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|                                             |              |          |          |           |           |           |          |         |          |         |          |        |    |
|---------------------------------------------|--------------|----------|----------|-----------|-----------|-----------|----------|---------|----------|---------|----------|--------|----|
| NTDB id 203158 BLA55 RS01975 WP 139553180.1 | .....MENITTN | EKKQLT   | SEALKE   | IEKKFGRES | VMLLGEN   | .DDTVVET  | FSSGSYKL | NKILGIN | GF       | PKGR    | 63       |        |    |
| NTDB id 600 KW2 RS01765 WP 011675413.1      | MATKK....    | KTNFDDIT | KKYGA    | ERDKALAD  | ALAL      | IEKDFGKGS | LMRLGEA  | .ANQKVS | VSVSSGSL | ALDIALG | AGGYPKGR | 74     |    |
| NTDB id 269 KZH43 RS08665 WP 001085462.1    | .MAKK....    | PKKLEEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 228 SPD RS09265 WP 001085462.1      | .MAKK....    | PKKLEEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 194 SPR RS08825 WP 001085462.1      | .MAKK....    | PKKLEEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 159 SP RS09750 WP 001085462.1       | .MAKK....    | PKKLEEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 499 SM12261 RS08315 WP 078228268.1  | .MAKK....    | PKKLDEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 527 SMSK321 RS11065 WP 001085454.1  | .MAKK....    | PKKLDEIS | KKFGA    | EREKALND  | ALKL      | IEKDFGKGS | SIMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | SGGYPKGR | 73     |    |
| NTDB id 453 Spy49 1753c ACI62003.1          | .MAKK....    | LKKNEEIT | KKFGD    | ERRKALDD  | ALKN      | IEKDFGKG  | AVMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | AGGYPKGR | 73     |    |
| NTDB id 408 SMU RS09530 WP 002262392.1      | .MAKR....    | IKKTEEIT | KKFGD    | ERKKALDD  | ALKN      | IEKDFGKG  | AVMRLGER | .AEQKVQ | VMSSGSL  | ALDIALG | AGGYPKGR | 73     |    |
| NTDB id 115 BSU 16940 NP 389576.2           | .....        | MS       | DRQAALD  | MALKQ     | IEKQFGKGS | SIMKLGEK  | .TDTRI   | STVPSG  | SLALD    | TALGIG  | GYPRGR   | 58     |    |
| NTDB id 625 LCA RS02525 WP 011374196.1      | .....        | MAKD     | ERQAALD  | AALKK     | IEKNFGKGS | SIMRMGEK  | .VDTQV   | STVSSG  | SLALD    | EALGVG  | GGYPRGR  | 60     |    |
| NTDB id 1313 DR RS12030 WP 010888966.1      | .....        | MSKDATKE | ISAPTD   | AKERSKAT  | ETAMSQ    | IEKAFGKGS | SIMKLGAE | .SKLDV  | QVVSTG   | SLSLDL  | ALGVGG   | IPRGR  | 72 |
| NTDB id 1245 Cj1673c YP 002345041.1         | .....        | MDDN     | KRKSLD   | AALKS     | LDKTFGKG  | TILRLGDK  | .EVEQID  | SIGTGS  | VGLDL    | ALGIGG  | VVPKGR   | 59     |    |
| NTDB id 1211 C694 RS00795 WP 000963128.1    | .....        | MAIDE    | DKQKAT   | ISLATIKQ  | IDKVF     | GKGALV    | RLGDK    | .QVEKID | SISTGS   | LGLDL   | ALGIGG   | VVPKGR | 61 |
| NTDB id 1214 NCTC11637 00359 SQJ03206.1     | .....        | MAIDE    | DKQKAT   | ISLATIKQ  | IDKVF     | GKGALV    | RLGDK    | .QVEKID | AISTGS   | LGLDL   | ALGIGG   | VVPKGR | 61 |
| NTDB id 1334 RAOC RS04870 WP 004918236.1    | .....        | MAKT..   | ETTSPND  | DKKKALA   | AVLEK     | LDKTYGKG  | TVMKLGD  | GTVDHN  | IEVIPS   | GSGLDL  | ALGVGG   | YPKGR  | 68 |
| NTDB id 1389 A4U84 RS07560 WP 021112712.1   | .MAENKK      | SSKNNTV  | .VKQVEPE | QKKQALEA  | AALAQ     | IEKQFGKGS | SIMKLGQT | .EQLDIE | SVSTGS   | LGLDL   | ALGIGG   | LPMGR  | 76 |
| NTDB id 1130 NGFG RS03960 WP 003688695.1    | .....        | MSD      | DKSKALAA | AALAQ     | IEKSFGKGA | IMKMDGS   | QQUEEN   | LEVIST  | GSGLDL   | ALGVGG  | LPRGR    | 60     |    |
| NTDB id 1124 NGFG RS03960 WP 003688695.1    | .....        | MSD      | DKSKALAA | AALAQ     | IEKSFGKGA | IMKMDGS   | QQUEEN   | LEVIST  | GSGLDL   | ALGVGG  | LPRGR    | 60     |    |
| NTDB id 1123 OK783 RS03845 WP 003688695.1   | .....        | MSD      | DKSKALAA | AALAQ     | IEKSFGKGA | IMKMDGS   | QQUEEN   | LEVIST  | GSGLDL   | ALGVGG  | LPRGR    | 60     |    |
| NTDB id 1427 RS RS02760 WP 011000510.1      | .MEDG....    | .K..     | KAASMSA  | EKQKALAA  | AALAQ     | IEKQFGKGS | SIMKMGDA | .EVEPV  | QVVSTG   | SLGLD   | VALGVG   | GLPRGR | 68 |
| NTDB id 1165 A1552VC RS01565 WP 000344154.1 | .....        | MDEN     | KQKALAA  | AALGQ     | IEKQFGKGS | SIMRLGDN  | .RAMDVET | ISTGSL  | SLDIAL   | GAGGL   | PMGR     | 59     |    |
| NTDB id 1142 GTF74 RS11550 WP 000344154.1   | .....        | MDEN     | KQKALAA  | AALGQ     | IEKQFGKGS | SIMRLGDN  | .RAMDVET | ISTGSL  | SLDIAL   | GAGGL   | PMGR     | 59     |    |
| NTDB id 1022 ACIAD RS06390 WP 004925639.1   | .....        | MDDN     | KSKALQA  | ALSQ      | IEKQFGKNT | VMRLGDN   | .TVQAVE  | AVSTGS  | LTLDIAL  | GIGGL   | PKGR     | 59     |    |
| NTDB id 1074 ABD1 RS10195 WP 000344167.1    | .....        | MDEN     | KSKALQA  | ALSQ      | IEKQFGKNT | VMRLGDN   | .TVQAVE  | AVSTGS  | LTLDIAL  | GIGGL   | PKGR     | 59     |    |
| NTDB id 1205 PSJM300 05545 AFN77183.1       | .....        | MDEN     | KKRALAA  | AALGQ     | IEKQFGKG  | AVMRMGDH  | .DRQAIP  | SISTGS  | LGLDIAL  | GIGGL   | PKGR     | 59     |    |
| consensus                                   |              |          | **       | **        | *         | ***       | ***      | *       | ***      | ***     | ***      | ***    |    |

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|                                             |                                                                                  |     |
|---------------------------------------------|----------------------------------------------------------------------------------|-----|
| NTDB id 203158 BLA55 RS01975 WP 139553180.1 | IIEIYGPESSGKTTISLHAI                                                             | 143 |
| NTDB id 600 KW2 RS01765 WP 011675413.1      | IVEIYGPESSGKTTVALHAVA                                                            | 154 |
| NTDB id 269 KZH43 RS08665 WP 001085462.1    | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 228 SPD RS09265 WP 001085462.1      | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 194 SPR RS08825 WP 001085462.1      | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 159 SP RS09750 WP 001085462.1       | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 499 SM12261 RS08315 WP 078228268.1  | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 527 SMSK321 RS11065 WP 001085454.1  | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 453 Spy49 1753c ACI62003.1          | IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDA                                              | 153 |
| NTDB id 408 SMU RS09530 WP 002262392.1      | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 153 |
| NTDB id 115 BSU 16940 NP 389576.2           | IIEIYGPESSGKTTVALHAVAQAQKDG                                                      | 153 |
| NTDB id 625 LCA RS02525 WP 011374196.1      | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 140 |
| NTDB id 1313 DR RS12030 WP 010888966.1      | ITEIYGPESSGKTTVALHAVAQAQKDG                                                      | 152 |
| NTDB id 1245 Cj1673c YP 002345041.1         | IIEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| NTDB id 1211 C694 RS00795 WP 000963128.1    | IIEIYGPESSGKTTVALHAVAQAQKDG                                                      | 141 |
| NTDB id 1214 NCTC11637 00359 SQJ03206.1     | IIEIYGPESSGKTTVALHAVAQAQKDG                                                      | 141 |
| NTDB id 1334 RAOC RS04870 WP 004918236.1    | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 148 |
| NTDB id 1389 A4U84 RS07560 WP 021112712.1   | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 156 |
| NTDB id 1130 NGFG RS03960 WP 003688695.1    | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 140 |
| NTDB id 1124 NGFG RS03960 WP 003688695.1    | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 140 |
| NTDB id 1123 OK783 RS03845 WP 003688695.1   | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 140 |
| NTDB id 1427 RS RS02760 WP 011000510.1      | VVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 148 |
| NTDB id 1165 A1552VC RS01565 WP 000344154.1 | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| NTDB id 1142 GTF74 RS11550 WP 000344154.1   | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| NTDB id 1022 ACIAD RS06390 WP 004925639.1   | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| NTDB id 1074 ABD1 RS10195 WP 000344167.1    | IIEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| NTDB id 1205 PSJM300 05545 AFN77183.1       | IVEIYGPESSGKTTVALHAVAQAQKDG                                                      | 139 |
| consensus                                   | ***!***!!!!*!!!!* ! **! !* ** !***!!!!**!* !! *!*****!*****!!*!!!!*!*! * *****!* |     |







NTDB id 203158 BLA55 RS01975 WP 139553180.1  
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 499 SM12261 RS08315 WP 078228268.1  
NTDB id 527 SMSK321 RS11065 WP 001085454.1  
NTDB id 453 Spy49 1753c ACI62003.1  
NTDB id 408 SMU RS09530 WP 002262392.1  
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 1211 C694 RS00795 WP 000963128.1  
NTDB id 1214 NCTC11637 00359 SQJ03206.1  
NTDB id 1334 RAOC RS04870 WP 004918236.1  
NTDB id 1389 A4U84 RS07560 WP 021112712.1  
NTDB id 1130 NGFG RS03960 WP 003688695.1  
NTDB id 1124 NGFG RS03960 WP 003688695.1  
NTDB id 1123 OK783 RS03845 WP 003688695.1  
NTDB id 1427 RS RS02760 WP 011000510.1  
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

DQKLAQGRKSLKDYLNENQETIFKEIEKEFLTSTF..... 330  
 DEKIGQGGAEKAKNYLKEHQDVDFEIDHKVRAAHGLDDSEVAETEETETASKTKAKAKKEEKAVETEEIELELED..... 387  
 DEKIGQGSSENAKKYLAEHPEIFDEIDKQVRSKFGFLIDGEEVSEQDTENKKKDE... PKKEEA..VNEEVPLDLGDELEIE 385  
 DEKIGQGSSENAKKYLAEHPEIFDEIDKQVRSKFGFLIDGEEVSEQDTENKKKDE... PKKEEA..VNEEVPLDLGDELEIE 385  
 DEKIGQGSSENAKKYLAEHPEIFDEIDKQVRSKFGFLIDGEEVSEQDTENKKKDE... PKKEEA..VNEEVPLDLGDELEIE 385  
 DEKIGQGSSENAKKYLAEHPEIFDEIDKQVRSKFGFLIDGEEVSEQDTENKKKDE... PKKEEA..VNEEVPLDLGDELEIE 385  
 DEKIGQGSSENAKKYLAENPEIFDEIDHQVRVQFGLIDGEEIAES... KKDE... AAQVDS..VNEEVTLDLGDLEIE 381  
 DEKIGQGSSENAKKYLAENPEVFAEIDHQVRVQFGLIDGEEAAES... KKDE... VAQVDS..VNEEVTLDLGDLEIE 381  
 GEKIGQGSSENAKRYLADHPQLFDEIDRKVRVKFGLLEESEESAMAVASE..... E..... TDDLALDLNGIEIE 377  
 GEKIGQGSSENAKKFLADNPEIFDDIDHKVRVQYGLIEEDNTEEKQSSKEK..... ETDEK..ADKNLVLELDDTIELE 382  
 EERLGGGRENAAKQFLKENKDIMLMIQEIREHYGLDNNGVVQQAAETQEEL.EFE.E..... 348  
 SERIGQGRENAAKNYLADHEDVEVLRLKVRAAAYGISDVPPEEDLPTTEDE.QI.NILPDOST..... EE..... 355  
 DERIGQGKEKTIAYIAIERPEMEQEITRDRVMAAIRAGNAGEAPALAPAPAAPEAAE..A..... 363  
 DKKLGGGRENKAFLEKENPEIADBITKAIQNSMGTIEGMI..... SGSEDD..EGE..E..... 343  
 DKKLGGGRENAAKALLKEDKALADEITLKIKESIGSNEEI..... MPLPDE..PLE..EME..... 347  
 DKKLGGGRENAAKALLKEDKALADEITLKIKESIGSNEEI..... MPLPDE..PLE..EME..... 347  
 DTKLGGGRDITVKELIKDNPELAEELEAKIREKLQAK..... 343  
 GTKIGQGGKNNAVKWLKENPEIADKLEQEIINTLASNPNS..... VLKATASDSND..ESDVEEFSEEEEL..... 372  
 GAKIGQGGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.... TEGTQDETGE..R..... PEE..... 348  
 GAKIGQGGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.... TEGTQDETGE..R..... PEE..... 348  
 GAKIGQGGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.... TEGTQDETGE..R..... PEE..... 348  
 GERIGQGRDNCREFLRNAAELARIEIENKVRHLGVTPMG.... AVTLA.EEEVE..D..... 352  
 GDKIGQGGKANACKYLKENPEIAKTLDDKKLREMLLNPNEM.... QLIAETSSAAD..DVEFGAVPEEF..... 354  
 GDKIGQGGKANACKYLKENPEIAKTLDDKKLREMLLNPNEM.... QLIAETSSAAD..DVEFGAVPEEF..... 354  
 GNKIGQGGKNNVIRYLEENPQISTEIEAVIREQLLTKASD.... QTAA.HDETEE..EPDLL..ES..... 349  
 GNKIGQGGKNNVIRYFEENNQIAEIEIERNIREQLLTTGTN.... GAVQ..I..EDEE..EPDLL..LES..... 349  
 GSKIGQGGKANAAKYLEENPEIQEIEQQIRAKLLVTSAN.... TKATPVAEDLA..DADI..... 347

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| NTDB id 203158 BLA55 RS01975 WP 139553180.1 | ... | 330 |
| NTDB id 600 KW2 RS01765 WP 011675413.1      | ... | 387 |
| NTDB id 269 KZH43 RS08665 WP 001085462.1    | IEE | 388 |
| NTDB id 228 SPD RS09265 WP 001085462.1      | IEE | 388 |
| NTDB id 194 SPR RS08825 WP 001085462.1      | IEE | 388 |
| NTDB id 159 SP RS09750 WP 001085462.1       | IEE | 388 |
| NTDB id 499 SM12261 RS08315 WP 078228268.1  | IEE | 384 |
| NTDB id 527 SMSK321 RS11065 WP 001085454.1  | IEE | 384 |
| NTDB id 453 Spy49 1753c ACI62003.1          | D.. | 378 |
| NTDB id 408 SMU RS09530 WP 002262392.1      | D.. | 383 |
| NTDB id 115 BSU 16940 NP 389576.2           | ... | 348 |
| 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 1211 C694 RS00795 WP 000963128.1    | ... | 347 |
| NTDB id 1214 NCTC11637 00359 SQJ03206.1     | ... | 347 |
| NTDB id 1334 RAOC RS04870 WP 004918236.1    | ... | 343 |
| NTDB id 1389 A4U84 RS07560 WP 021112712.1   | ... | 372 |
| NTDB id 1130 NGFG RS03960 WP 003688695.1    | ... | 348 |
| NTDB id 1124 NGFG RS03960 WP 003688695.1    | ... | 348 |
| NTDB id 1123 OK783 RS03845 WP 003688695.1   | ... | 348 |
| NTDB id 1427 RS RS02760 WP 011000510.1      | ... | 352 |
| 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