

TABLE S8

o/e ratio of the sense:sense codon pairs in bacteria genomes

Species	Repeats	A/T			C/G			A/T/C/G
		<i>o</i>	<i>e</i> _{nor}	<i>o</i> / <i>e</i> _{nor}	<i>o</i>	<i>e</i> _{nor}	<i>o</i> / <i>e</i> _{nor}	<i>o</i> / <i>e</i> _{nor}
<i>A. marina</i>	2	71024	76948	0.923	149442	149494	1.000	0.974
	3	68945	69054	0.998	68822	62496	1.101	1.047
	4	41287	43870	0.941	34060	30227	1.127	1.017
	5	11545	11592	0.996	5343	5393	0.991	0.994
	6	2105	2813	0.748	811	1137	0.713	0.738
	0-1*							1.000
<i>A. bacterium</i>	2	44622	36261	1.231	197726	236762	0.835	0.888
	3	34437	33265	1.035	55619	82189	0.677	0.780
	4	15113	16922	0.893	15973	27858	0.573	0.694
	5	3432	4372	0.785	1479	4033	0.367	0.584
	6	429	722	0.594	91	627	0.145	0.385
	0-1*							1.060
<i>A. avenae</i>	2	13125	12569	1.044	286322	304739	0.940	0.944
	3	13456	10863	1.239	93685	115308	0.812	0.849
	4	4543	4021	1.130	29435	42974	0.685	0.723
	5	1058	753	1.404	3892	7911	0.492	0.571
	6	142	124	1.143	421	1386	0.304	0.373
	0-1*							1.051
<i>A. variabilis</i>	2	99528	98529	1.010	95162	98885	0.962	0.986
	3	95146	88362	1.077	45886	42002	1.092	1.082
	4	58133	57642	1.009	21374	17836	1.198	1.053
	5	16300	16294	1.000	2576	3004	0.857	0.978
	6	3065	3599	0.852	290	531	0.546	0.812
	0-1*							0.992
<i>A. aurescens</i>	2	29349	25217	1.164	210683	197560	1.066	1.077
	3	22202	20326	1.092	74346	80666	0.922	0.956
	4	7437	7900	0.941	25254	30795	0.820	0.845
	5	1102	1401	0.787	2694	5208	0.517	0.574
	6	74	172	0.430	97	657	0.148	0.206
	0-1*							0.997
<i>B. anthracis</i>	2	98645	96493	1.022	50693	62936	0.805	0.937
	3	88678	79538	1.115	17005	20767	0.819	1.054
	4	68363	66181	1.033	6303	6915	0.911	1.021
	5	20581	21987	0.936	604	949	0.636	0.924
	6	4679	6919	0.676	46	180	0.256	0.666
	0-1*							1.007
<i>B. weihenstephanensis</i>	2	101264	98338	1.030	53614	65246	0.822	0.947
	3	90626	81487	1.112	17720	21453	0.826	1.053
	4	69630	67688	1.029	6807	7461	0.912	1.017

<i>C. ATCC 51142</i>	2	101596	95028	1.069	62808	64148	0.979	1.033
	3	93372	90963	1.026	38508	32125	1.199	1.071
	4	69780	67402	1.035	23732	17747	1.337	1.098
	5	21899	21674	1.010	4394	3389	1.297	1.049
	6	4930	5841	0.844	482	791	0.609	0.816
	0-1*							0.980
<i>D. aromatica RCB</i>	2	28401	24891	1.141	191122	200816	0.952	0.973
	3	31502	26264	1.199	58218	78717	0.740	0.855
	4	15647	13662	1.145	16286	21564	0.755	0.907
	5	4161	3343	1.245	1807	3079	0.587	0.929
	6	606	568	1.067	289	393	0.735	0.931
	0-1*							1.026
<i>D. acidovorans</i>	2	16536	19449	0.850	360065	371228	0.970	0.964
	3	17128	16198	1.057	117811	142832	0.825	0.849
	4	8429	7099	1.187	31259	47919	0.652	0.721
	5	1847	1404	1.315	3449	9265	0.372	0.496
	6	243	263	0.926	262	1451	0.181	0.295
	0-1*							1.043
<i>D. alkenivorans</i>	2	53659	38793	1.383	286613	230457	1.244	1.264
	3	63014	42209	1.493	106455	95665	1.113	1.229
	4	55781	35454	1.573	39223	41016	0.956	1.242
	5	20657	12371	1.670	4661	7936	0.587	1.247
	6	4238	3664	1.157	611	1389	0.440	0.959
	0-1*							0.907
<i>D. hafniense</i>	2	68043	61476	1.107	174931	145952	1.199	1.171
	3	61698	53509	1.153	66666	61713	1.080	1.114
	4	46596	41144	1.133	30863	28334	1.089	1.115
	5	14745	12991	1.135	3881	4571	0.849	1.061
	6	2837	3498	0.811	441	888	0.497	0.747
	0-1*							0.952
<i>E. coli</i>	2	51147	48682	1.051	149550	157571	0.949	0.973
	3	44147	39740	1.111	46222	58227	0.794	0.922
	4	33248	31226	1.065	13490	16906	0.798	0.971
	5	10077	9577	1.052	1185	1993	0.594	0.973
	6	2230	2900	0.769	105	294	0.357	0.731
	0-1*							1.014
<i>F. johnsoniae</i>	2	147432	120427	1.224	73245	69992	1.046	1.159
	3	129137	101106	1.277	24060	27636	0.871	1.190
	4	129004	105011	1.228	4360	5896	0.739	1.202
	5	36929	33521	1.102	275	661	0.416	1.088
	6	10601	12986	0.816	17	62	0.273	0.814
	0-1*							0.939
<i>F. alni</i>	2	12700	14847	0.855	379533	423321	0.897	0.895
	3	5461	7348	0.743	153363	179549	0.854	0.850
	4	1301	1686	0.771	58049	77970	0.745	0.745

<i>M. smegmatis</i>	2	20061	23054	0.870	326748	383968	0.851	0.852
	3	12195	15870	0.768	107452	142610	0.753	0.755
	4	3127	4516	0.692	34823	55117	0.632	0.636
	5	451	703	0.642	3490	8917	0.391	0.410
	6	20	70	0.285	88	1386	0.063	0.074
	0-1*							1.087
<i>M. vanbaalenii</i>	2	19477	20966	0.929	310369	355110	0.874	0.877
	3	10960	14158	0.774	107135	138276	0.775	0.775
	4	2614	3948	0.662	37871	54565	0.694	0.692
	5	316	586	0.539	4276	9031	0.473	0.477
	6	20	58	0.346	239	1473	0.162	0.169
	0-1*							1.077
<i>M. xanthus</i>	2	22470	22740	0.988	543975	548434	0.992	0.992
	3	13028	16328	0.798	175859	199546	0.881	0.875
	4	2738	4319	0.634	71659	87169	0.822	0.813
	5	346	577	0.599	8412	15233	0.552	0.554
	6	29	56	0.519	1143	3438	0.332	0.335
	0-1*							1.031
<i>N. farcinica</i>	2	10846	11560	0.938	306985	354835	0.865	0.867
	3	6898	8400	0.821	112963	142149	0.795	0.796
	4	1047	2009	0.521	33089	53458	0.619	0.615
	5	87	262	0.332	4455	9461	0.471	0.467
	6	3	27	0.112	129	1404	0.092	0.092
	0-1*							1.088
<i>N. PCC 7120</i>	2	101174	99869	1.013	96331	99846	0.965	0.989
	3	96744	90059	1.074	46479	42562	1.092	1.080
	4	59788	59117	1.011	21905	18299	1.197	1.055
	5	16821	16758	1.004	2599	3043	0.854	0.981
	6	3163	3695	0.856	289	533	0.542	0.817
	0-1*							0.991
<i>O. terrae</i>	2	24375	20209	1.206	242758	306422	0.792	0.818
	3	25404	18811	1.350	67113	110286	0.609	0.717
	4	13098	10064	1.301	19202	37092	0.518	0.685
	5	3662	2508	1.460	1880	5608	0.335	0.683
	6	477	457	1.043	151	806	0.187	0.497
	0-1*							1.093
<i>P. atrosepticum</i>	2	45340	48191	0.941	144636	160392	0.902	0.911
	3	41669	39014	1.068	42824	56242	0.761	0.887
	4	29957	28090	1.066	13812	18096	0.763	0.948
	5	8502	8216	1.035	1208	2227	0.543	0.930
	6	1732	2317	0.748	163	354	0.460	0.710
	0-1*							1.031
<i>P. naphthalenivorans</i>	2	19026	15334	1.241	205635	218273	0.942	0.962
	3	22361	16582	1.348	64043	86072	0.744	0.842
	4	16886	11383	1.483	14371	24479	0.587	0.872

<i>R. baltica</i>	2	92151	72214	1.276	228844	268980	0.851	0.941
	3	78846	68796	1.146	66533	94091	0.707	0.893
	4	32560	33095	0.984	22235	33283	0.668	0.825
	5	6916	8256	0.838	2402	5412	0.444	0.682
	6	819	1555	0.527	188	878	0.214	0.414
	0-1*							1.032
<i>R. castenholzii</i>	2	34290	33519	1.023	188568	232168	0.812	0.839
	3	21870	26451	0.827	48214	79488	0.607	0.662
	4	10627	11966	0.888	19077	30948	0.616	0.692
	5	2199	2856	0.770	1887	4459	0.423	0.559
	6	330	554	0.596	224	758	0.296	0.422
	0-1*							1.085
<i>R. RS-1</i>	2	35382	36136	0.979	197635	243391	0.812	0.834
	3	22025	27250	0.808	55543	83691	0.664	0.699
	4	11133	12307	0.905	21774	33015	0.660	0.726
	5	2438	2955	0.825	2393	4886	0.490	0.616
	6	319	556	0.574	328	873	0.376	0.453
	0-1*							1.081
<i>R. denitrificans</i>	2	23575	23357	1.009	156714	170444	0.919	0.930
	3	29926	23451	1.276	52747	63400	0.832	0.952
	4	18548	14828	1.251	23872	29262	0.816	0.962
	5	4368	3797	1.150	2851	4359	0.654	0.885
	6	414	871	0.475	492	922	0.533	0.505
	0-1*							1.024
<i>S. arenicola</i>	2	13336	18152	0.735	297474	308568	0.964	0.951
	3	6464	9765	0.662	110957	129059	0.860	0.846
	4	1653	2318	0.713	37365	49140	0.760	0.758
	5	271	329	0.823	4593	8480	0.542	0.552
	6	14	35	0.402	305	1416	0.215	0.220
	0-1*							1.049
<i>S. proteamaculans</i>	2	39161	36594	1.070	213232	208091	1.025	1.032
	3	39159	32998	1.187	61006	80244	0.760	0.885
	4	26575	23141	1.148	19415	23186	0.837	0.993
	5	7201	6643	1.084	1785	2818	0.633	0.950
	6	1474	1868	0.789	175	401	0.437	0.727
	0-1*							1.006
<i>S. usitatus</i>	2	65476	51345	1.275	436941	463126	0.943	0.977
	3	53225	45719	1.164	126252	172919	0.730	0.821
	4	22646	21337	1.061	45366	69268	0.655	0.751
	5	4551	4966	0.916	4822	11829	0.408	0.558
	6	421	771	0.546	447	2132	0.210	0.299
	0-1*							1.039
<i>S. cellulosum</i>	2	22796	23780	0.959	603614	734549	0.822	0.826
	3	12955	13642	0.950	193455	266490	0.726	0.737
	4	3292	3698	0.890	92034	128663	0.715	0.720

	5	558	660	0.846	12035	21442	0.561	0.570
	6	67	79	0.850	1734	4827	0.359	0.367
	0-1*							1.102
<i>T. erythraeum</i>	2	110636	107004	1.034	68293	63007	1.084	1.052
	3	101064	93766	1.078	32841	28270	1.162	1.097
	4	77174	73174	1.055	13499	10434	1.294	1.085
	5	24320	23241	1.046	1753	1667	1.052	1.047
	6	5656	6150	0.920	180	264	0.682	0.910
	0-1*							0.975
geometric mean	2	-	-	1.055	-	-	0.940	0.962
	3	-	-	1.046	-	-	0.831	0.898
	4	-	-	0.983	-	-	0.788	0.861
	5	-	-	0.952	-	-	0.551	0.737
	6	-	-	0.696	-	-	0.325	0.488
	0-1*	-	-		-	-		1.026

* codon pairs with 0-1 repeats represents those with no mononucleotides in the pair junction. For each species, if all the codon pairs with 0-6 repeats are considered, the sum of e equals the sum of the counts of θ .