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NTDB id 600 KW2 RS01765 WP 011675413.1	MATKKK.....TNFDDITKKYGAERDKALADALALIEKD FGKGSIMRLGER.A.NQKVSVVSSGSLALDIALGAGGYPKGR	74
NTDB id 269 KZH43 RS08665 WP 001085462.1	.MAKKP.....KKLEEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 228 SPD RS09265 WP 001085462.1	.MAKKP.....KKLEEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 194 SPR RS08825 WP 001085462.1	.MAKKP.....KKLEEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 159 SP RS09750 WP 001085462.1	.MAKKP.....KKLEEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 527 SMSK321 RS11065 WP 001085454.1	.MAKKP.....KKLDEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 499 SM12261 RS08315 WP 0028228268.1	.MAKKP.....KKLDEISKKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR	73
NTDB id 408 SMU RS09530 WP 002262392.1	.MAKRI.....KKTEEITKKKFGDERKKALDDALKNIEKDFGKGAVMRLGER.AEQKVQVMSSGSLALDIALGAGGYPKGR	73
NTDB id 453 Spy49 1753c ACI62003.1	.MAKKL.....KKNEEITKKKFGDERRKALDDALKNIEKDFGKGAVMRLGER.AEQKVQVMSSGSLALDIALGAGGYPKGR	73
NTDB id 115 BSU 16940 NP 389576.2	.....MSDRQAALDMALKQIEKQFGKGSIMKLG EK.TDTRISTVPSGSLALDIALGIGGYPKGR	58
NTDB id 625 LCA RS02525 WP 011374196.1	.....MAKDERQAALDAALKKIEKNFGKGSIMRMGEK.VDTQVSTVSSGSLALDEALGVGGYPKGR	60
NTDB id 1313 DR RS12030 WP 010888966.1	.....MSKDATKEISAPTDAKERSKATETAMSI EKAFGKGSIMKLGAE.SKLDVQVVSTGSLSLDLALGVGGIPKGR	72
NTDB id 1245 Cj1673c YP 002345041.1	.....MDNKRKSLDAALKS LDKT FGKGTILRLGDK.EVEQIDSIGTGSVGLDLALGIGGVPKGR	59
NTDB id 1214 NCTC11637 00359 SQJ03206.1	.....MAIDEDKQKATISLAIKQIDKVF GK GALVRLGDK.QVEKIDAISTGSLGLDLALGIGGVPKGR	61
NTDB id 1211 C694 RS00795 WP 000963128.1	.....MAIDEDKQKATISLAIKQIDKVF GK GALVRLGDK.QVEKIDSISTGSLGLDLALGIGGVPKGR	61
NTDB id 1334 RAOC RS04870 WP 004918236.1	.....MAKT..ETTSPNDDKKKALAAVLEK LDKT YGKGTVMKLG DGTVDHNIIEVIPSGSLGLDLALGVGGYPKGR	68
NTDB id 1130 NGFG RS03960 WP 003688695.1	.....MSDDKSKALAAALAQIEKSF GKGAIMKMDGSQEQENLEVISTGSLGLDLALGVGGLPKGR	60
NTDB id 1124 NGFG RS03960 WP 003688695.1	.....MSDDKSKALAAALAQIEKSF GKGAIMKMDGSQEQENLEVISTGSLGLDLALGVGGLPKGR	60
NTDB id 1123 OK783 RS03845 WP 003688695.1	.....MSDDKSKALAAALAQIEKSF GKGAIMKMDGSQEQENLEVISTGSLGLDLALGVGGLPKGR	60
NTDB id 37065 XCAW RS11195 WP 011051113.1	.....MDENKKRALSAALSQIEKQFGKGSVMRMGDR.VIEAVEV IPTGSLMLDIALGIGGLPKGR	59
NTDB id 1427 RS RS02760 WP 011000510.1	.....MEDGK..KAASMSAEKQKALAAALAQIEKQFGKGSIMKMGDA.EVEPVQVVSTGSLGLDVALGVGGLPKGR	68
NTDB id 1389 A4U84 RS07560 WP 021112712.1	.MAENKKS SKNNTV.VKQVEPEKQKQALEAALAQIEKQFGKGSIMKLGQT.EQLDIESVSTGSLGLDLALGIGGLPKGR	76
NTDB id 1165 A1552VC RS01565 WP 000344154.1	.....MDENKQKALAAALGQIEKQFGKGSIMRLGDN.RAMDVETISTGSLSLDIALGAGGLPKGR	59
NTDB id 1142 GTF74 RS11550 WP 000344154.1	.....MDENKQKALAAALGQIEKQFGKGSIMRLGDN.RAMDVETISTGSLSLDIALGAGGLPKGR	59
NTDB id 1022 ACIAD RS06390 WP 004925639.1	.....MDDNKSKALQAALSQIEKQFGKNTVMRLGDN.TVQAVEAVSTGSLTLDIALGIGGLPKGR	59
NTDB id 1074 ABD1 RS10195 WP 000344167.1	.....MDENKSKALQAALSQIEKQFGKNTVMRLGDN.TVQAVEAVSTGSLTLDIALGIGGLPKGR	59
NTDB id 1205 PSJM300 05545 AFN77183.1MDENKKRALAAALGQIEKQFGKGAVMRMGDH.DRQAIPSI STGSLGLDIALGIGGLPKGR	59
consensus	*** ** * ** *! *!***** * **!*!*!*!*!*! !! *!*	

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NTDB id 600 KW2 RS01765 WP 011675413.1	ASVRLDVRGSTKIEEGS.GDNKTQIGKI	TKIKVVKNKVAPPFKVALVDIMFGEGISSTGELINIAVEEGI	TKKSGAWFAY	311
NTDB id 269 KZH43 RS08665 WP 001085462.1	ASVRLDVRGNTQIKGTG.DQKETN	VGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 228 SPD RS09265 WP 001085462.1	ASVRLDVRGNTQIKGTG.DQKETN	VGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 194 SPR RS08825 WP 001085462.1	ASVRLDVRGNTQIKGTG.DQKETN	VGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 159 SP RS09750 WP 001085462.1	ASVRLDVRGNTQIKGTG.DQKETN	VGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 527 SMSK321 RS11065 WP 001085454.1	ASVRLDVRGSTQIKGTG.DQKDTN	VGKETKIKVVKNKVAPPFKEAFVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 499 SM12261 RS08315 WP 0028228268.1	ASVRLDVRGSTQIKGTG.DQKDTN	VGKETKIKVVKNKVAPPFKEAFVEIMYGEGISKTGELLKIASDLDI	TKKAGAWYSY	310
NTDB id 408 SMU RS09530 WP 002262392.1	SSVRLDVRGNTQIKGTG.EQKDSN	IGKETKIKVVKNKVAPPFKEAFVEIITYGEGISRTGELVKIASDLGI	IQQKAGAWFSY	310
NTDB id 453 Spy49 1753c ACI62003.1	ASVRLDVRGTTQIKGTG.DQKDS	IGKETKIKVVKNKVAPPFKEAFVEIMYGEGISRTGELVKIASDLDI	IQQKAGAWFSY	310
NTDB id 115 BSU 16940 NP 389576.2	SSVRLVRRRAEQLKQGN.....	DVMGNKTKIKVVKNKVAPPFRTAEVDIMYGEGISKEGEITD	LGTELDIVQKSGSWYSY	291
NTDB id 625 LCA RS02525 WP 011374196.1	STVRLVRRRAETIKNGT.....	DMIGNRARIKVVKNKVAPPFKVAEVDIMYGGISRTGELVDM	AVEKDIINKSGSWYSY	293
NTDB id 1313 DR RS12030 WP 010888966.1	ASVRLDVRKIGQ....PTKVGND	AVANTVKIKTIVKNKVAAPFKEVELALVYKGFQDLS	DLVGLAADMDITKKAGSFYSY	306
NTDB id 1245 Cj1673c YP 002345041.1	ASVRLDVRKIVAT....L.KQNE	EPIGNRVKVVKNKVAPPFRQAEFDVMFGEGLSREGELIDY	GVKLDIVDKSGAWFSY	293
NTDB id 1214 NCTC11637 00359 SQJ03206.1	ASVRIDIRRIAA....L.KQNE	QHIGNRAKAKVVKNKVAPPFREAEFDMFGEGISKEGEI	IDYGVKLDIVDKSGAWLSY	295
NTDB id 1211 C694 RS00795 WP 000963128.1	ASVRIDIRRIAS....L.KQNE	QHIGNRAKAKVVKNKVAPPFREAEFDMFGEGISKEGEI	IDYGVKLDIVDKSGAWLSY	295
NTDB id 1334 RAOC RS04870 WP 004918236.1	ASVRIDIRRSLSDTGKIKDKS	GEVIGNRTKVVKNKVAPPFKSAEFDIMYGEGVSKVGEILD	VATDLDI IQKSGSWFSY	306
NTDB id 1130 NGFG RS03960 WP 003688695.1	SSVRLDIRRTGS....I.KKG	EEVLGNETRVKVIKKNVAPPFRQAEFDILYGEGISWEGEL	IDIGVKNDIINKSGAWYSY	293
NTDB id 1124 NGFG RS03960 WP 003688695.1	SSVRLDIRRTGS....I.KKG	EEVLGNETRVKVIKKNVAPPFRQAEFDILYGEGISWEGEL	IDIGVKNDIINKSGAWYSY	293
NTDB id 1123 OK783 RS03845 WP 003688695.1	SSVRLDIRRTGS....I.KKG	EEVLGNETRVKVIKKNVAPPFRQAEFDILYGEGISWEGEL	IDIGVKNDIINKSGAWYSY	293
NTDB id 37065 XCAW RS11195 WP 011051113.1	ASVRLDIRRIGA....I.KKG	DEIIGNQTKIKVVKNKLAPPFKQVVTEILYGEGISREGEL	IDMGVEAKLVDKAGAWYSY	294
NTDB id 1427 RS RS02760 WP 011000510.1	ASVRLDIRRIGS....I.KKG	DEVVGNETKVVKNKVAPPFREAI	FIDILYGAGVSRGEITD LGVEAKVVEKSGAWYSY	301
NTDB id 1389 A4U84 RS07560 WP 021112712.1	ASVRLDIRRCGV....V.KDG	DEIIGSETKVVKNKVAPPFRE	VQFDIMYGEGISRMNELLILAEANGFIKKSGAWFSY	309
NTDB id 1165 A1552VC RS01565 WP 000344154.1	ASVRLDIRRTGA....I.KEG	EEVVGNETRIKVVKNKIAAPFKEANTQIMYGGFN	REGELIDLGVKHKMVEKSGAWYSY	292
NTDB id 1142 GTF74 RS11550 WP 000344154.1	ASVRLDIRRTGA....I.KEG	EEVVGNETRIKVVKNKIAAPFKEANTQIMYGGFN	REGELIDLGVKHKMVEKSGAWYSY	292
NTDB id 1022 ACIAD RS06390 WP 004925639.1	ASVRLDIRRIGQ....V.KEG	DEIIGSETKVVKNKMAPPFREAI	FQILYGKGVNQLGELVDLAVQQNIVQKAGAWYSY	292
NTDB id 1074 ABD1 RS10195 WP 000344167.1	ASVRLDIRRIGQ....V.KEG	DEIIGSETKVVKNKMAPPFREAI	FQILYGKGTNQLGELVDLAVQQDIVQKAGAWYSY	292
NTDB id 1205 PSJM300 05545 AFN77183.1	ASVRLDIRRTGA....V.KEG	DEVVGSETRVKVVKNKVAPPFRQAEFQ	ILYGKGIYRNGEITD LGVQQGLVEKSGAWAY	292
consensus	**! !**!*	* ** *****! ! ! ! ! ! ! ! ! ! ! *	*****! !** ** * * * * *	*** ! !*****!

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NTDB id 600 KW2 RS01765 WP 011675413.1
 NTDB id 269 KZH43 RS08665 WP 001085462.1
 NTDB id 228 SPD RS09265 WP 001085462.1
 NTDB id 194 SPR RS08825 WP 001085462.1
 NTDB id 159 SP RS09750 WP 001085462.1
 NTDB id 527 SMSK321 RS11065 WP 001085454.1
 NTDB id 499 SM12261 RS08315 WP 078228268.1
 NTDB id 408 SMU RS09530 WP 002262392.1
 NTDB id 453 Spy49 1753c ACI62003.1
 NTDB id 115 BSU 16940 NP 389576.2
 NTDB id 625 LCA RS02525 WP 011374196.1
 NTDB id 1313 DR RS12030 WP 010888966.1
 NTDB id 1245 Cj1673c YP 002345041.1
 NTDB id 1214 NCTC11637 00359 SQJ03206.1
 NTDB id 1211 C694 RS00795 WP 000963128.1
 NTDB id 1334 RAOC RS04870 WP 004918236.1
 NTDB id 1130 NGFG RS03960 WP 003688695.1
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 NTDB id 1123 OK783 RS03845 WP 003688695.1
 NTDB id 37065 XCAW RS11195 WP 011051113.1
 NTDB id 1427 RS RS02760 WP 011000510.1
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 NTDB id 1165 A1552VC RS01565 WP 000344154.1
 NTDB id 1142 GTF74 RS11550 WP 000344154.1
 NTDB id 1022 ACIAD RS06390 WP 004925639.1
 NTDB id 1074 ABD1 RS10195 WP 000344167.1
 NTDB id 1205 PSJM300 05545 AFN77183.1

consensus



NDEKIGQGA**AKAKNYLKEHQDVFDEIDHKVRAAHG**ILDDSEVAETEEETTAS³⁸⁷TKAKAKKEEKAVETEEIELELED...
 KDEKIGQGS**ENAKKYLAEHPEIFDEIDKQVRSKFG**LIDGEEVSEQDTENKKDE...PKKEEA..VNEEVPLDLGDELEI 384
 KDEKIGQGS**ENAKKYLAEHPEIFDEIDKQVRSKFG**LIDGEEVSEQDTENKKDE...PKKEEA..VNEEVPLDLGDELEI 384
 KDEKIGQGS**ENAKKYLAEHPEIFDEIDKQVRSKFG**LIDGEEVSEQDTENKKDE...PKKEEA..VNEEVPLDLGDELEI 384
 KDEKIGQGS**ENAKKYLAEHPEIFDEIDKQVRSKFG**LIDGEEVSEQDTENKKDE...PKKEEA..VNEEVPLDLGDELEI 384
 KDEKIGQGS**ENAKKYLAENPEVFAEIDHQVVRVQFGL**IDGEEAAE...SKKDE...VAQVDS..VNEEVTLDLGDELEI 380
 KDEKIGQGS**ENAKKYLAENPEIFDEIDHQVVRVQFGL**IDGEEIAE...SKKDE...AAQVDS..VNEEVTLDLGDELEI 380
 NGEKIGQGS**ENAKKFLADNPEIFDDIDHKVVRVQYGL**IEEDNTEEKQSSKEK.....ETDEK..ADKNLVLELDDTIEL 381
 NGEKIGQGS**ENAKRYLADHPQLFDEIDRKRVRVQFGL**LEESEESAMAVASE.....E.....TDDLALDLDN³⁷⁶GIEI
 EEER**LGQGR**ENAK**QFLKENKDI**MLMIQE**QIREHYGL**DNNGVVQQAEETQEEL.EFE.E..... 348
 GSERIGQGR**ENAKNYLADHEDVEDEVRLKVR**AA**YGIS**DVPEEDLPTTEDE.QI.NILPDDST.....EE..... 355
 GDERIGQ**GKEKTI**AY**IAERP**EME**QEI**RDRVMA**AIRAG**NAGEAPALAPAPA**AAPEAAEA**..... 363
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 QDK**KLQGR**ENAK**KALLKEDKAL**AD**EITLK**IKESIG**SNEEI**.....MPLPDEPLEEME..... 347
 QDT**KLQGR**DT**IVKELIKDNPEL**A**ELEAK**IREKLQAK..... 343
 NGAKIGQ**GKDNVRVWLKENPEIS**DEIDAK**IRALNG**VM**EMHI**.....TEGTQDET**DGER**.....PEE..... 348
 NGAKIGQ**GKDNVRVWLKENPEIS**DEIDAK**IRALNG**VM**EMHI**.....TEGTQDET**DGER**.....PEE..... 348
 NGAKIGQ**GKDNVRVWLKENPEIS**DEIDAK**IRALNG**VM**EMHI**.....TEGTQDET**DGER**.....PEE..... 348
 GDERIGQ**GKDNARTYLR**DN**SQVATR**LE**AELREK**FQ**PAEAP**.....REAGDDEDKE..... 344
 NGERIGQ**GRDNCREF**LR**ENAELAR**E**IE**EN**KVREHLG**V**TPMG**.....AVTLAEEVEED..... 352
 DGT**KIGQ**G**KNNAVKWLKENPEI**AD**DKLEQ**E**IRNTL**AS**NPNS**.....VLKATASDSN**DES**DV..EEF**S**EEEL..... 372
 NGD**KIGQ**G**KANACKYLKENPEI**AK**TLDKKL**RE**MLLN**PN**EM**.....QLIAETSSA**ADD**VEF..GAV**P**EEF..... 354
 NGD**KIGQ**G**KANACKYLKENPEI**AK**TLDKKL**RE**MLLN**PN**EM**.....QLIAETSSA**ADD**VEF..GAV**P**EEF..... 354
 QGN**KIGQ**G**KNNVIRYFEEN**Q**IAE**E**IE**ERN**IRE**QL**LT**TG**TN**.....GAVQ.I.EDE**EE**PD**L**..L..ES..... 349
 KGS**KIGQ**G**KANA**AK**YLEENPEI**G**Q**E**IE**Q**Q**IRAK**LLV**TSAN.....TKAT**P**VAED**L**AD**ADI**..... 347

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NTDB id 228 SPD RS09265 WP 001085462.1	EIEE	388
NTDB id 194 SPR RS08825 WP 001085462.1	EIEE	388
NTDB id 159 SP RS09750 WP 001085462.1	EIEE	388
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NTDB id 499 SM12261 RS08315 WP 078228268.1	EIEE	384
NTDB id 408 SMU RS09530 WP 002262392.1	ED..	383
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NTDB id 625 LCA RS02525 WP 011374196.1	355
NTDB id 1313 DR RS12030 WP 010888966.1	363
NTDB id 1245 Cj1673c YP 002345041.1	343
NTDB id 1214 NCTC11637 00359 SQJ03206.1	347
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NTDB id 1130 NGFG RS03960 WP 003688695.1	348
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NTDB id 1123 OK783 RS03845 WP 003688695.1	348
NTDB id 37065 XCAW RS11195 WP 011051113.1	344
NTDB id 1427 RS RS02760 WP 011000510.1	352
NTDB id 1389 A4U84 RS07560 WP 021112712.1	372
NTDB id 1165 A1552VC RS01565 WP 000344154.1	354
NTDB id 1142 GTF74 RS11550 WP 000344154.1	354
NTDB id 1022 ACIAD RS06390 WP 004925639.1	349
NTDB id 1074 ABD1 RS10195 WP 000344167.1	349
NTDB id 1205 PSJM300 05545 AFN77183.1	347

consensus

 non conserved
 similar
 ≥ 50% conserved