```
logo
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
NTDB id 64470 C19 RS0103590 WP 009872817.1   ....................MSVPDRKRALEAAIAYIEKQFGAGSIMSLGKHSSAHEISTIKTGALSLDLALGIGGVPKGR   61
NTDB id 600 KW2 RS01765 WP 011675413.1       MATKK.....KTNFDDITKKYGAERDKALADALALIEKDFGKGSLMRLGEA.ANQKVSVVSSGSLALDIALGAGGYPKGR   74
NTDB id 269 KZH43 RS08665 WP 001085462.1     .MAKK.....PKKLEEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 228 SPD RS09265 WP 001085462.1       .MAKK.....PKKLEEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 194 SPR RS08825 WP 001085462.1       .MAKK.....PKKLEEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 159 SP RS09750 WP 001085462.1        .MAKK.....PKKLEEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 499 SM12261 RS08315 WP 078228268.1   .MAKK.....PKKLDEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 527 SMSK321 RS11065 WP 001085454.1   .MAKK.....PKKLDEISKKFGAEREKALNDALKLIEKDFGKGSIMRLGER.AEQKVQVMSSGSLALDIALGSGGYPKGR   73
NTDB id 453 Spy49 1753c ACI62003.1           .MAKK.....LKKNEEITKKFGDERRKALDDALKNIEKDFGKGAVMRLGER.AEQKVQVMSSGSLALDIALGAGGYPKGR   73
NTDB id 408 SMU RS09530 WP 002262392.1       .MAKR.....IKKTEEITKKFGDERKKALDDALKNIEKDFGKGAVMRLGER.AEQKVQVMSSGSLALDIALGAGGYPKGR   73
NTDB id 115 BSU 16940 NP 389576.2            ......................MSDRQAALDMALKQIEKQFGKGSIMKLGEK.TDTRISTVPSGSLALDTALGIGGYPRGR   58
NTDB id 625 LCA RS02525 WP 011374196.1       ....................MAKDERQAALDAALKKIEKNFGKGSIMRMGEK.VDTQVSTVSSGSLALDEALGVGGYPRGR   60
NTDB id 1313 DR RS12030 WP 010888966.1       .......MSKDATKEISAPTDAKERSKAIETAMSQIEKAFGKGSIMKLGAE.SKLDVQVVSTGSLSLDLALGVGGIPRGR   72
NTDB id 1245 Cj1673c YP 002345041.1          ....................MDDNKRKSLDAALKSLDKTFGKGTILRLGDK.EVEQIDSIGTGSVGLDLALGIGGVPKGR   59
NTDB id 1211 C694 RS00795 WP 000963128.1     ..................MAIDEDKQKAISLAIKQIDKVFGKGALVRLGDK.QVEKIDSISTGSLGLDLALGIGGVPKGR   61
NTDB id 1214 NCTC11637 00359 SQJ03206.1      ..................MAIDEDKQKAISLAIKQIDKVFGKGALVRLGDK.QVEKIDAISTGSLGLDLALGIGGVPKGR   61
NTDB id 1334 RA0C RS04870 WP 004918236.1     ..........MAKT..ETTSPNDDKKKALAAVLEKLDKTYGKGTVMKLGDGTVDHNIEVIPSGSLGLDLALGVGGYPKGR   68
NTDB id 1389 A4U84 RS07560 WP 021112712.1    .MAENKKSSKNNTV..VKQVEPEQKKQALEAALAQIEKQFGKGSIMKLGQT.EQLDIESVSTGSLGLDLALGIGGLPMGR   76
NTDB id 1130 NGFG RS03960 WP 003688695.1     ......................MSDDKSKALAAALAQIEKSFGKGAIMKMDGSQQEENLEVISTGSLGLDLALGVGGLPRGR   60
NTDB id 1124 NGFG RS03960 WP 003688695.1     ......................MSDDKSKALAAALAQIEKSFGKGAIMKMDGSQQEENLEVISTGSLGLDLALGVGGLPRGR   60
NTDB id 1123 OK783 RS03845 WP 003688695.1    ......................MSDDKSKALAAALAQIEKSFGKGAIMKMDGSQQEENLEVISTGSLGLDLALGVGGLPRGR   60
NTDB id 1427 RS RS02760 WP 011000510.1       .MEDG........K..KAASMSAEKQKALAAALAQIEKQFGKGSIMKMGDA.EVEPVQVVSTGSLGLDVALGVGGLPRGR   68
NTDB id 1165 A1552VC RS01565 WP 000344154.1  ......................MDENKQKALAAALGQIEKQFGKGSIMRLGDN.RAMDVETISTGSLSLDIALGAGGLPMGR   59
NTDB id 1142 GTF74 RS11550 WP 000344154.1    ......................MDENKQKALAAALGQIEKQFGKGSIMRLGDN.RAMDVETISTGSLSLDIALGAGGLPMGR   59
NTDB id 1205 PSJM300 05545 AFN77183.1        ......................MDENKKRALAAALGQIEKQFGKGAVMRMGDH.DRQAIPSISTGSLGLDIALGIGGLPKGR   59
NTDB id 1022 ACIAD RS06390 WP 004925639.1    ......................MDDNKSKALQAALSQIEKQFGKNTVMRLGDN.TVQAVEAVSTGSLTLDIALGIGGLPKGR   59
NTDB id 1074 ABD1 RS10195 WP 000344167.1     ......................MDENKSKALQAALSQIEKQFGKNTVMRLGDN.TVQAVEAVSTGSLTLDIALGIGGLPKGR   59
consensus                                                                                ** ***  **  **! *!*********      *  ***!***!!*!!! !! !*!!
```

```
logo
NTDB id 64470 C19 RS0103590 WP 009872817.1   IVEIFGPESSGKTTLATHIVANAQKMGGVAAYIDAEHALDPNYAALIGANINDLMISQPDCGEDALSIAELLARSGAVDV   141
NTDB id 600 KW2 RS01765 WP 011675413.1       IVEIYGPESSGKTTVALHAVAAVQKEGGIAAFIDAENALDPEYAKALGVNIDELLLSQPDYGEQGLQIAEKLITSGAVDL   154
NTDB id 269 KZH43 RS08665 WP 001085462.1     IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 228 SPD RS09265 WP 001085462.1       IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 194 SPR RS08825 WP 001085462.1       IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 159 SP RS09750 WP 001085462.1        IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 499 SM12261 RS08315 WP 078228268.1   IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 527 SMSK321 RS11065 WP 001085454.1   IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 453 Spy49 1753c ACI62003.1           IIEIYGPESSGKTTVALHAVAQAQKEGGIAAFIDAEHALDPAYAAALGVNIDELLLAQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 408 SMU RS09530 WP 002262392.1       IVEIYGPESSGKTTVALHAVAQAQKDGGIAAFIDAEHALDPAYAAALGVNIDELLLSQPDSGEQGLEIAGKLIDSGAVDL   153
NTDB id 115 BSU 16940 NP 389576.2            IIEVYGPESSGKTTVALHAIAEVQQQGGQAAFIDAEHALDPVYAQKLGVNIEELLLSQPDTGEQALEIAEALVRSGAVDI   138
NTDB id 625 LCA RS02525 WP 011374196.1       IVEIYGPESSGKTTVALHAVAEVQKQGGTAAYIDAENAMDPKYATALGVNIDDLLLSQPDTGEQGLEIADALVSSGAVDI   140
NTDB id 1313 DR RS12030 WP 010888966.1       ITEIYGPESGGKTTLALAIVAQAQKAGGTCAFIDAEHALDPVYARALGVNTDELLVSQPDNGEQALEIMELLVRSGAIDV   152
NTDB id 1245 Cj1673c YP 002345041.1          IIEIYGPESSGKTTLTLHIIAECQKAGGVCAFIDAEHALDVKYAKNLGVNTDDLYVSQPDFGEQALEIVETIARSGAVDL   139
NTDB id 1211 C694 RS00795 WP 000963128.1     IIEIYGPESSGKTTLSLHIIAECQKNGGVCAFIDAEHALDVHYAKRLGVDTENLLVSQPDTGEQALEILETITRSGGIDL   141
NTDB id 1214 NCTC11637 00359 SQJ03206.1      IIEIYGPESSGKTTLSLHIIAECQKNGGVCAFIDAEHALDVHYAKRLGVDTENLLVSQPDTGEQALEILETITRSGGIDL   141
NTDB id 1334 RA0C RS04870 WP 004918236.1     IVEIYGPESSGKTTLTLHAIAEAQKVGGTAAFIDAEHAFDMHYAEKLGINLEELIVSQPDNGEQALEIADSLIRSGGVDI   148
NTDB id 1389 A4U84 RS07560 WP 021112712.1    IVEIYGPESSGKTTLTLSLIAQAQKGNKTCAFIDAEHALDPVYARNLGVNTDELLISQPDNGEQALEICDALVRSGAVDV   156
NTDB id 1130 NGFG RS03960 WP 003688695.1     IVEIFGPESSGKTTLCLEAVAQCQKNGGVCAFVDAEHAFDPVYARKLGVKVEELYLSQPDTGEQALEICDTLVRSGGIDM   140
NTDB id 1124 NGFG RS03960 WP 003688695.1     IVEIFGPESSGKTTLCLEAVAQCQKNGGVCAFVDAEHAFDPVYARKLGVKVEELYLSQPDTGEQALEICDTLVRSGGIDM   140
NTDB id 1123 OK783 RS03845 WP 003688695.1    IVEIFGPESSGKTTLCLEAVAQCQKNGGVCAFVDAEHAFDPVYARKLGVKVEELYLSQPDTGEQALEICDTLVRSGGIDM   140
NTDB id 1427 RS RS02760 WP 011000510.1       VVEIYGPESSGKTTLTLQVVAEMQKLGGTCAFIDAEHALDVTYADKLGVKVPDLLISQPDTGEQALEIADALVRSGSVDL   148
NTDB id 1165 A1552VC RS01565 WP 000344154.1  IVEIFGPESSGKTTLTLELIAAAQREGKTCAFIDAEHALDPVYAKKLGVNIDELLVSQPDTGEQALEICDALARSGAVDV   139
NTDB id 1142 GTF74 RS11550 WP 000344154.1    IVEIFGPESSGKTTLTLELIAAAQREGKTCAFIDAEHALDPVYAKKLGVNIDELLVSQPDTGEQALEICDALARSGAVDV   139
NTDB id 1205 PSJM300 05545 AFN77183.1        IVEIYGPESSGKTTLTLSVIAAAQRMGSTCAFVDAEHALDPDYAGKLGVNVDDLLVSQPDTGEQALEITDMLVRSNAVDV   139
NTDB id 1022 ACIAD RS06390 WP 004925639.1    IVEIYGPESSGKTTMTLQAIAQCQKAGGTCAFIDAEHALDPQYARKLGVDIDNLLVSQPDHGEQALEIADMLVRSGAIDL   139
NTDB id 1074 ABD1 RS10195 WP 000344167.1     IIEIYGPESSGKTTMTLQAIAQCQKSGGTCAFIDAEHALDPQYARKLGVDIDNLLVSQPDNGEQALEIADMLVRSGAIDL   139
consensus                                    **!**!!!!*!!!!* * **!  !* **  !**!!!*!*!* !!  *!*****!***!!!*!!**!*! * ***!***!*
```

```
logo
NTDB id 64470 C19 RS0103590 WP 009872817.1   IVIDSVAALVPKSELEGEIGDVHVGLQARMMSQALRKLTATLARTNTCAIFINQIREKIGVS.FGNPETTTGGRALKFYS   220
NTDB id 600 KW2 RS01765 WP 011675413.1       VVIDSVAALVPKAEIDGEIGDSSVGLQARMMSQAMRKLAGHINKTKTTAIFINQLREKVGVM.FGSPETTPGGRALKFYA   233
NTDB id 269 KZH43 RS08665 WP 001085462.1     VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 228 SPD RS09265 WP 001085462.1       VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 194 SPR RS08825 WP 001085462.1       VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 159 SP RS09750 WP 001085462.1        VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 499 SM12261 RS08315 WP 078228268.1   VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 527 SMSK321 RS11065 WP 001085454.1   VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLGASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 453 Spy49 1753c ACI62003.1           VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLSASINKTKTIAIFINQLREKVGVM.FGNPETTPGGRALKFYA   232
NTDB id 408 SMU RS09530 WP 002262392.1       VVVDSVAALVPRAEIDGDIGDSHVGLQARMMSQAMRKLSASINKTKTIAIFINQLREKVGIM.FGNPETTPGGRALKFYS   232
NTDB id 115 BSU 16940 NP 389576.2            VVVDSVAALVPKAEIEGDMGDSHVGLQARLMSQALRKLSGAINKSKTIAIFINQIREKVGVM.FGNPETTPGGRALKFYS   217
NTDB id 625 LCA RS02525 WP 011374196.1       LVVDSVAALVPRAEIEGEMGDAHVGLQARLMSQALRKLSGTINKTKTIALFINQIREKVGVM.FGNPEVTPGGRALKFYS   219
NTDB id 1313 DR RS12030 WP 010888966.1       VVVDSVAALTPRAEIEGDMGDSLPGLQARLMSQALRKLTAILSKTGTAAIFINQVREKIGVM.YGNPETTTGGRALKFYA   231
NTDB id 1245 Cj1673c YP 002345041.1          IVVDSVAALTPKAEIEGDMGDQHVGLQARLMSQALRKLTGIVHKMNTTVIFINQIRMKIGAMGYGTPETTTGGNALKFYA   219
NTDB id 1211 C694 RS00795 WP 000963128.1     VVVDSVAALTPKAEIDGDMGDQHVGLQARLMSHALRKITGVLHKMNTTLIFINQIRMKIGMMGYGSPETTTGGNALKFYA   221
NTDB id 1214 NCTC11637 00359 SQJ03206.1      VVVDSVAALTPKAEIDGDMGDQHVGLQARLMSHALRKITGVLHKMNTTLIFINQIRMKIGMMGYGSPETTTGGNALKFYA   221
NTDB id 1334 RA0C RS04870 WP 004918236.1     VVVDSVAALTPKAEIDGDMGDSKMGLHARLMSQALRKLTSSISKTKCTVIFINQLRDKIGVM.FGSPETTTGGNALKFYA   227
NTDB id 1389 A4U84 RS07560 WP 021112712.1    IIVDSVAALTPKAEIEGDMGDSHMGLQARLMSQALRKLTANIKNTNCLVVFINQIRMKIGVM.FGNPETTTGGNALKFYA   235
NTDB id 1130 NGFG RS03960 WP 003688695.1     VVVDSVAALVPKAEIEGDMGDSHVGLQARLMSQALRKLTGHIKKTNTLVVFINQIRMKIGVM.FGSPETTTGGNALKFYS   219
NTDB id 1124 NGFG RS03960 WP 003688695.1     VVVDSVAALVPKAEIEGDMGDSHVGLQARLMSQALRKLTGHIKKTNTLVVFINQIRMKIGVM.FGSPETTTGGNALKFYS   219
NTDB id 1123 OK783 RS03845 WP 003688695.1    VVVDSVAALVPKAEIEGDMGDSHVGLQARLMSQALRKLTGHIKKTNTLVVFINQIRMKIGVM.FGSPETTTGGNALKFYS   219
NTDB id 1427 RS RS02760 WP 011000510.1       IVIDSVAALVPKAEIEGEMGDALPGLQARLMSQALRKLTGTIKRTNCLVIFINQIRMKIGVM.FGSPETTTGGNALKFYA   227
NTDB id 1165 A1552VC RS01565 WP 000344154.1  IVVDSVAALTPKAEIEGEMGDSHMGLQARMLSQAMRKLTGNLKQSNCMCIFINQIRMKIGVM.FGNPETTTGGNALKFYA   218
NTDB id 1142 GTF74 RS11550 WP 000344154.1    IVVDSVAALTPKAEIEGEMGDSHMGLQARMLSQAMRKLTGNLKQSNCMCIFINQIRMKIGVM.FGNPETTTGGNALKFYA   218
NTDB id 1205 PSJM300 05545 AFN77183.1        IIVDSVAALVPKAEIEGEMGDAHVGLQARLMSQALRKITGNIKNANCLVIFINQIRMKIGVM.FGSPETTTGGNALKFYA   218
NTDB id 1022 ACIAD RS06390 WP 004925639.1    IVVDSVAALTPKAEIEGEMGDSHMGLQARLMSQALRKITGNAKRSNCMVIFINQIRMKIGVM.FGSPETTTGGNALKFYA   218
NTDB id 1074 ABD1 RS10195 WP 000344167.1     IVVDSVAALTPKAEIEGEMGDSHMGLQARLMSQALRKITGNAKRSNCMVIFINQIRMKIGVM.FGSPETTTGGNALKFYA   218
consensus                                    ***!!!!!!*!**!**!**!!***!!*!!**!*!*!!*** * ** ** *!!!!*! !*!** *! !!*! !! !!!!!*
```

```
logo
NTDB id 64470 C19 RS0103590 WP 009872817.1   SIRIDIRRIGSIKGGE....NFDIGNRIKVKVAKNKLAPPFRTAEFDILFNEGISSAGCIIDLAVEKNIIDKKGSWFNYQ   296
NTDB id 600 KW2 RS01765 WP 011675413.1       SVRLDVRGSTKIEEGS.GDNKTQIGKITKIKVVKNKVAPPFKVALVDIMFGEGISSTGELLNIAVEEGIIKKSGAWFAYN   312
NTDB id 269 KZH43 RS08665 WP 001085462.1     SVRLDVRGNTQIKGTG.DQKETNVGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 228 SPD RS09265 WP 001085462.1       SVRLDVRGNTQIKGTG.DQKETNVGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 194 SPR RS08825 WP 001085462.1       SVRLDVRGNTQIKGTG.DQKETNVGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 159 SP RS09750 WP 001085462.1        SVRLDVRGNTQIKGTG.DQKETNVGKETKIKVVKNKVAPPFKEAVVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 499 SM12261 RS08315 WP 078228268.1   SVRLDVRGSTQIKGTG.DQKDTNVGKETKIKVVKNKVAPPFKEAFVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 527 SMSK321 RS11065 WP 001085454.1   SVRLDVRGSTQIKGTG.DQKDTNVGKETKIKVVKNKVAPPFKEAFVEIMYGEGISKTGELLKIASDLDIIKKAGAWYSYK   311
NTDB id 453 Spy49 1753c ACI62003.1           SVRLDVRGTTQIKGTG.DQKDSSIGKETKIKVVKNKVAPPFKVAEVEIMYGEGISRTGELVKIASDLDIIQKAGAWFSYN   311
NTDB id 408 SMU RS09530 WP 002262392.1       SVRLDVRGNTQIKGTG.EQKDSNIGKETKIKVVKNKVAPPFKEAFVEIIYGEGISRTGELVKIASDLGIIQKAGAWYSYN   311
NTDB id 115 BSU 16940 NP 389576.2            SVRLEVRRAEQLKQGN.....DVMGNKTKIKVVKNKVAPPFRTAEVDIMYGEGISKEGEIIDLGTELDIVQKSGSWYSYE   292
NTDB id 625 LCA RS02525 WP 011374196.1       TVRLEVRRAETIKNGT.....DMIGNRARIKVVKNKVAPPFKVAEVDIMYGQGISRTGELVDMAVEKDIINKSGSWYSYG   294
NTDB id 1313 DR RS12030 WP 010888966.1       SVRLDVRKIGQ....PTKVGNDAVANTVKIKTVKNKVAAPFKEVELALVYGKGFDQLSDLVGLAADMDIIKKAGSFYSYG   307
NTDB id 1245 Cj1673c YP 002345041.1          SVRLDVRKVAT....L.KQNEEPIGNRVKVKVVKNKVAPPFRQAEFDVMFGEGLSREGELIDYGVKLDIVDKSGAWFSYK   294
NTDB id 1211 C694 RS00795 WP 000963128.1     SVRIDIRRIAS....L.KQNEQHIGNRAKAKVVKNKVAPPFREAEFDIMFGEGISKEGEIIDYGVKLDIVDKSGAWLSYQ   296
NTDB id 1214 NCTC11637 00359 SQJ03206.1      SVRIDIRRIAA....L.KQNEQHIGNRAKAKVVKNKVAPPFREAEFDIMFGEGISKEGEIIDYGVKLDIVDKSGAWLSYQ   296
NTDB id 1334 RA0C RS04870 WP 004918236.1     SVRIDIRRSLSDTGKIKDKSGEVIGNRTKVKVVKNKVAPPFKSAEFDIMYGEGVSKVGEILDVATDLDIIQKSGSWFSYQ   307
NTDB id 1389 A4U84 RS07560 WP 021112712.1    SVRLDIRRCGV....V.KDGDEIIGSETKVKVVKNKVAPPFREVQFDIMYGEGISRMNELLILAEANGFIKKSGAWFSYD   310
NTDB id 1130 NGFG RS03960 WP 003688695.1     SVRLDIRRTGS....I.KKGEEVLGNETRVKVIKNKVAPPFRQAEFDILYGEGISWEGELIDIGVKNDIINKSGAWYSYN   294
NTDB id 1124 NGFG RS03960 WP 003688695.1     SVRLDIRRTGS....I.KKGEEVLGNETRVKVIKNKVAPPFRQAEFDILYGEGISWEGELIDIGVKNDIINKSGAWYSYN   294
NTDB id 1123 OK783 RS03845 WP 003688695.1    SVRLDIRRTGS....I.KKGEEVLGNETRVKVIKNKVAPPFRQAEFDILYGEGISWEGELIDIGVKNDIINKSGAWYSYN   294
NTDB id 1427 RS RS02760 WP 011000510.1       SVRLDIRRIGS....I.KKGDEVVGNETKVKVVKNKVAPPFREAIFDILYGAGVSREGEIIDLGVEAKVVEKSGAWYSYN   302
NTDB id 1165 A1552VC RS01565 WP 000344154.1  SVRLDIRRTGA....I.KEGEEVVGNETRIKVVKNKIAAPFKEANTQIMYGQGFNREGELIDLGVKHKMVEKSGAWYSYN   293
NTDB id 1142 GTF74 RS11550 WP 000344154.1    SVRLDIRRTGA....I.KEGEEVVGNETRIKVVKNKIAAPFKEANTQIMYGQGFNREGELIDLGVKHKMVEKSGAWYSYN   293
NTDB id 1205 PSJM300 05545 AFN77183.1        SVRLDIRRTGA....V.KEGDEVVGSETRVKVVKNKVAPPFRQAEFQILYGKGIYRNGEIIDLGVQQGLVEKSGAWYAYK   293
NTDB id 1022 ACIAD RS06390 WP 004925639.1    SVRLDIRRIGQ....V.KEGDEIIGSETKVKVVKNKMAPPFREAIFQILYGKGVNQLGELVDLAVQQNIVQKAGAWYSYQ   293
NTDB id 1074 ABD1 RS10195 WP 000344167.1     SVRLDIRRIGQ....V.KEGDEIVGSETKVKVVKNKMAPPFKEAIFQILYGKGTNQLGELVDLAVQQDIVQKAGAWYSYQ   293
consensus                                    **!***!*             *  ** ****!**!!!*!*!!* *  ******!*** **** **   *** ! !****!
```

```
logo
NTDB id 64470 C19 RS0103590 WP 009872817.1   DRKLGQGREAVREELKRNKELFHELERRIYESVQASQAPAAACVDSES.....REVAEAAK.....................  352
NTDB id 600 KW2 RS01765 WP 011675413.1       DEKIGQGAEKAKNYLKEHQDVFDEIDHKVRAAHGLLDDSEVAETEEETTASKTKAKAKKEEKAVETEEIELELED......  387
NTDB id 269 KZH43 RS08665 WP 001085462.1     DEKIGQGSENAKKYLAEHPEIFDEIDKQVRSKFGLIDGEEVSEQDTENKKDE....PKKEEA..VNEEVPLDLGDELEIE  385
NTDB id 228 SPD RS09265 WP 001085462.1       DEKIGQGSENAKKYLAEHPEIFDEIDKQVRSKFGLIDGEEVSEQDTENKKDE....PKKEEA..VNEEVPLDLGDELEIE  385
NTDB id 194 SPR RS08825 WP 001085462.1       DEKIGQGSENAKKYLAEHPEIFDEIDKQVRSKFGLIDGEEVSEQDTENKKDE....PKKEEA..VNEEVPLDLGDELEIE  385
NTDB id 159 SP RS09750 WP 001085462.1        DEKIGQGSENAKKYLAEHPEIFDEIDKQVRSKFGLIDGEEVSEQDTENKKDE....PKKEEA..VNEEVPLDLGDELEIE  385
NTDB id 499 SM12261 RS08315 WP 078228268.1   DEKIGQGSENAKKYLADNPEIFDEIDHQVRVQFGLIDGEEIAES....KKDE....AAQVDS..VNEEVTLDLGDELEIE  381
NTDB id 527 SMSK321 RS11065 WP 001085454.1   DEKIGQGSENAKKYLADNPEVFAEIDHQVRVQFGLIDGEEAAES....KKDE....VAQVDS..VNEEVTLDLGDELEIE  381
NTDB id 453 Spy49 1753c ACI62003.1           GEKIGQGSENAKRYLADHPQLFDEIDRKVRVKFGLLEESEEESAMAVASE.......E.......TDDLALDLDNGIEIE  377
NTDB id 408 SMU RS09530 WP 002262392.1       GEKIGQGSENAKKFLADNPEIFDDIDHKVRVQYGLIEEDNTEEKQSSKEK.......ETDEK..ADKNLVLELDDTIELE  382
NTDB id 115 BSU 16940 NP 389576.2            EERLGQGRENAKQFLKENKDIMLMIQEQIREHYGLDNNGVVQQQAEETQEEL.EFE.E.......................  348
NTDB id 625 LCA RS02525 WP 011374196.1       SERIGQGRENAKNYLADHEDVEDEVRLKVRAAYGISDVPEEDLPTTEDE.QI.NILPDDST.....EE............  355
NTDB id 1313 DR RS12030 WP 010888966.1       DERIGQGKEKTIAYIAERPEMEQEIRDRVMAAIRAGNAGEAPALAPAPAAPEAAE..A......................  363
NTDB id 1245 Cj1673c YP 002345041.1          DKKLGQGRENSKAFLKENPEIADEITKAIQNSMGIEGMI.....SGSEDDE..GE..E......................  343
NTDB id 1211 C694 RS00795 WP 000963128.1     DKKLGQGRENAKALLKEDKALADEITLKIKESIGSNEEI.....MPLPDEP..LE..EME....................  347
NTDB id 1214 NCTC11637 00359 SQJ03206.1      DKKLGQGRENAKALLKEDKALADEITLKIKESIGSNEEI.....MPLPDEP..LE..EME....................  347
NTDB id 1334 RAOC RS04870 WP 004918236.1     DTKLGQGRDTVKELIKDNPELAEELEAKIREKLQAK.........................................  343
NTDB id 1389 A4U84 RS07560 WP 021112712.1    GTKIGQGKNNAVKWLKENPEIADKLEQEIRNTLASNPNS.....VLKATASDSND..ESDVEEFSEEEL...........  372
NTDB id 1130 NGFG RS03960 WP 003688695.1     GAKIGQGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.....TEGT......Q..DETDGERPEE.............  348
NTDB id 1124 NGFG RS03960 WP 003688695.1     GAKIGQGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.....TEGT......Q..DETDGERPEE.............  348
NTDB id 1123 OK783 RS03845 WP 003688695.1    GAKIGQGKDNVRVWLKENPEISDEIDAKIRALNGVEMHI.....TEGT......Q..DETDGERPEE.............  348
NTDB id 1427 RS RS02760 WP 011000510.1       GERIGQGRDNCREFLRENAELAREIENKVREHLGVTPMG.....AV.TLAEEVEE..D......................  352
NTDB id 1165 A1552VC RS01565 WP 000344154.1  GDKIGQGKANACKYLKENPEIAKTLDKKLREMLLNPENM.....QLIAETSSAAD..DVEFGAVPEEF............  354
NTDB id 1142 GTF74 RS11550 WP 000344154.1    GDKIGQGKANACKYLKENPEIAKTLDKKLREMLLNPENM.....QLIAETSSAAD..DVEFGAVPEEF............  354
NTDB id 1205 PSJM300 05545 AFN77183.1        GSKIGQGKANAAKYLEENPEIGQEIEQQIRAKLLVTSAN.....TKATPVAEDLA..DADI...................  347
NTDB id 1022 ACIAD RS06390 WP 004925639.1    GNKIGQGKNNVIRYLEENPQISTEIEAVIREQLLTKASD.....QTAA.HDETEE..EPDLL..ES..............  349
NTDB id 1074 ABD1 RS10195 WP 000344167.1     GNKIGQGKNNVIRYFEENNQIAEEIERNIREQLLTTGTN.....GAVQ.I.EDEE..EPDLL..LES.............  349
consensus                                      **!!!***** ** ***** ****  **   **                      *
```

```
logo
                                                LEE
NTDB id 64470 C19 RS0103590 WP 009872817.1      ...   352
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 RA0C 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 1205 PSJM300 05545 AFN77183.1           ...   347
NTDB id 1022 ACIAD RS06390 WP 004925639.1       ...   349
NTDB id 1074 ABD1 RS10195 WP 000344167.1        ...   349
consensus
```

X non conserved
X similar
X ≥ 50% conserved