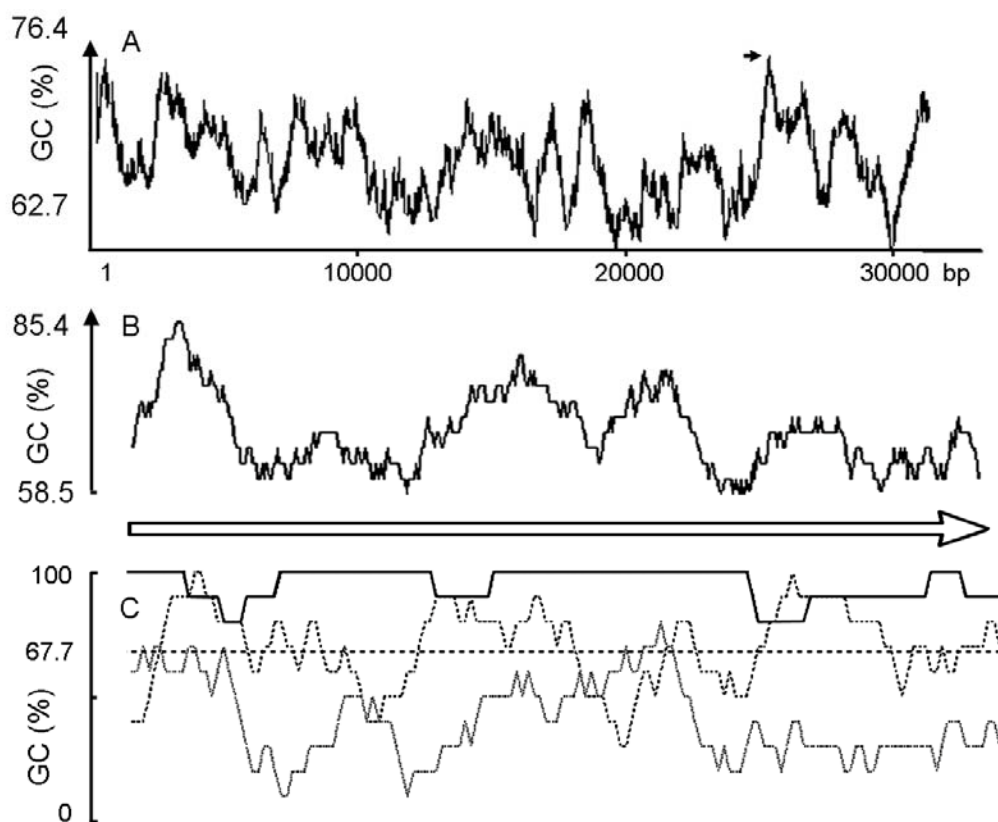


### The IDs of proteins used in Figure 1:

ACIAD1205-A. sp. ADP1 (CAG68082); AAH-*M. arborescens* (AAV65949);  
all1173-*N. sp.* PCC7120 (BAB73130); BL0618-*B. longum* (NP\_695805); BR2149-*B. suis* (AAN31039); CE2833-*C. efficiens* (BAC19643); Cgl2999-*C. glutamicum* (BAC00393); CJE1705-*C. jejuni* (YP\_179683); DIP2303-*C. diphtheriae* (CAE50826); Dpl-1-*B. anthracis* (AAP28955); Dpl-2-*B. anthracis* (AAP25903); Dpr-*S. mutans* (BAA96472); DpsA-*S. elongatus* (YP\_401188); Dps-A-*tumefaciens* (NP\_533149); Dps-B-*brevis* (1N1QA); Dps-B-*fragilis* (BAD48082); Dps-C-*feundii* (AAO47739); Dps-E-*cloacae* (AAO41729); Dps-E-*coli* (NP\_415333); Dps-K-*cryocrescens* (AAO41728); Dps-K-*pneumoniae* (AAO41730); Dps-P-*vulgaris* (AAO47740); Dps-S-*aureus* (NP\_372663); Dps-S-*marcescens* (AAO47741); Dps-S-*flexneri* (AAN42397); Dps-*M. smegmatis* (AAL40885); DpsA-*S. elongatus* (AAA86318); ECA2767-*E. carotovora* (CAG75667); Flp-*L. innocua* (P80725); FtpA-*H. ducreyi* (AAP95079); IL0075-*I. loihiensis* (AAV80918); GOX0707-*G. oxydans* (AAW60484); Lxx08790-*L. xyli* (YP\_061879); MAP3560-*M. avium* (AAS06110); MrgA-*B. subtilis* (NP\_391178); MS0670-*M. succiniciproducens* (AAU37277); NapA-*H. pylori* (AAD07308); nfa13000-*N. farcinica* (YP\_117509); nfa43820-*N. farcinica* (YP\_120595); PPA2134-*P. acnes* (AAT83841); RB4433-*R. baltica* (CAD73784); SAV1605-*S. avermitilis* (BAC69316); SAV2504-*S. avermitilis* (BAC70215); SCO0596-*S. coelicolor* (CAB61290); STH866-*S. thermophilum* (YP\_074695); STM0831-*S. typhimurium* (NP\_459808); TpF1-*T. pallidum* (P16665); TW375-*T. whipplei* (NP\_789308); y1677-*Y. pestis* (NP\_668995); Ferritin-*E. coli* (AAC74975)

**FIGURE S1. The GC profiles of the *aah* gene.**

A, the GC distribution on the whole cotig. The location of the *aah* gene is indicated by a black arrow. B, the GC content of the whole *aah* coding region. The gene is diagrammed as a hollow arrow. C, Plots of GC content at different base positions of the codons. Solid curve is GC3; broken curve is GC1; dotted curve is GC2. The broken straight line is the average GC content of the ORF with value shown on the y axis.



**TABLE S1. The stop codon usage and genome GC content in some bacteria.**

Species <sup>a</sup>	GC content (%)	ORF counted	Stop codon usage (%) <sup>b</sup>		
			TAA	TAG	TGA
<i>Mycoplasma mobile</i> 163K	25.0	635	84.25	15.75	0
<i>Rickettsia typhi</i> wilmington	28.9	835	64.79	17.60	17.60
<i>Campylobacter jejuni</i> RM1221	31.0	1840	64.46	9.84	25.71
<i>Methanococcus maripaludis</i> S2	33.1	1714	85.06	7.58	7.35
<i>Bacillus anthracis</i> Ames	35.0	5365	68.33	16.01	15.66
<i>Staphylococcus aureus</i> MW2	37.0	2632	73.44	15.35	11.21
<i>Haemophilus ducreyi</i> 35000HP	38.2	1717	74.02	16.48	9.49
<i>Streptococcus pneumoniae</i> R6	40.0	2043	59.72	23.20	17.08
<i>Bacillus subtilis</i> 168	42.0	4098	62.05	14.42	23.52
<i>Lactobacillus plantarum</i> WCFS1	44.5	3009	57.76	25.06	17.18
<i>Vibrio vulnificus</i> YJ016	45.0	3261	62.43	19.38	18.18
<b><i>Tropheryma whippelii</i> TW08/27</b>	46.3	780	31.79	34.23	33.97
<i>Synechocystis</i> sp. PCC6803	47.0	3163	43.82	36.36	19.82
<i>Escherichia coli</i> K12-MG1655	50.0	4285	63.08	7.61	29.31
<i>Salmonella enterica</i> serovar Typhi CT18	52.0	4387	59.04	9.78	31.18
<i>Corynebacterium glutamicum</i> ATCC 13032	53.8	3057	53.32	30.06	16.62
<i>Synechococcus elongatus</i> PCC 7942	55.4	2611	32.82	39.64	27.54
<i>Chlorobium tepidum</i> TLS	56.0	2254	33.72	9.01	57.28
<i>Agrobacterium tumefaciens</i> str. C58	59.0	2785	26.25	11.45	62.30
<i>Desulfovibrio desulfuricans</i> G20	60.0	3775	30.86	24.08	45.06
<i>Bifidobacterium longum</i> NCC2705	60.0	1729	23.71	19.84	56.45
<i>Thiobacillus denitrificans</i> ATCC 25259	63.0	2827	17.97	16.63	65.41
<i>Corynebacterium efficiens</i> YS-314	63.1	2950	25.8	36.68	37.53
<i>Azoarcus</i> sp. EbN1	65.1	4115	13.68	12.95	73.37
<i>Halobacterium</i> sp. NRC-1	65.9	2058	20.46	29.2	50.34
<i>Pseudomonas aeruginosa</i> PAO1	67.0	5565	9.45	11.48	79.07
<b><i>Leifsonia xyli</i> CTCB07</b>	67.7	2030	10.1	21.48	68.42
<b><i>M. arborescens</i> SE14 - 10D5</b>	69.3	27	3.70	7.41	88.89
<i>Thermus thermophilus</i> HB27	69.4	1982	19.48	37.74	42.79
<i>Nocardia farcinica</i> IFM 10152	70.7	5722	3.43	14.59	81.98
<i>Streptomyces coelicolor</i> A3(2)	72.1	7493	4.46	17.52	78.02

<sup>a</sup>. All data are the result of analyzing the whole genome, except *M. arborescens* SE14. All non-chromosome sequences such as plasmids had been omitted even if they had been deposited. Bold words are for highlighting purposes.

<sup>b</sup>. In *Mycoplasma* species, “TGA” is used to encode tryptophan instead of stop signal, *e.g* there are 1756 “TGA” coding Tryptophan in the genome in *Mycoplasma mobile* 163K.