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|                 |           |                |                |                                                                                   |    |
|-----------------|-----------|----------------|----------------|-----------------------------------------------------------------------------------|----|
| NTDB id 1159    | ABDM36    | RS04765        | WP 001166105.1 | MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAABTPEYKEINLSAEVVAVSKDLYEKEVSKKEEKKEEPL          | 0  |
| NTDB id 1150    | A1552VC   | RS08580        | WP 001166105.1 | .....                                                                             | 0  |
| NTDB id 1395    | DSB67     | RS04445        | WP 010649155.1 | .....                                                                             | 0  |
| NTDB id 1362    | HI 1008   | AAC22669.1     |                | .....                                                                             | 0  |
| NTDB id 1382    | A4U84     | RS07375        | WP 062924234.1 | .....                                                                             | 0  |
| NTDB id 595     | KW2       | RS08725        | WP 021037687.1 | .....MEKILDKLKEYWKIM.LLVVICALIAGGIFYIFTNSPKPAETLSVEN....LSSS..STKSSVSKFNSSSSSEK   | 65 |
| NTDB id 521     | SMSK321   | RS04960        | WP 000443804.1 | .....MESIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPHTPVKETNLQAE...VVAISKDSSTEKDVKKKEEKKEEPL | 69 |
| NTDB id 493     | SM12261   | RS04300        | WP 000387351.1 | .....MEAIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAVSKDSVSEKEVNKKEEKKEEPL | 69 |
| NTDB id 263     | KZH43     | RS04195        | WP 000387330.1 | .....MEAIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAVSKDLVSEKEVNKKEEKKEEPL | 69 |
| NTDB id 222     | SPD       | RS04535        | WP 000387330.1 | .....MEAIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAVSKDLVSEKEVNKKEEKKEEPL | 69 |
| NTDB id 188     | SPR       | RS04295        | WP 000387330.1 | .....MEAIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAVSKDLVSEKEVNKKEEKKEEPL | 69 |
| NTDB id 153     | SP        | RS04730        | WP 000387344.1 | .....MEAIIEKIKEYKIIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAVSKDSSTEKEVNKKEEKKEEPL | 69 |
| NTDB id 1069    | ABD1      | RS03060        | WP 043960841.1 | .....                                                                             | 0  |
| NTDB id 1041    | HON27     | RS14740        | WP 005124713.1 | .....                                                                             | 0  |
| NTDB id 105     | BSU 25590 | NP 390437.1    |                | .....MNWLNQHKKAIILAASAAVFTAIMIFLATG....KNKE....PVKQAVPT....ETENTVVVKQEANNDE       | 57 |
| NTDB id 36      | MW        | RS08230        | WP 001793467.1 | MVLLYQFLLRYKDFLTQWKLYIISAVVLMVLI GFIFWRQDDYTSRNFENKDNALKQSTSENSSLSKVEDVQVKDGDNSK  | 80 |
| NTDB id 20      | SA        | RS08005        | WP 001802022.1 | MVLLYQFLLRYKDFLTQWKLYIISAVVLMVLI GFIFWRQDDYTSRNFENKDTALKQSTSENNSLSKLEDVQVKDGDNSK  | 80 |
| NTDB id 1014    | ACIAD     | RS13855        | WP 004924483.1 | .....                                                                             | 0  |
| NTDB id 1123390 | EL222     | RS00050        | WP 002853093.1 | .....                                                                             | 0  |
| NTDB id 1242    | Cj0011c   | YP 002343483.1 |                | .....                                                                             | 0  |
| NTDB id 1127    | NGFG      | RS10560        | WP 003703428.1 | .....                                                                             | 0  |
| NTDB id 1126    | NGFG      | RS09375        | WP 003703428.1 | .....                                                                             | 0  |
| NTDB id 1125    | NGFG      | RS07215        | WP 003703428.1 | .....                                                                             | 0  |
| NTDB id 1108    | NGFG      | RS06525        | WP 003703428.1 | .....                                                                             | 0  |
| consensus       |           |                |                |                                                                                   |    |

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| NTDB id 1159    | ABDM36    | RS04765        | WP 001166105.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEESASQHTGSGAP.. | 33  |
| NTDB id 1150    | A1552VC   | RS08580        | WP 001166105.1 | .....MQIKTK..IVTLFISLCLPT.....LPLLANAETAPAAQ.....                                   | 33  |
| NTDB id 1395    | DSB67     | RS04445        | WP 010649155.1 | .....MQIKTK..IVTLFISLCLPT.....LPLLANAETAPAAQ.....                                   | 33  |
| NTDB id 1362    | HI 1008   | AAC22669.1     |                | .....MKWMITLCLL.....LAPMSWAE..TKTKAD.....                                           | 25  |
| NTDB id 1382    | A4U84     | RS07375        | WP 062924234.1 | .....MKTL.....FTSVLCCAL.....VSSSFAEEKATXQTAQSVVTT                                   | 36  |
| NTDB id 595     | KW2       | RS08725        | WP 021037687.1 | .....MKKL...SRYTFSLLFC..L.....FSATTFABEKVTTSTEHTPVVM                                | 37  |
| NTDB id 521     | SMSK321   | RS04960        | WP 000443804.1 | NKNEIMVDLKGAVAKPNVYQISSDE.RIVDLIRQAGGFTDQADQKSINLSAKIKDEEVIIYVPKVCSSSSSESTDSP TG..  | 142 |
| NTDB id 493     | SM12261   | RS04300        | WP 000387351.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEESASQHTGSGAP.. | 146 |
| NTDB id 263     | KZH43     | RS04195        | WP 000387330.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEEASQQAGPGTA..  | 146 |
| NTDB id 222     | SPD       | RS04535        | WP 000387330.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEEAVSQQTGLGTA.. | 146 |
| NTDB id 188     | SPR       | RS04295        | WP 000387330.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEEAVSQQTGLGTA.. | 146 |
| NTDB id 153     | SP        | RS04730        | WP 000387344.1 | EQDLITVDVKCAVKSPGIYDLVSVGS.RVNDVAVQKAGGLTEQADSKSLNLAQKVSD EALVYVPTKCEEAVSQQTGLGTA.. | 146 |
| NTDB id 1069    | ABD1      | RS03060        | WP 043960841.1 | .....MQYSMRFWKNKYFVLLIMLCLGV.....ISPSVCAQSFDQNFQEWKVKQMYDQ                          | 48  |
| NTDB id 1041    | HON27     | RS14740        | WP 005124713.1 | .....MQYSMRFWKNKYFVLLIMLCLGV.....ISPSVCAQSFDQNFQEWKAKQMYDQ                          | 48  |
| NTDB id 105     | BSU 25590 | NP 390437.1    |                | SNETIVVDIKGAVQHHPGVYEMRTGD.RVSAIEKAGGTSEQADEAQVNLAIEIQDGTIVVYIPKKCEETAV.....Q       | 127 |
| NTDB id 36      | MW        | RS08230        | WP 001793467.1 | NKGPVYVDVKCAVKHPNVYKMTSKD.RVVDLIDKAQ..LLEDADV SQINLSEKLTQDKMIFIPH.....K.GQKNVEP     | 149 |
| NTDB id 20      | SA        | RS08005        | WP 001802022.1 | NKGPVYVDVKCAVKHPNVYKMTSKD.RVVDLIDKAQ..LLEDADVSRINLSEKLTQDKMIFIPH.....K.GQKNVEP      | 149 |
| NTDB id 1014    | ACIAD     | RS13855        | WP 004924483.1 | .....MSIR.HFF...T....FFWAT.....LL..TLFSMQIVFAAQGFDQYDAWK TQQKAHDT                   | 44  |
| NTDB id 1123390 | EL222     | RS00050        | WP 002853093.1 | .....MKKLLFLF...F.....                                                              | 9   |
| NTDB id 1242    | Cj0011c   | YP 002343483.1 |                | .....MKKLLFLF...F.....                                                              | 9   |
| NTDB id 1127    | NGFG      | RS10560        | WP 003703428.1 | .....MSRGGA....TPYRFLLR.HIV...ARCG..LLFAT.....LKGKTMKKMFVLF CML.....                | 43  |
| NTDB id 1126    | NGFG      | RS09375        | WP 003703428.1 | .....MSRGGA....TPYRFLLR.HIV...ARCG..LLFAT.....LKGKTMKKMFVLF CML.....                | 43  |
| NTDB id 1125    | NGFG      | RS07215        | WP 003703428.1 | .....MSRGGA....TPYRFLLR.HIV...ARCG..LLFAT.....LKGKTMKKMFVLF CML.....                | 43  |
| NTDB id 1108    | NGFG      | RS06525        | WP 003703428.1 | .....MSRGGA....TPYRFLLR.HIV...ARCG..LLFAT.....LKGKTMKKMFVLF CML.....                | 43  |
| consensus       |           |                |                |                                                                                     |     |

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| NTDB id 1159    | ABDM36  | RS04765        | WP 001166105.1 | .....VEEGIVITVNINTASABELATLLKIGIGLKKAAQAIVDYREANGPFTHIDDLTNVKGIGEATV              | 94  |
| NTDB id 1150    | A1552VC | RS08580        | WP 001166105.1 | .....VEEGIVITVNINTASABELATLLKIGIGLKKAAQAIVDYREANGPFTHIDDLTNVKGIGEATV              | 94  |
| NTDB id 1395    | DSB67   | RS04445        | WP 010649155.1 | .....KYEGIEITVMVNSATAQETATLLIGIGBKKAQDIVEYRNEHGPFKTAADLTQVKGIGEATV                | 86  |
| NTDB id 1362    | HI 1008 | AAC22669.1     |                | QAEA.....QVAPAVVSDKLNINTATASEIQKSLTGICAKKABAIQYREKHCNFXNAEQLLLEVQGIGKATL          | 103 |
| NTDB id 1382    | A4U84   | RS07375        | WP 062924234.1 | QQ.V.....AATQKVNANVVNINTATASEIQDKLVGIGAKKAQAIVEYREKNGKFLNVEQLTEVSGIGKATL          | 103 |
| NTDB id 595     | KW2     | RS08725        | WP 021037687.1 | .....S.....S..VSNQISTTSGPKVNINKADITELQK.LTGIGQKKAAQDIDDERMKNCGDFKSIDDLGKVSQFGDKTL | 208 |
| NTDB id 521     | SMSK321 | RS04960        | WP 000443804.1 | .....SSTSCKDKKLNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGAKTI                 | 206 |
| NTDB id 493     | SM12261 | RS04300        | WP 000387351.1 | .....SSTSKEKKVNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGAKTI                  | 206 |
| NTDB id 263     | KZH43   | RS04195        | WP 000387330.1 | .....SSISKEKKVNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGGKTI                  | 206 |
| NTDB id 222     | SPD     | RS04535        | WP 000387330.1 | .....SSISKEKKVNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGGKTI                  | 206 |
| NTDB id 188     | SPR     | RS04295        | WP 000387330.1 | .....SSISKEKKVNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGGKTI                  | 206 |
| NTDB id 153     | SP      | RS04730        | WP 000387344.1 | .....SSTSKEKKVNINKASLEELKQ.VKCLGGKRAQDIDHREANGKFKSVDLKKVSGIGGKTI                  | 206 |
| NTDB id 1069    | ABD1    | RS03060        | WP 043960841.1 | KLNISKSSSHSNSSKISQTKNFNDSTGQIHLNQANVNEFQQ.LKGIGEKKAQAIVEYRQKNCSFKNIDETKNVKGIGPAIF | 127 |
| NTDB id 1041    | HON27   | RS14740        | WP 005124713.1 | KLNITKSSSHSNGSKISQTKNFNDSTGQIHLNQANVNEFQQ.LKGIGEKKAQAIVEYRQKNCSFKNIDETKNVKGIGPAIF | 127 |
| NTDB id 105     | BSU     | 25590          | NP 390437.1    | QGGG.....GSV....QSDGGKGALVNINTATLEELQG.LSCVGPSSKABAIAYREENGCRFQITIEDITKVSGIGESF   | 195 |
| NTDB id 36      | MW      | RS08230        | WP 001793467.1 | QIGVNSV.....HV....KNGNTNNTKVNINTASVSELSMS.VPCVQQAQANAIVEYRNQQGAFQETDDLKKVKGFCSKTF | 219 |
| NTDB id 20      | SA      | RS08005        | WP 001802022.1 | QIEVNSV.....HV....KNGNTNNTKVNINTASVSELSMS.VPCVQQAQANAIVEYRNQQGAFQETDDLKKVKGFCSKTF | 219 |
| NTDB id 1014    | ACIAD   | RS13855        | WP 004924483.1 | RLNSSASHHSLSKP....TQSGTGVKVNINSATAKELQQ.LHCVGEKKALAIVEYRQQYCKFASVDDLQKVKGIGPKFI   | 119 |
| NTDB id 1123390 | EL222   | RS00050        | WP 002853093.1 | .....ALTAFLFGAVNINTATLKEKLS.LNGICEAKAKAILEYRKE.ANFTSIDDLKKVKGIGDKLF               | 69  |
| NTDB id 1242    | Cj0011c | YP 002343483.1 |                | .....ALTAFLFGAVNINTATLKEKLS.LNGICEAKAKAILEYRKE.ANFTSIDDLKKVKGIGDKLF               | 69  |
| NTDB id 1127    | NGFG    | RS10560        | WP 003703428.1 | .....FSCAFSLAAVNINAASQQELEA.LPGIGPAKAKAIAEYRAQNGAFKSVDLTKVKGIGPAVL                | 104 |
| NTDB id 1126    | NGFG    | RS09375        | WP 003703428.1 | .....FSCAFSLAAVNINAASQQELEA.LPGIGPAKAKAIAEYRAQNGAFKSVDLTKVKGIGPAVL                | 104 |
| NTDB id 1125    | NGFG    | RS07215        | WP 003703428.1 | .....FSCAFSLAAVNINAASQQELEA.LPGIGPAKAKAIAEYRAQNGAFKSVDLTKVKGIGPAVL                | 104 |
| NTDB id 1108    | NGFG    | RS06525        | WP 003703428.1 | .....FSCAFSLAAVNINAASQQELEA.LPGIGPAKAKAIAEYRAQNGAFKSVDLTKVKGIGPAVL                | 104 |
| consensus       |         |                |                | ***! !** !* * !*! **!*!!***! ** !***** *!*!*! ***                                 |     |

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| NTDB id 1159    | ABDM36  | RS04765        | WP 001166105.1 | RNAARILL.....                 | 103 |
| NTDB id 1150    | A1552VC | RS08580        | WP 001166105.1 | RNAARILL.....                 | 103 |
| NTDB id 1395    | DSB67   | RS04445        | WP 010649155.1 | RKNEDRILL.....                | 95  |
| NTDB id 1362    | HI 1008 | AAC22669.1     |                | EKNRDRILF.....                | 112 |
| NTDB id 1382    | A4U84   | RS07375        | WP 062924234.1 | EKNRDCIVIE.....               | 113 |
| NTDB id 595     | KW2     | RS08725        | WP 021037687.1 | EKLKDEISID.....               | 218 |
| NTDB id 521     | SMSK321 | RS04960        | WP 000443804.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 493     | SM12261 | RS04300        | WP 000387351.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 263     | KZH43   | RS04195        | WP 000387330.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 222     | SPD     | RS04535        | WP 000387330.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 188     | SPR     | RS04295        | WP 000387330.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 153     | SP      | RS04730        | WP 000387344.1 | EKLKDYVTVD.....               | 216 |
| NTDB id 1069    | ABD1    | RS03060        | WP 043960841.1 | EKNKSRIAL.....                | 136 |
| NTDB id 1041    | HON27   | RS14740        | WP 005124713.1 | EKNKSRIAL.....                | 136 |
| NTDB id 105     | BSU     | 25590          | NP 390437.1    | EKLKSSITVK.....               | 205 |
| NTDB id 36      | MW      | RS08230        | WP 001793467.1 | DKLKSIFTI.....                | 228 |
| NTDB id 20      | SA      | RS08005        | WP 001802022.1 | DKLKSIFTI.....                | 228 |
| NTDB id 1014    | ACIAD   | RS13855        | WP 004924483.1 | EKNRDRILAI.....               | 128 |
| NTDB id 1123390 | EL222   | RS00050        | WP 002853093.1 | EKLKNDITIE.....               | 79  |
| NTDB id 1242    | Cj0011c | YP 002343483.1 |                | EKLKNDITIE.....               | 79  |
| NTDB id 1127    | NGFG    | RS10560        | WP 003703428.1 | AKLKDQASVGAPAPKGPAPKPVLPVAVKK | 131 |
| NTDB id 1126    | NGFG    | RS09375        | WP 003703428.1 | AKLKDQASVGAPAPKGPAPKPVLPVAVKK | 131 |
| NTDB id 1125    | NGFG    | RS07215        | WP 003703428.1 | AKLKDQASVGAPAPKGPAPKPVLPVAVKK | 131 |
| NTDB id 1108    | NGFG    | RS06525        | WP 003703428.1 | AKLKDQASVGAPAPKGPAPKPVLPVAVKK | 131 |
| consensus       |         |                |                | ***** ***                     |     |

 non conserved  
 similar  
  $\geq 50\%$  conserved