

Additional file 1 - Table 1: Class I aminoacyl synthetase sequence details.

Species/Protein	E-value	Identity	Accession code	PDB ID	Coverage
Methionine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IJ60		889
<i>Plasmodium malariae</i>	0	78.1	A0A1C3KE62		880
<i>Plasmodium ovale</i>	0	76.9	A0A1A8YPD8		914
<i>Plasmodium knowlesi</i>	0	76.5	B3L2B7		885
<i>Plasmodium vivax</i>	0	75.6	A0A0J9WEH2		886
<i>Plasmodium fragile</i>	0	75.5	A0A0D9QHP9		885
<i>Plasmodium yoelii</i>	0	70.3	A0A078K512		898
<i>Plasmodium berghei</i>	0	69.1	A0A0Y9UYU4		898
<i>Homo sapiens</i>	4.6e-13	24.3	P56192	4BL7,4BVX	900
<i>Toxoplasma gondii</i>	0	42.0	S7VYI1		976
<i>Cryptosporidium andersoni</i>	4.00E-164	48.0	A0A1J4MM36		556
<i>Escherichia coli</i>	4.5E-32	23.2	P00959	3H9C, 1F4L,3H9C	677
<i>Saccharomyces cerevisiae</i>	7.5E-35	24.3	P00958	2HSN	751
Leucine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IBB3		1481
<i>Plasmodium malariae</i>	0	46.6	A0A1A8VSK8		1456
<i>Plasmodium ovale</i>	0	44.9	A0A1A8VTV7		1382
<i>Plasmodium yoelii</i>	0	44.9	V7PGP1		1321
<i>Plasmodium knowlesi</i>	0	44.7	B3L108		1291
<i>Plasmodium berghei</i>	0	45.6	A0A077XBW6		1203
<i>Plasmodium vivax</i>	7.4e-113	53.2	A0A0J9TZP3		1257
<i>Plasmodium fragile</i>	4.2e-109	51.7	A0A0D9QR21		1270
<i>Homo sapiens</i>	-----	-----	Q9P2J5	2WFD	1176
<i>Escherichia coli</i>	-----	-----	P07813	4AS1,4ARI,4ARC	860
Arginine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8I5M2	5JLD	590
<i>Plasmodium malariae</i>	0	76.2	A0A1D3TEU0		588
<i>Plasmodium vivax</i>	0	76.4	A0A0J9TME5		591
<i>Plasmodium ovale</i>	0	74.7	A0A1C3L5C5		588
<i>Plasmodium fragile</i>	0	74.4	A0A0D9QJI4		594
<i>Plasmodium knowlesi</i>	0	75.0	B3LCI0		588
<i>Plasmodium berghei</i>	0	73.0	A0A077XII2		588
<i>Plasmodium yoelii</i>	0	72.4	V7PSR5		588
<i>Homo sapiens</i>	1.8e-125	36.7	P54136	4Q2T, 4Q2X, ZAJ,4Q2Y	660
<i>Cryptosporidium andersoni</i>	2.00E-168	42.0	B6A914		603
<i>Escherichia coli</i>	1.4E-104	32.6	P11875	4OBY	577
<i>Saccharomyces cerevisiae</i>	1.9E-46	28.3	Q05506	1F7V,1BS2,1F7U	607
Valine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IKL5		1090
<i>Plasmodium malariae</i>	0	78.8	A0A1D3SPV8		1089
<i>Plasmodium yoelii</i>	0	77.8	V7PVF4		1077
<i>Plasmodium fragile</i>	0	78.3	A0A0D9QNU6		1046
<i>Plasmodium vivax</i>	0	77.1	A0A0J9TS21		1071
<i>Plasmodium knowlesi</i>	0	76.6	B3L9E5		1070
<i>Plasmodium berghei</i>	0	76.1	A0A077XIK7		1077
<i>Plasmodium ovale</i>	0	75.5	A0A1A8WWY3		1138
<i>Homo sapiens</i>	-----	-----	P26640		1264
<i>Cryptosporidium andersoni</i>	0	47.0	A0A1J4MSQ0		1046
<i>Cryptosporidium parvum</i>	0	45.0	Q9Y1L6		1050
<i>Dictyostelium discoideum</i>	0	43.1	Q86KU2		10072
Glutamate aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100	Q8IDK7		863
<i>Plasmodium fragile</i>	0	64.5	A0A0D9QKM1		802
<i>Plasmodium ovale</i>	0	65.6	A0A1C3KUT6		789
<i>Plasmodium knowlesi</i>	0	64.6	B3L8A1		802

<i>Plasmodium vivax</i>	0	63.7	A0A0J9SRD3		787
<i>Plasmodium yoelii</i>	0	64.0	V7PWS4		804
<i>Plasmodium berghei</i>	0	64.2	A0A077XJ13		803
<i>Plasmodium malariae</i>	0	61.6	A0A1C3LOG3		802
<i>Homo sapiens</i>	5.6e-151	39.2	P07814	5A5H,5A1N,4K87,5BMU	1512
<i>Toxoplasma gondii</i>	0	49.0	S8F214		849
<i>Cryptosporidium andersoni</i>	0	57.0	A0A1J4MSL8		562
<i>Saccharomyces cerevisiae</i>	9.3E-159	38.5	P46655		708
Isoleucine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IDZ9		1272
<i>Plasmodium ovale</i>	0	71.8	A0A1C3KVD6		1189
<i>Plasmodium malariae</i>	0	68.0	A0A1C3LOV5		1365
<i>Plasmodium yoelii</i>	0	68.8	Q7RNG8		1294
<i>Plasmodium berghei</i>	0	69.8	A0A077XJ63		1275
<i>Plasmodium knowlesi</i>	0	68.4	B3L8Q4		1190
<i>Plasmodium fragile</i>	0	66.5	A0A0D9QHQ1		1082
<i>Plasmodium vivax</i>	0	67.5	A0A0J9VFT0		1206
<i>Homo sapiens</i>	----	----	P41252		1262
<i>Toxoplasma gondii</i>	0	44.0	A0A086QSP8		1242
<i>Cryptosporidium ubiquitum</i>	0	48.0	A0A1J4MJA8		1099
<i>Escherichia coli</i>	8.90E-07	24.6	P07813		860
Tryptophan aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IDW3	4J76,4J75,4JFA	632
<i>Plasmodium knowlesi</i>	0	79.9	B3L8M2		651
<i>Plasmodium vivax</i>	0	80.5	A0A0J9S986		645
<i>Plasmodium ovale</i>	0	79.6	A0A1C3KV46		648
<i>Plasmodium fragile</i>	0	78.4	A0A0D9QIG0		658
<i>Plasmodium malariae</i>	0	75.0	A0A1C3L0K6		679
<i>Plasmodium yoelii</i>	0	74.6	V7PT19		666
<i>Plasmodium berghei</i>	0	74.4	A0A077XJ93		662
<i>Homo sapiens</i>	2.5e-130	50.4	P23381		471
<i>Toxoplasma gondii</i>	0	44.0	A0A086QHU2		689
<i>Cryptosporidium andersoni</i>	1.00E-168	43.0	A0A1J4MNU6		598
<i>Escherichia coli</i>	0.13	37.1	P00954		334
<i>Saccharomyces cerevisiae</i>	1E-123	48.5	Q12109		432
Glutamine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IE10		918
<i>Plasmodium malariae</i>	0	59.4	A0A1A8W8L1		922
<i>Plasmodium yoelii</i>	0	60.9	V7PXA4		887
<i>Plasmodium ovale</i>	0	65.9	A0A1C3KVA4		844
<i>Plasmodium berghei</i>	0	59.8	A0A077XKG1		852
<i>Plasmodium knowlesi</i>	0	59.4	B3L8R5		863
<i>Plasmodium vivax</i>	0	57.7	A0A1G4H184		878
<i>Plasmodium fragile</i>	0	64.8	A0A0D9QKQ9		847
<i>Homo sapiens</i>	2.2e-108	38.3	P47897	4YE6,4YE9,4YE8	775
<i>Toxoplasma gondii</i>	0	52.0	A0A086QTE2		860
<i>Saccharomyces cerevisiae</i>	6,5E-112	35.9	P13188		809
<i>Escherichia coli</i>	4.3E-172	44.8	P00962		554
Tyrosine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IAR7	3VGJ	373
<i>Plasmodium malariae</i>	0	85.8	A0A1A8VP49		372
<i>Plasmodium knowlesi</i>	0	80.5	B3KZ67		385
<i>Plasmodium berghei</i>	0	81.8	A0A077XEQ8		372
<i>Plasmodium fragile</i>	0	80.8	A0A0D9QTW8		380
<i>Plasmodium vivax</i>	0	80.5	A0A0J9U5P1		380
<i>Plasmodium ovale</i>	0	77.5	A0A1A8VJM4		374
<i>Plasmodium yoelii</i>	0	82.0	A0A078K7H1		372
<i>Homo sapiens</i>	3e-403	30.0	P54577	1Q11,4QBT,4Q93	528
<i>Saccharomyces cerevisiae</i>	7.3E-31	30.7	P36421		394
<i>Bacillus subtilis</i>	0,0000024	23.6	P21656		330
Cysteine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IJP3		677
<i>Plasmodium malariae</i>	0	76.0	A0A1D3PAE8		678
<i>Plasmodium vivax</i>	0	71.9	A0A0D9QHH7		699

<i>Plasmodium fragile</i>	0	71.6	A0A0J9TZ62		686
<i>Plasmodium knowlesi</i>	0	71.0	B3L3U5		695
<i>Plasmodium berghei</i>	0	73.7	A0A077XEI5		668
<i>Plasmodium ovale</i>	0	71.8	A0A1D3TGR8		704
<i>Plasmodium yoelii</i>	0	73.1	A0A078KDT0		665
<i>Homo sapiens</i>	-----	----	P49589		748
<i>Toxoplasma gondii</i>	0	52.0	S8EQ47		898
<i>Cryptosporidium hominis</i>	0	50.0	A0A0S4TGX8		581
<i>Escherichia coli</i>	4.5E-73	41.5	P21888		461

Additional file 1 - Table 2: Class II aminoacyl synthetase sequence details

Species/Protein	E-value	Identity	Accession code	PDB ID	Coverage
Threonine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IIA4		1013
<i>Plasmodium ovale</i>	0	65.8	A0A1D3TI17		903
<i>Plasmodium malariae</i>	0	65.8	A0A1A8VYM6		890
<i>Plasmodium knowlesi</i>	0	60.3	B3L565		888
<i>Plasmodium fragile</i>	0	64.8	A0A0D9QSY6		875
<i>Plasmodium berghei</i>	0	58.9	A0A077XDL8		890
<i>Plasmodium yoelii</i>	0	57.9	A0A078K4L5		935
<i>Plasmodium vivax</i>	0	65.3	A0A1G4GXN4		924
<i>Homo sapiens</i>	9.9e-176	53.3	P26639	4TTV,4P3N,4HWT	723
<i>Toxoplasma gondii</i>	0	50.0	A0A151HOC0		846
<i>Staphylococcus aureus</i>	1.1e-100	38.3	Q8NW68	1NYQ,1NYR	645
<i>Escherichia coli</i>	3.7e-108	41.3	P0A8M3	1EVL,1TKE,1TKY,4HWS,1QF6	642
<i>Cryptosporidium andersoni</i>	0	49.0	A0A1J4MNI4		743
Alanine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8ID31		1408
<i>Plasmodium ovale</i>	0	72.6	A0A1A8W127		1274
<i>Plasmodium malariae</i>	0	70.7	A0A1A8W685		1182
<i>Plasmodium knowlesi</i>	0	71.8	B3L6U2		1180
<i>Plasmodium fragile</i>	0	71.7	A0A0D9QQK3		1184
<i>Plasmodium berghei</i>	0	63.5	A0A077XGH3		1218
<i>Plasmodium yoelii</i>	0	64.0	Q7RK23		1218
<i>Plasmodium vivax</i>	0	72.4	A0A1G4GZF2		1197
<i>Homo sapiens</i>	0	36.8	P49588	4XEM, 5T76,4XEO,5T5S	968
<i>Toxoplasma gondii</i>	0	44.0	V4Z4M5		1280
<i>Cryptosporidium hominis</i>	0	44.0	A0A0S4TIH6		989
<i>Cryptosporidium ubiquitum</i>	0	-----	A0A1J4MG14		991
<i>Escherichia coli</i>	-----	-----	P00957		876
Serine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IBS3		539
<i>Plasmodium malariae</i>	0	68.6	A0A1A8VNA1		571
<i>Plasmodium fragile</i>	0	70.5	A0A0D9QLI8		555
<i>Plasmodium knowlesi</i>	0	70.4	B3L070		597
<i>Plasmodium ovale</i>	0	69.5	A0A1C3KNB7		560
<i>Plasmodium vivax</i>	0	68.7	A0A1G4GS18		616
<i>Plasmodium yoelii</i>	0	69.1	V7PG45		534
<i>Plasmodium berghei</i>	0	68.8	A0A077XBK7		536
<i>Homo sapiens</i>	3.00E-120	38.7	P49591	4L87,3VBB,4RQF,4RQE	514
<i>Toxoplasma gondii</i>	2.00E-169	46.0	S7WG10		482
<i>Cryptosporidium parvum</i>	9.00E-145	44.0	Q5CVB3		454
<i>Candida albicans</i>	-----	-----	Q9HGT6		462
<i>Trypanosoma brucei</i>	-----	-----	Q384V4		479
Lysine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IDJ8	4PG3,4H02	583
<i>Plasmodium malariae</i>	0	82.8	A0A1C3L068		583
<i>Plasmodium knowlesi</i>	0	81.4	B3L892		585
<i>Plasmodium fragile</i>	0	81.9	A0A0D9QKL2		585
<i>Plasmodium vivax</i>	0	81.0	A0A0J9WC33		585

<i>Plasmodium berghei</i>	0	80.4	A0A077XH86		578
<i>Plasmodium yoelii</i>	0	79.8	V7PTW4		581
<i>Plasmodium ovale</i>	0	80.0	A0A1D3TJZ1		601
<i>Homo sapiens</i>	0	51.6	Q15046-2	4YCU,4DPG	597
<i>Toxoplasma gondii</i>	0	60.0	A0A125YM18		658
<i>Escherichia coli</i>	2.8E-114	42.7	P0A8N5		505
Glycine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8ILP6		889
<i>Plasmodium malariae</i>	0	64.0	A0A1A8W9X0		884
<i>Plasmodium knowlesi</i>	0	64.0	B3LAH4		830
<i>Plasmodium berghei</i>	0	62.1	A0A077YEW9		812
<i>Plasmodium yoelii</i>	0	61.1	V7PKZ3		806
<i>Plasmodium fragile</i>	0	60.8	A0A0D9QRV8		857
<i>Plasmodium ovale</i>	0	61.2	A0A1A8W3I2		806
<i>Plasmodium vivax</i>	0	63.3	A0A0J9S894		842
<i>Homo sapiens</i>	8.2e-137	43.9	P41250	2Q5I, 5E6M	739
<i>Cryptosporidium ubiquitum</i>	0	48.0	A0A1J4MED4		655
<i>Toxoplasma gondii</i>	0	50.0	S7UYX0		771
<i>Thermus thermophilus</i>	1.6E-21	30.3	P56206		506
Histidine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8IL22		1132
<i>Plasmodium ovale</i>	0	59.4	A0A1D3TLI4		1074
<i>Plasmodium malariae</i>	0	58.4	A0A1D3SQX7		1069
<i>Plasmodium yoelii</i>	0	57.2	V7PBA0		1032
<i>Plasmodium berghei</i>	0	57.7	A0A077XI40		1068
<i>Plasmodium vivax</i>	0	55.9	A0A0J9TR61		1067
<i>Plasmodium knowlesi</i>	0	55.9	B3L9W6		1056
<i>Plasmodium fragile</i>	0	54.7	A0A0D9QPZ2		1056
<i>Homo sapiens</i>	1.6e-89	48.0	P12081	4G84,4PHC	509
<i>Cryptosporidium parvum</i>	4.00E-103	46.0	Q5CVH7		977
<i>Trypanosoma cruzi</i>	1.3E-22	27.3	Q4DA54		478
Aspartate aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8I2B1		626
<i>Plasmodium ovale</i>	0	79.6	A0A1D3KWQ4		648
<i>Plasmodium malariae</i>	0	71.8	A0A1D3JKS8		640
<i>Plasmodium vivax</i>	0	70.8	A0A0J9TKH9		631
<i>Plasmodium knowlesi</i>	0	73.5	B3KZP7		628
<i>Plasmodium yoelii</i>	0	75.8	V7PM27		681
<i>Plasmodium berghei</i>	0	77.3	A0A077X659		686
<i>Plasmodium fragile</i>	0	76.6	A0A0D9QTT7		582
<i>Homo sapiens</i>	2.8e-133	48.0	P14868	4I15	501
<i>Toxoplasma gondii</i>	3.00E-156	45.0	S8F9A0		773
<i>Cryptosporidium parvum</i>	7.00E-153	49.0	A3FPN1		532
<i>Escherichia coli</i>	1.8E-11	25.6	P21889		590
<i>Saccharomyces cerevisiae</i>	1.3E-127	41.0	P04802		557
Phenylalanine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	Q8I5A1		556
<i>Plasmodium berghei</i>	0	48.5	A0A077XKI5		608
<i>Plasmodium malariae</i>	0	48.6	A0A1D3TF68		635
<i>Plasmodium yoelii</i>	2.00E-172	48.5	Q7RFF0		589
<i>Plasmodium knowlesi</i>	1.7e-169	45.1	A0A1A7VGI2		563
<i>Plasmodium ovale</i>	2.5e-166	43.9	A0A1A9A0Y8		627
<i>Plasmodium vivax</i>	3.6e-151	42.8	A0A1K9YHP8		539
<i>Plasmodium fragile</i>	1.7e-160	43.6	A0A0D9QSX6		561
<i>Homo sapiens</i>	5.1e-13	25.5	O95363	5MGW,3TEG,3TEG	451
Asparagine aminoacyl synthetase					
<i>Plasmodium falciparum</i>	0	100.0	O96198		610
<i>Plasmodium ovale</i>	0	76.7	A0A1A8YJG9		612
<i>Plasmodium fragile</i>	0	76.9	A0A0D9QIE9		581
<i>Plasmodium knowlesi</i>	0	76.4	B3L0N7		586
<i>Plasmodium vivax</i>	0	75.7	A0A0J9TZK6		584
<i>Plasmodium malariae</i>	0	76.1	A0A1A8VU61		595
<i>Plasmodium berghei</i>	0	76.7	A0A077X7L3		575
<i>Plasmodium yoelii</i>	0	75.5	V7PCK4		576
<i>Toxoplasma gondii</i>	0	56.0	S8EYCO		676

<i>Cryptosporidium ubiquitum</i>	0	50.0	A0A1J4M9Q6		499
<i>Salmonella typhi</i>	1.3E-150	46.1	P58696		466
<i>Homo sapiens</i>	2.9E-38	32.6	O43776	4ZYA	548
Proline aminoacyl synthetase					
<i>Plasmodium falciparum</i>	----	100.0	Q8ISR7	4WI1,4OLF,4NCX,4YDQ	746
<i>Plasmodium malariae</i>	0	81.4	A0A1A8WCF8		747
<i>Plasmodium ovale</i>	0	78.1	A0A1A8X0X1		776
<i>Plasmodium knowlesi</i>	0	78.0	A0A1A7VHC7		715
<i>Plasmodium yoelii</i>	0	76.8	V7PQB2		728
<i>Plasmodium fragile</i>	0	78.9	A0A0D9QI05		748
<i>Plasmodium vivax</i>	0	78.3	A0A0J9SMR8		773
<i>Plasmodium berghei</i>	0	76.2	A0A077XI12		755
<i>Homo sapiens</i>	1.00E-167	48.1	P07814	4K86	1512
<i>Toxoplasma gondii</i>	0	51.0	S7V2A6		830
<i>Cryptosporidium andersoni</i>	0	50.0	A0A1J4MHX7		691
<i>Thermus thermophilus</i>	4.4E-120	44.3	Q5SM28		477