

**Table 3.** Amino acid distributions and protein quantification for *E. coli*, *Synechococcus* 7002, and *A. acidocaldarius*. Amino acid mass and mole percentages of total protein are reported as averages of three biological replicates; percent relative standard deviations are in parentheses. HPLC quantification was obtained with a diode array detector for *E. coli* and *Synechococcus* 7002 and a fluorescence detector for *A. acidocaldarius*. Cysteine, methionine, and tryptophan were factored in according to genome-based codon proportions. Asparagine and glutamine were converted to aspartate and glutamate, respectively, during derivatization with OPA. The final row includes the total protein mass percent of cell dry weight, averaged from three biological replicates with standard deviation in parentheses.

Amino Acid	<i>E. coli</i>		<i>Synechococcus</i> 7002		<i>A. acidocaldarius</i>	
	Mass %	Mole %	Mass %	Mole %	Mass %	Mole %
Alanine	7.1 (3.5)	10.1 (3.2)	8.5 (1.4)	12.0 (1.4)	8.4 (1.0)	11.8 (0.9)
Arginine	6.9 (4.9)	5.0 (4.6)	8.3 (0.5)	6.0 (0.6)	7.7 (1.9)	5.6 (1.9)
Asparagine/Aspartate	9.9 (1.3)	9.5 (1.0)	10.2 (3.3)	9.7 (3.3)	10.0 (1.0)	9.5 (1.0)
Cysteine	1.1 (NA)	1.2 (NA)	0.9 (NA)	1.0 (NA)	0.9 (NA)	0.9 (NA)
Glutamine/Glutamate	14.0 (4.9)	12.1 (4.5)	14.6 (2.7)	12.5 (2.6)	13.2 (0.7)	11.3 (0.8)
Glycine	6.4 (4.0)	10.9 (3.6)	6.1 (3.0)	10.2 (2.9)	5.7 (0.3)	9.6 (0.3)
Histidine	2.0 (4.9)	1.6 (5.2)	1.8 (9.7)	1.4 (9.8)	2.1 (1.8)	1.7 (1.8)
Isoleucine	4.9 (6.4)	4.8 (6.7)	4.6 (2.8)	4.4 (3.0)	4.1 (0.4)	3.9 (0.5)
Leucine	7.4 (3.3)	7.2 (2.9)	9.0 (2.0)	8.6 (2.0)	7.6 (0.2)	7.3 (0.2)
Lysine	6.7 (3.4)	5.8 (3.1)	5.3 (0.2)	4.6 (0.1)	4.4 (1.1)	3.8 (1.1)
Methionine	3.2 (NA)	2.8 (NA)	2.2 (NA)	1.9 (NA)	3.0 (NA)	2.6 (NA)
Phenylalanine	5.1 (13.3)	3.9 (13.6)	5.1 (0.9)	3.9 (0.7)	3.6 (0.9)	2.8 (1.0)
Proline	3.6 (8.2)	4.0 (8.6)	4.1 (5.2)	4.5 (5.3)	4.3 (0.8)	4.8 (0.8)
Serine	4.0 (11.3)	4.9 (11.7)	4.1 (1.7)	4.9 (1.6)	4.7 (0.6)	5.6 (0.6)
Threonine	4.9 (2.2)	5.3 (2.0)	4.9 (0.9)	5.2 (0.7)	5.8 (0.4)	6.2 (0.5)
Tryptophan	2.4 (NA)	1.5 (NA)	2.4 (NA)	1.5 (NA)	2.6 (NA)	1.6 (NA)
Tyrosine	3.9 (19.7)	2.8 (20.0)	2.5 (10.4)	1.8 (10.6)	4.4 (1.0)	3.0 (1.1)
Valine	6.3 (5.9)	6.8 (5.5)	5.4 (0.9)	5.8 (1.0)	7.5 (0.5)	8.1 (0.5)
<b>Total Mass % Protein</b>	<b>35.2 (1.3)</b>		<b>27.2 (1.5)</b>		<b>38.5 (2.2)</b>	