## Additional Information Table 1. Consensus sequences for HBV polymerase and core

The table shows the consensus sequences for genotypes A-D and the consensus sequence for all 4 genotypes for polymerase and core. Data are based on: https://www.hiv.lanl.gov/cgi- bin/ENTROPY/entropy_main.cgi.

| Polymerase |  |  |  |  |  |  |  | Core |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { 은 } \\ & \vdots \\ & \vdots \\ & 0 \end{aligned}$ |  | $\begin{aligned} & \text { n } \\ & \tilde{W} \\ & 0 \\ & \omega \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \mathbb{0} \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { n } \\ & \tilde{u} \\ & 0 \\ & \omega \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { n } \\ & \text { Nu } \\ & 0 \\ & \omega \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ | $\begin{aligned} & \text { n } \\ & \text { जै } \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & \tilde{0} \\ & 0 \\ & 0 \\ & \hline 0 \end{aligned}$ |  | $\stackrel{U}{\check{U}}$ $\stackrel{\rightharpoonup}{U}$ $\stackrel{\rightharpoonup}{U}$ $\stackrel{U}{0}$ 0 |  | $\begin{aligned} & \text { n } \\ & \stackrel{y}{む} \\ & \stackrel{N}{0} \\ & 0 \end{aligned}$ |  |  | $\begin{aligned} & \tilde{\sim} \\ & \tilde{0} \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \\ & 0 \end{aligned}$ |  |  |
| Analyzed | enomes | $\stackrel{\sim}{\infty}$ | $\begin{aligned} & \mathrm{O} \\ & \infty \\ & N \end{aligned}$ | $\stackrel{\infty}{\stackrel{\infty}{\sim}}$ | $\underset{\sim}{\stackrel{0}{n}}$ |  |  | Analyz | enomes | $\stackrel{\infty}{\stackrel{\infty}{-}}$ | $\begin{aligned} & \mathrm{O} \\ & \infty \\ & N \end{aligned}$ | $\underset{\sim}{\infty} \underset{\sim}{\infty}$ | $\stackrel{9}{n}$ |  |
| 1 | M | M | M | M | M |  |  | 1 | M | M | M | M | M |  |
| 2 | P | P | P | P | P | P |  | 2 | D | D | D | D | D | D |
| 3 | L | L | L | L | L | L |  | 3 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 | S | S | S | S | S | S |  | 4 | D | D | D | D | D | D |
| 5 | Y | Y | Y | Y | Y | Y |  | 5 | P | P | P | P | P | P |
| 6 | Q | Q | Q | Q | Q | Q |  | 6 | Y | Y | Y | Y | Y | $Y$ |
| 7 | H | H | H | H | H | H |  | 7 | K | K | K | K | K | K |
| 8 | F | F | F | F | F | F |  | 8 | E | E | E | E | E | E |
| 9 | R | R | R | R | R | R |  | 9 | F | F | F | F | F | F |
| 10 | NoCon | K | K | K | R | K |  | 10 | G | G | G | G | G | G |
| 11 | L | L | L | L | L | L |  | 11 | A | A | A | A | A | A |
| 12 | L | L | L | L | L | L |  | 12 | NoCon | T | S | S | T | T |
| 13 | L | L | L | L | L | L |  | 13 | V | V | V | V | V | V |
| 14 | L | L | L | L | L | L |  | 14 | E | E | E | E | E | E |
| 15 | D | D | D | D | D | D |  | 15 | L | L | L | L | L | L |
| 16 | NoCon | D | - | D | D | E |  | 16 | L | L | L | L | L | L |
| 17 | NoCon | G | - | - |  |  |  | 17 | S | S | S | S | S | S |
| 18 | NoCon | T |  | - |  |  |  |  |  |  | - |  |  |  |
| 19 | NoCon | - |  |  |  |  |  |  |  |  | - | - |  |  |
| 20 | E | E | E | E | E | E |  | 18 | F | F | F | F | F | F |
| 21 | A | A | A | A | A | A |  | 19 | L | L | L | L | L | L |
| 22 | G | G | G | G | G | G |  | 20 | P | P | P | P | P | P |
| 23 | P | P | P | P | P | P |  | 21 | S | S | S | S | S | S |
| 24 | L | L | L | L | L | L |  | 22 | D | D | D | D | D | D |
| 25 | E | E | E | E | E | E |  | 23 | F | F | F | F | F | F |
| 26 | E | E | E | E | E | E |  | 24 | F | F | F | F | F | F |
| 27 | E | E | E | E | E | E |  | 25 | P | P | P | P | P | P |
| 28 | L | L | L | L | L | L |  | 26 | S | S | S | S | S | S |
| 29 | P | P | P | P | P | P |  | 27 | NoCon | V | 1 | 1 | V | 1 |


| 30 | R | R | R | R | R | R | 28 | R | R | R | R | R | R |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 31 | L | L | L | L | L | L | 29 | D | D | D | D | D | D |
| 32 | A | A | A | A | A | A | 30 | L | L | L | L | L | L |
| 33 | D | D | D | D | D | D | 31 | L | L | L | L | L | L |
| 34 | NoCon | A | E | E | E | E | 32 | D | D | D | D | D | D |
| 35 | NoCon | D | G | G | G | G | 33 | T | T | T | T | T | T |
| 36 | L | L | L | L | L | L | 34 | A | A | A | A | A | A |
| 37 | N | N | N | N | N | N | 35 | S | S | S | S | S | S |
| 38 | R | R | R | R | R | R | 36 | A | A | A | A | A | A |
| 39 | R | R | R | R | R | R | 37 | L | L | L | L | L | L |
| 40 | V | V | V | V | V | V | 38 | Y | Y | Y | Y | Y | Y |
| 41 | A | A | A | A | A | A | 39 | R | R | R | R | R | R |
| 42 | E | E | E | E | E | E | 40 | E | E | E | E | E | E |
| 43 | D | D | D | D | D | D | 41 | A | A | A | A | A | A |
| 44 | L | L | L | L | L | L | 42 | L | L | L | L | L | L |
| 45 | N | N | N | N | N | N | 43 | E | E | E | E | E | E |
| 46 | L | L | L | L | L | L | 44 | S | S | S | S | S | S |
| 47 | G | G | G | G | G | G | 45 | P | P | P | P | P | P |
| 48 | N | N | N | N | N | N | 46 | E | E | E | E | E | E |
| 49 | L | L | L | L | L | L | 47 | H | H | H | H | H | H |
| 50 | N | N | N | N | N | N | 48 | C | C | C | C | C | C |
| 51 | V | V | V | V | V | V | 49 | S | S | S | S | S | S |
| 52 | S | S | S | S | S | S | 50 | P | P | P | P | P | P |
| 53 | 1 | 1 | 1 | 1 | 1 | 1 | 51 | H | H | H | H | H | H |
| 54 | P | P | P | P | P | P | 52 | H | H | H | H | H | H |
| 55 | W | W | W | W | W | W | 53 | T | T | T | T | T | T |
| 56 | T | T | T | T | T | T | 54 | A | A | A | A | A | A |
| 57 | H | H | H | H | H | H | 55 | L | L | L | L | L | L |
| 58 | K | K | K | K | K | K | 56 | R | R | R | R | R | R |
| 59 | V | V | V | V | V | V | 57 | Q | Q | Q | Q | Q | Q |
| 60 | G | G | G | G | G | G | 58 | A | A | A | A | A | A |
| 61 | N | N | N | N | N | N | 59 | 1 | 1 | 1 | 1 | 1 | I |
| 62 | F | F | F | F | F | F | 60 | L | L | L | L | L | L |
| 63 | T | T | T | T | T | T | 61 | C | C | C | C | C | C |
| 64 | G | G | G | G | G | G | 62 | W | W | W | W | W | W |
| 65 | L | L | L | L | L | L | 63 | G | G | G | G | G | G |
| 66 | Y | Y | Y | Y | Y | Y | 64 | E | E | E | E | E | E |
| 67 | S | S | S | S | S | S | 65 | L | L | L | L | L | L |
| 68 | S | S | S | S | S | S | 66 | M | M | M | M | M | M |
| 69 | T | T | T | T | T | T | 67 | NoCon | T | N | N | T | T |
| 70 | V | V | V | V | V | V | 68 | L | L | L | L | L | L |
| 71 | P | P | P | P | P | P | 69 | A | A | A | A | A | A |
| 72 | NoCon | I | C | V | V | V | 70 | T | T | T | T | T | T |
| 73 | F | F | F | F | F | F | 71 | W | W | W | W | W | W |
| 74 | N | N | N | N | N | N | 72 | V | V | V | V | V | V |
| 75 | P | P | P | P | P | P | 73 | G | G | G | G | G | G |
| 76 | NoCon | E | K | E | H | E | 74 | NoCon | N | S | S | G | S |
| 77 | W | W | W | W | W | W | 75 | N | N | N | N | N | N |


| 78 | NoCon | Q | Q | Q | K | Q | 76 | L | L | L | L | L | L |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 79 | T | T | T | T | T | T | 77 | E | E | E | E | E | E |
| 80 | P | P | P | P | P | P | 78 | D | D | D | D | D | D |
| 81 | S | S | S | S | S | S | 79 | P | P | P | P | P | P |
| 82 | F | F | F | F | F | F | 80 | A | A | A | A | A | A |
| 83 | P | P | P | P | P | P | 81 | S | S | S | S | S | S |
| 84 | NoCon | K | D | H | N | K | 82 | R | R | R | R | R | R |
| 85 | 1 | 1 | 1 | 1 | 1 | 1 | 83 | NoCon | D | E | E | D | E |
| 86 | H | H | H | H | H | H | 84 | L | L | L | L | L | L |
| 87 | L | L | L | L | L | L | 85 | V | V | V | V | V | V |
| 88 | NoCon | Q | Q | Q | H | Q | 86 | V | V | v | V | V | V |
| 89 | NoCon | E | E | E | Q | E | 87 | NoCon | N | S | S | S | S |
| 90 | D | D | D | D | D | D | 88 | Y | Y | Y | Y | Y | Y |
| 91 | I | 1 | 1 | 1 | 1 | 1 | 89 | V | V | V | V | V | V |
| 92 | NoCon | 1 | V | 1 | 1 | V | 90 | N | N | N | N | N | N |
| 93 | NoCon | N | D | N | K | D | 91 | NoCon | T | V | V | T | V |
| 94 | NoCon | R | R | R | K | R | 92 | N | N | N | N | N | N |
| 95 | C | C | C | C | C | C | 93 | M | M | M | M | M | M |
| 96 | NoCon | Q | K | Q | E | K | 94 | G | G | G | G | G | G |
| 97 | Q | Q | Q | Q | Q | Q | 95 | L | L | L | L | L | L |
| 98 | NoCon | F | F | Y | F | F | 96 | K | K | K | K | K | K |
| 99 | V | V | V | V | V | V | 97 | NoCon | 1 | 1 | 1 | F | 1 |
| 100 | G | G | G | G | G | G | 98 | R | R | R | R | R | R |
| 101 | P | P | P | P | P | P | 99 | Q | Q | Q | Q | Q | Q |
| 102 | L | L | L | L | L | L | 100 | L | L | L | L | L | L |
| 103 | T | T | T | T | T | T | 101 | L | L | L | L | L | L |
| 104 | V | V | V | V | V | V | 102 | W | W | W | W | W | W |
| 105 | N | N | N | N | N | N | 103 | F | F | F | F | F | F |
| 106 | E | E | E | E | E | E | 104 | H | H | H | H | H | H |
| 107 | NoCon | K | N | K | K | K | 105 | 1 | 1 | 1 | 1 | 1 | 1 |
| 108 | R | R | R | R | R | R | 106 | S | S | S | S | S | S |
| 109 | R | R | R | R | R | R | 107 | C | C | C | C | C | C |
| 110 | L | L | L | L | L | L | 108 | L | L | L | L | L | L |
| 111 | NoCon | K | K | K | Q | K | 109 | T | T | T | T | T | T |
| 112 | L | L | L | L | L | L | 110 | F | F | F | F | F | F |
| 113 | 1 | 1 | 1 | 1 | 1 | 1 | 111 | G | G | G | G | G | G |
| 114 | M | M | M | M | M | M | 112 | R | R | R | R | R | R |
| 115 | P | P | P | P | P | P | 113 | E | E | E | E | E | E |
| 116 | A | A | A | A | A | A | 114 | T | T | T | T | T | T |
| 117 | R | R | R | R | R | R | 115 | V | V | V | V | V | V |
| 118 | F | F | F | F | F | F | 116 | NoCon | L | L | L | 1 | 1 |
| 119 | Y | Y | Y | Y | Y | Y | 117 | E | E | E | E | E | E |
| 120 | P | P | P | P | P | P | 118 | Y | Y | Y | Y | Y | Y |
| 121 | NoCon | T | N | N | N | N | 119 | L | L | L | L | L | L |
| 122 | NoCon | H | V | L | V | V | 120 | V | V | V | V | V | V |
| 123 | T | T | T | T | T | T | 121 | S | S | S | S | S | S |
| 124 | K | K | K | K | K | K | 122 | F | F | F | F | F | F |
| 125 | Y | Y | Y | Y | Y | Y | 123 | G | G | G | G | G | G |


| 126 | L | L | L | L | L | L | 124 | V | V | v | V | v | v |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 127 | P | P | P | P | P | P | 125 | W | W | W | W | W | W |
| 128 | L | L | L | L | L | L | 126 | 1 | I | 1 | 1 | 1 | I |
| 129 | D | D | D | D | D | D | 127 | R | R | R | R | R | R |
| 130 | K | K | K | K | K | K | 128 | T | T | T | T | T | T |
| 131 | G | G | G | G | G | G | 129 | P | P | P | P | P | P |
| 132 | 1 | 1 | 1 | 1 | 1 | 1 | 130 | P | P | P | P | P | P |
| 133 | K | K | K | K | K | K | 131 | A | A | A | A | A | A |
| 134 | P | P | P | P | P | P | 132 | Y | Y | Y | Y | Y | Y |
| 135 | Y | Y | Y | Y | Y | Y | 133 | R | R | R | R | R | R |
| 136 | Y | Y | Y | Y | Y | Y | 134 | P | P | P | P | P | P |
| 137 | P | P | P | P | P | P | 135 | P | P | P | P | P | P |
| 138 | NoCon | D | E | E | E | E | 136 | N | N | N | N | N | N |
| 139 | NoCon | Q | H | H | H | H | 137 | A | A | A | A | A | A |
| 140 | NoCon | V | V | A | L | A | 138 | P | P | P | P | P | P |
| 141 | V | V | V | V | V | V | 139 | 1 | I | I | 1 | 1 | I |
| 142 | N | N | N | N | N | N | 140 | L | L | L | L | L | L |
| 143 | H | H | H | H | H | H | 141 | S | S | S | S | S | S |
| 144 | Y | Y | Y | Y | Y | Y | 142 | T | T | T | T | T | T |
| 145 | F | F | F | F | F | F | 143 | L | L | L | L | L | L |
| 146 | NoCon | Q | Q | K | Q | Q | 144 | P | P | P | P | P | P |
| 147 | T | T | T | T | T | T | 145 | E | E | E | E | E | E |
| 148 | R | R | R | R | R | R | 146 | T | T | T | T | T | T |
| 149 | H | H | H | H | H | H | 147 | T | T | T | T | T | T |
| 150 | Y | Y | Y | Y | Y | Y | 148 | V | V | V | V | V | V |
| 151 | L | L | L | L | L | L | 149 | V | V | V | V | V | V |
| 152 | H | H | H | H | H | H |  |  |  | - | - |  |  |
| 153 | T | T | T | T | T | T |  |  |  | - | - |  |  |
| 154 | L | L | L | L | L | L | 150 | R | R | R | R | R | R |
| 155 | W | W | W | W | W | W | 151 | R | R | R | R | R | R |
| 156 | K | K | K | K | K | K |  |  |  |  | - |  |  |
| 157 | A | A | A | A | A | A |  |  |  |  | - |  |  |
| 158 | G | G | G | G | G | G | 152 | R | R | R | R | R | R |
| 159 | 1 | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  | - |  |
| 160 | L | L | L | L | L | L |  |  |  |  |  | - |  |
| 161 | Y | Y | Y | Y | Y | Y | 153 | NoCon | D | G | G | G | D |
| 162 | K | K | K | K | K | K | 154 | R | R | R | R | R | R |
| 163 | R | R | R | R | R | R |  |  | - |  |  |  |  |
| 164 | E | E | E | E | E | E | 155 | NoCon | G | S | S | S | G |
| 165 | NoCon | T | S | T | T | T | 156 | NoCon | R | P | P | P | R |
| 166 | T | T | T | T | T | T |  |  |  |  |  | - |  |
| 167 | NoCon | R | R | R | H | R |  | NoCon | S |  |  |  | S |
| 168 | S | S | S | S | S | S |  | NoCon | P |  |  |  | P |
| 169 | A | A | A | A | A | A | 157 | R | R | R | R | R | R |
| 170 | S | S | S | S | S | S | 158 | R | R | R | R | R | R |
| 171 | F | F | F | F | F | F | 159 | R | R | R | R | R | R |
| 172 | C | C | C | C | C | C | 160 | T | T | T | T | T | T |
| 173 | G | G | G | G | G | G | 161 | P | P | P | P | P | P |


| 174 | S | S | S | S | S | S | 162 | S | S | S | S | S | S |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 175 | P | P | P | P | P | P | 163 | P | P | P | P | P | P |
| 176 | Y | Y | Y | Y | Y | Y | 164 | R | R | R | R | R | R |
| 177 | S | S | S | S | S | S | 165 | R | R | R | R | R | R |
| 178 | W | W | W | W | W | W | 166 | R | R | R | R | R | R |
| 179 | E | E | E | E | E | E | 167 | R | R | R | R | R | R |
| 180 | Q | Q | Q | Q | Q | Q | 168 | S | S | S | S | S | S |
| 181 | NoCon | E | D | E | E | E | 169 | Q | Q | Q | Q | Q | Q |
| 182 | L | L | L | L | L | L | 170 | S | S | S | S | S | S |
| 183 | Q | Q | Q | Q | Q | Q | 171 | P | P | P | P | P | P |
| 184 | H | H | H | H | H | H | 172 | R | R | R | R | R | R |
| 185 | G | G | G | G | G | G | 173 | R | R | R | R | R | R |
| 186 | NoCon | R | R | R | A |  | 174 | R | R | R | R | R | R |
| 187 | NoCon | L | L | L | - |  | 175 | R | R | R | R | R | R |
| 188 | NoCon | V | V | V | - |  | 176 | S | S | S | S | S | S |
| 189 | NoCon | I | F | F | - |  | 177 | Q | Q | Q | Q | Q | Q |
| 190 | NoCon | K | Q | Q | - |  | 178 | S | S | S | S | S | S |
| 191 | NoCon | T | T | T | E |  | 179 | R | R | R | R | R | R |
| 192 | S | S | S | S | S |  | 180 | E | E | E | E | E | E |
| 193 | NoCon | Q | K | T | F |  |  |  |  | - |  |  |  |
| 194 | NoCon | R | R | R |  |  | 181 | S | S | S | S | S | S |
| 195 | H | H | H | H | H |  |  |  |  |  |  | - |  |
| 196 | NoCon | G | G | G | Q |  | 182 | Q | Q | Q | Q | Q | Q |
| 197 | NoCon | D | D | D |  |  | 183 | C | C | C | C | C | C |
| 198 | NoCon | E | K | E |  |  | 184 | - | - | - | - | - |  |
| 199 | NoCon | S | S | S |  |  |  |  |  |  |  |  |  |
| 200 | NoCon | F | F | F |  |  |  |  |  |  |  |  |  |
| 201 | NoCon | C | C | C |  |  |  |  |  |  |  |  |  |
| 202 | NoCon | S | P | S |  |  |  |  |  |  |  |  |  |
| 203 | Q | Q | Q | Q | Q |  |  |  |  |  |  |  |  |
| 204 | NoCon | P | S | S | S |  |  |  |  |  |  |  |  |
| 205 | NoCon | S | P | S | S |  |  |  |  |  |  |  |  |
| 206 | G | G | G | G | G |  |  |  |  |  |  |  |  |
| 207 | 1 | 1 | 1 | 1 | 1 |  |  |  |  |  |  |  |  |
| 208 | L | L | L | L | L |  |  |  |  |  |  |  |  |
| 209 | NoCon | S | P | S | S |  |  |  |  |  |  |  |  |
| 210 | R | R | R | R | R |  |  |  |  |  |  |  |  |
| 211 | NoCon | S | S | S | P |  |  |  |  |  |  |  |  |
| 212 | NoCon | S | S | P | P |  |  |  |  |  |  |  |  |
| 213 | V | V | V | V | V |  |  |  |  |  |  |  |  |
| 214 | G | G | G | G | G |  |  |  |  |  |  |  |  |
| 215 | NoCon | P | P | P | S |  |  |  |  |  |  |  |  |
| 216 | NoCon | C | C | C | S |  |  |  |  |  |  |  |  |
| 217 | NoCon | 1 | 1 | V | L |  |  |  |  |  |  |  |  |
| 218 | NoCon | R | Q | R | Q |  |  |  |  |  |  |  |  |
| 219 | S | S | S | S | S |  |  |  |  |  |  |  |  |
| 220 | NoCon | Q | Q | Q | K |  |  |  |  |  |  |  |  |
| 221 | NoCon | L | L | L | H |  |  |  |  |  |  |  |  |


| 222 | NoCon | K | R | K | R |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 223 | NoCon | Q | K | Q | K |  |  |
| 224 | S | S | S | S | S |  |  |
| 225 | R | R | R | R | R |  |  |
| 226 | L | L | L | L | L |  |  |
| 227 | G | G | G | G | G |  |  |
| 228 | NoCon | L | P | L | L |  |  |
| 229 | Q | Q | Q | Q | Q |  |  |
| 230 | NoCon | P | P | P | S |  |  |
| 231 | NoCon | H | A | Q | Q |  |  |
| 232 | Q | Q | Q | Q | Q |  |  |
| 233 | G | G | G | G | G |  |  |
| 234 | NoCon | P | Q | S | H |  |  |
| 235 | L | L | L | L | L |  |  |
| 236 | A | A | A | A | A |  |  |
| 237 | NoCon | S | G | R | R |  |  |
| 238 | NoCon | S | R | G | R |  |  |
| 239 | NoCon | Q | Q | K | Q |  |  |
| 240 | NoCon | P | Q | S | Q |  |  |
| 241 | G | G | G | G | G |  |  |
| 242 | NoCon | R | G | R | R |  |  |
| 243 | S | S | S | S | S |  |  |
| 244 | NoCon | G | G | G | W |  |  |
| 245 | S | S | S | S | S |  |  |
| 246 | 1 | 1 | 1 | 1 | 1 |  |  |
| 247 | R | R | R | R | R |  |  |
| 248 | A | A | A | A | A |  |  |
| 249 | NoCon | R | R | R | G |  |  |
| 250 | NoCon | A | V | V | 1 |  |  |
| 251 | H | H | H | H | H |  |  |
| 252 | P | P | P | P | P |  |  |
| 253 | NoCon | S | S | T | T |  |  |
| 254 | NoCon | T | P | T | A |  |  |
| 255 | NoCon | R | W | R | R |  |  |
| 256 | NoCon | R | G | R | R |  |  |
| 257 | NoCon | Y | T | S | P |  |  |
| 258 | NoCon | F | v | F | F |  |  |
| 259 | G | G | G | G | G |  |  |
| 260 | V | V | V | V | V |  |  |
| 261 | E | E | E | E | E |  |  |
| 262 | P | P | P | P | P |  |  |
| 263 | S | S | S | S | S |  |  |
| 264 | G | G | G | G | G |  |  |
| 265 | S | S | S | S | S |  |  |
| 266 | G | G | G | G | G |  |  |
| 267 | NoCon | H | P | H | H |  |  |
| 268 | NoCon | 1 | T | 1 | T |  |  |
| 269 | NoCon | D | H | D | T |  |  |



| 318 | Q | Q | Q | Q | Q |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 319 | S | S | S | S | S |  |  |
| 320 | NoCon | Q | Q | E | E |  |  |
| 321 | NoCon | G | G | G | R |  |  |
| 322 | NoCon | S | P | P | P |  |  |
| 323 | NoCon | V | V | I | V |  |  |
| 324 | NoCon | F | L | L | F |  |  |
| 325 | NoCon | S | S | S | P | S |  |
| 326 | C | C | C | C | C | C |  |
| 327 | W | W | W | W | W | W |  |
| 328 | W | W | W | W | W | w |  |
| 329 | L | L | L | L | L | L |  |
| 330 | Q | Q | Q | Q | Q | Q |  |
| 331 | F | F | F | F | F | F |  |
| 332 | R | R | R | R | R | R |  |
| 333 | N | N | N | N | N | N |  |
| 334 | S | S | S | S | S | S |  |
| 335 | NoCon | K | E | K | K | K |  |
| 336 | P | P | P | P | P | P |  |
| 337 | C | C | C | C | C | C |  |
| 338 | S | S | S | S | S | S |  |
| 339 | NoCon | E | E | D | D | E |  |
| 340 | Y | Y | Y | Y | Y | Y |  |
| 341 | C | C | C | C | C | C |  |
| 342 | L | L | L | L | L | L |  |
| 343 | NoCon | S | C | T | S | T |  |
| 344 | H | H | H | H | H | H |  |
| 345 | NoCon | L | 1 | 1 | 1 | L |  |
| 346 | V | V | V | V | V | V |  |
| 347 | N | N | N | N | N | N |  |
| 348 | L | L | L | L | L | L |  |
| 349 | NoCon | R | 1 | L | L | L |  |
| 350 | E | E | E | E | E | E |  |
| 351 | D | D | D | D | D | D |  |
| 352 | W | W | W | W | W | W |  |
| 353 | G | G | G | G | G | G |  |
| 354 | P | P | P | P | P | P |  |
| 355 | C | C | C | C | C | C |  |
| 356 | NoCon | D | T | T | A | D |  |
| 357 | E | E | E | E | E | E |  |
| 358 | H | H | H | H | H | H |  |
| 359 | G | G | G | G | G | G |  |
| 360 | E | E | E | E | E | E |  |
| 361 | H | H | H | H | H | H |  |
| 362 | NoCon | H | R | N | H | H |  |
| 363 | 1 | 1 | 1 | 1 | 1 | 1 |  |
| 364 | R | R | R | R | R | R |  |
| 365 | NoCon | 1 | T | 1 | 1 | 1 |  |



| 414 | N | N | N | N | N | N |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 415 | L | L | L | L | L | L |  |
| 416 | Q | Q | Q | Q | Q | Q |  |
| 417 | S | S | S | S | S | S |  |
| 418 | L | L | L | L | L | L |  |
| 419 | T | T | T | T | T | T |  |
| 420 | N | N | N | N | N | N |  |
| 421 | L | L | L | L | L | L |  |
| 422 | L | L | L | L | L | L |  |
| 423 | S | S | S | S | S | S |  |
| 424 | S | S | S | S | S | S |  |
| 425 | N | N | N | N | N | N |  |
| 426 | L | L | L | L | L | L |  |
| 427 | S | S | S | S | S | S |  |
| 428 | W | W | W | W | W | W |  |
| 429 | L | L | L | L | L | L |  |
| 430 | S | S | S | S | S | S |  |
| 431 | L | L | L | L | L | L |  |
| 432 | D | D | D | D | D | D |  |
| 433 | V | V | V | V | V | V |  |
| 434 | S | S | S | S | S | S |  |
| 435 | A | A | A | A | A | A |  |
| 436 | A | A | A | A | A | A |  |
| 437 | F | F | F | F | F | F |  |
| 438 | Y | Y | Y | Y | Y | Y |  |
| 439 | H | H | H | H | H | H |  |
| 440 | NoCon | 1 | L | 1 | L | 1 |  |
| 441 | P | P | P | P | P | P |  |
| 442 | L | L | L | L | L | L |  |
| 443 | H | H | H | H | H | H |  |
| 444 | P | P | P | P | P | P |  |
| 445 | A | A | A | A | A | A |  |
| 446 | A | A | A | A | A | A |  |
| 447 | M | M | M | M | M | M |  |
| 448 | P | P | P | P | P | P |  |
| 449 | H | H | H | H | H |  | H |
| 450 | L | L | L | L | L |  | L |
| 451 | L | L | L | L | L |  | L |
| 452 | NoCon | 1 | V | V | V |  | V |
| 453 | G | G | G | G | G |  | G |
| 454 | S | S | S | S | S |  | S |
| 455 | S | S | S | S | S |  | S |
| 456 | G | G | G | G | G |  | G |
| 457 | L | L | L | L | L |  | L |
| 458 | NoCon | S | S | P | S |  | S |
| 459 | R | R | R | R | R |  | R |
| 460 | Y | Y | Y | Y | Y |  | Y |
| 461 | V | V | V | V | V |  | V |


| 462 | A | A | A | A | A | A |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 463 | R | R | R | R | R | R |
| 464 | L | L | L | L | L | L |
| 465 | S | S | S | S | S | S |
| 466 | S | S | S | S | S | S |
| 467 | NoCon | N | N | T | N | N |
| 468 | S | S | S | S | S | S |
| 469 | NoCon | R | R | R | R | R |
| 470 | NoCon | 1 | 1 | - | I | 1 |
| 471 | NoCon | N | 1 | - | F | 1 |
| 472 | NoCon | N | N | N | N | N |
| 473 | NoCon | N | N | - |  | H |
| 474 | NoCon | Q | Q | 1 |  | Q |
| 475 | NoCon | Y | H | - | H | H |
| 476 | NoCon | G | R | - | - | G |
| 477 | NoCon | T | T | N | - | T |
| 478 | NoCon | M | M | Y | - | M |
| 479 | Q | Q | Q | Q | Q | Q |
| 480 | NoCon | N | N | D | N | N |
| 481 | L | L | L | L | L | L |
| 482 | H | H | H | H | H | H |
| 483 | NoCon | D | N | D | D | D |
| 484 | S | S | S | S | S | S |
| 485 | C | C | C | C | C | C |
| 486 | S | S | S | S | S | S |
| 487 | R | R | R | R | R | R |
| 488 | NoCon | Q | N | N | N | N |
| 489 | L | L | L | L | L | L |
| 490 | Y | Y | Y | Y | Y | Y |
| 491 | V | V | V | V | V | V |
| 492 | S | S | S | S | S | S |
| 493 | L | L | L | L | L | L |
| 494 | NoCon | M | M | L | L | L |
| 495 | L | L | L | L | L | L |
| 496 | L | L | L | L | L | L |
| 497 | Y | Y | Y | Y | Y | Y |
| 498 | NoCon | K | K | K | Q | K |
| 499 | T | T | T | T | T | T |
| 500 | NoCon | Y | Y | F | F | F |
| 501 | G | G | G | G | G | G |
| 502 | NoCon | W | R | R | R | R |
| 503 | K | K | K | K | K | K |
| 504 | L | L | L | L | L | L |
| 505 | H | H | H | H | H | H |
| 506 | L | L | L | L | L | L |
| 507 | Y | Y | Y | Y | Y | Y |
| 508 | S | S | S | S | S | S |
| 509 | H | H | H | H | H | H |


| 510 | P | P | P | P | P | P |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 511 | 1 | 1 | 1 | 1 | 1 | I |
| 512 | NoCon | V | 1 | 1 | 1 | I |
| 513 | L | L | L | L | L | L |
| 514 | G | G | G | G | G |  |
| 515 | F | F | F | F | F |  |
| 516 | R | R | R | R | R |  |
| 517 | K | K | K | K | K |  |
| 518 | 1 | 1 | 1 | 1 | 1 |  |
| 519 | P | P | P | P | P |  |
| 520 | M | M | M | M | M |  |
| 521 | G | G | G | G | G |  |
| 522 | V | V | V | V | V |  |
| 523 | G | G | G | G | G |  |
| 524 | L | L | L | L | L |  |
| 525 | S | S | S | S | S |  |
| 526 | P | P | P | P | P |  |
| 527 | F | F | F | F | F |  |
| 528 | L | L | L | L | L |  |
| 529 | L | L | L | L | L |  |
| 530 | A | A | A | A | A |  |
| 531 | Q | Q | Q | Q | Q |  |
| 532 | F | F | F | F | F |  |
| 533 | T | T | T | T | T |  |
| 534 | S | S | S | S | S |  |
| 535 | A | A | A | A | A |  |
| 536 | 1 | 1 | 1 | 1 | 1 |  |
| 537 | C | C | C | C | C |  |
| 538 | S | S | S | S | S |  |
| 539 | V | V | v | V | V |  |
| 540 | V | V | V | V | V |  |
| 541 | R | R | R | R | R |  |
| 542 | R | R | R | R | R |  |
| 543 | A | A | A | A | A |  |
| 544 | F | F | F | F | F |  |
| 545 | P | P | P | P | P |  |
| 546 | H | H | H | H | H |  |
| 547 | C | C | C | C | C |  |
| 548 | L | L | L | L | L |  |
| 549 | A | A | A | A | A |  |
| 550 | F | F | F | F | F |  |
| 551 | S | S | S | S | S |  |
| 552 | Y | Y | Y | Y | Y |  |
| 553 | M | M | M | M | M |  |
| 554 | D | D | D | D | D |  |
| 555 | D | D | D | D | D |  |
| 556 | V | V | V | V | V |  |
| 557 | V | V | v | v | V |  |


| 558 | L | L | L | L | L |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 559 | G | G | G | G | G |  |
| 560 | A | A | A | A | A |  |
| 561 | K | K | K | K | K |  |
| 562 | S | S | S | S | S |  |
| 563 | V | V | V | V | V |  |
| 564 | Q | Q | Q | Q | Q |  |
| 565 | H | H | H | H | H |  |
| 566 | NoCon | R | L | L | L |  |
| 567 | E | E | E | E | E |  |
| 568 | S | S | S | S | S |  |
| 569 | L | L | L | L | L |  |
| 570 | NoCon | Y | Y | F | F |  |
| 571 | NoCon | T | A | T | T |  |
| 572 | NoCon | A | A | S | A |  |
| 573 | NoCon | V | V | 1 | V |  |
| 574 | T | T | T | T | T |  |
| 575 | N | N | N | N | N |  |
| 576 | F | F | F | F | F |  |
| 577 | L | L | L | L | L |  |
| 578 | L | L | L | L | L |  |
| 579 | S | S | S | S | S |  |
| 580 | L | L | L | L | L |  |
| 581 | G | G | G | G | G |  |
| 582 | 1 | 1 | 1 | 1 | 1 |  |
| 583 | H | H | H | H | H |  |
| 584 | L | L | L | L | L |  |
| 585 | N | N | N | N | N |  |
| 586 | P | P | P | P | P |  |
| 587 | NoCon | N | H | N | N |  |
| 588 | K | K | K | K | K | K |
| 589 | T | T | T | T | T | T |
| 590 | K | K | K | K | K | K |
| 591 | R | R | R | R | R | R |
| 592 | W | W | W | W | W | W |
| 593 | G | G | G | G | G | G |
| 594 | Y | Y | Y | Y | Y | Y |
| 595 | S | S | S | S | S | S |
| 596 | L | L | L | L | L | L |
| 597 | NoCon | N | N | N | H | N |
| 598 | F | F | F | F | F | F |
| 599 | M | M | M | M | M | M |
| 600 | G | G | G | G | G | G |
| 601 | Y | Y | Y | Y | Y | Y |
| 602 | NoCon | 1 | V | V | V | v |
| 603 | 1 | 1 | 1 | 1 | 1 | 1 |
| 604 | G | G | G | G | G | G |
| 605 | NoCon | S | S | S | C | S |


| 606 | NoCon | W | W | W | Y | W |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 607 | G | G | G | G | G | G |
| 608 | NoCon | T | T | T | S | S |
| 609 | L | L | L | L | L | L |
| 610 | P | P | P | P | P | P |
| 611 | Q | Q | Q | Q | Q | Q |
| 612 | NoCon | D | E | E | D | D |
| 613 | H | H | H | H | H | H |
| 614 | 1 | 1 | 1 | 1 | 1 | 1 |
| 615 | NoCon | V | V | V | 1 | 1 |
| 616 | NoCon | Q | Q | L | Q | Q |
| 617 | K | K | K | K | K | K |
| 618 | 1 | 1 | 1 | 1 | 1 | 1 |
| 619 | K | K | K | K | K | K |
| 620 | NoCon | H | M | Q | E | E |
| 621 | C | C | C | C | C | C |
| 622 | F | F | F | F | F | F |
| 623 | R | R | R | R | R | R |
| 624 | K | K | K | K | K | K |
| 625 | L | L | L | L | L | L |
| 626 | P | P | P | P | P | P |
| 627 | V | V | V | V | V | V |
| 628 | N | N | N | N | N | N |
| 629 | R | R | R | R | R | R |
| 630 | P | P | P | P | P | P |
| 631 | 1 | 1 | 1 | 1 | 1 | 1 |
| 632 | D | D | D | D | D | D |
| 633 | W | W | W | W | W | W |
| 634 | K | K | K | K | K | K |
| 635 | V | V | V | V | V | V |
| 636 | C | C | C | C | C | C |
| 637 | Q | Q | Q | Q | Q | Q |
| 638 | R | R | R | R | R | R |
| 639 | 1 | 1 | 1 | 1 | 1 | 1 |
| 640 | V | V | V | V | V | V |
| 641 | G | G | G | G | G | G |
| 642 | L | L | L | L | L | L |
| 643 | L | L | L | L | L | L |
| 644 | G | G | G | G | G | G |
| 645 | F | F | F | F | F | F |
| 646 | A | A | A | A | A | A |
| 647 | A | A | A | A | A | A |
| 648 | P | P | P | P | P | P |
| 649 | F | F | F | F | F | F |
| 650 | T | T | T | T | T | T |
| 651 | Q | Q | Q | Q | Q | Q |
| 652 | C | C | C | C | C | C |
| 653 | G | G | G | G | G | G |


| 654 | Y | Y | Y | Y | Y | Y |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 655 | P | P | P | P | P | P |
| 656 | A | A | A | A | A | A |
| 657 | L | L | L | L | L | L |
| 658 | M | M | M | M | M | M |
| 659 | P | P | P | P | P | P |
| 660 | L | L | L | L | L | L |
| 661 | Y | Y | Y | Y | Y | Y |
| 662 | A | A | A | A | A | A |
| 663 | C | C | C | C | C | C |
| 664 | 1 | 1 | 1 | 1 | 1 | 1 |
| 665 | Q | Q | Q | Q | Q | Q |
| 666 | NoCon | A | A | S | S | S |
| 667 | K | K | K | K | K | K |
| 668 | Q | Q | Q | Q | Q | Q |
| 669 | A | A | A | A | A | A |
| 670 | F | F | F | F | F | F |
| 671 | T | T | T | T | T | T |
| 672 | F | F | F | F | F | F |
| 673 | S | S | S | S | S | S |
| 674 | P | P | P | P | P | P |
| 675 | T | T | T | T | T | T |
| 676 | Y | Y | Y | Y | Y | Y |
| 677 | K | K | K | K | K | K |
| 678 | A | A | A | A | A | A |
| 679 | F | F | F | F | F | F |
| 680 | L | L | L | L | L | L |
| 681 | NoCon | S | S | C | C | S |
| 682 | K | K | K | K | K | K |
| 683 | Q | Q | Q | Q | Q | Q |
| 684 | Y | Y | Y | Y | Y | Y |
| 685 | NoCon | M | L | L | L | L |
| 686 | N | N | N | N | N | N |
| 687 | L | L | L | L | L | L |
| 688 | Y | Y | Y | Y | Y | Y |
| 689 | P | P | P | P | P | P |
| 690 | V | V | V | V | V | V |
| 691 | A | A | A | A | A | A |
| 692 | R | R | R | R | R | R |
| 693 | Q | Q | Q | Q | Q | Q |
| 694 | R | R | R | R | R | R |
| 695 | NoCon | P | P | S | P | P |
| 696 | G | G | G | G | G | G |
| 697 | L | L | L | L | L | L |
| 698 | C | C | C | C | C | C |
| 699 | Q | Q | Q | Q | Q | Q |
| 700 | V | V | V | V | V | V |
| 701 | F | F | F | F | F | F |


| 702 | A | A | A | A | A | A |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 703 | D | D | D | D | D | D |
| 704 | A | A | A | A | A | A |
| 705 | T | T | T | T | T | T |
| 706 | P | P | P | P | P | P |
| 707 | T | T | T | T | T | T |
| 708 | G | G | G | G | G | G |
| 709 | W | W | W | W | W | W |
| 710 | G | G | G | G | G | G |
| 711 | L | L | L | L | L | L |
| 712 | NoCon | A | A | A | V | A |
| 713 | NoCon | 1 | 1 | 1 | M | M |
| 714 | G | G | G | G | G | G |
| 715 | H | H | H | H | H | H |
| 716 | NoCon | Q | Q | R | Q | Q |
| 717 | R | R | R | R | R | R |
| 718 | M | M | M | M | M | M |
| 719 | R | R | R | R | R | R |
| 720 | G | G | G | G | G | G |
| 721 | T | T | T | T | T | T |
| 722 | F | F | F | F | F | F |
| 723 | NoCon | V | V | V | L | V |
| 724 | NoCon | A | S | A | A | A |
| 725 | P | P | P | P | P | P |
| 726 | L | L | L | L | L | L |
| 727 | P | P | P | P | P | P |
| 728 | 1 | 1 | 1 | 1 | 1 | I |
| 729 | H | H | H | H | H | H |
| 730 | T | T | T | T | T | T |
| 731 | A | A | A | A | A | A |
| 732 | E | E | E | E | E | E |
| 733 | L | L | L | L | L | L |
| 734 | L | L | L | L | L | L |
| 735 | A | A | A | A | A | A |
| 736 | A | A | A | A | A | A |
| 737 | C | C | C | C | C | C |
| 738 | F | F | F | F | F | F |
| 739 | A | A | A | A | A | A |
| 740 | R | R | R | R | R | R |
| 741 | S | S | S | S | S | S |
| 742 | R | R | R | R | R | R |
| 743 | S | S | S | S | S | S |
| 744 | G | G | G | G | G | G |
| 745 | A | A | A | A | A | A |
| 746 | NoCon | K | K | K | N | K |
| 747 | NoCon | L | L | L | 1 | I |
| 748 | NoCon | 1 | 1 | 1 | L | L |
| 749 | G | G | G | G | G | G |


| 750 | T | T | T | T | T | T |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 751 | D | D | D | D | D | D |
| 752 | N | N | N | N | N | N |
| 753 | S | S | S | S | S | S |
| 754 | V | V | V | V | V | V |
| 755 | V | V | V | V | V | V |
| 756 | L | L | L | L | L | L |
| 757 | S | S | S | S | S | S |
| 758 | R | R | R | R | R | R |
| 759 | K | K | K | K | K | K |
| 760 | Y | Y | Y | Y | Y | Y |
| 761 | T | T | T | T | T | T |
| 762 | S | S | S | S | S | S |
| 763 | F | F | F | F | F | F |
| 764 | P | P | P | P | P | P |
| 765 | W | W | W | W | W | W |
| 766 | L | L | L | L | L | L |
| 767 | L | L | L | L | L | L |
| 768 | G | G | G | G | G | G |
| 769 | C | C | C | C | C | C |
| 770 | NoCon | T | A | A | A | A |
| 771 | A | A | A | A | A | A |
| 772 | N | N | N | N | N | N |
| 773 | W | W | W | W | W | W |
| 774 | 1 | 1 | I | 1 | 1 | I |
| 775 | L | L | L | L | L | L |
| 776 | R | R | R | R | R | R |
| 777 | G | G | G | G | G | G |
| 778 | T | T | T | T | T | T |
| 779 | S | S | S | S | S | S |
| 780 | F | F | F | F | F | F |
| 781 | V | V | V | V | V | V |
| 782 | Y | Y | Y | Y | Y | Y |
| 783 | V | V | V | V | V | V |
| 784 | P | P | P | P | P | P |
| 785 | S | S | S | S | S | S |
| 786 | A | A | A | A | A | A |
| 787 | L | L | L | L | L | L |
| 788 | N | N | N | N | N | N |
| 789 | P | P | P | P | P | P |
| 790 | A | A | A | A | A | A |
| 791 | D | D | D | D | D | D |
| 792 | D | D | D | D | D | D |
| 793 | P | P | P | P | P | P |
| 794 | S | S | S | S | S | S |
| 795 | R | R | R | R | R | R |
| 796 | G | G | G | G | G | G |
| 797 | R | R | R | R | R | R |


| 798 | L | L | L | L | L | L |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 799 | G | G | G | G | G | G |
| 800 | L | L | L | L | L | L |
| 801 | NoCon | S | Y | Y | S | S |
| 802 | R | R | R | R | R | R |
| 803 | P | P | P | P | P | P |
| 804 | L | L | L | L | L | L |
| 805 | L | L | L | L | L | L |
| 806 | NoCon | R | R | H | R | R |
| 807 | L | L | L | L | L | L |
| 808 | NoCon | P | L | P | P | P |
| 809 | NoCon | F | Y | F | F | F |
| 810 | NoCon | Q | R | R | R | R |
| 811 | P | P | P | P | P | P |
| 812 | T | T | T | T | T | T |
| 813 | T | T | T | T | T | T |
| 814 | G | G | G | G | G | G |
| 815 | R | R | R | R | R | R |
| 816 | T | T | T | T | T | T |
| 817 | S | S | S | S | S | S |
| 818 | L | L | L | L | L | L |
| 819 | Y | Y | Y | Y | Y | Y |
| 820 | A | A | A | A | A | A |
| 821 | NoCon | V | D | V | D | V |
| 822 | S | S | S | S | S | S |
| 823 | P | P | P | P | P | P |
| 824 | S | S | S | S | S | S |
| 825 | V | V | V | V | V | V |
| 826 | P | P | P | P | P |  |
| 827 | S | S | S | S | S |  |
| 828 | H | H | H | H | H |  |
| 829 | L | L | L | L | L |  |
| 830 | P | P | P | P | P |  |
| 831 | NoCon | V | D | D | D |  |
| 832 | R | R | R | R | R |  |
| 833 | V | V | V | V | V |  |
| 834 | H | H | H | H | H |  |
| 835 | F | F | F | F | F |  |
| 836 | A | A | A | A | A |  |
| 837 | S | S | S | S | S |  |
| 838 | P | P | P | P | P |  |
| 839 | L | L | L | L | L |  |
| 840 | H | H | H | H | H |  |
| 841 | V | V | V | V | V |  |
| 842 | A | A | A | A | A |  |
| 843 | W | W | W | W | W |  |
| 844 | R | R | R | R | R |  |
| 845 | P | P | P | P | P |  |

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