

## **Supporting Information: S2 Table**

*Protein Synthesis in E. coli: Dependence of Codon-specific Elongation on tRNA Concentration and Codon Usage*

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**Table S2. Codon-specific elongation rates  $\omega_{c,\text{elo}}$  for all sense codons  $c$  in *E. coli*, assuming a 2-1-2 pathway of tRNA release from the E site.**All rates in  $[\text{s}^{-1}]$ .

|     | Specific growth rate $[\text{h}^{-1}]$ |      |      |      |     | Specific growth rate $[\text{h}^{-1}]$ |      |      |      |
|-----|----------------------------------------|------|------|------|-----|----------------------------------------|------|------|------|
|     | 0.7                                    | 1.07 | 1.6  | 2.5  |     | 0.7                                    | 1.07 | 1.6  | 2.5  |
| AAA | 15.3                                   | 16.4 | 14.6 | 12.3 | GAA | 38.9                                   | 40.1 | 53.8 | 63.7 |
| AAC | 7.9                                    | 10.2 | 14.8 | 16.6 | GAC | 20.9                                   | 21.1 | 30.0 | 39.0 |
| AAG | 15.3                                   | 16.3 | 14.5 | 12.2 | GAG | 38.6                                   | 39.9 | 53.3 | 63.2 |
| AAU | 7.8                                    | 10.1 | 14.6 | 16.4 | GAU | 19.6                                   | 19.9 | 28.3 | 37.1 |
| ACA | 11.8                                   | 11.5 | 17.7 | 22.7 | GCA | 26.7                                   | 32.5 | 37.5 | 43.1 |
| ACC | 10.6                                   | 11.1 | 12.3 | 16.2 | GCC | 5.1                                    | 6.4  | 9.9  | 10.4 |
| ACG | 19.6                                   | 19.2 | 27.4 | 32.9 | GCG | 25.9                                   | 31.5 | 36.6 | 42.3 |
| ACU | 19.2                                   | 19.4 | 25.6 | 32.2 | GCU | 25.7                                   | 31.3 | 36.6 | 41.9 |
| AGA | 12.2                                   | 12.8 | 16.2 | 15.9 | GGA | 17.1                                   | 17.4 | 24.9 | 23.1 |
| AGC | 15.8                                   | 15.7 | 19.2 | 16.7 | GGC | 36.8                                   | 39.1 | 44.2 | 55.9 |
| AGG | 8.7                                    | 8.3  | 13.0 | 10.6 | GGG | 26.9                                   | 27.5 | 38.2 | 36.7 |
| AGU | 15.6                                   | 15.5 | 19.0 | 16.6 | GGU | 35.0                                   | 37.3 | 42.1 | 53.7 |
| AUA | 3.0                                    | 3.1  | 4.7  | 5.5  | GUA | 31.7                                   | 28.0 | 45.4 | 48.4 |
| AUC | 31.9                                   | 34.3 | 46.8 | 59.4 | GUC | 14.8                                   | 16.0 | 20.8 | 23.1 |
| AUG | 5.7                                    | 7.0  | 10.2 | 10.9 | GUG | 29.2                                   | 25.6 | 42.2 | 45.4 |
| AUU | 30.5                                   | 33.1 | 44.9 | 57.4 | GUU | 38.6                                   | 36.4 | 53.5 | 56.5 |
| CAA | 10.9                                   | 14.2 | 12.4 | 16.0 | UAA | <i>stop</i>                            |      |      |      |
| CAC | 4.0                                    | 6.3  | 7.6  | 11.9 | UAC | 22.5                                   | 22.2 | 33.5 | 33.9 |
| CAG | 6.4                                    | 8.2  | 13.0 | 16.3 | UAG | <i>stop</i>                            |      |      |      |
| CAU | 4.0                                    | 6.3  | 7.6  | 11.8 | UAU | 22.0                                   | 21.8 | 33.0 | 33.4 |
| CCA | 3.9                                    | 5.6  | 4.7  | 3.9  | UCA | 22.0                                   | 20.7 | 26.6 | 26.2 |
| CCC | 11.3                                   | 9.8  | 17.7 | 14.5 | UCC | 9.0                                    | 9.6  | 11.9 | 12.3 |
| CCG | 9.8                                    | 15.3 | 10.7 | 9.7  | UCG | 24.3                                   | 23.3 | 29.8 | 30.0 |
| CCU | 13.7                                   | 13.8 | 20.2 | 16.8 | UCU | 26.4                                   | 25.8 | 32.5 | 32.6 |
| CGA | 40.9                                   | 41.9 | 58.1 | 62.8 | UGA | <i>stop</i>                            |      |      |      |
| CGC | 38.9                                   | 39.9 | 56.0 | 60.4 | UGC | 19.6                                   | 19.8 | 27.1 | 26.4 |
| CGG | 12.3                                   | 6.6  | 10.7 | 9.3  | UGG | 11.5                                   | 13.6 | 17.2 | 21.7 |
| CGU | 38.8                                   | 39.8 | 55.9 | 60.3 | UGU | 19.2                                   | 19.5 | 26.7 | 26.1 |
| CUA | 9.1                                    | 9.3  | 11.6 | 12.0 | UUA | 15.5                                   | 17.3 | 16.5 | 15.5 |
| CUC | 13.1                                   | 14.7 | 17.7 | 18.8 | UUC | 7.4                                    | 10.7 | 9.8  | 8.1  |
| CUG | 43.7                                   | 46.5 | 56.6 | 60.3 | UUG | 34.1                                   | 36.1 | 44.1 | 44.3 |
| CUU | 12.6                                   | 14.2 | 16.9 | 18.1 | UUU | 6.9                                    | 10.1 | 9.2  | 7.6  |