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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...VVAISKDLVSEKEVNKKEEKEEPL       | 69 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLVSEKEVNKKEEKEEPL       | 69 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDLVSEKEVNKKEEKEEPL       | 69 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | .....MEAIIEKIKEYKIIV.ICTGLGLLVGGFFLLKPAPQTPVKETNLQAE...VVAISKDSSTEKEVKKEEKEEPL        | 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...TENTVVVKQEANNDE              | 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 422824 | G3R55     | RS00055        | WP 002855574.1 | .....                                                                                 | 0  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....                                                                                 | 0  |
| consensus      |           |                |                | .....                                                                                 | 0  |

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| NTDB id 1159   | ABDM36    | RS04765        | WP 001166105.1 | .....EQDLITVDYKGAVKSPGYYLITYSKRYNDKLYLFCMLE...AKGLLEQADSKSLNLAQKVSDEALVYVPKGEESA | 33  |
| NTDB id 1150   | A1552VC   | RS08580        | WP 001166105.1 | .....MQIKT.KIVTLFLSLCLPTLPLLANAEETAPAAQ.....                                     | 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.LFSATTFAEEKVTTSTEHTPV.....VMQQ.....                         | 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.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA         | 137 |
| NTDB id 222    | SPD       | RS04535        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA         | 137 |
| NTDB id 188    | SPR       | RS04295        | WP 000387330.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....QKAGGLTEQADSKSLNLAQKVSDEALVYVPTKGEESA         | 137 |
| NTDB id 153    | SP        | RS04730        | WP 000387344.1 | EQDLITVDVKGAVKSPGIYDLVSGSRVNDV.....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.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...VFAQGGFDQYDQAW.....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 422824 | G3R55     | RS00055        | WP 002855574.1 | .....MKKLLFLF..FA.....                                                           | 10  |
| NTDB id 1242   | Cj0011c   | YP 002343483.1 |                | .....MKKLLFLF..FA.....                                                           | 10  |
| consensus      |           |                |                | .....                                                                            | 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    | LLEVGIG     | KATLE   | 104  |
| NTDB id 1382   | A4U84   | RS07375        | WP 062924234.1                   | .....VAATQKVNANV                    | VNINTATASEIQDKLVGIGAKKAQAI      | IVEYREKNGK  | FLNVEQL   | TEVSGIG     | KATLE   | 104  |
| NTDB id 595    | KW2     | RS08725        | WP 021037687.1                   | SESTDSPTG...SSVSNQISTTSGPKVNINKAD   | ITELQK.LTGIGQKKAQDI             | IDFRMKN     | GD        | FKSIEDL     | GKVS    | 209  |
| NTDB id 521    | SMSK321 | RS04960        | WP 000443804.1                   | SQHTGSGAP.....SSTS                  | SKDKKINLNKASLEELKQ.VKGLGGKRAQDI | IDHREANGK   | FKSVDEL   | KKVSGIG     | AKTIE   | 207  |
| NTDB id 493    | SM12261 | RS04300        | WP 000387351.1                   | SQQAGPGTA.....SSTS                  | KEKKVNLNKASLEELKQ.VKGLGGKRAQDI  | IDHREANGK   | FKSVDEL   | KKVSGIG     | AKTIE   | 207  |
| NTDB id 263    | KZH43   | RS04195        | WP 000387330.1                   | SQQTGLGTA.....SSISKEKKVNLNKASLEELKQ | .VKGLGGKRAQDI                   | IDHREANGK   | FKSVDEL   | KKVSGIG     | GKTIE   | 207  |
| NTDB id 222    | SPD     | RS04535        | WP 000387330.1                   | SQQTGLGTA.....SSISKEKKVNLNKASLEELKQ | .VKGLGGKRAQDI                   | IDHREANGK   | FKSVDEL   | KKVSGIG     | GKTIE   | 207  |
| NTDB id 188    | SPR     | RS04295        | WP 000387330.1                   | SQQTGLGTA.....SSISKEKKVNLNKASLEELKQ | .VKGLGGKRAQDI                   | IDHREANGK   | FKSVDEL   | KKVSGIG     | GKTIE   | 207  |
| NTDB id 153    | SP      | RS04730        | WP 000387344.1                   | SQQTGSGTA.....SSTS                  | KEKKVNLNKASLEELKQ.VKGLGGKRAQDI  | IDHREANGK   | FKSVDEL   | KKVSGIG     | GKTIE   | 207  |
| NTDB id 1069   | ABD1    | RS03060        | WP 043960841.1                   | LNISKSSHSNSSKISQTKNFNDSTGQIHLNQAN   | VNEFQQ.LKGIGEKKAQAI             | IVEYRQKNGS  | FKNIDEI   | KNVKGIG     | PAIFE   | 128  |
| NTDB id 1041   | HON27   | RS14740        | WP 005124713.1                   | LNITKSSHSNGSKISQTKNFNDSTGQIHLNQAN   | VNEFQQ.LKGVGEKKAQAI             | IVEYRQKNGS  | FKNIDEI   | KNVKGIG     | PAIFE   | 128  |
| NTDB id 36     | MW      | RS08230        | WP 001793467.1                   | EP....QIGVNS..VHVKNGNTNNTKVNLTASV   | SELMS.VPGVGQAKANA               | IVEYRNQQGAF | QEIDDL    | KKVKG       | FGSKTFD | 220  |
| NTDB id 20     | SA      | RS08005        | WP 001802022.1                   | EP....QIEVNS..VHVKNGNTNNTKVNLTASV   | SELMS.VPGVGQAKANA               | IVEYRNQQGAF | QEIDDL    | KKVKG       | FGSKTFD | 220  |
| NTDB id 105    | BSU     | 25590          | NP 390437.1                      | V....QQGGGGS..V..QSDGGKGALVNINTAT   | LEELQG.ISGVGPSKAEAI             | IAYREENG    | RFTIED    | ITKVSGIG    | EKSFE   | 196  |
| NTDB id 1014   | ACIAD   | RS13855        | WP 004924483.1                   | LNSSASHHSLSK..P..TQQSGTG            | VKNINSATAKELQQ.LHGVGEKKALAI     | IVEYRQQY    | GKFASVDDL | QKVKGIG     | PKFIE   | 120  |
| NTDB id 1127   | NGFG    | RS10560        | WP 003703428.1                   | .....SCAFSLAAVNINAASQQELEA.LPGIG    | PAKAKAIAEYRAQNGAFKSVDDL         | IKVKGIG     | PAVLA     |             |         | 105  |
| NTDB id 1126   | NGFG    | RS09375        | WP 003703428.1                   | .....SCAFSLAAVNINAASQQELEA.LPGIG    | PAKAKAIAEYRAQNGAFKSVDDL         | IKVKGIG     | PAVLA     |             |         | 105  |
| NTDB id 1125   | NGFG    | RS07215        | WP 003703428.1                   | .....SCAFSLAAVNINAASQQELEA.LPGIG    | PAKAKAIAEYRAQNGAFKSVDDL         | IKVKGIG     | PAVLA     |             |         | 105  |
| NTDB id 1108   | NGFG    | RS06525        | WP 003703428.1                   | .....SCAFSLAAVNINAASQQELEA.LPGIG    | PAKAKAIAEYRAQNGAFKSVDDL         | IKVKGIG     | PAVLA     |             |         | 105  |
| NTDB id 422824 | G3R55   | RS00055        | WP 002855574.1                   | .....LTAFLFGAVNINTATL               | KELKS.LNGIGEAKAKAILEYRKE.ANFTS  | IDDL        | KKVKGIG   | DKLFE       |         | 70   |
| NTDB id 1242   | Cj0011c | YP 002343483.1 | .....LTAFLFGAVNINTATL            | KELKS.LNGIGEAKAKAILEYRKE.ANFTS      | IDDL                            | KKVKGIG     | DKLFE     |             |         | 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 422824 | G3R55   | RS00055        | WP 002855574.1 | KIKNDITVE.....   | 79      |       |     |
| NTDB id 1242   | Cj0011c | YP 002343483.1 | KIKNDITIE..... | 79               |         |       |     |
| consensus      |         |                |                | *****            | ****    |       |     |

 non conserved  
 similar  
  $\geq 50\%$  conserved