# HBV-RYD-49

| | |
|---|---|
| File name | **HBV-RYD-49.sam** |
| Ref name | **KX357637.1 Hepatitis B virus isolate MK20ETH, complete genome** |
| Ref len | **3182** |
| Program used | **Tanoti Assembler 1.0** |
| Total reads | **7212738** |
| Mapped reads | **6777302 (93.96%)** |
| Unmapped reads | **435436** |
| Mapped loan pairs | **13512** |
| Average read length | **148nt** |
| Coverage | **3182nt (100.00%)** |
| Average depth | **312512 reads/site** |
| Average insert length | **1906nt** |

## COVERAGE



**Coverage by reads**

## SHANNON ENTROPY



**Entropy of the reads**
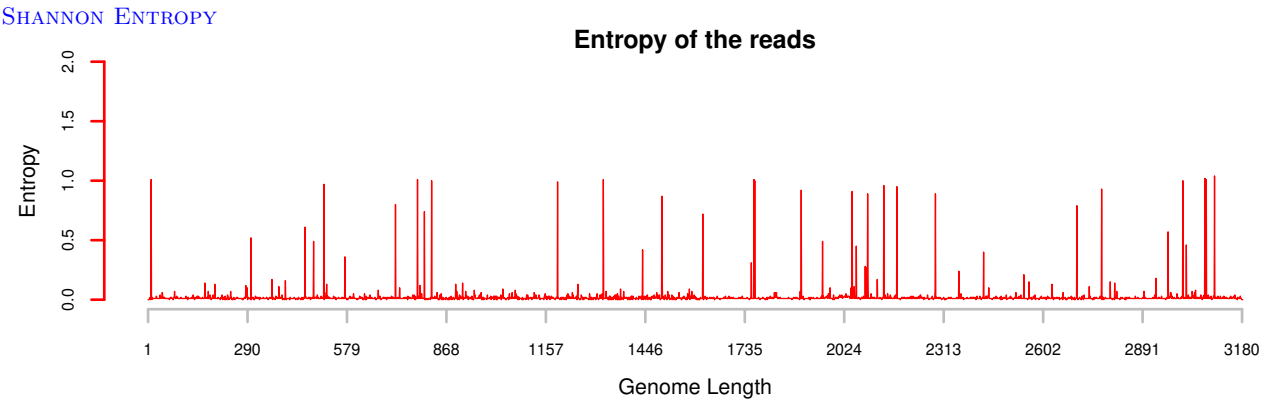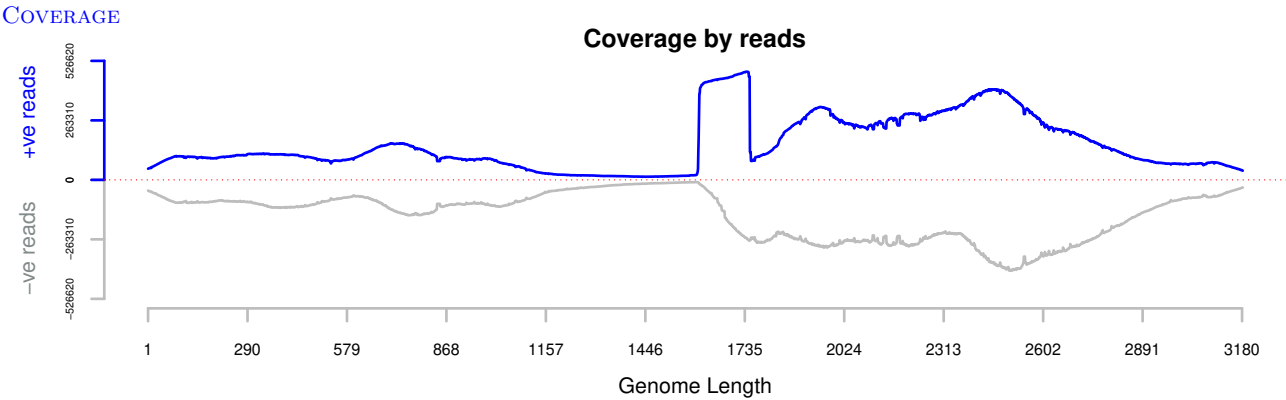
# Consensus sequence

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   1     CTCCACAACG TTCCACCAAA CTCTGCAAGA TCCCAGAGTG AGAGGCCTGT ATTTCCCTGC TGGTGGCTCC
  70     AGTTCAGGAA CAGTAAACCC TGTTCCGACT ACTGTCTCTC ACATATCGTC AATCTTCTCG AGGATTGGGG
 140     ACCCTGCGCT GAACATGGAG AACATCACAT CAGGATTCCT AGGACCCCTG CTCGTGTTAC AGGCGGGGTT
 210     TTTCTTGTTG ACAAGAATCC TCACAATACC GCAGAGTCTA GACTCGTGGT GGACTTCTCT CAATTTTCTA
 280     GGGGGAACTA CCGTGTGTCT TGGCCAAAAT TCGCAGTCCC CAACCTCCAA TCACTCACCA ACCTCCTGTC
 350     CTCCAACTTG TCCTGGTTAT CGCTGGATGT GTCTGCGGCG TTTTATCATC TTCCTCTTCA TCCTGCTGCT
 420     ATGCCTCATC TTCTTGTTGG TTCTTCTGGA CTATCAAGGT ATGTTGCCCG TTTGTCCTCT AATTCCAGGA
 490     TCTTCAACCA CCAGCACGGG ACCATGCAGA ACCTGCACGA CTCCTGCTCA AGGAACCTCT ATGTATCCCT
 560     CCTGTTGCTG TACCAAACCT TCGGACGGAA ATTGCACCTG TATTCCCATC CCATCATCCT GGGCTTTCGG
 630     AAAATTCCTA TGGGAGTGGG CCTCAGCCCG TTTCTCCTGG CTCAGTTTAC TAGTGCCATT TGTTCAGTGG
 700     TTCGTAGGGC TTTCCCCCAC TGTTTGGCTT TCAGTTATAT GGATGATGTG GTATTGGGGG CCAAGTCTGT
 770     ACAGCATCTT GAGTCCCTTT TTACCGCTGT TACCAATTTT CTTTTGTCTT TGGGTATACA TTTAAACCCT
 840     AACAAAACAA AAAGATGGGG TTACTCTTTA CATTTCATGG GCTATGTCAT TGGATGTTAT GGGTCATTGC
 910     CACAAGATCA CATCATACAG AAAATCAAAG AATGTTTTAG AAAACTTCCT GTTAACAGAC CTATTGATTG
 980     GAAAGTCTGT CAACGTATTG TGGGTCTTTT GGGTTTTGCT GCCCCTTTTA CACAATGTGG TTATCCTGCT
1050     TTAATGCCCT TGTATGCATG CATTCAATCT AAGCAGGCTT TCACTTTCTC GCCAACTTAC AAGGCCTTTC
1120     TGTGTAAACA ATACCTGAAC CTTTACCCCG TTGCCCGGCA ACGGCCAGGT CTGTGCCAAG TGTTTGCTGA
1190     CGCAACCCCC ACTGGCTGGG GCTTGGTTAT GGGCCATCAG CGCATGCGTG GAACCTTTTT GGCTCCTCTG
1260     CCGATCCATA CTGCGGAACT CCTAGCCGCT TGTTTTGCTC GCAGCAGGTC TGGAGCAAAC ATTCTCGGGA
1330     CGGATAACTC TGTTGTTCTC TCCCGCAAAT ATACATCGTT TCCATGGCTG CTAGGCTGTG CTGCCAACTG
1400     GATCCTGCGC GGGACGTCCT TTGTTTACGT CCCGTCGACG CTGAATCCCG CGGACGACCC TTCTCGGGGC
1470     CGCTTGGGAC TTTCTCGTCC CCTTCTCCGT CTGCCGTTTC GACCGACCAC GGGGCGCACC TCTCTTTACG
1540     CGGACTCCCC GTCTGTGCCT TCTCATCTGC CGGTCCGTGT GCACTTCGCT TCACCTCTGC ACGTCGCATG
1610     GAGACCACCG TGAACGCCCA CCAATTCTTG CCCAAGGTCT TACACAAGAG GACTCTTGGA CTCTCTGTAA
1680     TGTCAACGAC CGACCTTGAG GCATACTTCA AAGACTGTTT GTTTAAAGAC TGGGAGGAGT TGGGGGAGGA
1750     GATTAGGTTA AAGGTCTTTG TACTAGGAGG CTGTAGGCAT AAATTGGTCT GCGCACCAGC ACCATGCAAC
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1890     GCTTTGGGAC ATGGACATTG ATCCTTATAA AGAATTTGGA GCTACTGTGG AGTTACTCTC GTTTTTGCCT
1960     TCTGACTTCT TTCCTTCAGT ACGAGATCTT CTAGATACCG CCTCAGCTCT ATATCGGGAA GCCTTAGAGT
2030     CTCCTGAGCA TTGTTCACCT CACCATACTG CACTCAGGCA AGCAATTCTT TGCTGGGGGG ACCTAATGAC
2100     TCTAGCCACC TGGGTGGGTG GTAATTTGGA AGATCCAATA TCCAGGGACC TAGTAGTCAG TTATGTTAAC
2170     ACTAATGTGG GCCTAAAGTT CAGGCAACTA TTGTGGTTTC ACATTTCTTG TCTCACTTTT GGAAGAGAAA
2240     CGGTCATAGA GTATTTGGTG TCTTTCGGAG TGTGGATTCG CACTCCTCCA GCTTATAGAC CACCAAATGC
2310     CCCTATCTTA TCAACACTTC CGGAGACTAC TGTTGTTAGA CGACGAGGCA GGTCCCCTAG AAGAAGAACT
2380     CCCTCGCCTC GCAGACGAAG GTCTCAATCG CCGCGTCGCA GAAGATCTCA ATCTCGGGAA TCTCAATGTT
2450     AGTATTCCTT GGACTCATAA GGTGGGCAAC TTTACGGGGC TTTATTCTTC TACTGTGCCT GTCTTTAACC
2520     CTCATTGGAA AACACCCTCT TTTCCCAATA TACATTTACA CCAAGACATT ATCAAAAAAT GTGAACAATT
2590     TGTAGGCCCA CTCACAGTCA ATGAGAAAAG AAGACTGCAA TTGATTATGC CTGCTAGGTT TTATCCAAAT
2660     GTTACCAAAT ATTTGCCATT GGATAAGGGT ATTAAACCTT ATTATCCAGA ACATCTAGTT AATCATTACT
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2870     CAATCCTCTG GGATTCTTTC CCGACCACCA GTTGGATCCA GCCTTCAGAG CAAACACCGC AAATCCAGAT
2940     TGGGACTTCA ATCCCAACAA GGACACCTGG CCGGACGCCA ACAAGGTAGG AGCTGGAGCA TTCGGGCCGG
3010     GATTCACCCC ACCGCACGGA GGCCTTTTGG GGTGGAGCCC TCAGGCTCAG GGCATACTAC AAAACCTTGCC
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3150     AGAAACACTC ATCCTCAGGC CATGCAGTGG AA
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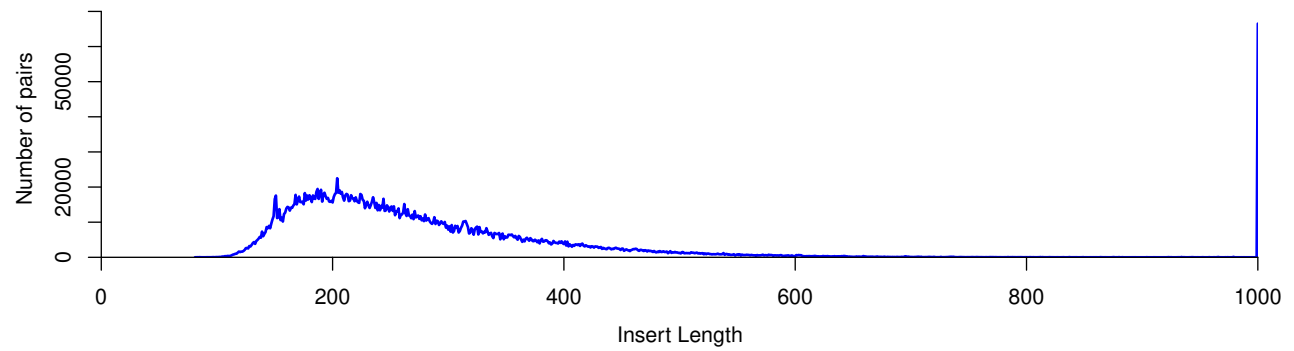
| Genome Composition | |
| --- | --- |
| A | 725 (22.78%) |
| T | 903 (28.38%) |
| G | 692 (21.75%) |
| C | 862 (27.09%) |
| N | 0 (0.00%) |
| Total Nucleotides | 3182 |
| GC% | 48.84 |

**Read quality**
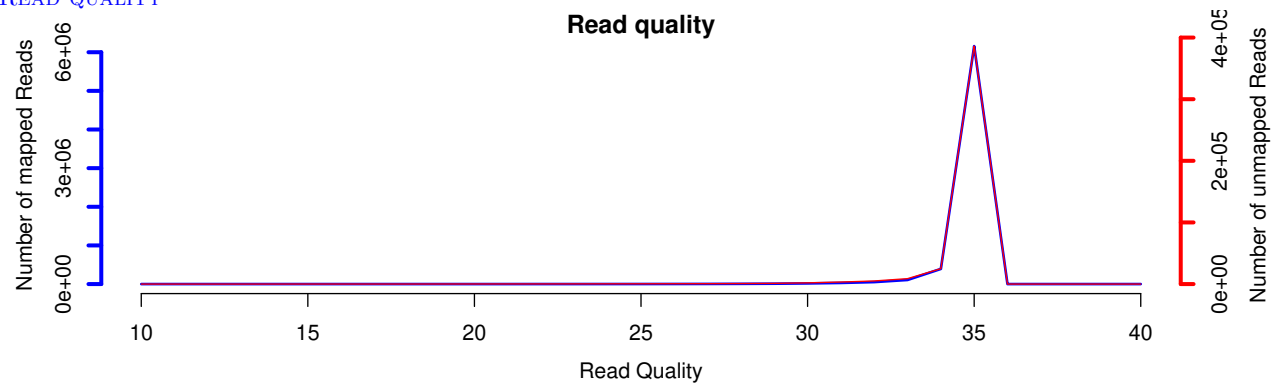
| Protein | Position | Ref AA | Consensus AA | All AAs |
|---------|----------|--------|--------------|---------|
| P2 | 1 | F | H | H::99.94(101291) |
| P2 | 2 | F | N | N::99.73(103269) |
| P2 | 3 | F | V | V::51.41(53233) F::48.44(50156) |
| P2 | 4 | F | P | P::99.75(112738) |
| P2 | 5 | F | P | P::99.88(116281) |
| P2 | 6 | F | N | N::99.82(120795) |
| P2 | 7 | F | S | S::99.92(123900) |
| P2 | 8 | F | A | A::99.53(128799) |
| P2 | 9 | F | R | R::99.85(134491) |
| P2 | 10 | F | S | S::99.90(138028) |
| P2 | 11 | F | Q | Q::99.81(143516) |
| P2 | 12 | F | S | S::99.72(146934) |
| P2 | 13 | F | E | E::99.73(152735) |
| P2 | 14 | F | R | R::99.48(155828) |
| P2 | 15 | F | P | P::99.86(161312) |
| P2 | 16 | F | V | V::99.79(166041) |
| P2 | 18 | F | P | P::99.83(175201) |
| P2 | 19 | F | C | C::99.84(177714) |
| P2 | 20 | F | W | W::99.84(182036) |
| P2 | 21 | F | W | W::99.76(185359) |
| P2 | 22 | F | L | L::99.89(188745) |
| P2 | 23 | F | Q | Q::99.86(192673) |
| P2 | 25 | F | R | R::99.72(199451) |
| P2 | 26 | F | N | N::99.81(203438) |
| P2 | 27 | F | S | S::99.74(203403) |
| P2 | 28 | F | K | K::99.72(201774) |
| P2 | 29 | F | P | P::99.92(202855) |
| P2 | 30 | F | C | C::99.78(201546) |
| P2 | 31 | F | S | S::99.85(200508) |
| P2 | 32 | F | D | D::99.80(200871) |
| P2 | 33 | F | Y | Y::99.89(200207) |
| P2 | 34 | F | C | C::99.83(193662) |
| P2 | 35 | F | L | L::99.89(197882) |
| P2 | 36 | F | S | S::99.88(190146) |
| P2 | 37 | F | H | H::99.84(199687) |
| P2 | 38 | F | I | I::99.90(202369) |
| P2 | 39 | F | V | V::99.75(201603) |
| P2 | 40 | F | N | N::99.83(200648) |
| P2 | 41 | F | L | L::99.90(198960) |
| P2 | 42 | F | L | L::99.74(196546) |
| P2 | 43 | F | E | E::99.87(199798) |
| P2 | 44 | F | D | D::99.86(199705) |
| P2 | 45 | F | W | W::99.79(197840) |
| P2 | 46 | F | G | G::99.88(196202) |
| P2 | 47 | F | P | P::99.91(188420) |
| P2 | 48 | F | C | C::99.82(192749) |

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|---|---|---|---|---|
| P2 | 49 | F | A | A::99.76(196515) |
| P2 | 50 | F | E | E::99.80(196226) |
| P2 | 51 | F | H | H::99.85(197076) |
| P2 | 52 | F | G | G::99.84(193514) |
| P2 | 53 | F | E | E::99.84(193775) |
| P2 | 54 | F | H | H::99.83(195436) |
| P2 | 55 | F | H | H::97.87(191067) |
| P2 | 56 | F | I | I::99.88(194512) |
| P2 | 57 | F | R | R::99.78(193723) |
| P2 | 58 | F | I | I::99.15(192134) |
| P2 | 59 | F | P | P::99.90(191886) |
| P2 | 60 | F | R | R::99.52(190336) |
| P2 | 61 | F | T | T::99.92(190319) |
| P2 | 62 | F | P | P::99.90(189327) |
| P2 | 63 | F | A | A::99.65(187359) |
| P2 | 64 | F | R | R::99.83(186986) |
| P2 | 65 | F | V | V::99.88(187562) |
| P2 | 66 | F | T | T::99.85(186419) |
| P2 | 67 | F | G | G::99.89(187083) |
| P2 | 68 | F | G | G::99.91(187063) |
| P2 | 69 | F | V | V::99.89(188441) |
| P2 | 71 | F | L | L::99.90(189522) |
| P2 | 72 | F | V | V::99.91(191752) |
| P2 | 73 | F | D | D::99.69(192050) |
| P2 | 74 | F | K | K::99.89(191869) |
| P2 | 75 | F | N | N::99.82(194326) |
| P2 | 76 | F | P | P::99.90(194283) |
| P2 | 77 | F | H | H::99.36(192910) |
| P2 | 78 | F | N | N::99.81(194576) |
| P2 | 79 | F | T | T::99.80(195735) |
| P2 | 80 | F | A | A::99.14(193435) |
| P2 | 81 | F | E | E::99.90(197908) |
| P2 | 82 | F | S | S::99.95(197973) |
| P2 | 83 | F | R | R::99.86(198551) |
| P2 | 84 | F | L | L::99.92(200177) |
| P2 | 85 | F | V | V::99.91(201047) |
| P2 | 86 | F | V | V::99.88(202404) |
| P2 | 87 | F | D | D::99.86(202599) |
| P2 | 89 | F | S | S::99.88(199513) |
| P2 | 90 | F | Q | Q::99.87(202690) |
| P2 | 92 | F | S | S::99.94(201642) |
| P2 | 93 | F | R | R::99.82(202939) |
| P2 | 94 | F | G | G::99.86(202581) |
| P2 | 95 | F | N | N::98.98(202693) |
| P2 | 96 | F | Y | Y::98.76(204264) |
| P2 | 97 | F | R | R::99.77(209498) |
| P2 | 98 | F | V | V::99.91(210971) |
| P2 | 99 | F | S | S::99.91(209647) |
| P2 | 100 | F | W | W::99.71(208331) |
| P2 | 101 | F | P | P::99.78(212021) |
| P2 | 102 | F | K | K::99.92(214052) |

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|---|---|---|---|---|
| P2 | 104 | F | A | A::99.59(213864) |
| P2 | 105 | F | V | V::99.90(217524) |
| P2 | 106 | F | P | P::99.83(217662) |
| P2 | 107 | F | N | N::99.91(219200) |
| P2 | 108 | F | L | L::99.84(220352) |
| P2 | 109 | F | Q | Q::99.87(220115) |
| P2 | 110 | F | S | S::99.91(220627) |
| P2 | 111 | F | L | L::99.87(222347) |
| P2 | 112 | F | T | T::99.89(224241) |
| P2 | 113 | F | N | N::99.91(225909) |
| P2 | 114 | F | L | L::99.91(226917) |
| P2 | 115 | F | L | L::99.85(227201) |
| P2 | 116 | F | S | S::99.93(229006) |
| P2 | 117 | F | S | S::99.89(229489) |
| P2 | 118 | F | N | N::99.80(230911) |
| P2 | 119 | F | L | L::99.88(228880) |
| P2 | 120 | F | S | S::97.44(225291) |
| P2 | 121 | F | W | W::99.81(231083) |
| P2 | 122 | F | L | L::99.93(230927) |
| P2 | 123 | F | S | S::99.90(230543) |
| P2 | 124 | F | L | L::99.92(231265) |
| P2 | 125 | F | D | D::99.86(232564) |
| P2 | 126 | F | V | V::99.91(232812) |
| P2 | 127 | F | S | S::99.90(232771) |
| P2 | 128 | F | A | A::99.75(232967) |
| P2 | 129 | F | A | A::99.84(232370) |
| P2 | 131 | F | Y | Y::99.87(231559) |
| P2 | 132 | F | H | H::99.91(231214) |
| P2 | 133 | F | L | L::97.74(224469) |
| P2 | 134 | F | P | P::99.93(231623) |
| P2 | 135 | F | L | L::99.86(228275) |
| P2 | 136 | F | H | H::99.90(228585) |
| P2 | 137 | F | P | P::99.94(228884) |
| P2 | 138 | F | A | A::99.85(229452) |
| P2 | 139 | F | A | A::99.86(229733) |
| P2 | 140 | F | M | M::99.84(229170) |
| P2 | 141 | F | P | P::99.83(229166) |
| P2 | 142 | F | H | H::99.88(228668) |
| P2 | 143 | F | L | L::99.93(226257) |
| P2 | 144 | F | L | L::99.85(224323) |
| P2 | 145 | F | V | V::99.93(226781) |
| P2 | 146 | F | G | G::99.84(222064) |
| P2 | 147 | F | S | S::99.91(220643) |
| P2 | 148 | F | S | S::99.95(219076) |
| P2 | 149 | F | G | G::99.79(219152) |
| P2 | 150 | F | L | L::99.95(217987) |
| P2 | 151 | F | S | S::99.82(215243) |
| P2 | 152 | F | R | R::99.27(207977) |
| P2 | 153 | F | Y | Y::99.88(216323) |
| P2 | 154 | F | V | V::99.89(215099) |
| P2 | 155 | F | A | A::99.73(212063) |

| P2 | 156 | F | R | R::99.82(209835) |
|---|---|---|---|---|
| P2 | 157 | F | L | L::99.86(206912) |
| P2 | 158 | F | S | S::99.86(205660) |
| P2 | 159 | F | S | S::99.75(204514) |
| P2 | 160 | F | N | N::89.16(182154) T::10.51(21470) |
| P2 | 161 | F | S | S::99.83(200445) |
| P2 | 162 | F | R | R::99.64(198309) |
| P2 | 163 | F | I | I::99.73(196142) |
| P2 | 165 | F | N | N::99.80(191909) |
| P2 | 166 | F | H | H::99.82(189311) |
| P2 | 167 | F | Q | Q::99.76(187217) |
| P2 | 168 | F | H | H::99.78(178210) |
| P2 | 169 | F | G | G::99.78(183744) |
| P2 | 170 | F | T | T::61.89(111103) I::37.80(67846) |
| P2 | 171 | F | M | M::99.10(179816) |
| P2 | 172 | F | Q | Q::99.61(177597) |
| P2 | 173 | F | N | N::98.15(175668) |
| P2 | 174 | F | L | L::99.84(176938) |
| P2 | 175 | F | H | H::99.76(174380) |
| P2 | 176 | F | D | D::99.80(169359) |
| P2 | 177 | F | S | S::99.78(154406) |
| P2 | 178 | F | C | C::99.82(164991) |
| P2 | 179 | F | S | S::99.91(168359) |
| P2 | 180 | F | R | R::99.81(170172) |
| P2 | 181 | F | N | N::99.84(169136) |
| P2 | 182 | F | L | L::99.92(167711) |
| P2 | 183 | F | Y | Y::99.86(165373) |
| P2 | 184 | F | V | V::99.75(165358) |
| P2 | 185 | F | S | S::99.87(163621) |
| P2 | 186 | F | L | L::99.89(163551) |
| P2 | 187 | F | L | L::99.81(163281) |
| P2 | 188 | F | L | L::99.89(164746) |
| P2 | 189 | F | L | L::99.93(163627) |
| P2 | 190 | F | Y | Y::99.90(163185) |
| P2 | 191 | F | Q | Q::99.59(163270) |
| P2 | 192 | F | T | T::99.94(164678) |
| P2 | 194 | F | G | G::99.86(164250) |
| P2 | 195 | F | R | R::99.73(163476) |
| P2 | 196 | F | K | K::99.84(165230) |
| P2 | 197 | F | L | L::99.87(165151) |
| P2 | 198 | F | H | H::99.77(163775) |
| P2 | 199 | F | L | L::99.73(157616) |
| P2 | 200 | F | Y | Y::99.87(167540) |
| P2 | 201 | F | S | S::99.86(167474) |
| P2 | 202 | F | H | H::99.91(170583) |
| P2 | 203 | F | P | P::99.86(172641) |
| P2 | 204 | F | I | I::99.88(175973) |
| P2 | 205 | F | I | I::99.71(178365) |
| P2 | 206 | F | L | L::99.81(179575) |
| P2 | 207 | F | G | G::99.73(181566) |
| P2 | 209 | F | R | R::99.77(189244) |

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|----|-----|---|---|---|
| P2 | 210 | F | K | K::99.92(194167) |
| P2 | 211 | F | I | I::99.76(197002) |
| P2 | 212 | F | P | P::99.84(198471) |
| P2 | 213 | F | M | M::99.70(200108) |
| P2 | 214 | F | G | G::99.75(204352) |
| P2 | 215 | F | V | V::99.51(207356) |
| P2 | 216 | F | G | G::99.75(211688) |
| P2 | 217 | F | L | L::99.87(215946) |
| P2 | 218 | F | S | S::99.81(220911) |
| P2 | 219 | F | P | P::99.87(225590) |
| P2 | 221 | F | L | L::99.93(231583) |
| P2 | 222 | F | L | L::99.93(236488) |
| P2 | 223 | F | A | A::99.13(239384) |
| P2 | 224 | F | Q | Q::99.87(245236) |
| P2 | 226 | F | T | T::99.86(252396) |
| P2 | 227 | F | S | S::99.80(256326) |
| P2 | 228 | F | A | A::99.77(259723) |
| P2 | 229 | F | I | I::99.88(263202) |
| P2 | 230 | F | C | C::99.75(262967) |
| P2 | 231 | F | S | S::99.91(266997) |
| P2 | 232 | F | V | V::99.91(276321) |
| P2 | 233 | F | V | V::99.76(280430) |
| P2 | 234 | F | R | R::99.82(284515) |
| P2 | 235 | F | R | R::99.75(287737) |
| P2 | 236 | F | A | A::99.68(289704) |
| P2 | 238 | F | P | P::99.85(292221) |
| P2 | 239 | F | H | H::99.89(293519) |
| P2 | 240 | F | C | C::99.83(295446) |
| P2 | 241 | F | L | L::99.89(298304) |
| P2 | 242 | F | A | A::99.72(301563) |
| P2 | 244 | F | S | S::99.80(303340) |
| P2 | 245 | F | Y | Y::99.87(304710) |
| P2 | 246 | F | M | M::99.85(306206) |
| P2 | 247 | F | D | D::99.85(307157) |
| P2 | 248 | F | D | D::99.77(306446) |
| P2 | 249 | F | V | V::99.87(307819) |
| P2 | 250 | F | V | V::99.91(307772) |
| P2 | 251 | F | L | L::99.91(306692) |
| P2 | 252 | F | G | G::99.88(306352) |
| P2 | 253 | F | A | A::99.68(304132) |
| P2 | 254 | F | K | K::99.73(301867) |
| P2 | 255 | F | S | S::99.91(300744) |
| P2 | 256 | F | V | V::99.60(297892) |
| P2 | 257 | F | Q | Q::99.61(294976) |
| P2 | 258 | F | H | H::99.88(281310) |
| P2 | 259 | F | L | L::99.90(287633) |
| P2 | 260 | F | E | E::99.70(286969) |
| P2 | 261 | F | S | S::53.43(151710) A::46.36(131637) |
| P2 | 262 | F | L | L::99.70(290030) |
| P2 | 264 | F | T | T::99.65(285839) |
| P2 | 265 | F | A | A::99.46(284080) |

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|----|-----|---|---|------------------|
| P2 | 266 | F | V | V::99.92(282723) |
| P2 | 267 | F | T | T::99.91(275003) |
| P2 | 268 | F | N | N::99.89(275741) |
| P2 | 270 | F | L | L::99.88(268997) |
| P2 | 271 | F | L | L::99.89(265399) |
| P2 | 272 | F | S | S::99.85(264727) |
| P2 | 273 | F | L | L::99.91(259474) |
| P2 | 274 | F | G | G::99.84(251115) |
| P2 | 275 | F | I | I::99.84(252462) |
| P2 | 276 | F | H | H::99.80(250133) |
| P2 | 277 | F | L | L::99.85(244078) |
| P2 | 278 | F | N | N::99.86(239318) |
| P2 | 279 | F | P | P::99.74(232420) |
| P2 | 280 | F | N | N::99.22(187406) |
| P2 | 281 | F | K | K::99.94(188773) |
| P2 | 282 | F | T | T::99.95(188756) |
| P2 | 283 | F | K | K::99.72(210209) |
| P2 | 284 | F | R | R::99.91(213984) |
| P2 | 285 | F | W | W::99.79(214361) |
| P2 | 286 | F | G | G::99.86(211677) |
| P2 | 287 | F | Y | Y::99.86(208635) |
| P2 | 288 | F | S | S::99.94(210450) |
| P2 | 289 | F | L | L::99.93(207728) |
| P2 | 290 | F | H | H::99.90(209629) |
| P2 | 292 | F | M | M::99.72(206608) |
| P2 | 293 | F | G | G::99.69(205911) |
| P2 | 294 | F | Y | Y::99.90(204363) |
| P2 | 295 | F | V | V::99.85(203567) |
| P2 | 296 | F | I | I::99.90(203818) |
| P2 | 297 | F | G | G::99.85(202761) |
| P2 | 298 | F | C | C::98.25(196286) |
| P2 | 299 | F | Y | Y::98.94(195999) |
| P2 | 300 | F | G | G::99.90(196755) |
| P2 | 301 | F | S | S::99.87(193948) |
| P2 | 302 | F | L | L::99.91(196706) |
| P2 | 303 | F | P | P::99.85(196456) |
| P2 | 304 | F | Q | Q::99.87(193786) |
| P2 | 305 | F | D | D::99.67(196008) |
| P2 | 306 | F | H | H::99.86(198169) |
| P2 | 307 | F | I | I::99.89(197400) |
| P2 | 308 | F | I | I::99.37(184887) |
| P2 | 309 | F | Q | Q::99.78(191822) |
| P2 | 310 | F | K | K::99.86(192086) |
| P2 | 311 | F | I | I::99.77(192877) |
| P2 | 312 | F | K | K::99.78(191824) |
| P2 | 313 | F | E | E::99.47(190583) |
| P2 | 314 | F | C | C::99.90(191800) |
| P2 | 316 | F | R | R::99.73(182178) |
| P2 | 317 | F | K | K::99.68(192114) |
| P2 | 318 | F | L | L::99.94(192552) |
| P2 | 319 | F | P | P::99.92(193268) |

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|---|---|---|---|---|
| P2 | 320 | F | V | V::99.89(193103) |
| P2 | 321 | F | N | N::99.65(193416) |
| P2 | 322 | F | R | R::99.89(187304) |
| P2 | 323 | F | P | P::99.91(194676) |
| P2 | 324 | F | I | I::99.79(196981) |
| P2 | 325 | F | D | D::99.79(198746) |
| P2 | 326 | F | W | W::99.78(198751) |
| P2 | 327 | F | K | K::99.90(202274) |
| P2 | 328 | F | V | V::99.90(195911) |
| P2 | 329 | F | C | C::99.84(198764) |
| P2 | 330 | F | Q | Q::99.83(202458) |
| P2 | 331 | F | R | R::99.79(202674) |
| P2 | 332 | F | I | I::99.71(202059) |
| P2 | 333 | F | V | V::99.81(202706) |
| P2 | 334 | F | G | G::99.83(201916) |
| P2 | 335 | F | L | L::99.91(195645) |
| P2 | 336 | F | L | L::99.85(199710) |
| P2 | 337 | F | G | G::99.86(199902) |
| P2 | 339 | F | A | A::99.64(194256) |
| P2 | 340 | F | A | A::99.74(192947) |
| P2 | 341 | F | P | P::99.93(192484) |
| P2 | 343 | F | T | T::99.62(186881) |
| P2 | 344 | F | Q | Q::99.88(184863) |
| P2 | 345 | F | C | C::99.82(183175) |
| P2 | 346 | F | G | G::99.93(182047) |
| P2 | 347 | F | Y | Y::99.82(179804) |
| P2 | 348 | F | P | P::99.92(180245) |
| P2 | 349 | F | A | A::99.84(171211) |
| P2 | 350 | F | L | L::99.91(173674) |
| P2 | 351 | F | M | M::99.65(172727) |
| P2 | 352 | F | P | P::99.85(170160) |
| P2 | 353 | F | L | L::99.87(166640) |
| P2 | 354 | F | Y | Y::99.88(164441) |
| P2 | 355 | F | A | A::99.70(149915) |
| P2 | 356 | F | C | C::99.41(149435) |
| P2 | 357 | F | I | I::99.83(155662) |
| P2 | 358 | F | Q | Q::99.54(155573) |
| P2 | 359 | F | S | S::99.92(153564) |
| P2 | 360 | F | K | K::99.81(151017) |
| P2 | 361 | F | Q | Q::99.84(146722) |
| P2 | 362 | F | A | A::99.88(145350) |
| P2 | 364 | F | T | T::99.88(141060) |
| P2 | 366 | F | S | S::99.88(122099) |
| P2 | 367 | F | P | P::99.92(126359) |
| P2 | 368 | F | T | T::99.94(127634) |
| P2 | 369 | F | Y | Y::99.91(126019) |
| P2 | 370 | F | K | K::99.84(123464) |
| P2 | 371 | F | A | A::99.73(120261) |
| P2 | 373 | F | L | L::99.94(114082) |
| P2 | 374 | F | C | C::98.85(110373) |
| P2 | 375 | F | K | K::99.58(108066) |

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|---|---|---|---|---|
| P2 | 376 | F | Q | Q::99.83(103594) |
| P2 | 377 | F | Y | Y::99.90(101552) |
| P2 | 378 | F | L | L::99.72(99228) |
| P2 | 379 | F | N | N::99.56(97088) |
| P2 | 380 | F | L | L::99.90(94750) |
| P2 | 381 | F | Y | Y::99.87(91292) |
| P2 | 382 | F | P | P::99.88(88994) |
| P2 | 383 | F | V | V::99.86(86691) |
| P2 | 384 | F | A | A::99.46(79692) |
| P2 | 385 | F | R | R::99.85(82287) |
| P2 | 386 | F | Q | Q::99.83(81614) |
| P2 | 387 | F | R | R::99.75(79992) |
| P2 | 388 | F | P | P::99.83(75198) |
| P2 | 389 | F | G | G::99.89(76834) |
| P2 | 390 | F | L | L::99.78(74351) |
| P2 | 391 | F | C | C::99.80(73700) |
| P2 | 392 | F | Q | Q::99.68(72393) |
| P2 | 393 | F | V | V::99.87(72495) |
| P2 | 395 | F | A | A::99.72(70736) |
| P2 | 396 | F | D | D::99.83(67911) |
| P2 | 397 | F | A | A::99.71(67516) |
| P2 | 398 | F | T | T::99.91(67404) |
| P2 | 399 | F | P | P::99.91(66947) |
| P2 | 400 | F | T | T::99.82(66725) |
| P2 | 401 | F | G | G::99.64(66160) |
| P2 | 402 | F | W | W::99.73(64793) |
| P2 | 403 | F | G | G::99.88(64273) |
| P2 | 404 | F | L | L::99.90(63738) |
| P2 | 405 | F | V | V::99.84(59597) |
| P2 | 406 | F | M | M::99.02(61254) |
| P2 | 407 | F | G | G::99.67(61318) |
| P2 | 408 | F | H | H::99.58(60497) |
| P2 | 409 | F | Q | Q::99.84(59297) |
| P2 | 410 | F | R | R::99.65(58645) |
| P2 | 411 | F | M | M::98.90(58014) |
| P2 | 412 | F | R | R::99.82(57847) |
| P2 | 413 | F | G | G::99.85(57987) |
| P2 | 414 | F | T | T::99.81(57964) |
| P2 | 416 | F | L | L::98.07(53194) |
| P2 | 417 | F | A | A::99.80(56211) |
| P2 | 418 | F | P | P::99.96(55275) |
| P2 | 419 | F | L | L::99.92(52558) |
| P2 | 420 | F | P | P::99.67(54557) |
| P2 | 421 | F | I | I::99.76(54767) |
| P2 | 422 | F | H | H::99.75(54145) |
| P2 | 423 | F | T | T::99.89(53704) |
| P2 | 424 | F | A | A::99.81(52795) |
| P2 | 425 | F | E | E::99.78(52325) |
| P2 | 426 | F | L | L::99.83(51601) |
| P2 | 427 | F | L | L::99.91(50898) |
| P2 | 428 | F | A | A::99.93(50653) |

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|---|---|---|---|---|
| P2 | 429 | F | A | A::99.75(50581) |
| P2 | 430 | F | C | C::99.86(49942) |
| P2 | 432 | F | A | A::99.81(49574) |
| P2 | 433 | F | R | R::99.79(48479) |
| P2 | 434 | F | S | S::99.79(48072) |
| P2 | 435 | F | R | R::99.78(47526) |
| P2 | 436 | F | S | S::99.90(46760) |
| P2 | 437 | F | G | G::99.90(46207) |
| P2 | 438 | F | A | A::99.88(45551) |
| P2 | 439 | F | N | N::99.69(45395) |
| P2 | 440 | F | I | I::99.47(44670) |
| P2 | 441 | F | L | L::55.60(24228) I::44.11(19220) |
| P2 | 442 | F | G | G::99.88(43753) |
| P2 | 443 | F | T | T::99.85(43079) |
| P2 | 444 | F | D | D::99.85(42722) |
| P2 | 445 | F | N | N::99.80(42382) |
| P2 | 446 | F | S | S::99.90(41839) |
| P2 | 447 | F | V | V::99.72(41694) |
| P2 | 448 | F | V | V::99.92(40988) |
| P2 | 449 | F | L | L::99.91(40303) |
| P2 | 450 | F | S | S::99.89(39588) |
| P2 | 451 | F | R | R::99.66(39770) |
| P2 | 452 | F | K | K::99.50(39252) |
| P2 | 453 | F | Y | Y::99.56(39115) |
| P2 | 454 | F | T | T::99.85(38796) |
| P2 | 455 | F | S | S::99.88(38496) |
| P2 | 457 | F | P | P::99.90(37916) |
| P2 | 458 | F | W | W::99.75(37714) |
| P2 | 459 | F | L | L::99.93(36815) |
| P2 | 460 | F | L | L::99.95(36092) |
| P2 | 461 | F | G | G::99.90(35842) |
| P2 | 462 | F | C | C::99.72(35103) |
| P2 | 463 | F | A | A::99.73(35163) |
| P2 | 464 | F | A | A::99.71(35061) |
| P2 | 465 | F | N | N::99.84(34811) |
| P2 | 466 | F | W | W::99.73(34084) |
| P2 | 467 | F | I | I::99.87(34129) |
| P2 | 468 | F | L | L::99.77(33624) |
| P2 | 469 | F | R | R::99.79(33061) |
| P2 | 470 | F | G | G::99.83(32681) |
| P2 | 471 | F | T | T::99.86(32328) |
| P2 | 472 | F | S | S::99.90(32188) |
| P2 | 474 | F | V | V::99.92(32236) |
| P2 | 475 | F | Y | Y::99.67(31831) |
| P2 | 476 | F | V | V::99.74(31681) |
| P2 | 477 | F | P | P::99.91(31190) |
| P2 | 478 | F | S | S::99.85(30630) |
| P2 | 479 | F | T | T::92.52(27247) A::6.75(1987) |
| P2 | 480 | F | L | L::99.86(30572) |
| P2 | 481 | F | N | N::99.62(30423) |
| P2 | 482 | F | P | P::99.94(30008) |

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| P2 | 483 | F | A | A::99.81(29641) |
| P2 | 484 | F | D | D::99.87(29686) |
| P2 | 485 | F | D | D::99.75(29529) |
| P2 | 486 | F | P | P::99.93(29675) |
| P2 | 487 | F | S | S::99.95(29280) |
| P2 | 488 | F | R | R::99.77(29056) |
| P2 | 489 | F | G | G::99.77(29026) |
| P2 | 490 | F | R | R::99.57(28742) |
| P2 | 491 | F | L | L::99.88(29089) |
| P2 | 492 | F | G | G::99.85(29200) |
| P2 | 493 | F | L | L::99.86(28329) |
| P2 | 494 | F | S | S::99.74(29149) |
| P2 | 495 | F | R | R::99.59(29099) |
| P2 | 496 | F | P | P::99.95(29376) |
| P2 | 497 | F | L | L::99.74(28843) |
| P2 | 498 | F | L | L::96.73(27995) |
| P2 | 499 | F | R | R::99.84(29050) |
| P2 | 500 | F | L | L::99.90(28937) |
| P2 | 501 | F | P | P::99.48(28882) |
| P2 | 503 | F | R | R::99.19(28369) |
| P2 | 504 | F | P | P::99.83(28780) |
| P2 | 505 | F | T | T::99.81(29078) |
| P2 | 506 | F | T | T::99.88(28896) |
| P2 | 507 | F | G | G::99.54(28762) |
| P2 | 508 | F | R | R::99.60(28657) |
| P2 | 509 | F | T | T::99.86(28847) |
| P2 | 510 | F | S | S::99.82(28559) |
| P2 | 511 | F | L | L::99.94(28676) |
| P2 | 512 | F | Y | Y::99.75(28323) |
| P2 | 513 | F | A | A::99.77(28550) |
| P2 | 514 | F | D | D::99.29(28623) |
| P2 | 515 | F | S | S::99.79(28881) |
| P2 | 516 | F | P | P::99.85(28837) |
| P2 | 517 | F | S | S::99.79(28878) |
| P2 | 518 | F | V | V::99.82(29030) |
| P2 | 519 | F | P | P::99.70(29122) |
| P2 | 520 | F | S | S::99.88(28784) |
| P2 | 521 | F | H | H::99.79(28910) |
| P2 | 522 | F | L | L::99.91(28735) |
| P2 | 523 | F | P | P::99.78(28969) |
| P2 | 524 | F | V | V::98.84(27964) |
| P2 | 525 | F | R | R::99.68(30023) |
| P2 | 526 | F | V | V::99.84(30510) |
| P2 | 527 | F | H | H::99.78(30486) |
| P2 | 529 | F | A | A::99.56(30387) |
| P2 | 530 | F | S | S::99.93(30435) |
| P2 | 531 | F | P | P::99.94(31568) |
| P2 | 532 | F | L | L::99.87(39852) |
| P2 | 533 | F | H | H::99.83(135972) |
| P2 | 534 | F | V | V::99.96(398532) |
| P2 | 535 | F | A | A::99.77(428092) |

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|---|---|---|---|---|
| P2 | 536 | F | W | W::99.85(440235) |
| P2 | 537 | F | R | R::79.97(358383) K::19.86(89013) |
| P2 | 538 | F | P | P::99.89(457486) |
| S2 | 1 | F | S | S::100.00(97366) |
| S2 | 2 | F | T | T::99.83(102353) |
| S2 | 3 | F | T | T::99.76(103301) |
| S2 | 5 | F | H | H::99.84(114075) |
| S2 | 6 | F | Q | Q::99.72(117604) |
| S2 | 7 | F | T | T::99.90(122424) |
| S2 | 8 | F | L | L::99.91(124677) |
| S2 | 9 | F | Q | Q::99.73(130852) |
| S2 | 10 | F | D | D::99.88(135903) |
| S2 | 11 | F | P | P::99.90(140571) |
| S2 | 12 | F | R | R::99.53(144430) |
| S2 | 13 | F | V | V::99.88(148895) |
| S2 | 14 | F | R | R::99.06(152582) |
| S2 | 15 | F | G | G::99.75(158336) |
| S2 | 16 | F | L | L::99.77(161886) |
| S2 | 17 | F | Y | Y::99.84(166734) |
| S2 | 19 | F | P | P::99.85(176352) |
| S2 | 20 | F | A | A::99.80(180535) |
| S2 | 21 | F | G | G::99.89(184179) |
| S2 | 22 | F | G | G::99.80(187156) |
| S2 | 23 | F | S | S::99.79(189509) |
| S2 | 24 | F | S | S::99.84(193945) |
| S2 | 25 | F | S | S::99.92(196608) |
| S2 | 26 | F | G | G::99.09(199457) |
| S2 | 27 | F | T | T::99.89(202690) |
| S2 | 28 | F | V | V::99.58(201148) |
| S2 | 29 | F | N | N::99.72(202295) |
| S2 | 30 | F | P | P::99.87(203339) |
| S2 | 31 | F | V | V::99.83(202309) |
| S2 | 32 | F | P | P::99.78(200036) |
| S2 | 33 | F | T | T::99.90(200829) |
| S2 | 34 | F | T | T::99.88(202041) |
| S2 | 35 | F | V | V::99.85(193738) |
| S2 | 36 | F | S | S::99.87(198616) |
| S2 | 37 | F | H | H::99.63(189659) |
| S2 | 38 | F | I | I::99.79(201129) |
| S2 | 39 | F | S | S::99.87(201009) |
| S2 | 40 | F | S | S::99.90(199694) |
| S2 | 41 | F | I | I::99.89(200006) |
| S2 | 43 | F | S | S::99.78(194999) |
| S2 | 44 | F | R | R::99.52(198974) |
| S2 | 45 | F | I | I::99.85(199023) |
| S2 | 46 | F | G | G::99.82(197909) |
| S2 | 47 | F | D | D::99.72(196902) |
| S2 | 48 | F | P | P::99.72(188068) |
| S2 | 49 | F | A | A::99.66(195380) |
| S2 | 50 | F | L | L::99.83(196079) |
| S2 | 51 | F | N | N::99.88(197526) |

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| S2 | 52 | F | M | M::99.80(197094) |
| S2 | 53 | F | E | E::99.75(193439) |
| S2 | 54 | F | N | N::99.90(195196) |
| S2 | 55 | F | I | I::99.84(195704) |
| S2 | 56 | F | T | T::99.82(193384) |
| S2 | 57 | F | S | S::99.89(192476) |
| S2 | 58 | F | G | G::99.80(192947) |
| S2 | 60 | F | L | L::99.90(190054) |
| S2 | 61 | F | G | G::99.57(189267) |
| S2 | 62 | F | P | P::99.90(189727) |
| S2 | 63 | F | L | L::99.90(187936) |
| S2 | 64 | F | L | L::99.88(188396) |
| S2 | 65 | F | V | V::98.37(185236) |
| S2 | 66 | F | L | L::99.83(186179) |
| S2 | 67 | F | Q | Q::99.78(186717) |
| S2 | 68 | F | A | A::99.83(186390) |
| S2 | 69 | F | G | G::99.90(187009) |
| S2 | 72 | F | L | L::99.58(188330) |
| S2 | 73 | F | L | L::99.77(191005) |
| S2 | 74 | F | T | T::99.81(190340) |
| S2 | 75 | F | R | R::99.68(192309) |
| S2 | 76 | F | I | I::99.83(194552) |
| S2 | 77 | F | L | L::99.83(193878) |
| S2 | 78 | F | T | T::99.74(192733) |
| S2 | 79 | F | I | I::99.87(194756) |
| S2 | 80 | F | P | P::99.84(195357) |
| S2 | 81 | F | Q | Q::99.73(195644) |
| S2 | 82 | F | S | S::99.84(198170) |
| S2 | 83 | F | L | L::99.92(196003) |
| S2 | 84 | F | D | D::99.90(199482) |
| S2 | 85 | F | S | S::99.87(198351) |
| S2 | 86 | F | W | W::99.80(200449) |
| S2 | 87 | F | W | W::99.74(201326) |
| S2 | 88 | F | T | T::99.89(202625) |
| S2 | 89 | F | S | S::99.91(200844) |
| S2 | 90 | F | L | L::99.87(201031) |
| S2 | 91 | F | N | N::99.84(203967) |
| S2 | 93 | F | L | L::99.90(199267) |
| S2 | 94 | F | G | G::99.74(203108) |
| S2 | 95 | F | G | G::98.51(199649) |
| S2 | 96 | F | T | T::99.09(203008) |
| S2 | 97 | F | T | T::99.86(209747) |
| S2 | 98 | F | V | V::99.79(210479) |
| S2 | 99 | F | C | C::99.87(209984) |
| S2 | 100 | F | L | L::88.51(184933) R::11.31(23642) |
| S2 | 101 | F | G | G::99.74(211901) |
| S2 | 102 | F | Q | Q::99.76(212266) |
| S2 | 103 | F | N | N::99.95(215486) |
| S2 | 104 | F | S | S::99.85(212754) |
| S2 | 105 | F | Q | Q::99.71(215124) |
| S2 | 106 | F | S | S::99.79(215976) |

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| S2 | 107 | F | P | P::99.85(217141) |
| S2 | 108 | F | T | T::99.91(219858) |
| S2 | 109 | F | S | S::99.81(219906) |
| S2 | 110 | F | N | N::99.87(221327) |
| S2 | 111 | F | H | H::99.87(222200) |
| S2 | 112 | F | S | S::99.74(220364) |
| S2 | 113 | F | P | P::99.90(224368) |
| S2 | 114 | F | T | T::99.89(226722) |
| S2 | 115 | F | S | S::99.73(226432) |
| S2 | 116 | F | C | C::99.81(226548) |
| S2 | 117 | F | P | P::99.91(230683) |
| S2 | 118 | F | P | P::99.80(228259) |
| S2 | 119 | F | T | T::99.86(230826) |
| S2 | 120 | F | C | C::97.39(222917) |
| S2 | 121 | F | P | P::99.91(232276) |
| S2 | 122 | F | G | G::99.85(232215) |
| S2 | 123 | F | Y | Y::99.88(231136) |
| S2 | 124 | F | R | R::99.60(230323) |
| S2 | 125 | F | W | W::99.73(230016) |
| S2 | 126 | F | M | M::99.86(231691) |
| S2 | 127 | F | C | C::98.57(229483) |
| S2 | 128 | F | L | L::99.84(231919) |
| S2 | 129 | F | R | R::99.76(232233) |
| S2 | 130 | F | R | R::99.53(230255) |
| S2 | 132 | F | I | I::99.88(231797) |
| S2 | 133 | F | I | I::99.93(229691) |
| S2 | 135 | F | L | L::99.91(230392) |
| S2 | 137 | F | I | I::99.92(229362) |
| S2 | 138 | F | L | L::99.81(228074) |
| S2 | 139 | F | L | L::99.87(228477) |
| S2 | 140 | F | L | L::99.91(228879) |
| S2 | 141 | F | C | C::99.87(228457) |
| S2 | 142 | F | L | L::99.74(228932) |
| S2 | 143 | F | I | I::99.87(227595) |
| S2 | 145 | F | L | L::99.91(222853) |
| S2 | 146 | F | L | L::99.76(223147) |
| S2 | 147 | F | V | V::99.88(222328) |
| S2 | 148 | F | L | L::99.89(220327) |
| S2 | 149 | F | L | L::99.92(217471) |
| S2 | 150 | F | D | D::99.81(219833) |
| S2 | 151 | F | Y | Y::99.77(217887) |
| S2 | 152 | F | Q | Q::86.65(181578) H::13.13(27516) |
| S2 | 153 | F | G | G::99.64(214588) |
| S2 | 154 | F | M | M::99.82(215211) |
| S2 | 155 | F | L | L::99.88(213363) |
| S2 | 156 | F | P | P::99.77(211485) |
| S2 | 157 | F | V | V::99.76(209511) |
| S2 | 158 | F | C | C::99.82(207202) |
| S2 | 159 | F | P | P::99.83(206093) |
| S2 | 160 | F | L | L::99.90(202434) |
| S2 | 161 | F | I | I::89.32(181932) L::10.54(21469) |

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|---|---|---|---|---|
| S2 | 162 | F | P | P::99.79(199589) |
| S2 | 163 | F | G | G::99.72(197324) |
| S2 | 164 | F | S | S::99.73(185501) |
| S2 | 165 | F | S | S::99.85(188415) |
| S2 | 166 | F | T | T::99.91(190683) |
| S2 | 167 | F | T | T::99.87(188858) |
| S2 | 168 | F | S | S::99.68(186167) |
| S2 | 169 | F | T | T::99.68(178033) |
| S2 | 170 | F | G | G::99.81(182077) |
| S2 | 171 | F | P | P::61.80(110514) S::37.97(67900) |
| S2 | 172 | F | C | C::99.74(180190) |
| S2 | 173 | F | R | R::99.54(177605) |
| S2 | 174 | F | T | T::99.77(178323) |
| S2 | 175 | F | C | C::99.66(175555) |
| S2 | 176 | F | T | T::99.74(172038) |
| S2 | 177 | F | T | T::99.84(154525) |
| S2 | 178 | F | P | P::99.82(154457) |
| S2 | 179 | F | A | A::99.77(166810) |
| S2 | 180 | F | Q | Q::99.69(168477) |
| S2 | 181 | F | G | G::99.71(168158) |
| S2 | 182 | F | T | T::99.76(168766) |
| S2 | 183 | F | S | S::99.86(167312) |
| S2 | 184 | F | M | M::99.81(165776) |
| S2 | 185 | F | Y | Y::99.64(165185) |
| S2 | 186 | F | P | P::99.81(164265) |
| S2 | 187 | F | S | S::99.87(162990) |
| S2 | 188 | F | C | C::99.75(163835) |
| S2 | 189 | F | C | C::99.70(164125) |
| S2 | 190 | F | C | C::99.81(163226) |
| S2 | 191 | F | T | T::93.19(152317) I::6.76(11053) |
| S2 | 192 | F | K | K::99.74(163618) |
| S2 | 193 | F | P | P::99.96(164573) |
| S2 | 194 | F | S | S::99.85(162613) |
| S2 | 195 | F | D | D::99.81(165193) |
| S2 | 196 | F | G | G::99.59(163516) |
| S2 | 197 | F | N | N::99.87(166274) |
| S2 | 198 | F | C | C::99.69(164212) |
| S2 | 199 | F | T | T::99.88(157870) |
| S2 | 200 | F | C | C::99.65(164843) |
| S2 | 201 | F | I | I::99.91(168308) |
| S2 | 202 | F | P | P::99.80(168306) |
| S2 | 203 | F | I | I::99.93(171109) |
| S2 | 204 | F | P | P::99.80(172681) |
| S2 | 205 | F | S | S::99.86(174914) |
| S2 | 206 | F | S | S::99.89(178332) |
| S2 | 207 | F | W | W::99.69(178699) |
| S2 | 208 | F | A | A::99.75(183028) |
| S2 | 210 | F | G | G::99.36(189329) |
| S2 | 211 | F | K | K::99.77(195265) |
| S2 | 213 | F | L | L::99.93(198444) |
| S2 | 214 | F | W | W::99.71(200596) |

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|---|---|---|---|---|
| S2 | 215 | F | E | E::99.73(205861) |
| S2 | 216 | F | W | W::99.73(208351) |
| S2 | 217 | F | A | A::99.67(212575) |
| S2 | 218 | F | S | S::99.85(214775) |
| S2 | 219 | F | A | A::99.80(222557) |
| S2 | 220 | F | R | R::99.76(226657) |
| S2 | 222 | F | S | S::99.91(231293) |
| S2 | 223 | F | W | W::98.94(234997) |
| S2 | 224 | F | L | L::99.89(241667) |
| S2 | 225 | F | S | S::99.65(246465) |
| S2 | 226 | F | L | L::99.93(248114) |
| S2 | 227 | F | L | L::99.94(251753) |
| S2 | 228 | F | V | V::99.68(257481) |
| S2 | 229 | F | P | P::99.75(260191) |
| S2 | 231 | F | V | V::99.78(267351) |
| S2 | 232 | F | Q | Q::99.78(271340) |
| S2 | 233 | F | W | W::99.73(275484) |
| S2 | 235 | F | V | V::99.79(285351) |
| S2 | 236 | F | G | G::99.85(289506) |
| S2 | 237 | F | L | L::99.85(289662) |
| S2 | 238 | F | S | S::99.80(288333) |
| S2 | 239 | F | P | P::99.89(293250) |
| S2 | 240 | F | T | T::75.78(222958) I::24.09(70872) |
| S2 | 241 | F | V | V::99.90(298916) |
| S2 | 242 | F | W | W::99.69(297715) |
| S2 | 243 | F | L | L::99.90(301542) |
| S2 | 244 | F | S | S::98.63(297220) |
| S2 | 245 | F | V | V::99.93(305194) |
| S2 | 246 | F | I | I::99.83(304999) |
| S2 | 247 | F | W | W::99.82(305899) |
| S2 | 248 | F | M | M::99.74(305917) |
| S2 | 249 | F | M | M::99.78(305944) |
| S2 | 250 | F | W | W::99.77(306577) |
| S2 | 251 | F | Y | Y::99.78(307111) |
| S2 | 252 | F | W | W::99.69(305324) |
| S2 | 253 | F | G | G::99.81(305033) |
| S2 | 254 | F | P | P::99.73(301284) |
| S2 | 255 | F | S | S::99.78(303065) |
| S2 | 256 | F | L | L::99.94(298935) |
| S2 | 257 | F | Y | Y::99.51(296666) |
| S2 | 258 | F | S | S::99.33(294988) |
| S2 | 259 | F | I | I::99.63(280619) |
| S2 | 260 | F | L | L::99.87(288295) |
| S2 | 261 | F | S | S::53.40(151487) R::46.38(131587) |
| S2 | 262 | F | P | P::99.84(289598) |
| S2 | 264 | F | L | L::98.23(281167) |
| S2 | 265 | F | P | P::99.76(285251) |
| S2 | 266 | F | L | L::99.90(283565) |
| S2 | 267 | F | L | L::99.91(278581) |
| S2 | 268 | F | P | P::78.80(214705) L::21.12(57557) |
| S2 | 269 | F | I | I::99.90(275490) |

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|---|---|---|---|---|
| S2 | 272 | F | C | C::99.82(265545) |
| S2 | 273 | F | L | L::99.87(263297) |
| S2 | 274 | F | W | W::99.80(258702) |
| S2 | 275 | F | V | V::53.11(133219) A::46.74(117238) |
| S2 | 276 | F | Y | Y::99.80(252213) |
| X | 1 | F | M | M::98.97(37594) |
| X | 2 | F | A | A::99.84(37239) |
| X | 3 | F | A | A::99.82(36719) |
| X | 4 | F | R | R::99.35(35769) |
| X | 5 | F | L | L::99.74(35410) |
| X | 6 | F | C | C::99.79(35019) |
| X | 7 | F | C | C::99.70(34688) |
| X | 8 | F | Q | Q::99.82(34714) |
| X | 9 | F | L | L::99.94(34376) |
| X | 10 | F | D | D::99.86(34252) |
| X | 11 | F | P | P::99.69(33918) |
| X | 12 | F | A | A::99.51(33189) |
| X | 13 | F | R | R::99.82(32797) |
| X | 14 | F | D | D::99.83(32447) |
| X | 15 | F | V | V::99.85(32201) |
| X | 16 | F | L | L::99.75(32407) |
| X | 17 | F | C | C::99.83(32029) |
| X | 18 | F | L | L::99.64(31743) |
| X | 19 | F | R | R::99.64(31652) |
| X | 20 | F | P | P::99.88(31338) |
| X | 21 | F | V | V::99.64(31012) |
| X | 22 | F | D | D::92.53(27251) G::6.75(1987) |
| X | 23 | F | A | A::99.83(30742) |
| X | 24 | F | E | E::99.58(30547) |
| X | 25 | F | S | S::99.91(30050) |
| X | 26 | F | R | R::99.62(29742) |
| X | 27 | F | G | G::99.62(29465) |
| X | 28 | F | R | R::99.85(29341) |
| X | 29 | F | P | P::99.88(29643) |
| X | 31 | F | S | S::99.87(28860) |
| X | 32 | F | G | G::99.73(29020) |
| X | 33 | F | P | P::99.73(28703) |
| X | 34 | F | L | L::99.83(29053) |
| X | 35 | F | G | G::99.89(29380) |
| X | 36 | F | T | T::99.37(29041) |
| X | 38 | F | S | S::99.78(28953) |
| X | 39 | F | S | S::99.90(29202) |
| X | 40 | F | P | P::99.85(29259) |
| X | 41 | F | S | S::71.01(20388) P::25.75(7395) |
| X | 42 | F | P | P::99.69(29072) |
| X | 43 | F | S | S::99.88(28901) |
| X | 44 | F | A | A::99.38(28984) |
| X | 45 | F | V | V::99.75(29028) |
| X | 46 | F | S | S::99.93(28593) |
| X | 47 | F | T | T::99.56(28682) |
| X | 48 | F | D | D::99.34(28762) |

| X | 49 | F | H | H::99.87(29037) |
|---|---|---|---|---|
| X | 50 | F | G | G::99.82(28895) |
| X | 51 | F | A | A::99.83(28670) |
| X | 52 | F | H | H::99.88(28747) |
| X | 53 | F | L | L::99.80(28831) |
| X | 54 | F | S | S::99.95(28772) |
| X | 55 | F | L | L::99.80(28353) |
| X | 56 | F | R | R::99.86(28655) |
| X | 57 | F | G | G::99.79(28516) |
| X | 58 | F | L | L::99.78(28800) |
| X | 59 | F | P | P::99.91(28951) |
| X | 60 | F | V | V::99.94(28899) |
| X | 61 | F | C | C::99.72(28793) |
| X | 62 | F | A | A::99.56(29018) |
| X | 64 | F | S | S::99.92(28583) |
| X | 65 | F | S | S::99.90(28766) |
| X | 66 | F | A | A::99.47(28880) |
| X | 67 | F | G | G::99.73(28167) |
| X | 68 | F | P | P::99.92(29658) |
| X | 69 | F | C | C::99.83(30369) |
| X | 70 | F | A | A::99.04(30117) |
| X | 71 | F | L | L::99.92(30434) |
| X | 72 | F | R | R::99.53(30157) |
| X | 74 | F | T | T::99.78(30775) |
| X | 75 | F | S | S::99.95(33840) |
| X | 76 | F | A | A::99.81(58738) |
| X | 77 | F | R | R::99.94(297898) |
| X | 78 | F | R | R::99.72(423550) |
| X | 79 | F | M | M::99.84(435665) |
| X | 80 | F | E | E::99.83(445920) |
| X | 81 | F | T | T::99.88(455083) |
| X | 82 | F | T | T::99.72(459614) |
| X | 83 | F | V | V::99.71(467896) |
| X | 84 | F | N | N::99.89(474305) |
| X | 85 | F | A | A::99.79(478199) |
| X | 86 | F | H | H::99.82(484591) |
| X | 87 | F | Q | Q::99.75(489632) |
| X | 89 | F | L | L::99.86(494143) |
| X | 90 | F | P | P::99.84(507635) |
| X | 91 | F | K | K::99.68(513710) |
| X | 92 | F | V | V::99.90(522098) |
| X | 93 | F | L | L::99.86(522638) |
| X | 94 | F | H | H::99.86(522468) |
| X | 95 | F | K | K::99.86(541871) |
| X | 96 | F | R | R::99.83(547217) |
| X | 97 | F | T | T::99.89(558398) |
| X | 98 | F | L | L::99.86(559622) |
| X | 99 | F | G | G::99.86(577738) |
| X | 100 | F | L | L::99.90(583857) |
| X | 101 | F | S | S::99.76(584101) |
| X | 102 | F | V | V::99.78(612491) |

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|---|---|---|---|---|
| X | 103 | F | M | M::99.77(620203) |
| X | 104 | F | S | S::99.87(626179) |
| X | 105 | F | T | T::99.76(632390) |
| X | 106 | F | T | T::99.69(639097) |
| X | 107 | F | D | D::99.73(646544) |
| X | 108 | F | L | L::99.80(650356) |
| X | 109 | F | E | E::99.82(658325) |
| X | 110 | F | A | A::99.73(663971) |
| X | 111 | F | Y | Y::99.86(672040) |
| X | 113 | F | K | K::99.86(685279) |
| X | 114 | F | D | D::99.81(691770) |
| X | 115 | F | C | C::99.73(693406) |
| X | 116 | F | L | L::99.86(700460) |
| X | 118 | F | K | K::99.75(710483) |
| X | 119 | F | D | D::99.57(716078) |
| X | 120 | F | W | W::99.74(719204) |
| X | 121 | F | E | E::99.84(726551) |
| X | 122 | F | E | E::99.81(731332) |
| X | 123 | F | L | L::99.72(731425) |
| X | 124 | F | G | G::99.87(736751) |
| X | 125 | F | E | E::99.88(720198) |
| X | 126 | F | E | E::99.89(389294) |
| X | 127 | F | I | I::94.59(320670) M::5.01(16987) |
| X | 128 | F | R | R::99.87(338612) |
| X | 129 | F | L | L::99.84(346596) |
| X | 130 | F | K | K::54.14(183247) M::45.66(154548) |
| X | 131 | F | V | V::54.29(183314) I::45.52(153684) |
| X | 133 | F | V | V::99.93(374162) |
| X | 134 | F | L | L::99.95(374571) |
| X | 135 | F | G | G::99.93(373981) |
| X | 136 | F | G | G::99.90(377374) |
| X | 137 | F | C | C::99.80(376489) |
| X | 138 | F | R | R::99.85(381125) |
| X | 139 | F | H | H::99.79(383827) |
| X | 140 | F | K | K::99.91(383450) |
| X | 141 | F | L | L::99.90(379910) |
| X | 142 | F | V | V::99.88(380999) |
| X | 143 | F | C | C::99.87(374674) |
| X | 144 | F | A | A::99.80(378753) |
| X | 145 | F | P | P::99.90(384357) |
| X | 146 | F | A | A::99.71(382365) |
| X | 147 | F | P | P::99.84(382523) |
| X | 148 | F | C | C::99.69(379034) |
| X | 149 | F | N | N::99.85(384171) |
| X | 152 | F | T | T::99.25(373384) |
| X | 153 | F | S | S::99.88(380059) |
| C | 1 | F | M | M::99.81(528747) |
| C | 2 | F | D | D::99.68(533853) |
| C | 3 | F | I | I::99.86(542076) |
| C | 4 | F | D | D::99.86(527515) |
| C | 5 | F | P | P::99.84(551391) |

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|---|---|---|---|---|
| C | 6 | F | Y | Y::99.86(553640) |
| C | 7 | F | K | K::99.87(563276) |
| C | 8 | F | E | E::99.78(570996) |
| C | 10 | F | G | G::99.79(577966) |
| C | 11 | F | A | A::99.87(584919) |
| C | 12 | F | T | T::99.78(591302) |
| C | 13 | F | V | V::99.89(596174) |
| C | 14 | F | E | E::99.81(597942) |
| C | 15 | F | L | L::99.84(597569) |
| C | 16 | F | L | L::99.88(603323) |
| C | 17 | F | S | S::99.88(600138) |
| C | 19 | F | L | L::99.89(605253) |
| C | 20 | F | P | P::99.73(611871) |
| C | 21 | F | S | S::89.60(544047) T::10.30(62566) |
| C | 22 | F | D | D::99.79(611764) |
| C | 25 | F | P | P::99.75(605186) |
| C | 26 | F | S | S::99.72(595056) |
| C | 27 | F | V | V::99.83(596916) |
| C | 28 | F | R | R::98.62(560992) |
| C | 29 | F | D | D::99.81(571273) |
| C | 30 | F | L | L::99.90(568752) |
| C | 31 | F | L | L::99.94(548958) |
| C | 32 | F | D | D::99.89(563845) |
| C | 33 | F | T | T::99.82(558032) |
| C | 34 | F | A | A::99.84(552089) |
| C | 35 | F | S | S::99.81(543369) |
| C | 36 | F | A | A::99.89(544847) |
| C | 37 | F | L | L::99.88(518509) |
| C | 38 | F | Y | Y::99.67(534682) |
| C | 39 | F | R | R::99.78(535204) |
| C | 40 | F | E | E::99.81(528640) |
| C | 41 | F | A | A::99.87(518938) |
| C | 42 | F | L | L::99.58(504982) |
| C | 43 | F | E | E::99.83(510779) |
| C | 44 | F | S | S::99.87(509356) |
| C | 45 | F | P | P::99.72(510100) |
| C | 46 | F | E | E::99.66(505560) |
| C | 47 | F | H | H::99.82(510178) |
| C | 48 | F | C | C::99.72(505032) |
| C | 49 | F | S | S::99.87(500400) |
| C | 50 | F | P | P::99.69(509502) |
| C | 51 | F | H | H::99.59(483056) |
| C | 52 | F | H | H::99.90(508164) |
| C | 53 | F | T | T::99.77(509362) |
| C | 54 | F | A | A::99.66(503957) |
| C | 55 | F | L | L::99.84(504223) |
| C | 56 | F | R | R::99.82(503034) |
| C | 57 | F | Q | Q::99.89(498893) |
| C | 58 | F | A | A::99.83(497344) |
| C | 59 | F | I | I::99.81(501016) |
| C | 60 | F | L | L::99.87(494592) |

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|---|---|---|---|---|
| C | 61 | F | C | C::99.77(489513) |
| C | 62 | F | W | W::99.75(457944) |
| C | 63 | F | G | G::99.89(484876) |
| C | 64 | F | D | D::67.68(327090) E::27.63(133534) |
| C | 65 | F | L | L::99.90(476598) |
| C | 66 | F | M | M::99.80(506823) |
| C | 67 | F | T | T::99.85(512337) |
| C | 68 | F | L | L::99.90(505592) |
| C | 69 | F | A | A::99.77(468497) |
| C | 70 | F | T | T::99.89(469007) |
| C | 71 | F | W | W::99.73(507009) |
| C | 72 | F | V | V::99.91(515981) |
| C | 73 | F | G | G::99.86(515312) |
| C | 74 | F | G | G::97.42(486436) |
| C | 75 | F | N | N::99.89(530125) |
| C | 76 | F | L | L::99.89(531672) |
| C | 77 | F | E | E::99.84(529630) |
| C | 78 | F | D | D::99.87(530890) |
| C | 79 | F | P | P::99.75(523326) |
| C | 80 | F | I | I::62.26(301920) T::37.59(182294) |
| C | 81 | F | S | S::99.85(474073) |
| C | 82 | F | R | R::99.76(473690) |
| C | 83 | F | D | D::99.87(536087) |
| C | 84 | F | L | L::99.87(545931) |
| C | 85 | F | V | V::99.90(551095) |
| C | 86 | F | V | V::99.88(554538) |
| C | 87 | F | S | S::99.77(557058) |
| C | 88 | F | Y | Y::99.84(554452) |
| C | 89 | F | V | V::99.86(536124) |
| C | 90 | F | N | N::99.79(553391) |
| C | 91 | F | T | T::99.79(553050) |
| C | 92 | F | N | N::99.77(544931) |
| C | 93 | F | V | V::66.02(322862) M::33.79(165231) |
| C | 94 | F | G | G::99.82(488165) |
| C | 95 | F | L | L::99.87(488347) |
| C | 96 | F | K | K::99.86(548941) |
| C | 98 | F | R | R::99.77(541303) |
| C | 99 | F | Q | Q::99.73(561068) |
| C | 100 | F | L | L::99.91(565400) |
| C | 101 | F | L | L::99.82(567985) |
| C | 102 | F | W | W::99.76(571331) |
| C | 104 | F | H | H::99.81(578201) |
| C | 105 | F | I | I::99.84(578798) |
| C | 106 | F | S | S::99.90(576138) |
| C | 107 | F | C | C::99.84(570227) |
| C | 108 | F | L | L::99.83(572531) |
| C | 109 | F | T | T::99.85(575182) |
| C | 111 | F | G | G::99.80(564439) |
| C | 112 | F | R | R::99.71(563972) |
| C | 113 | F | E | E::99.68(566978) |
| C | 114 | F | T | T::99.81(565409) |

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|---|---|---|---|---|
| C | 115 | F | V | V::99.77(521105) |
| C | 116 | F | I | I::99.49(537155) |
| C | 117 | F | E | E::99.76(543448) |
| C | 118 | F | Y | Y::99.77(518923) |
| C | 119 | F | L | L::99.87(533309) |
| C | 120 | F | V | V::99.88(513923) |
| C | 121 | F | S | S::99.89(531948) |
| C | 123 | F | G | G::99.82(531973) |
| C | 124 | F | V | V::99.92(535916) |
| C | 125 | F | W | W::99.77(530916) |
| C | 126 | F | I | I::99.89(532004) |
| C | 127 | F | R | R::99.52(523718) |
| C | 128 | F | T | T::99.92(530034) |
| C | 129 | F | P | P::99.92(531614) |
| C | 130 | F | P | P::68.93(360827) Q::29.99(156989) |
| C | 131 | F | A | A::99.76(532646) |
| C | 132 | F | Y | Y::99.84(529286) |
| C | 133 | F | R | R::99.77(529059) |
| C | 134 | F | P | P::99.84(527656) |
| C | 135 | F | P | P::99.82(529147) |
| C | 136 | F | N | N::99.92(535086) |
| C | 137 | F | A | A::99.84(530954) |
| C | 138 | F | P | P::99.77(533738) |
| C | 139 | F | I | I::99.93(531321) |
| C | 140 | F | L | L::99.91(527416) |
| C | 141 | F | S | S::99.90(534693) |
| C | 142 | F | T | T::99.90(539360) |
| C | 143 | F | L | L::99.76(540822) |
| C | 144 | F | P | P::99.87(541141) |
| C | 145 | F | E | E::99.84(538903) |
| C | 146 | F | T | T::99.79(545179) |
| C | 147 | F | T | T::99.80(549491) |
| C | 148 | F | V | V::99.86(553183) |
| C | 149 | F | V | V::99.92(552204) |
| C | 150 | F | R | R::99.87(546287) |
| C | 151 | F | R | R::99.80(546348) |
| C | 152 | F | R | R::99.81(548447) |
| C | 153 | F | G | G::96.05(535707) |
| C | 154 | F | R | R::99.78(560529) |
| C | 155 | F | S | S::99.47(559645) |
| C | 156 | F | P | P::99.79(569125) |
| C | 157 | F | R | R::99.83(571395) |
| C | 158 | F | R | R::99.87(576090) |
| C | 159 | F | R | R::99.82(587000) |
| C | 160 | F | T | T::99.88(598192) |
| C | 161 | F | P | P::99.74(605888) |
| C | 162 | F | S | S::99.84(603686) |
| C | 163 | F | P | P::99.90(619289) |
| C | 164 | F | R | R::99.65(626188) |
| C | 165 | F | R | R::99.83(639511) |
| C | 166 | F | R | R::99.79(641721) |

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|---|---|---|---|---|
| C | 167 | F | R | R::99.79(633691) |
| C | 168 | F | S | S::99.87(656335) |
| C | 169 | F | Q | Q::99.76(666061) |
| C | 170 | F | S | S::99.83(673336) |
| C | 171 | F | P | P::99.81(679538) |
| C | 172 | F | R | R::99.81(684800) |
| C | 173 | F | R | R::99.59(688748) |
| C | 174 | F | R | R::99.74(693996) |
| C | 175 | F | R | R::99.86(708176) |
| C | 176 | F | S | S::99.81(710717) |
| C | 177 | F | Q | Q::91.95(659642) K::7.90(56686) |
| C | 178 | F | S | S::99.89(721540) |
| C | 179 | F | R | R::99.76(727255) |
| C | 180 | F | E | E::99.73(732725) |
| C | 181 | F | S | S::99.57(735269) |
| C | 182 | F | Q | Q::98.68(738519) |
| P1 | 1 | F | M | M::99.88(532591) |
| P1 | 2 | F | P | P::99.84(531570) |
| P1 | 3 | F | L | L::99.86(531647) |
| P1 | 4 | F | S | S::99.93(531558) |
| P1 | 5 | F | Y | Y::99.89(531497) |
| P1 | 6 | F | Q | Q::99.83(536390) |
| P1 | 7 | F | H | H::99.76(541030) |
| P1 | 9 | F | R | R::99.82(540749) |
| P1 | 10 | F | R | R::99.67(539188) |
| P1 | 11 | F | L | L::99.90(544100) |
| P1 | 12 | F | L | L::99.92(549143) |
| P1 | 13 | F | L | L::99.91(551045) |
| P1 | 14 | F | L | L::99.92(541495) |
| P1 | 15 | F | D | D::99.86(548994) |
| P1 | 16 | F | D | D::99.79(551515) |
| P1 | 17 | F | E | E::96.03(533289) |
| P1 | 18 | F | A | A::99.75(554844) |
| P1 | 19 | F | G | G::99.86(562621) |
| P1 | 20 | F | P | P::99.87(565233) |
| P1 | 21 | F | L | L::99.91(560748) |
| P1 | 22 | F | E | E::99.92(568044) |
| P1 | 23 | F | E | E::99.90(577115) |
| P1 | 24 | F | E | E::99.83(588186) |
| P1 | 25 | F | L | L::99.88(598553) |
| P1 | 26 | F | P | P::99.86(607982) |
| P1 | 27 | F | R | R::99.80(611111) |
| P1 | 28 | F | L | L::99.90(620714) |
| P1 | 29 | F | A | A::99.72(626277) |
| P1 | 30 | F | D | D::99.86(644415) |
| P1 | 31 | F | E | E::99.76(647702) |
| P1 | 32 | F | G | G::99.79(633708) |
| P1 | 33 | F | L | L::99.87(658589) |
| P1 | 34 | F | N | N::99.87(671825) |
| P1 | 35 | F | R | R::99.64(677204) |
| P1 | 36 | F | R | R::99.82(682129) |

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|---|---|---|---|---|
| P1 | 37 | F | V | V::99.85(689920) |
| P1 | 38 | F | A | A::99.65(679054) |
| P1 | 39 | F | E | E::99.84(695844) |
| P1 | 40 | F | D | D::99.75(708418) |
| P1 | 41 | F | L | L::99.86(710459) |
| P1 | 42 | F | N | N::99.87(724046) |
| P1 | 43 | F | L | L::99.89(722850) |
| P1 | 44 | F | G | G::99.80(729163) |
| P1 | 45 | F | N | N::99.85(739990) |
| P1 | 46 | F | L | L::99.72(736453) |
| P1 | 47 | F | N | N::99.80(752648) |
| P1 | 48 | F | V | V::99.84(754877) |
| P1 | 49 | F | S | S::99.76(754660) |
| P1 | 50 | F | I | I::99.93(758040) |
| P1 | 51 | F | P | P::99.92(760995) |
| P1 | 52 | F | W | W::99.84(756427) |
| P1 | 53 | F | T | T::99.92(765862) |
| P1 | 54 | F | H | H::99.87(767660) |
| P1 | 55 | F | K | K::99.85(769978) |
| P1 | 56 | F | V | V::99.91(771092) |
| P1 | 57 | F | G | G::99.79(744704) |
| P1 | 58 | F | N | N::99.92(769952) |
| P1 | 60 | F | T | T::99.82(772548) |
| P1 | 61 | F | G | G::99.90(769569) |
| P1 | 62 | F | L | L::99.89(769410) |
| P1 | 63 | F | Y | Y::99.89(769792) |
| P1 | 64 | F | S | S::99.91(771041) |
| P1 | 65 | F | S | S::99.91(764676) |
| P1 | 66 | F | T | T::99.84(770050) |
| P1 | 67 | F | V | V::99.84(763789) |
| P1 | 68 | F | P | P::99.81(761212) |
| P1 | 69 | F | V | V::99.88(758382) |
| P1 | 71 | F | N | N::99.90(746682) |
| P1 | 72 | F | P | P::99.90(741768) |
| P1 | 73 | F | H | H::99.25(731576) |
| P1 | 74 | F | W | W::99.80(726972) |
| P1 | 75 | F | K | K::99.86(723057) |
| P1 | 76 | F | T | T::99.76(719114) |
| P1 | 77 | F | P | P::99.83(716956) |
| P1 | 78 | F | S | S::99.80(707116) |
| P1 | 80 | F | P | P::99.89(629110) |
| P1 | 81 | F | N | N::99.84(629497) |
| P1 | 82 | F | I | I::99.90(671864) |
| P1 | 83 | F | H | H::99.86(680765) |
| P1 | 84 | F | L | L::99.94(668283) |
| P1 | 85 | F | H | H::99.79(667255) |
| P1 | 86 | F | Q | Q::99.84(655363) |
| P1 | 87 | F | D | D::99.81(656020) |
| P1 | 88 | F | I | I::99.92(651322) |
| P1 | 89 | F | I | I::99.89(641765) |
| P1 | 90 | F | K | K::99.82(633943) |

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|---|---|---|---|---|
| P1 | 91 | F | K | K::99.69(630072) |
| P1 | 92 | F | C | C::99.88(625605) |
| P1 | 93 | F | E | E::99.82(615546) |
| P1 | 94 | F | Q | Q::99.86(612328) |
| P1 | 96 | F | V | V::99.88(592966) |
| P1 | 97 | F | G | G::99.78(564908) |
| P1 | 98 | F | P | P::99.88(581848) |
| P1 | 99 | F | L | L::99.89(582960) |
| P1 | 100 | F | T | T::99.86(571475) |
| P1 | 101 | F | V | V::99.87(549820) |
| P1 | 102 | F | N | N::99.88(571298) |
| P1 | 103 | F | E | E::99.78(558675) |
| P1 | 104 | F | K | K::99.90(551466) |
| P1 | 105 | F | R | R::99.87(534453) |
| P1 | 106 | F | R | R::99.84(558265) |
| P1 | 107 | F | L | L::99.93(555963) |
| P1 | 108 | F | Q | Q::98.03(540051) |
| P1 | 109 | F | L | L::99.89(525605) |
| P1 | 110 | F | I | I::99.89(541700) |
| P1 | 111 | F | M | M::99.78(543360) |
| P1 | 112 | F | P | P::99.78(540059) |
| P1 | 113 | F | A | A::99.85(536893) |
| P1 | 114 | F | R | R::99.85(533601) |
| P1 | 116 | F | Y | Y::99.88(530528) |
| P1 | 117 | F | P | P::99.84(530698) |
| P1 | 118 | F | N | N::99.29(505825) |
| P1 | 119 | F | V | V::99.85(524209) |
| P1 | 120 | F | T | T::99.88(527763) |
| P1 | 121 | F | K | K::99.92(523634) |
| P1 | 122 | F | Y | Y::99.92(521229) |
| P1 | 123 | F | L | L::99.85(513951) |
| P1 | 124 | F | P | P::99.80(510877) |
| P1 | 125 | F | L | L::99.87(482708) |
| P1 | 126 | F | D | D::99.72(496238) |
| P1 | 127 | F | K | K::99.83(501834) |
| P1 | 128 | F | G | G::99.86(499501) |
| P1 | 129 | F | I | I::99.94(496965) |
| P1 | 130 | F | K | K::99.92(491825) |
| P1 | 131 | F | P | P::99.91(490712) |
| P1 | 132 | F | Y | Y::76.01(365151) H::23.90(114802) |
| P1 | 133 | F | Y | Y::99.93(481585) |
| P1 | 134 | F | P | P::99.90(475914) |
| P1 | 135 | F | E | E::99.82(473988) |
| P1 | 136 | F | H | H::99.92(472679) |
| P1 | 137 | F | L | L::99.79(460640) |
| P1 | 138 | F | V | V::99.91(463029) |
| P1 | 139 | F | N | N::99.55(457866) |
| P1 | 140 | F | H | H::99.86(455051) |
| P1 | 141 | F | Y | Y::99.90(448016) |
| P1 | 143 | F | Q | Q::99.86(439140) |
| P1 | 144 | F | T | T::98.52(430261) |

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|---|---|---|---|---|
| P1 | 145 | F | R | R::99.85(431482) |
| P1 | 146 | F | H | H::99.89(428972) |
| P1 | 147 | F | Y | Y::99.92(425747) |
| P1 | 148 | F | L | L::99.91(419793) |
| P1 | 149 | F | H | H::99.81(418168) |
| P1 | 150 | F | T | T::99.90(414596) |
| P1 | 151 | F | L | L::99.93(407420) |
| P1 | 152 | F | W | W::99.81(402915) |
| P1 | 153 | F | K | K::99.82(399500) |
| P1 | 154 | F | A | A::99.77(392662) |
| P1 | 155 | F | G | G::99.83(388217) |
| P1 | 156 | F | I | I::65.51(246080) V::34.43(129324) |
| P1 | 157 | F | L | L::99.93(363490) |
| P1 | 158 | F | Y | Y::99.90(379616) |
| P1 | 159 | F | K | K::99.83(371918) |
| P1 | 160 | F | R | R::99.85(367166) |
| P1 | 161 | F | E | E::99.85(366047) |
| P1 | 162 | F | T | T::99.86(361886) |
| P1 | 163 | F | T | T::99.90(359674) |
| P1 | 164 | F | H | H::97.82(347026) |
| P1 | 165 | F | S | S::99.85(333602) |
| P1 | 166 | F | A | A::99.89(341351) |
| P1 | 167 | F | S | S::99.85(338370) |
| P1 | 169 | F | C | C::99.83(331260) |
| P1 | 170 | F | G | G::99.82(327421) |
| P1 | 171 | F | S | S::99.83(321887) |
| P1 | 172 | F | P | P::99.79(321879) |
| P1 | 173 | F | Y | Y::99.91(319786) |
| P1 | 174 | F | S | S::99.88(314509) |
| P1 | 175 | F | W | W::99.81(307565) |
| P1 | 176 | F | E | E::99.78(306811) |
| P1 | 177 | F | Q | Q::99.89(298723) |
| P1 | 178 | F | E | E::99.86(296843) |
| P1 | 179 | F | L | L::99.75(290900) |
| P1 | 180 | F | Q | Q::99.63(286486) |
| P1 | 181 | F | H | H::99.85(284413) |
| P1 | 182 | F | G | G::99.78(278166) |
| P1 | 183 | F | A | A::99.79(268828) |
| P1 | 184 | F | E | E::99.81(268896) |
| P1 | 185 | F | S | S::99.89(265514) |
| P1 | 187 | F | H | H::99.81(258954) |
| P1 | 188 | F | Q | Q::99.80(254955) |
| P1 | 189 | F | Q | Q::99.85(250643) |
| P1 | 190 | F | S | S::99.88(248466) |
| P1 | 191 | F | S | S::99.83(244560) |
| P1 | 192 | F | G | G::99.84(241915) |
| P1 | 193 | F | I | I::99.88(239185) |
| P1 | 194 | F | L | L::99.83(233946) |
| P1 | 195 | F | S | S::99.89(229868) |
| P1 | 196 | F | R | R::99.79(226311) |
| P1 | 197 | F | P | P::99.16(223566) |

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|---|---|---|---|---|
| P1 | 198 | F | P | P::99.78(223586) |
| P1 | 199 | F | V | V::99.87(222771) |
| P1 | 200 | F | G | G::99.86(219513) |
| P1 | 201 | F | S | S::99.81(216535) |
| P1 | 202 | F | S | S::99.87(214011) |
| P1 | 203 | F | L | L::99.88(211766) |
| P1 | 204 | F | Q | Q::99.87(207251) |
| P1 | 205 | F | S | S::99.80(205797) |
| P1 | 206 | F | K | K::99.84(201570) |
| P1 | 207 | F | H | H::99.47(197666) |
| P1 | 208 | F | R | R::99.33(193576) |
| P1 | 209 | F | K | K::99.78(191417) |
| P1 | 210 | F | S | S::99.85(189019) |
| P1 | 211 | F | R | R::99.79(187714) |
| P1 | 212 | F | L | L::99.82(186839) |
| P1 | 213 | F | G | G::99.84(185108) |
| P1 | 214 | F | L | L::99.68(182240) |
| P1 | 215 | F | Q | Q::99.86(180713) |
| P1 | 216 | F | S | S::99.89(179090) |
| P1 | 217 | F | Q | Q::99.86(176094) |
| P1 | 218 | F | Q | Q::99.88(173565) |
| P1 | 219 | F | G | G::99.69(171955) |
| P1 | 220 | F | H | H::85.99(145945) P::13.05(22149) |
| P1 | 221 | F | L | L::99.89(168737) |
| P1 | 222 | F | A | A::99.67(165763) |
| P1 | 223 | F | G | G::99.42(155828) |
| P1 | 224 | F | R | R::99.57(162987) |
| P1 | 225 | F | Q | Q::99.83(163306) |
| P1 | 226 | F | Q | Q::99.75(161723) |
| P1 | 227 | F | G | G::99.88(161619) |
| P1 | 228 | F | R | R::99.83(160561) |
| P1 | 229 | F | S | S::99.46(158637) |
| P1 | 230 | F | W | W::99.75(156950) |
| P1 | 231 | F | S | S::99.81(156169) |
| P1 | 232 | F | I | I::99.86(156186) |
| P1 | 233 | F | R | R::99.79(154162) |
| P1 | 234 | F | A | A::99.62(148919) |
| P1 | 235 | F | G | G::99.69(150821) |
| P1 | 236 | F | I | I::99.73(151626) |
| P1 | 237 | F | H | H::99.77(150236) |
| P1 | 238 | F | P | P::90.40(135425) T::9.49(14216) |
| P1 | 239 | F | T | T::99.70(148345) |
| P1 | 240 | F | A | A::99.52(142297) |
| P1 | 241 | F | R | R::99.75(148437) |
| P1 | 242 | F | R | R::99.86(148837) |
| P1 | 243 | F | P | P::99.76(148399) |
| P1 | 245 | F | G | G::99.75(148113) |
| P1 | 246 | F | V | V::99.29(146747) |
| P1 | 247 | F | E | E::98.95(145588) |
| P1 | 248 | F | P | P::99.83(146918) |
| P1 | 249 | F | S | S::99.75(145602) |

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|----|-----|---|---|---------------------------|
| P1 | 250 | F | G | G::99.78(147439) |
| P1 | 251 | F | S | S::99.87(145782) |
| P1 | 252 | F | G | G::99.54(146838) |
| P1 | 253 | F | H | H::99.85(144588) |
| P1 | 254 | F | T | T::99.67(131655) |
| P1 | 255 | F | T | T::99.55(131500) |
| P1 | 256 | F | N | N::53.34(73819) H::46.28(64053) |
| P1 | 257 | F | L | L::53.03(73664) R::46.05(63972) |
| P1 | 258 | F | A | A::99.56(148775) |
| P1 | 259 | F | S | S::99.53(150189) |
| P1 | 260 | F | K | K::99.76(149549) |
| P1 | 261 | F | S | S::99.80(149462) |
| P1 | 262 | F | A | A::99.63(150102) |
| P1 | 263 | F | S | S::99.87(150366) |
| P1 | 264 | F | C | C::99.64(147659) |
| P1 | 265 | F | L | L::51.76(73497) R::47.47(67407) |
| P1 | 266 | F | H | H::99.62(149913) |
| P1 | 267 | F | Q | Q::99.75(148475) |
| P1 | 268 | F | S | S::99.87(146346) |
| P1 | 269 | F | P | P::99.71(143487) |
| P1 | 270 | F | V | V::99.82(138423) |
| P1 | 271 | F | R | R::99.74(138326) |
| P1 | 272 | F | K | K::99.79(135102) |
| P1 | 273 | F | A | A::99.66(129839) |
| P1 | 274 | F | A | A::99.61(126898) |
| P1 | 275 | F | Y | Y::99.78(123639) |
| P1 | 276 | F | P | P::99.73(121207) |
| P1 | 277 | F | S | S::99.80(115779) |
| P1 | 278 | F | V | V::99.84(115052) |
| P1 | 279 | F | S | S::99.85(112841) |
| P1 | 280 | F | T | T::99.78(109565) |
| P1 | 282 | F | E | E::99.86(102829) |
| P1 | 283 | F | K | K::99.61(100776) |
| P1 | 284 | F | H | H::99.56(98543) |
| P1 | 285 | F | S | S::99.63(95001) |
| P1 | 286 | F | S | S::99.93(93499) |
| P1 | 287 | F | S | S::99.90(89232) |
| P1 | 288 | F | G | G::99.79(87247) |
| P1 | 289 | F | H | H::99.77(84486) |
| P1 | 290 | F | A | A::99.51(80163) |
| P1 | 291 | F | V | V::99.84(78280) |
| S1 | 1   | F | M | M::99.84(281653) |
| S1 | 2   | F | G | G::99.77(275669) |
| S1 | 3   | F | Q | Q::99.82(268545) |
| S1 | 4   | F | N | N::99.87(269284) |
| S1 | 5   | F | L | L::99.89(264112) |
| S1 | 6   | F | S | S::99.91(260393) |
| S1 | 7   | F | T | T::99.83(257665) |
| S1 | 8   | F | S | S::99.68(254008) |
| S1 | 9   | F | N | N::99.87(250814) |
| S1 | 10  | F | P | P::99.88(247549) |

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|---|---|---|---|---|
| S1 | 11 | F | L | L::99.92(242930) |
| S1 | 12 | F | G | G::99.89(240443) |
| S1 | 15 | F | P | P::99.82(229696) |
| S1 | 16 | F | D | D::99.10(225004) |
| S1 | 17 | F | H | H::99.86(225226) |
| S1 | 18 | F | Q | Q::99.77(223275) |
| S1 | 19 | F | L | L::99.87(220861) |
| S1 | 20 | F | D | D::99.85(219783) |
| S1 | 21 | F | P | P::99.86(214964) |
| S1 | 22 | F | A | A::99.81(213394) |
| S1 | 24 | F | R | R::99.84(206630) |
| S1 | 25 | F | A | A::99.77(202642) |
| S1 | 26 | F | N | N::99.87(201345) |
| S1 | 27 | F | T | T::99.54(196252) |
| S1 | 28 | F | A | A::96.94(186693) |
| S1 | 29 | F | N | N::99.78(191313) |
| S1 | 30 | F | P | P::99.85(187940) |
| S1 | 31 | F | D | D::99.77(188087) |
| S1 | 32 | F | W | W::99.71(185733) |
| S1 | 33 | F | D | D::99.82(185035) |
| S1 | 35 | F | N | N::99.90(180848) |
| S1 | 36 | F | P | P::99.89(178671) |
| S1 | 37 | F | N | N::99.88(176479) |
| S1 | 38 | F | K | K::99.78(174263) |
| S1 | 39 | F | D | D::99.77(171662) |
| S1 | 40 | F | T | T::85.99(145942) P::13.05(22156) |
| S1 | 41 | F | W | W::99.69(166666) |
| S1 | 42 | F | P | P::99.65(156454) |
| S1 | 43 | F | D | D::99.70(161648) |
| S1 | 44 | F | A | A::99.69(163370) |
| S1 | 45 | F | N | N::99.86(163592) |
| S1 | 46 | F | K | K::99.72(161878) |
| S1 | 47 | F | V | V::99.89(160177) |
| S1 | 48 | F | G | G::99.87(159873) |
| S1 | 49 | F | A | A::99.80(158720) |
| S1 | 50 | F | G | G::99.89(156762) |
| S1 | 51 | F | A | A::99.80(155759) |
| S1 | 53 | F | G | G::99.85(153594) |
| S1 | 54 | F | P | P::53.23(79258) L::46.62(69420) |
| S1 | 55 | F | G | G::99.81(151442) |
| S1 | 57 | F | T | T::99.77(149307) |
| S1 | 58 | F | P | P::99.88(149367) |
| S1 | 59 | F | P | P::99.80(142711) |
| S1 | 60 | F | H | H::99.83(147613) |
| S1 | 61 | F | G | G::99.73(147952) |
| S1 | 62 | F | G | G::99.84(149003) |
| S1 | 63 | F | L | L::99.41(147797) |
| S1 | 64 | F | L | L::99.88(147687) |
| S1 | 65 | F | G | G::99.88(147993) |
| S1 | 66 | F | W | W::98.41(144970) |
| S1 | 67 | F | S | S::99.76(146871) |

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|---|---|---|---|---|
| S1 | 68 | F | P | P::99.85(146915) |
| S1 | 69 | F | Q | Q::99.77(147138) |
| S1 | 70 | F | A | A::99.81(147419) |
| S1 | 71 | F | Q | Q::99.73(147051) |
| S1 | 72 | F | G | G::99.64(146381) |
| S1 | 73 | F | I | I::99.84(143441) |
| S1 | 74 | F | L | L::99.90(131970) |
| S1 | 75 | F | Q | Q::52.86(72455) H::46.72(64034) |
| S1 | 76 | F | T | T::99.79(138682) |
| S1 | 77 | F | L | L::53.48(74154) V::46.20(64059) |
| S1 | 78 | F | P | P::99.78(149096) |
| S1 | 79 | F | A | A::99.45(148662) |
| S1 | 80 | F | N | N::99.69(149993) |
| S1 | 81 | F | P | P::99.82(149424) |
| S1 | 82 | F | P | P::99.89(151025) |
| S1 | 83 | F | P | P::99.87(150388) |
| S1 | 84 | F | A | A::99.50(141291) |
| S1 | 85 | F | S | S::52.91(76724) A::46.52(67464) |
| S1 | 86 | F | T | T::99.70(149758) |
| S1 | 87 | F | N | N::99.64(148083) |
| S1 | 88 | F | R | R::99.70(145515) |
| S1 | 89 | F | Q | Q::99.82(143099) |
| S1 | 90 | F | S | S::99.84(138450) |
| S1 | 91 | F | G | G::99.85(136313) |
| S1 | 92 | F | R | R::99.91(133320) |
| S1 | 93 | F | Q | Q::99.68(128810) |
| S1 | 94 | F | P | P::99.72(125296) |
| S1 | 95 | F | T | T::99.87(122997) |
| S1 | 96 | F | P | P::99.87(115878) |
| S1 | 97 | F | L | L::99.88(115883) |
| S1 | 98 | F | S | S::99.90(114234) |
| S1 | 99 | F | P | P::99.87(110894) |
| S1 | 100 | F | P | P::99.90(108809) |
| S1 | 101 | F | L | L::99.86(105886) |
| S1 | 102 | F | R | R::99.83(102339) |
| S1 | 103 | F | N | N::99.52(100175) |
| S1 | 104 | F | T | T::99.84(97390) |
| S1 | 105 | F | H | H::99.88(94874) |
| S1 | 106 | F | P | P::99.93(92317) |
| S1 | 107 | F | Q | Q::99.80(88642) |
| S1 | 108 | F | A | A::99.83(86597) |
| S1 | 109 | F | M | M::99.64(83333) |
| S1 | 110 | F | Q | Q::99.57(79622) |

| Meta data | |
| --- | --- |
| Assembly file: | HBV-RYD-49.sam |
| Annotation file: | /home3/vatt01s/Work/Project-150-HBV/Data/P150-1/Annotation/HBV.anno |
| Reference file: | KX357637.fa. |
| User name | ales01a |
| Hostname | Alpha |
| Location | /home2/ales01a/HBV/P150-5/HBV-RYD-49 |
| Date/Time | Mon 25 Mar 12:23:07 GMT 2019 |