

```

                20          40
CsTPS3FN M--AVHQFSPSIVSSLPTISTYNNNHFCRFFFTPKTSI-SPISKTKSK----- 44
CsTPS1FN M--AFHQFAPS--SSLPIWSRVNNP-----FTPKTSIITSISKPKSKPKSNLKSR 46
CsTPS2FN M----- 1
CsTPS33PK MRLGVHQFSP-----LSLILN-----TTKLARASTLS----- 27
CsTPS13PK MLY-----RPKIYTNYNII 14
CsTPS6FN MLY-----RPKIYTNYNII 14
CsTPS30PK M-----AALVSTVSSIIRWNSNN 19
CsTPS5FN MSL----- 3
CsTPS8FN MS----- 2
CsTPS7FN MS----- 2
CsTPS9FN MS----- 2
CsTPS4FN MS----- 2

                60          80          100
CsTPS3FN -----SSTCYP IQCTVVN--NSSPSSTIV-----RRSANYEP 74
CsTPS1FN SKLRRSRSSSTCYP IQCIVID--N--PSSTII-----NNS-DRRSANYGP 86
CsTPS2FN -----CSLAKSPS-SDTSTIV-----RRSANYDP 24
CsTPS33PK -----SACYPIQCTMVNSTNITNNTTIF-----DNHHRRSANYEP 63
CsTPS13PK NGGTKSRLSSACYP IQCAVNVSSN-----AII-----D-----RRSANFEP 50
CsTPS6FN NGGTKSRLSSACYP IQCAVNVSSN-----AII-----D-----RRSANFEP 50
CsTPS30PK NNNNFTRSVKSC--LSSNYHNNNNIIHNKTVLMSTNNNNNNNQKNSRRRSANYQP 72
CsTPS5FN -----SGLISTTTFKEQPAIV-----RRSGNYKP 27
CsTPS8FN -----NIQVLASSQLCDKI--IA-----RPTTKFHP 26
CsTPS7FN -----S-QVLASSQLSDKI--IA-----RPTTNFHP 25
CsTPS9FN -----YQVLASSQ-NDKVKSI V-----RPTTTYQP 26
CsTPS4FN -----T-QILATSFKNDNIHKI V-----RPTTNYHP 27

                120          140          160
CsTPS3FN P IWSFDYIQ--SLST-QYKGESYTRQLNKLKKEVKRMLL-RMEINS-LALLELI 123
CsTPS1FN P IWSFDFVQ--SLPI-QYKGESYTRLNKLEKDVKRMLI-GVE-NS-LAQLELI 134
CsTPS2FN P IWSFDFIQ--SLPC-KYKGEPYTRSNNKLEEVKKMLV-GME-NS-LVQLELI 72
CsTPS33PK P IWSFDYIQ--SLSSSQYKGETCTSRNLNELEANVKEILLVEMKSN- LAQLEFI 114
CsTPS13PK S IWSFDYIQ--SL-TSQYKGEPYTRS VKKLERDVKKILV-EME-NS-LAQLELI 98
CsTPS6FN S IWSFDYIQ--SL-TSQYKGEPYTRS VKKLERDVKKILV-EME-NS-LAQLELI 98
CsTPS30PK P LWQFDYVQ--SL-SSPFKDEAYVKRVEKLEEVVMVKRAREEEKPLSQLELI 123
CsTPS5FN P LWDAHFVQ--SLQVI-YTEESYGKR INELKEDVRRIL--EKEAENPLVKLEQI 76
CsTPS8FN S IWGDRFLHYNISEQDLVCKQE--RVEELIQVVKKEILSSN----HDQLKLI 72
CsTPS7FN S IWGDRFLHYNVSEQDLVCKQE--RIEELIQVVKKEILSSN----HDQLKLI 71
CsTPS9FN S IWGERFLQYSISDQDFSYKQ--RVDELKEVVRREVFLE-CYDNVSYVLKIV 76
CsTPS4FN S IWGDRFLHYDIPKEELNYKQG--QVEELKEVVRKEIFGEFLCDDWNRLKLI 78

                180          200          220
CsTPS3FN DTLQRLGISYHFENEINTILKKKYNDYINNNIITNPNYNN-LYATALEFRLLRQ 177
CsTPS1FN DTIQRLGISYRFENEIISILKKEFTNN--NNN--PNPNYD--LYATALQFRLLRQ 183
CsTPS2FN DTLQRLGISYHFENEIISILKKYFTNISTNKN--PKYD--LYATALEFRLLRE 121
CsTPS33PK DALQRLGLSYRFETEINTILNEKYS--GNIIDNPYNN--LYATALEFRLLRH 162
CsTPS13PK DTLQRLGISYRFENEINSILNKKYLN-----INNPYSDLLYALALEFRLLRQ 146
CsTPS6FN DTLQRLGISYRFENEINSILNKKYVN-----INNPYNN--LYALALEFRLLRQ 144
CsTPS30PK DVLQRLGISYHFEDIINDILKHIYNNNNVY-----NTNNNVYANSLEFRLLRQ 171
CsTPS5FN NDL SRLGISYHFEDQIKAILNLTYNNNNALWK-----KDNLYATALHFKLLRQ 124
CsTPS8FN DNLQRLGLSYHFESI EKILLE--QLSI--GTHHQNH--NLHDVSLRFRLLRQ 118
CsTPS7FN DNLQRLGLSHHFESI EKILLE--QLSI--GTHHQNH--QDLHDASLWFRLLRQ 118
CsTPS9FN DDVQRLGLSYHFENEI EKALQHIYD-----NTI HQNHKDEDLHDTSTRFRLLRQ 125
CsTPS4FN DVVERLGLSYHFESI QNELQHIYNKISII--NDSNFKH--ETLHDASIRFRLLRQ 129

                240          260
CsTPS3FN HGY-TVPQEIFNAFKD-KRQKFKTSL-DDIMGVLCLEYASFYAMKHEN-ILDEA 228
CsTPS1FN YGF-EVPQEIFNFKNKTGEFKANIS-NDIMGALGLEYASFYKKGES-ILDEA 235
CsTPS2FN YGY-AVPQEIFNDFKDE-TGKFKASIKNDDIKGVLALYEASFYKNGEN-ILDEA 173
CsTPS33PK HGY-DVSQEIFNVPKDEITSKFKARTSGEDIIGVLALYEASFYKKGES-ILDEA 215
CsTPS13PK HGY-AVPQEIFNQLKNEIEN-IKKNINGNDIMGILALYEASFYEKKCES-ILKEA 198
CsTPS6FN HGY-AVPQEIFNQLKNEIEN-IKKNINGNDIMGILALYEASFYEKKCES-ILKEA 196
CsTPS30PK HGY-PVSQEIFSTCKDERGNFM--VCTNDIKGMLSLEYASFYLVENEDGILEET 222
CsTPS5FN YGFNPVSSEIFNAFKDEKK-EFKESLS-KDVKGMVCLYEASFYSFRGEP-ILDEA 176
CsTPS8FN SGFK-VSSSIFEKFKDE-KGNFKESLI-TDVSGLLSLEYASHLSYVGES-ILDEA 169
CsTPS7FN HGLN-VSSSIFEKFKDD-EGNFKKSLI-TDVSGLLSLEYASHLSYVGES-ILDEA 169
CsTPS9FN HGFV-VSSNIFKFKDE-QGNFKECLEI-TDILGLLSLEYASHLSYIGEN-ILNEA 176
CsTPS4FN HGYR-VSLDIFDKFKDE-NGNFKECLEA-SDTVGLLSLEYASHLSVGVEN-LLDEA 180

                280          300          320
CsTPS3FN RIFSTKCLKKYMEDIENEEKKILLND-NNINSNLLLINHAFELPLHWRITRSE 282
CsTPS1FN RIFTTKCLKKY-----KLMSSNN-NNMTLISLLVNHAEMLPQWRITRSE 280
CsTPS2FN RVFTTEYLKRYVMMIDQN-----MILND-----NMAILVRHAEMPLHWRITRAE 218
CsTPS33PK RVSSIECLENYVATMTMERNKPSLVNDYDDDDNNMLLVNHAELEPLYWRITRSE 270
CsTPS13PK RIFTTECLKNYTIMIS--EQKMLINDYDYD--IEVVNHAELEPLHRRTRTE 248
CsTPS6FN RIFTTECLKNYTIMIS--EQKMLINDYDYD--IEVVNHAELEPLHRRTRTE 246
CsTPS30PK REKTKKYLEEYIIMIEKQQLLDQNNNNYDYDYDELVSHALEPLHWRMLRLE 277
CsTPS5FN RDTFTTKHLKQYLMTRQGGQVVDHDDND-----LMVKLVEHALEPLVHWRMKRLE 226
CsTPS8FN LAFTTTHLKAIVANSK----DHPLSHQ-----ISKALETPLRKTIERLH 209
CsTPS7FN LAFTTTHLKSIVANSK----NHPLSHQ-----ISKALEPLRMTLERLH 209
CsTPS9FN LAFTTTHLHQFVKNK-----THPLSNE-----VLLALQRP IRKSLERLH 216
CsTPS4FN LSFTTKHLTEFLENNKKEHPNDPLSKE-----ISRALERPLRKTIVNLH 225

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      340              360              380
CsTPS3FN ARWF IDEI YEKKQD - - MNSTLFEFAKLDNF I VQSTHQEDLQHL SRWWRDCKLGG - 334
CsTPS1FN AKWF IEEI YERKQD - - MNPTLLEFAKLDNF MVQSTYQEE LKLLSRWVKDSKLG E - 332
CsTPS2FN AKWF IEE - YEKTQD - - NKGTLLEFAKLDNF MLQS I FQEDLKHVSRWWEH SKLGN - 270
CsTPS33PK ARWF ID - LYEKNHN - - MNSTLLEFAKLDNF MVQSI YQEDLKHLSRWWSHTKLG E - 321
CsTPS13PK AKWF IDA - YAKKQD - - MNPMLLELAKLDNF I VQSTHHEDLKH I FRWWRHTKLG E - 299
CsTPS6FN AKWF IDA - YAKKQD - - MNPMLLELAKLDNF I VQSTHHEDLKH I FRWWRHTKLG E - 297
CsTPS30PK SRWF ID - VYEKRLD - - MNPTLLTLAKLDNF I VQSI YQDDLKHVFSWWE STDMGK - 328
CsTPS5FN ARWF IDMYAEMSHHHMNSTFLQLAKLDNF VVQSTYQEDLKHVVRWVKTTSLG E - 280
CsTPS8FN ARFY IS - IY EK - - DASHNKLLLELAKLDNF VLQCFHKKE LSE I MRWVKEHEFVK - 260
CsTPS7FN ARFY IS - IY EK - - DASHNKVLLLELAKLDNF LLQCFHKKE LSE I VRWVKEHEFAK - 260
CsTPS9FN ARHY IS - SYEN - - KISHNKTLLELAKLDNF LLQCLHRKEL SQ I SRWVKE I D FVH - 267
CsTPS4FN ARFY IS - IY EK - - DASHNKVLLQLAKLDNF LLQSMHKKEL SE I SRWVKE L DSAH - 276

      400              420              440
CsTPS3FN KLN FARDRLMEAF LWDVGLK FEGEFSYFRRTNARL FVLI T I IDDIYDVYGTLEEL 389
CsTPS1FN KLP FVRDR LVECF L WQVGRFEPQFSYFR I MDTKLYVLL T I IDDMHDI YGTLEEL 387
CsTPS2FN KMVYARDR LVEAF L WQVGRFEPQFSHFRR I SAR IYAL I T I IDDIYDVYGTLEEL 325
CsTPS33PK KMD FFRDR LMECF L WTVGI ACEPEKSYRRMSGR L YVLI T T I IDDIYDVYGTLEEL 376
CsTPS13PK KLN FARDRLMECF L WQVGRFEPKFSYFR I T T AKL FEL I T V I DDIYDVYGTLEDEL 354
CsTPS6FN KLN FARDRLMECF L WNI G I RFESKFSYFR I T T AKL FEL V T F I DDIYDVYGTLEDEL 352
CsTPS30PK KLE FARDR TMVNF L WTVGVAFEPHFKSFRMI T KVNAL I T V I DDIYDVYGTLEDEL 383
CsTPS5FN RLP FARDR IVE I FLWSVGLK FEPQFRYCRKMLTK I GQLVTTMDD I F DVYGTLEDEL 335
CsTPS8FN KFP FARDR MVEL YFW I LGVYYEPKYSRARKLLTKVI ALTS I TDDYDAYGT IDEL 315
CsTPS7FN KFP FARDR MVEL YFW I LGVYYEPKYSRARKLLTKVI ALTS I TDDYDAYGT IDEL 315
CsTPS9FN KLP FARDR IVEL YLWLVGFHEPELSLARI I STKVIALASVADD I YDAYGTFEEL 322
CsTPS4FN NFP FARNR IVEL Y I W I LGVYYEPQYSFARN I LVK I I ALSSIADD I YDSYGI FEEH 331

      460              480
CsTPS3FN ELFTSAVERW DVK I NEL - PDYMKMPFFVLHNT I NEMGF DVLVEQNF - VNI EY LK 442
CsTPS1FN QLFTNALQRWDLKELDKL - PDYMKSAFYFTYNTNEL AFDV LQEHGF - VHI EYFK 440
CsTPS2FN ELFTKAVERW DVKTVDEL - PDYMKLPFFTLNFTV NEMAYDVL EEHNF - VSVEY LK 378
CsTPS33PK ELFTNAVERW DVKAMDDL - PEYMRMPFFLLHNT I NEMAFDVLGHQNF - LNVKFLK 429
CsTPS13PK ELFTKAVERW DVKMI NEL - PEYMKMPYLVLHNT I NDMVFEVLRDQE I S I NIQYLK 408
CsTPS6FN ELFTKAVERW DVKMI NEL - PEYMKMPYLVLHNT I NDMVFEVLRDQE I S I NIQYLK 406
CsTPS30PK ELFTNAVERW D I S AMDGL - PEYMKTCFLALYNF I NDLPFDVLKGE EGLHI I KFLQ 437
CsTPS5FN SLFQHALGRWD I N T I DQL - PDYMK I FFLATY NVVNEMAYDVLKQNG I L I - I KYL K 388
CsTPS8FN ELLTKAIQRWD I N C M D K L E P E Y L R T Y Y K V M L E S Y E E F E K E L K K E E L Y - - K L E Y A K 368
CsTPS7FN QLLTKAMQRWD I N C M D K L E P E Y L K T Y Y K V M L E S Y E E F E K E L K K E E L Y - - K L E Y A K 368
CsTPS9FN ELLTES I NRWDLNCADQLRPECLQTFYKVLNLCYEEFESELGKEESY - - K V Y Y A R 375
CsTPS4FN KLL I E A I DRWDKNCMDK L H P E Y L Q K Y Y K I L L Q S F E E F E Q E F E K E E T Y - - K V Y Y G K 384

      500              520              540
CsTPS3FN KSWVDLCKCYLQEA KWYYSGYPTLEEY TELGWLS I GASVILMHAYFCFTN - - - - 493
CsTPS1FN KLMVELCKHHLQEA KWYYSGYPTLQ EYVENGWLSVGGQVILMHAYFAFTN - - - - 491
CsTPS2FN NSWAE LCRCYLEA KWYYSGYPTLKKY I ENASLS I GGGQV I FVYAFFSLTK - - - - 429
CsTPS33PK RTWVDFCKHQLQEA KWYYSGYKPTFE EY I NNAW I SVSGP I LMDAYFSLTN - - - - 480
CsTPS13PK KTWVDMCRGFLQEA KWYYSGYTPTLEEY I ENGWI SVGAPVL I VHAYF SHAN YNHT 463
CsTPS6FN KTWVDMCKSFLQEA KWYYSGYTPTLEEY I ENGWI SVGAPVIL VHAYFFHANNRNT 461
CsTPS30PK KSWADLCKSYLREARWYYSGYTPSFE EY I ENAW I S I SGPVILSHLYFFV VNPKE 492
CsTPS5FN KTWTDLCKCYML E ANWYHSGYTPSLEEY I KNGWI S I AEPL I LNLVLYCL I TN - - - - 439
CsTPS8FN EEMKR I I RAYFEARWLNEGYLPRLDEHLRVS YVSCGYVML I ATSYVGM - - HD I - 420
CsTPS7FN EEMKR I I RAYFEARWLNEGYLPSFDEHLRVS Y I SSGYVLL I ATSYVGM - - DD I - 420
CsTPS9FN EAMKRLLGAYFSEARWLHEGYFPSFDEHLK VSL I SCGYTMMI V TSL I GMK - - DC - 427
CsTPS4FN ETFKRLLKGYFEARWLNEGYMPSLEEHLKVSLV TSGYFMLMACSLVGMKSNNI I - 438

      560              580              600
CsTPS3FN - P I T K Q D L K S L Q L Q H H Y P N I I K Q A C L I T R L A D D L G T S S D E L N R G D V P K S I Q C Y M Y 547
CsTPS1FN - P V T K E A L E C L K D G H - - P N I V R H A S I I L R L A D D L G T L S D E M K R G D V P K S I Q C Y M H 543
CsTPS2FN - S I T N E A L E S L Q E G H Y - - A A C R Q G S L M L R L A D D L G T S S D E L K R G D I L K S V C Y M H 481
CsTPS33PK - P V T K D A I N L L E L G - - Y P P I I Y H A S M I L R L T D D L G T S N D E M K R G D I P K S I Q C Y M N 532
CsTPS13PK V T S S K E I F E C F E H G - Y Y P A I I R H S A I I L R L T N D L A T S S E E L K R G D A P T S I Q C Y M Q 517
CsTPS6FN I T N T K E I F E C L E Y G - Y Y P A I I R H S A I I L R F T N D L A T S S E E L K R G D A P T S I Q C Y M Q 515
CsTPS30PK N A L L S T C F D G - - - - - Y P T I I R H S S M I L R L K D D M G T S T D E L K R G D V P K S I Q C K M Y 541
CsTPS5FN - P I K E D D I D C L L Q - - - - Y P T F I R I S G I I A R L V D D L G T S S D E L K R G D N P K S I Q C Y M K 490
CsTPS8FN - - V T H E T L D W L S K D - - - - P K I S A S T L L S R F M D D I G S R K F E Q E R N H I P S T V D C Y M K 470
CsTPS7FN - - V T H E T L N W L S K D - - - - P K I V S A S T L L S R F M D D I G S R K F E Q E R N H V L S T V E C Y M K 470
CsTPS9FN - - V T K Q D F E W L S K D - - - - P K I M R D C N I L C R F M D D I V S H K F E Q Q R D H S P S T V E S Y M R 477
CsTPS4FN - - V T K Q V F E W L S K D - - - - P K I V R A S A S V C R Y M D D V A G H K N E Q E R N H I P S T I E C Y M K 488

      620              640              660
CsTPS3FN DNNATEDE - AREH I KFL I SETWKDMN - - - - - KKDED - ESCLS - - - - - EN 584
CsTPS1FN DTGASEDE - AREH I KYL I SEWKEMN - - - - - NEDGN I NSFFS - - - - - NE 581
CsTPS2FN ETGVSEDE - AREH I KFL I SEWKEMN - - - - - DEDE - YNS I FS - - - - - KE 518
CsTPS33PK DTGVSEDE - ARDHMKFL I SELWKE I N - - - - - NEDENMDS PFS - - - - - KQ 570
CsTPS13PK EKNVSEEE - AREH I KFL I NEAWKEMN - - - - - ND - - - - - VGLYP - - - - - IS 551
CsTPS6FN EK I VSEEE - AREH I KFL I NEAWKEMN - - - - - ND - - - - - VGLYP - - - - - IS 549
CsTPS30PK EDG I SEEE - ARQR I KLL I SETWKL I NKDY I N L D D D D G D D Y S P M F Y K S N N I N K A 595
CsTPS5FN ENG I CDEKNGREH I RNL I SETWKEMNEARVG - - - - - ESPFS - - - - - QA 528
CsTPS8FN QYGVSEEEA I KELNKRVT - YWKE I NEDFIRPTV - - - - - - - - - - - VPFP 507
CsTPS7FN QYEVSEEEAVKELNKRVAN - CWKE I NEDFIRPTS - - - - - - - - - - - VPFP 507
CsTPS9FN QYGVSEEQACDEL R K Q V I N - SWKE I NKAFLRPSN - - - - - - - - - - - VPYP 514
CsTPS4FN QYGVSEEEACDEMNRVV I - AWKE I NEEFLKPT E - - - - - - - - - - - AASP 525

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        680                               700
        |                               |
CsTPS3FN FVEVCKNMARTALFIYE-NGDGHGSQ-NSLSKERISTLIITPINIPK* 630
CsTPS1FN FVQVCQNLGRASQFIYQ-YGDGHASQ-NNLSKERV LGLIITPI--PM* 625
CsTPS2FN FVQACKNLGRMSLFMYQ-HGDGHASQ-DSHSRKRISDLIINPI--PL* 562
CsTPS33PK FLQNCKNLARISQFIYQ-YGDGHASQ-DSLKQRISELIINH I--PS* 614
CsTPS13PK LTEDATNFAKMGFFIYQ-HGDGHSSQ-DNQS KQKISSLIIEPIPLYT* 597
CsTPS6FN LTEDATNFAKMGFFIYQ-HGDGHSSQ-DNQS KQKISSLIIEPIPLYT* 595
CsTPS30PK F IEMCLNLGRMAHCIYQ-YGDGHGIQ-DRQTKDHVLSLLIHP IPLTQ* 641
CsTPS5FN F IETAIIDFVRTAMMIYQKEQDGVGTNFDHYTKDGIISLFFTSIPI*-- 574
CsTPS8FN I LVRVLNFTKVIDLFYKEGDDQY-TRVGKALKESIDALLIDS I--PL* 552
CsTPS7FN I LFR IINLTKTADFMYREGGQY-THVGKMLKDSIAALLIDP I--PL* 552
CsTPS9FN VLSLVLNFSRVMDLLYKDG-DGY-THIGKETKNSVVALLIDQ I--P*-- 557
CsTPS4FN I LVRALN LARVMDLLYKNG-DNY-TQVGKVTKDSVAVLLIDP I--P*-- 568

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