

Additional Table 1

Rare codon frequencies in *Escherichia coli* and model photosynthetic organisms

	Codon frequency						
	Arg (<i>arg</i> U)		Ile (<i>ile</i> Y)	Leu (<i>leu</i> W)	Pro (<i>pro</i> L)	Ser	Thr
	AGA	AGG	AUA	CUA	CCC	UCA	ACA
<i>Escherichia coli</i>	2.4 (5.10)	2.1 (4.12)	5.0 (7.15)	3.4 (2.81)	2.4 (5.93)	6.1 (10.65)	6.1 (11.38)
Protists							
<i>Chlamydomonas reinhardtii</i>	0.7 (1.24)	2.7 (4.79)	1.1 (3.08)	2.6 (2.90)	29.5 (46.53)	3.2 (4.89)	4.1 (7.75)
<i>Synechococcus elongatus</i> PCC 7942	1.6 (2.36)	1.0 (1.48)	1.0 (1.84)	11.2 (9.13)	18.3 (33.52)	5.6 (9.33)	7.2 (13.85)
Plants							
<i>Arabidopsis thaliana</i>	19.0 (35.19)	11.0 (20.37)	12.6 (23.95)	9.9 (10.59)	5.3 (10.88)	18.3 (20.49)	15.7 (30.66)
<i>Pisum sativum</i>	16.6 (35.24)	11.0 (23.35)	13.3 (23.92)	8.8 (9.85)	6.3 (12.40)	17.9 (22.80)	17.5 (31.99)
<i>Nicotiana tabacum</i>	16.0 (32.92)	12.2 (25.10)	14.0 (25.13)	9.4 (10.26)	6.6 (13.17)	17.6 (23.04)	17.4 (33.53)
<i>Solanum lycopersicum</i>	16.4 (35.04)	11.9 (25.43)	14.0 (24.91)	10.0 (10.50)	5.7 (11.70)	20.7 (25.27)	17.9 (35.10)
<i>Lemna gibba</i>	15.1 (25.21)	11.8 (19.70)	4.7 (13.39)	3.2 (4.42)	25.5 (35.32)	9.2 (9.24)	5.4 (12.05)
<i>Medicago truncatula</i>	17.7 (35.40)	12.1 (24.20)	15.5 (26.45)	10.2 (10.54)	5.5 (12.22)	21.2 (25.00)	17.9 (35.51)
<i>Zea mays</i> L.	8.8 (15.22)	14.8 (26.61)	8.4 (18.71)	7.3 (7.86)	13.5 (24.24)	11.0 (14.80)	10.5 (21.52)
<i>Oryza sativa</i>	10.5 (15.09)	16.0 (22.99)	8.8 (20.76)	7.7 (8.51)	12.1 (20.90)	12.4 (15.80)	11.6 (23.92)

Codon frequencies (per 1000) were extracted from the Kazusa codon usage database (<http://www.kazusa.or.jp/codon/>).

Values in parenthesis indicate the percentage of each specific codon among the codons for the amino acid stated.