPYAIIRDLLRPIYQA TAAYGHFGRTDID----LPWEKVIKIF-----
Giardia lamblia DH_A2 RTFGLTPGKIIQEYALDTP IFFNTSRYGHFGRSE-----FPWEQPRRLTLD-----
Giardia lamblia WB_A1 RTFGLTPGKIIQEYALDTP IFFNTSRYGHFGRSE-----FPWEQPRRLTLD-----
Giardia lamblia Pig_E KTFGLTPGKIIQEYSLDTP IFFNTSKYGHFGRPE-----FPWEQPRRLTLD-----
Giardia lamblia GS_B RTFGLTPGKIIQEYGLDTP IFFNTSRYGHFGRPG-----LPWEQPRRLMLE-----

Naegleria gruberi strain NEG-M -----
Cryptosporidium hominis TU502 -----
Cryptosporidium parvum Iowa II -----
Leishmania infantum JPCM5 -----
Leishmania major strain Friedlin -----
Trypanosoma brucei gambiense DAL972 -----
Trypanosoma cruzi strain CL Brener -----
Plasmodium falciparum 3D7 LKN--
Plasmodium knowlesi strain H LKN--
Theileria annulata strain Ankara MTNGY
Theileria parva strain Muguga MVNGH
Trichomonas vaginalis G3 -----
Giardia lamblia DH_A2 -----
Giardia lamblia WB_A1 -----
Giardia lamblia Pig_E -----
Giardia lamblia GS_B -----

Trios-Phosphate Isomerase

1 10 20 30 40 50 60

| | | | | | |

Naegleria gruberi strain NEG-M -----
Plasmodium falciparum 3D7 -----
Plasmodium knowlesi strain H -----
Cryptosporidium parvum Iowa II -----
Cryptosporidium hominis TU502 -----
Theileria parva strain Muguga -----MSN---
Theileria annulata strain Ankara MEGNESISSLSMSKLVIGVNHHLNHTSMRSNHIFIHWLNYLINQSYYPYENWIIYGSSNNGV
Trypanosoma brucei gambiense DAL972 -----
Trypanosoma cruzi strain CL Brener -----
Leishmania infantum JPCM5 -----
Leishmania major strain Friedlin -----
Giardia lamblia DH_A2 -----
Giardia lamblia WB_A1 -----
Giardia lamblia Pig_E -----
Giardia lamblia GS_B -----
Trichomonas vaginalis G3 -----

Naegleria gruberi strain NEG-M -----MRTPYIGGNWKCNGTVESIKQLVQDLNQGPESTEGKVE
Plasmodium falciparum 3D7 -----MARKYFVAANWKCNGTLESIKSLTNSFNLDLDFPSKLD
Plasmodium knowlesi strain H -----MTRKYFVSANWKCNGTQESIKALAASFNELEFDPKLD
Cryptosporidium parvum Iowa II -----MSRKYFVGGNFKCNGTKESLKTLLIDSFQVESSNS--E
Cryptosporidium hominis TU502 -----MSRKYFVGGNFKCNGTKESLKTLLIDSFQVESSNS--E
Theileria parva strain Muguga -----RRKWLGGNWCNGGSKQISDLLAHFNLLKSKHNNLD
Theileria annulata strain Ankara LTLQRKLLRCLIKRFIIFYLYKIKRWLGGNWCNGTKQISDLLLHFNHRHQTKNNLD
Trypanosoma brucei gambiense DAL972 -----MSKPQPIAAANWKCNGSQSLSELIDLFN-ST SINHDVQ
Trypanosoma cruzi strain CL Brener -----MASKPQPIAAANWKCNGSESLVPLIETLN-AATFDHDVQ
Leishmania infantum JPCM5 -----MSSKPQPIAAANWKCNGTTASIEKLVQVLN-EHNISHDVQ
Leishmania major strain Friedlin -----MSAKPQPIAAANWKCNGTTASIEKLVQVLN-EHNISHDVQ
Giardia lamblia DH_A2 -----MPARRPFIGGNFKCNGSLDFIKSHVAAIA-AHKIPDSVD
Giardia lamblia WB_A1 -----MPARRPFIGGNFKCNGSLDFIKSHVAAIA-AHKIPDSVD
Giardia lamblia Pig_E -----MPARRPFIGGNFKCNGSLDFIKSHVAAIA-AHKIPDSID
Giardia lamblia GS_B -----MPARRPFIGGNFKCNGSLDFIKSHVASIA-SYKIPESVD
Trichomonas vaginalis G3 -----MRTFFVGGNWKANPKTVEEAekliemln-GAKVEGNVE

Naegleria gruberi strain NEG-M VIVAPSSIHIGLVQSLNLRK---DWKISAQNIVQEKNGGAFTEISASMLKDLGIDSTLL
Plasmodium falciparum 3D7 VVVFVPSVHYDTRKLLQS----KFSTGIQNVSKFGNG-SYTGESVAEIAKDLNIEYVII
Plasmodium knowlesi strain H VVVFVPSVHYELAKSLLKP----KFHTGIQNVSKYNG-SYTGESIAEIAKDLNIEYVII
Cryptosporidium parvum Iowa II VYVFPTSLHISLVKEFFGNDHPGVFKIGSQNISCTGNG-AFTGEVSCMLKDMVDVDCSLV
Cryptosporidium hominis TU502 VYVFPTSLHISLVKEFFGNDHPGVFKIGSQNISCTGNG-AFTGEVSCMLKDMIDVDCSLV
Theileria parva strain Muguga VVLFPPSLYVEHTRNVLKT---GVFELGVQNVQSQSKSG-AFTGELSLPMFSDFLKWSLV
Theileria annulata strain Ankara VVLFPPSLYVEHTRNELKS---EVFELGVQNVQSQSKSG-AFTGELSLTMFTDFGLKWSLV
Trypanosoma brucei gambiense DAL972 CVVASTFVHLAMTKERLSHP---KFVIAAQNAIAKS-G-AFTGEVSLPILKDFGVNWIIVL
Trypanosoma cruzi strain CL Brener CVVAPTFLHIPMTKARLTNP---KFQIAAQNAITRS-G-AFTGEVSLQILKDYGIKVVVL
Leishmania infantum JPCM5 CVVAPTfVHIPLVQAKLRNP---KYAVSAENAIKSG-AFTGEVSMPIKDLGINWVIL
Leishmania major strain Friedlin CVVAPTfVHIPLVQAKLRNP---KYVVAENAIKSG-AFTGEVSMPIKDLGINWVIL
Giardia lamblia DH_A2 VVIAPSAVHLSTAIJAANTS---QLRIAAQNVYLEGNG-AWTGETSVEMLQDMGLKHVIV
Giardia lamblia WB_A1 VVIAPSAVHLSTAIJAANTS---QLRIAAQNVYLEGNG-AWTGETSVEMLQDMGLKHVIV
Giardia lamblia Pig_E VVAPSVAHLSTAIJAANTS---QLKIAAQNVYLEGNG-AWTGETSVEMLQDMGLEVYVII
Giardia lamblia GS_B VVAPSVAHLSTAIJAANTS---CLKIAAQNVYLEGNG-AWTGETSVEMLLDMGLSHVYII
Trichomonas vaginalis G3 VVVAAPFIFLPTLQK-LRK---DWKVAENVFTKPNG-AFTGEVTPMIKSFGEIWTIL

Naegleria gruberi strain NEG-M GHSERRHVFGESNTVIAKKVKVSEEVGLTIIGCVGETLEERERGETNQVITSQLKDFN--
Plasmodium falciparum 3D7 GHFERRKYFHETDEDVREKLQASLKNLKAUVVCFGESLEQREKNKTIEVITKQVKAFVDL
Plasmodium knowlesi strain H GHFERRKFFNETDEDVKEKLQQLCKNNLKVVVVCFGESLEQREKNQIDVIKKQVNSFVHL
Cryptosporidium parvum Iowa II GHSERRQYSETDQIVNNKVKKGLEENGLKIVLCIGESLSERETGKTNDVIQKQLTEALKD
Cryptosporidium hominis TU502 GHSERRQYSETDQIVNNKVKKGLEENGLKIVLCIGESLSERETGKTNDVIQKQLTEALKD
Theileria parva strain Muguga GHSERRQLFNEDNFDVRAKVKMLQDNGVNAVVCFGETLSEREQQQTVNVLKRQLNAFVKD
Theileria annulata strain Ankara GHSERRQLFNEDDSYVCEKVMMLQENGVNAVVCFGETLSEREQQQTVNVLKRQLDAFVKH
Trypanosoma brucei gambiense DAL972 GHSERRAYGETNEIVADKVAAVAAGFMVIACIGETLQERESGRTAVVVLQIAAIAKK
Trypanosoma cruzi strain CL Brener GHSERRLYGETNEIVAQKVAACAAGFHVIVCVGETNEEREAGRTAAVVLQLAAVAQK
Leishmania infantum JPCM5 GHSERRTYGETDEIVAQKVADACKQGFVVIACIGETLQQREANQTAKVVLQTSIAIATK
Leishmania major strain Friedlin GHSERRTYGETDEIVAQKVADACKQGFVVIACIGETLQQREANQTAKVVLQTSIAIATK
Giardia lamblia DH_A2 GHSERRRIMGETDEQSAKKAKRALEKGMTVIFCVGETLDERKANRTMEVNIAQLEALGKE
Giardia lamblia WB_A1 GHSERRRIMGETDEQSAKKAKRALEKGMTVIFCVGETLDERKANRTMEVNIAQLEALGKE
Giardia lamblia Pig_E GHSERRRIMGETDEQSAKKAKRALEKGMTVIFCVGETLDERKANRTMEVNIAQLEALSKE
Giardia lamblia GS_B GHSERRRIMGETNEQSAKKAKRALDKGMTVIFCTGETLDERKANNTMEVNIAQLEALKKE
Trichomonas vaginalis G3 GHSERRDILKEDDEFLLAAKAKFALENGMKIYCCGEHLSEREAGKASEFVSAQIEKMIPA

Naegleria gruberi strain NEG-M ----VTNWDKFVIAIYEPVWAIIGTGTASPQQAQEAHKVLRDNLADNVNSEVAQKVRIIYG
Plasmodium falciparum 3D7 ID----NFDNVILAYEPLWAIIGTGTATPEQAQLVHKEIRKIVKDTTCGEKQANQIRILYG
Plasmodium knowlesi strain H IN----NFDNVVLAYEPIWAIIGTGTATPEQAQEVHKEIRNIVKEKCGEKNAQQIRILYG
Cryptosporidium parvum Iowa II VS----DLSNLVIAIYEPWAIIGTGCVVATPGQAQEAHAFIREYVTRMYPNPQVSSNLRRIYG
Cryptosporidium hominis TU502 VS----DLSNLVIAIYEPWAIIGTGCVVATPEQAQEAHAFIREYVTKMYSQVSSNLRRIYG
Theileria parva strain Muguga VK----DWDKVVLAYEPVWAIIGTGKVVATVEQVNAHAFVREHVRGLAG-AVADKVRVYVG
Theileria annulata strain Ankara VK----DWDKVVLAYEPVWAIIGTGKVVATVDQVKEAHKFVRDYVRGLVG-DVADKVRVYVG
Trypanosoma brucei gambiense DAL972 LK--KADWAKVVIAYEPVWAIIGTGKVVATPQAQEAHALIRSWSSKIGADVAGELRILYG
Trypanosoma cruzi strain CL Brener LS--KEAWAHVVIAYEPVWAIIGTGKVVATPQAQEAHELLRRWVRSKLGADIAAQLRILYG
Leishmania infantum JPCM5 LP--KEAWDQIVLAYEPVWAIIGTGKVVATPEQAQEVHALLRKWVSEKIGADVAAARLRILYG
Leishmania major strain Friedlin LP--KEAWDQIVLAYEPVWAIIGTGKVVATPEQAQEVHALLRKWVSEKIGTDVAAKLRILYG
Giardia lamblia DH_A2 LGESKMLWKEVVIAYEPVWSIGTGCVVATPEQAEEVHVGLRKWFAEKVCAEGAQHIRIYIG
Giardia lamblia WB_A1 LGESKMLWKEVVIAYEPVWSIGTGCVVATPEQAEEVHVGLRKWFAEKVCAEGAQHIRIYIG
Giardia lamblia Pig_E LGESKLLWKKVVIAYEPVWSIGTGCVVATPEQAEEVHVGLRKWFAEKVCAEGAQHIRIYIG
Giardia lamblia GS_B IGESKLLWENVVIAYEPVWSIGTGCVVATPEQAEEVHVGLRKWFAEKVCAEGAQHIRIYIG
Trichomonas vaginalis G3 IP--AGKWDDVVIAYEPIWAIIGTGKVVATPQAQEMCKVIRDILAAGVADIANKVRILYG

Naegleria gruberi strain NEG-M GSVNSANSDELKQPDIDGFLVGGASLKSDFLSIVNSGLKSVE
Plasmodium falciparum 3D7 GSVNTENCSSLIQQEDIDGFLVGNASLKE-SFVDIISAM----
Plasmodium knowlesi strain H GSVNTENCASLIKQEDIDGFLVGNASLKP-SFVEIISAM----
Cryptosporidium parvum Iowa II GSVTPDNCNELIKCADIDGFLVGGASLKP-TFAKIIESAQ----
Cryptosporidium hominis TU502 GSVTPDNCNELIKCADIDGFLVGGASLKP-TFAKIIESAQ----
Theileria parva strain Muguga GSVNEKNCHELAKCNDVDGFLVGGTSLKK-EFLDVLKSLEQ---
Theileria annulata strain Ankara GSVNEKNCLELSKCSDDVDGFLVGGASLKK-EFLDILKSLE----
Trypanosoma brucei gambiense DAL972 GSVNGKNARTLYQQRDVNGFLVGGASLKP-EFVDIIEATQ----
Trypanosoma cruzi strain CL Brener GSVTAKNARTLYQMRDINGFLVGGASLKP-EFVEIIEATK----
Leishmania infantum JPCM5 GSVSAGNAKTLYMKPDINGFLVGGASLKP-EFRDIIDATR----
Leishmania major strain Friedlin GSVSAGNAKTLYMKPDINGFLVGGASLKP-EFRDIIDATR----
Giardia lamblia DH_A2 GSANGSNCEKLGQCPNIDGFLVGGASLKP-EFMTMIDILAKTRT
Giardia lamblia WB_A1 GSANGSNCEKLGQCPNIDGFLVGGASLKP-EFMTMIDILTKTRT
Giardia lamblia Pig_E GSANGSNCEKLGQCPNIDGFLVGGASLKP-EFMTMIDLLAKVRA
Giardia lamblia GS_B GSANGSNCEKLGQCPNIDGFLVGGASLKP-EFTTMIDILAKTRA
Trichomonas vaginalis G3 GSVKPNNCNELAACPDVDGFLVGGASLEP-GFINIVNSNVHSK-

Alpha Tubulin

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.

Table with 7 columns (1, 10, 20, 30, 40, 50, 60) and 25 rows of sequence data for various species including Naegleria gruberi, Leishmania infantum, and Trypanosoma brucei.