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|                |           |                |                |                                                                                       |    |
|----------------|-----------|----------------|----------------|---------------------------------------------------------------------------------------|----|
| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | .....MEALIEKIKYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLSSEKESKEVSKKEEKSEPL..... | 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...STKSSVSKFNSSSSEK       | 65 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1 | .....MESIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPHTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV        | 69 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSVSEKEVVKKEEKEEPL       | 69 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VAAVSKDLVSEKEVNKEEKEEPL        | 69 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VAAVSKDLVSEKEVNKEEKEEPL        | 69 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VAAVSKDLVSEKEVNKEEKEEPL        | 69 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VAAVSKDSSTEKEVKKEEKEEPL        | 69 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1 | .....                                                                                 | 0  |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | .....                                                                                 | 0  |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1 | MVLLYQFLLRYKDFLTQWKLYIISAVVLMVVLIGFIFWRQDDYTSRNFENKDNALKQSTSENSSLSKVEDVQVKDGDNSK      | 80 |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1 | MVLLYQFLLRYKDFLTQWKLYIISAVVLMVVLIGFIFWRQDDYTSRNFENKDTALKQSTSENSSLSKLEDVQVKDGDNSK      | 80 |
| NTDB id 105    | BSU 25590 | NP 390437.1    |                | .....MNWLNQHKKAIILAASAAVFTAIMIFLATG...KNKE...PVKQAVPTE...TENTVVKQEANNDE               | 57 |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1 | .....                                                                                 | 0  |
| NTDB id 1127   | NGFG      | RS10560        | WP 003703428.1 | .....MSRGG                                                                            | 5  |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1 | .....MSRGG                                                                            | 5  |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1 | .....MSRGG                                                                            | 5  |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1 | .....MSRGG                                                                            | 5  |
| NTDB id 137953 | RC27      | RS08185        | WP 002855574.1 | .....                                                                                 | 0  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....                                                                                 | 0  |
| consensus      |           |                |                |                                                                                       |    |

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| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | .....EQDLITVDYKGAVKSPGYYLRTYKRYNDKLYLFCMLF.....AGGLTEQADSKSLNLAQKVSDEALVYVPKGEESA | 33  |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1 | .....MQIKT.KIVTLFSLCLPTLPLLANAEETAPAAQ.....                                       | 33  |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1 | .....MKWMLTLCLLILAPMSWAE.TKTKAD.....                                              | 25  |
| NTDB id 1362   | HI 1008   | AAC22669.1     |                | .....MKT.L.FTSVVLGALVSSSFEEKATXQTAQSVV.....TTQA.....                              | 38  |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1 | .....MKK.LSRYTFSLLFG.LFSATTFEEKVTTSTEHTPV.....VMQQ.....                           | 39  |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1 | NKNEIMVDLKGAVAKPNVYQISSDERLVDLI.....RQAGGFTDQADQKSINLSAKLKDEEVIYVPKVGESS          | 133 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | EQDLITVDVKGAVKSPGIYDLVGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1 | .....MQYSMRFWKN...K.YFVLIMLCGLVISPSVCAQSFQDNFQEWKVKQQM..YDQK.....                 | 49  |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | .....MQYSMRFWKN...K.YFLLIMLCGLVISPSVCAQSFQDNFQEWKAKQQM..YDQK.....                 | 49  |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1 | NKGPVYVDVKGAVKHPNVYKMTSKDRVVD.LL.....DKAQLLEDADVSRINLSEKLTQKMFIPHKGQKNV           | 147 |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1 | NKGPVYVDVKGAVKHPNVYKMTSKDRVVD.LL.....DKAQLLEDADVSRINLSEKLTQKMFIPHKGQKNV           | 147 |
| NTDB id 105    | BSU 25590 | NP 390437.1    |                | SNETIVIDIKGAVQHPGVYEM.RTGDRVS.....QAI...EKAGGTSEQADEAQVNLAELIQDGTVVYIPKKGEETA     | 125 |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1 | .....MSIRHFFT...FFWAT.....LLTLFSMQI...VFAQGGFDQQYDAW.....KTQQKAHDTR               | 45  |
| NTDB id 1127   | NGFG      | RS10560        | WP 003703428.1 | ATPYRFLIRHIVARCGLLFATLKGKTMKKMFVLFCLMF.....                                       | 44  |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1 | ATPYRFLIRHIVARCGLLFATLKGKTMKKMFVLFCLMF.....                                       | 44  |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1 | ATPYRFLIRHIVARCGLLFATLKGKTMKKMFVLFCLMF.....                                       | 44  |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1 | ATPYRFLIRHIVARCGLLFATLKGKTMKKMFVLFCLMF.....                                       | 44  |
| NTDB id 137953 | RC27      | RS08185        | WP 002855574.1 | .....MKKLLFLF..FA.....                                                            | 10  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....MKKLLFLF..FA.....                                                            | 10  |
| consensus      |           |                |                | .....                                                                             |     |

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| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1                  | .....VEEGIVITVNINTASAEELATLLKGI | GLKKAQAI              | VDYREANGP                    | FTH                 | IDDL          | TNVKGIGEAT  | VR           | 95              |     |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1                  | .....VEEGIVITVNINTASAEELATLLKGI | GLKKAQAI              | VDYREANGP                    | FTH                 | IDDL          | TNVKGIGEAT  | VR           | 95              |     |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1                  | .....KYEGIEITVNVNSATAQEIATLLIGI | GEKKAQD               | IVEYRNEHG                    | PF                  | KT            | ADLT        | TKVKGIGEAT   | VR              | 87  |
| NTDB id 1362   | HI 1008   | AAC22669.1     | .....EAQVAPAVVSDKLNINTATASEIQKS | LTGIGAKKA                       | E                     | AI                           | VQYREKHGN           | FXNA          | EQLLEV      | QGIGKATLE    | 104             |     |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1                  | .....VAATQKVNANV                | VNINTATASEIQDK        | LVGIGAKKAQAI                 | IVEYREKNGK          | FLN           | VEQLTEV     | SGIGKATLE    | 104             |     |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1                  | SESTDSPTG...                    | SSVSNQISTTSGPKVNINKAD | LT                           | ELQK                | LTGIGQKKAQD   | I           | DFRMKNGDFKSI | EDL             | 209 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1                  | SQHTGSGAP.....                  | SSTS                  | SKDKK                        | INLN                | KNASLEELKQ    | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1                  | SQQAGPGTA.....                  | SSTS                  | KEKK                         | VNLN                | KASLEELKQ     | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1                  | SQQTGLGTA.....                  | SSIS                  | KEKK                         | VNLN                | KASLEELKQ     | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1                  | SQQTGLGTA.....                  | SSIS                  | KEKK                         | VNLN                | KASLEELKQ     | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1                  | SQQTGLGTA.....                  | SSIS                  | KEKK                         | VNLN                | KASLEELKQ     | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1                  | SQQTGSGTA.....                  | SSTS                  | KEKK                         | VNLN                | KASLEELKQ     | VKGLGGKRAQD | I            | DHREANGKFKSVDEL | 207 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1                  | LNISKSSHSNSSKISQTKNFNDSTGQ      | IHLN                  | QANVNE                       | FQQ                 | LKGIGEKKAAQAI | IVEYRQKNGS  | FKN          | IDEI            | 128 |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1                  | LNITKSSHSNGSKISQTKNFNDSTGQ      | IHLN                  | QANVNE                       | FQQ                 | LKGIGEKKAAQAI | IVEYRQKNGS  | FKN          | IDEI            | 128 |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1                  | EP....QIGVNS..                  | VHVKNGNTNNTK          | VNLNTASV                     | SELMS               | VPGVGQAKANA   | IVEYRNQQGAF | QE           | IDDL            | 220 |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1                  | EP....QIEVNS..                  | VHVKNGNTNNTK          | VNLNTASV                     | SELMS               | VPGVGQAKANA   | IVEYRNQQGAF | QE           | IDDL            | 220 |
| NTDB id 105    | BSU 25590 | NP 390437.1    |                                 | V....QQGGGGS..                  | V..QSDGGKGALVNINTAT   | LEELQG                       | ISGVGPSKAE          | AI            | IAYREENG    | RFQ          | TIED            | 196 |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1                  | LNSSASHHSLSK..                  | P..TQQSGTG            | VKNINSAT                     | AKELQQ              | LHGVGEKKALAI  | IVEYRQQY    | GKFASVDDL    | QKVKGIGPKF      | 120 |
| NTDB id 1127   | NGFG      | RS10560        | WP 003703428.1                  | .....SCAFSLAAVNINAASQQE         | LEA                   | LPGIGPAKAKAIAEYRAQNGAFKSVDDL | IKVKGIGPAVLA        |               |             |              |                 | 105 |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1                  | .....SCAFSLAAVNINAASQQE         | LEA                   | LPGIGPAKAKAIAEYRAQNGAFKSVDDL | IKVKGIGPAVLA        |               |             |              |                 | 105 |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1                  | .....SCAFSLAAVNINAASQQE         | LEA                   | LPGIGPAKAKAIAEYRAQNGAFKSVDDL | IKVKGIGPAVLA        |               |             |              |                 | 105 |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1                  | .....SCAFSLAAVNINAASQQE         | LEA                   | LPGIGPAKAKAIAEYRAQNGAFKSVDDL | IKVKGIGPAVLA        |               |             |              |                 | 105 |
| NTDB id 137953 | RC27      | RS08185        | WP 002855574.1                  | .....LTAFLFGA                   | VNINTATL              | KELKS                        | LNGIGEAKAKAIALEYRKE | ANFTS         | IDDL        | KVKGIGD      | KLFE            | 70  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                                 | .....LTAFLFGA                   | VNINTATL              | KELKS                        | LNGIGEAKAKAIALEYRKE | ANFTS         | IDDL        | KVKGIGD      | KLFE            | 70  |
| consensus      |           |                |                                 | ***! !** !*                     |                       |                              |                     |               |             |              |                 |     |

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| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | NNAARILL         | 103 |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1 | NNAARILL         | 103 |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1 | KNEDRILL         | 95  |
| NTDB id 1362   | HI 1008   | AAC22669.1     |                | KNRDRIIF         | 112 |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1 | KNRDCIVIE        | 113 |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1 | KLKDEISID        | 218 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1 | KLKDYVTVD        | 216 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1 | KLKDYVTVD        | 216 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1 | KLKDYVTVD        | 216 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | KLKDYVTVD        | 216 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | KLKDYVTVD        | 216 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | KLKDYVTVD        | 216 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1 | KNKSRLAL         | 136 |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | KNKSRLAL         | 136 |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1 | KLKSYFTI         | 228 |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1 | KLKSYFTI         | 228 |
| NTDB id 105    | BSU 25590 | NP 390437.1    |                | KIKSSIIVK        | 205 |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1 | KNRDRLAI         | 128 |
| NTDB id 1127   | NGFG      | RS10560        | WP 003703428.1 | KLKDQASVGAPAPKGP | 131 |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1 | KLKDQASVGAPAPKGP | 131 |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1 | KLKDQASVGAPAPKGP | 131 |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1 | KLKDQASVGAPAPKGP | 131 |
| NTDB id 137953 | RC27      | RS08185        | WP 002855574.1 | KIKNDITVE        | 79  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | KIKNDITIE        | 79  |
| consensus      |           |                |                | **** *           |     |

 non conserved  
 similar  
  $\geq 50\%$  conserved