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|                |           |                |                |                                                                                     |    |
|----------------|-----------|----------------|----------------|-------------------------------------------------------------------------------------|----|
| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV..... | 0  |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV..... | 0  |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV..... | 0  |
| NTDB id 1362   | HI 1008   | AAC22669.1     |                | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV..... | 0  |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV..... | 0  |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1 | .....MEKILDKLKEYWKIM.LLVVICALIAGGIFYIFTNSPKPAETLSVEN....LSSS...STKSSVSKFNSSSSEK     | 65 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1 | .....MESIIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKDVKKEEKEEPV      | 69 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSVSEKEVKKEEKEEPL      | 69 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLVSEKEVNKKEEKEEPL     | 69 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLVSEKEVNKKEEKEEPL     | 69 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLVSEKEVNKKEEKEEPL     | 69 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKEVKKEEKEEPL      | 69 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKEVKKEEKEEPL      | 0  |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | .....MEALIEKIKKEYKLIYICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKEVKKEEKEEPL      | 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...TENTVVVKQEANNDE            | 57 |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1 | .....MSRGG                                                                          | 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 137582 | RC24      | RS08195        | WP 002855574.1 | .....MSRGG                                                                          | 0  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....MSRGG                                                                          | 0  |
| consensus      |           |                |                | .....MSRGG                                                                          | 0  |

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| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | .....EQDLITVDYKGAVKSPGYYLDTYKRYNDKLYLFCMLF.....AKGLLEQADSKSLNLAQKVSDEALVYVPTKGEAAV | 33  |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1 | .....EQDLITVDYKGAVKSPGYYLDTYKRYNDKLYLFCMLF.....AKGLLEQADSKSLNLAQKVSDEALVYVPTKGEAAV | 33  |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1 | .....EQDLITVDYKGAVKSPGYYLDTYKRYNDKLYLFCMLF.....AKGLLEQADSKSLNLAQKVSDEALVYVPTKGEAAV | 25  |
| NTDB id 1362   | HI 1008   | AAC22669.1     |                | .....EQDLITVDYKGAVKSPGYYLDTYKRYNDKLYLFCMLF.....AKGLLEQADSKSLNLAQKVSDEALVYVPTKGEAAV | 38  |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1 | .....EQDLITVDYKGAVKSPGYYLDTYKRYNDKLYLFCMLF.....AKGLLEQADSKSLNLAQKVSDEALVYVPTKGEAAV | 39  |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1 | NKNEIMVDLKGAVAKPNVYQISSDERLVDLI.....RQAGGFTDQADQKSINLSAKLKDEEVIYVPKVGESS           | 133 |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA           | 137 |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEAAV           | 137 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEAAV           | 137 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEAAV           | 137 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEAAV           | 137 |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1 | .....MQYSMRFWKN...K.YFVLIMLCGLVISPSVCAQSFQDNFQEWKVKQQM..YDQK.....                  | 49  |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | .....MQYSMRFWKN...K.YFVLIMLCGLVISPSVCAQSFQDNFQEWKVKQQM..YDQK.....                  | 49  |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1 | NKGPVYVDVKGAVKHPNVYKMTSKDRVVD.LL.....DKAQLLEDADVSRINLSEKLTQDKMIFIPHKGQKNV          | 147 |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1 | NKGPVYVDVKGAVKHPNVYKMTSKDRVVD.LL.....DKAQLLEDADVSRINLSEKLTQDKMIFIPHKGQKNV          | 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...VFAQQGFDQYDQAW.....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 137582 | RC24      | RS08195        | WP 002855574.1 | .....MKKLLFLF..FA.....                                                             | 10  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....MKKLLFLF..FA.....                                                             | 10  |
| consensus      |           |                |                | .....MKKLLFLF..FA.....                                                             | 10  |

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|----------------|-----------|----------------|----------------------------------|-------------------------------------------------------|----------|------------|-----------|-------------|-----------|----------|----------|---------|----------|----------|-----|
| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1                   | .....VEEGIVITVNINTASAEELATLLKGI                       | GLKKAQAI | VDYREANGP  | FTH       | IDDLTNVKGIG | EATVR     | 95       |          |         |          |          |     |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1                   | .....VEEGIVITVNINTASAEELATLLKGI                       | GLKKAQAI | VDYREANGP  | FTH       | IDDLTNVKGIG | EATVR     | 95       |          |         |          |          |     |
| NTDB id 1395   | DSB67     | RS04445        | WP 010649155.1                   | .....KYEGIEITVNVNSATAQEIATLLIGI                       | GEKKAQD  | IVEYRNEHG  | PFKTAADL  | TKVKGIG     | EATVR     | 87       |          |         |          |          |     |
| NTDB id 1362   | HI 1008   | AAC22669.1     | .....EAQVAPAVVSDKLNINTATASEIQKSL | TGIGAKKA                                              | EAI      | VQYREKHGN  | FXNAEQ    | LLEVQGIG    | KATLE     | 104      |          |         |          |          |     |
| NTDB id 1382   | A4U84     | RS07375        | WP 062924234.1                   | .....VAATQKVNANVNVINTATASEIQDKL                       | VGIGAKKA | QAI        | IVEYREKNG | KFLNVEQL    | TEVSGIG   | KATLE    | 104      |         |          |          |     |
| NTDB id 595    | KW2       | RS08725        | WP 021037687.1                   | SESTDSPTG...SSVSNQISTTSGPKVNINKA                      | DITELQK  | LTGIGQKKAQ | DI        | DFRMKNGD    | FKSIEDL   | GKVS     | GFGDKTLE | 209     |          |          |     |
| NTDB id 521    | SMSK321   | RS04960        | WP 000443804.1                   | SQHTGSGAP.....SSTS                                    | SKDKK    | INLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | AKTIE    | 207      |     |
| NTDB id 493    | SM12261   | RS04300        | WP 000387351.1                   | SQQAGPGTA.....SSTS                                    | KEKK     | VNLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | AKTIE    | 207      |     |
| NTDB id 263    | KZH43     | RS04195        | WP 000387330.1                   | SQQTGLGTA.....SSIS                                    | KEKK     | VNLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | GKTIE    | 207      |     |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1                   | SQQTGLGTA.....SSIS                                    | KEKK     | VNLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | GKTIE    | 207      |     |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1                   | SQQTGLGTA.....SSIS                                    | KEKK     | VNLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | GKTIE    | 207      |     |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1                   | SQQTGSGTA.....SSTS                                    | KEKK     | VNLNKAS    | LEELKQ    | VKGLGGKRAQ  | DI        | IDHREANG | KFKSVDEL | KKVSGIG | GKTIE    | 207      |     |
| NTDB id 1069   | ABD1      | RS03060        | WP 043960841.1                   | LNISKSSHSNSSKISQTKNFNDSTGQ                            | IHLNQANV | NEFQQ      | LKGIG     | EKKAAQAI    | IVEYRQKNG | SFKN     | IDEI     | KNVKGIG | PAIFE    | 128      |     |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1                   | LNITKSSHSNGSKISQTKNFNDSTGQ                            | IHLNQANV | NEFQQ      | LKGVG     | EKKAAQAI    | IVEYRQKNG | SFKN     | IDEI     | KNVKGIG | PAIFE    | 128      |     |
| NTDB id 36     | MW        | RS08230        | WP 001793467.1                   | EP....QIGVNS..VHVKNGNTNNTK                            | VNLNTAS  | VSELMS     | VPGVG     | QAKANA      | IAVEYRN   | QQGAF    | QEIDDL   | KKVKG   | FGSKTFD  | 220      |     |
| NTDB id 20     | SA        | RS08005        | WP 001802022.1                   | EP....QIEVNS..VHVKNGNTNNTK                            | VNLNTAS  | VSELMS     | VPGVG     | QAKANA      | IAVEYRN   | QQGAF    | QEIDDL   | KKVKG   | FGSKTFD  | 220      |     |
| NTDB id 105    | BSU 25590 | NP 390437.1    |                                  | V....QQGGGGS..V..QSDGGKGALVNINT                       | ATLEELQ  | ISGVGPSKA  | EAI       | IAYREENG    | RFTIED    | ITKV     | SGIG     | EKS     | SFE      | 196      |     |
| NTDB id 1014   | ACIAD     | RS13855        | WP 004924483.1                   | LNSSASHHSLSK..P..TQQSGTG                              | VKNINS   | ATAKELQ    | Q         | LHGVGE      | KKALAI    | AVEYRQ   | QYGFAS   | VDDL    | QKVKG    | GIGPKFIE | 120 |
| NTDB id 1127   | NGFG      | RS10560        | WP 003703428.1                   | .....SCAFSLAAVNINAASQ                                 | QLEA     | LPGIG      | PAKAKA    | IAEYRA      | QNGAFK    | SVDDL    | IKVKG    | GIG     | PAVLA    | 105      |     |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1                   | .....SCAFSLAAVNINAASQ                                 | QLEA     | LPGIG      | PAKAKA    | IAEYRA      | QNGAFK    | SVDDL    | IKVKG    | GIG     | PAVLA    | 105      |     |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1                   | .....SCAFSLAAVNINAASQ                                 | QLEA     | LPGIG      | PAKAKA    | IAEYRA      | QNGAFK    | SVDDL    | IKVKG    | GIG     | PAVLA    | 105      |     |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1                   | .....SCAFSLAAVNINAASQ                                 | QLEA     | LPGIG      | PAKAKA    | IAEYRA      | QNGAFK    | SVDDL    | IKVKG    | GIG     | PAVLA    | 105      |     |
| NTDB id 137582 | RC24      | RS08195        | WP 002855574.1                   | .....LTAFLFGA                                         | VNINTATL | KELKS      | LNGIGE    | AKAKA       | ILEYRKE   | ANFTS    | IDDL     | KKVKG   | GIGDKLFE | 70       |     |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                                  | .....LTAFLFGA                                         | VNINTATL | KELKS      | LNGIGE    | AKAKA       | ILEYRKE   | ANFTS    | IDDL     | KKVKG   | GIGDKLFE | 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 | KNKSRLIAL        | 136     |       |     |
| NTDB id 1041   | HON27     | RS14740        | WP 005124713.1 | KNKSRLIAL        | 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 | PAKPVLP | PAVKK | 131 |
| NTDB id 1126   | NGFG      | RS09375        | WP 003703428.1 | KLKDQASVGAPAPKGP | PAKPVLP | PAVKK | 131 |
| NTDB id 1125   | NGFG      | RS07215        | WP 003703428.1 | KLKDQASVGAPAPKGP | PAKPVLP | PAVKK | 131 |
| NTDB id 1108   | NGFG      | RS06525        | WP 003703428.1 | KLKDQASVGAPAPKGP | PAKPVLP | PAVKK | 131 |
| NTDB id 137582 | RC24      | RS08195        | WP 002855574.1 | KIKNDITVE        | 79      |       |     |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | KIKNDITIE        | 79      |       |     |
| consensus      |           |                |                | *****            |         |       |     |

 non conserved  
 similar  
  $\geq 50\%$  conserved