Supplementary Materials

Rooted tRNAomes and Evolution of the Genetic Code

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Supplemental Figures

Figure S1. An evolutionary tree of the *Pyrococcus furiosis DSM3638* (archaea) DNA tRNAome. Trees are rooted to $tRNA^{Pri}$. An error was corrected in $tRNA^{Arg}$ (anticodon GCG), in which the 5'- and 3'-acceptor stems did not fully pair.

Figure S2. An evolutionary tree of the *Pyrococcus abyssi GE5* (archaea) tRNAome.

Figure S3. An evolutionary tree of the *Pyrococcus horikoshii OT3* (archaea) tRNAome.

Figure S4. An evolutionary tree of the *Staphylothermus marinus F1* (archaea) tRNAome.

Figure S5. An evolutionary tree of the *Pyrobaculum aerophilium str. IM2* (archaea) tRNAome.

Figure S6. An evolutionary tree of the *Sulfolobus solfataricus P2* (archaea) tRNAome.

Figure S7. An evolutionary tree of the *Aeropyrum pernix K1* (archaea) tRNAome.

Figure S8. An evolutionary tree of the *Thermus thermophilus HB27* (bacteria) tRNAome.

Figure S9. Typical tRNA diagrams for *Pyrococcus furiosis*, *Thermus thermophilus* and *Escherichia coli*. Diagrams were generated using the tRNA database.[1]

Figure S10. Modifications of tRNAs in archaea. Modifications are shown for *Haloferax volcanii* (archaea). In the *Pyrococcus* typical DNA diagram: cyan dots) anticodon bases; orange dots) loop bases 6-7 (loop bases 3-7 are tightly stacked as in a helix, filling the 7-mer loop); yellow dots) intercalation of D loop G19 lifts T loop base 5 to the position of base 7 in the anticodon loop, flipping bases 6 and 7 out of the T loop. U turns are indicated (red arrows). The discriminator base is indicated (cyan arrow).

References:

1. Juhling F, Morl M, Hartmann RK, Sprinzl M, Stadler PF, Putz J. tRNAdb 2009: compilation of tRNA sequences and tRNA genes. Nucleic Acids Res 2009; 37:D159-62.

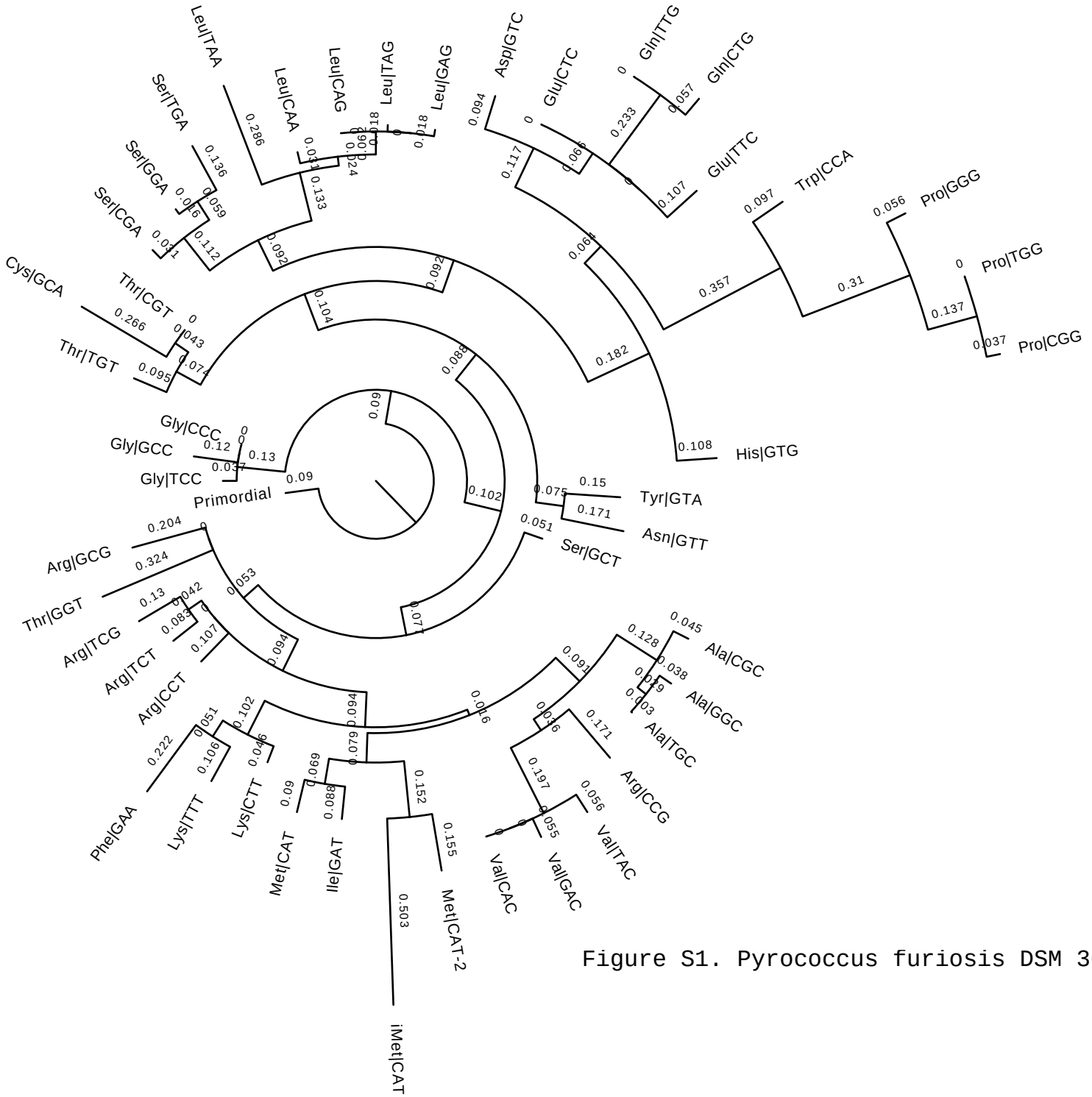


Figure S1. Pyrococcus furiosis DSM 3638.

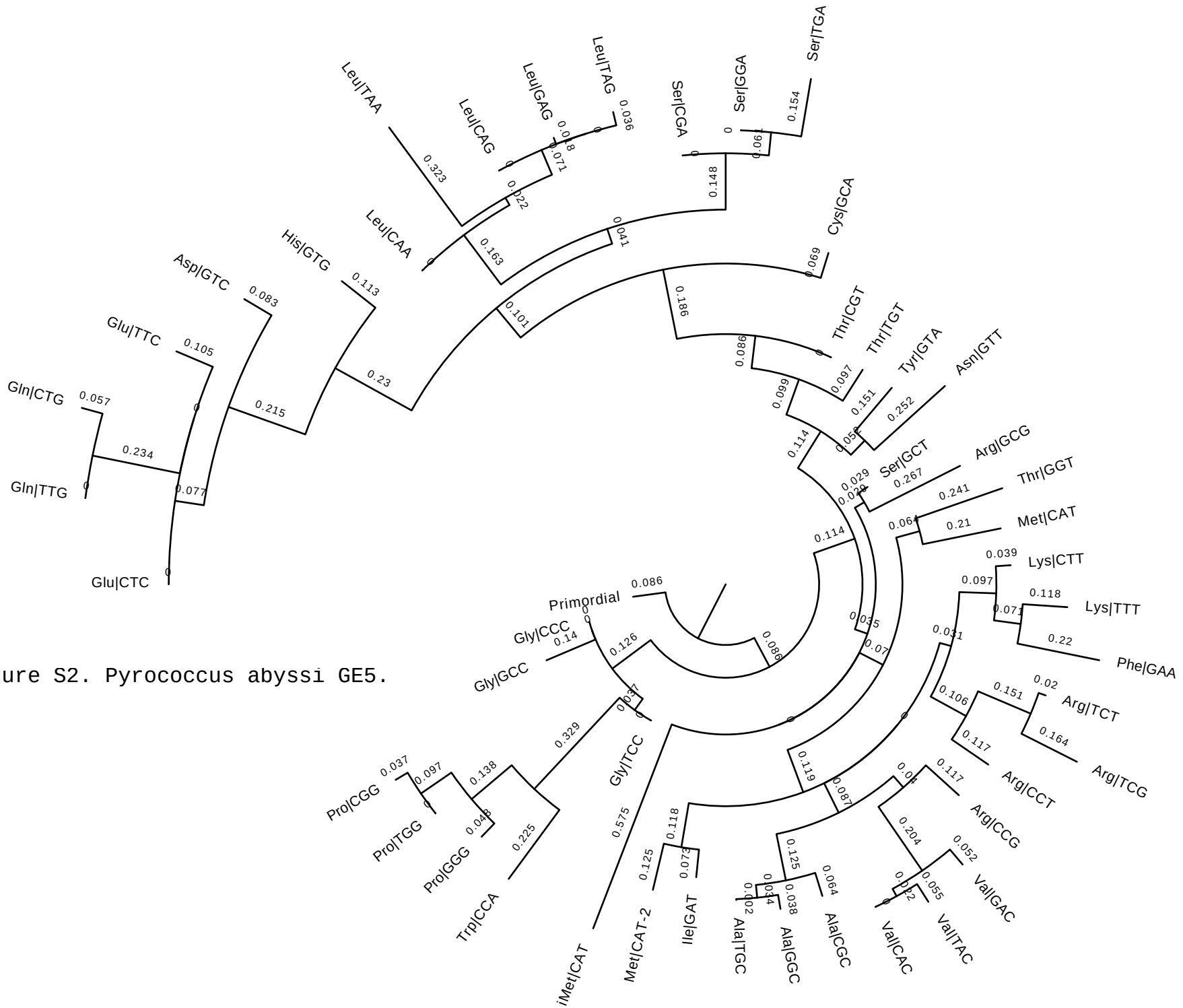


Figure S2. Pyrococcus abyssi GE5.

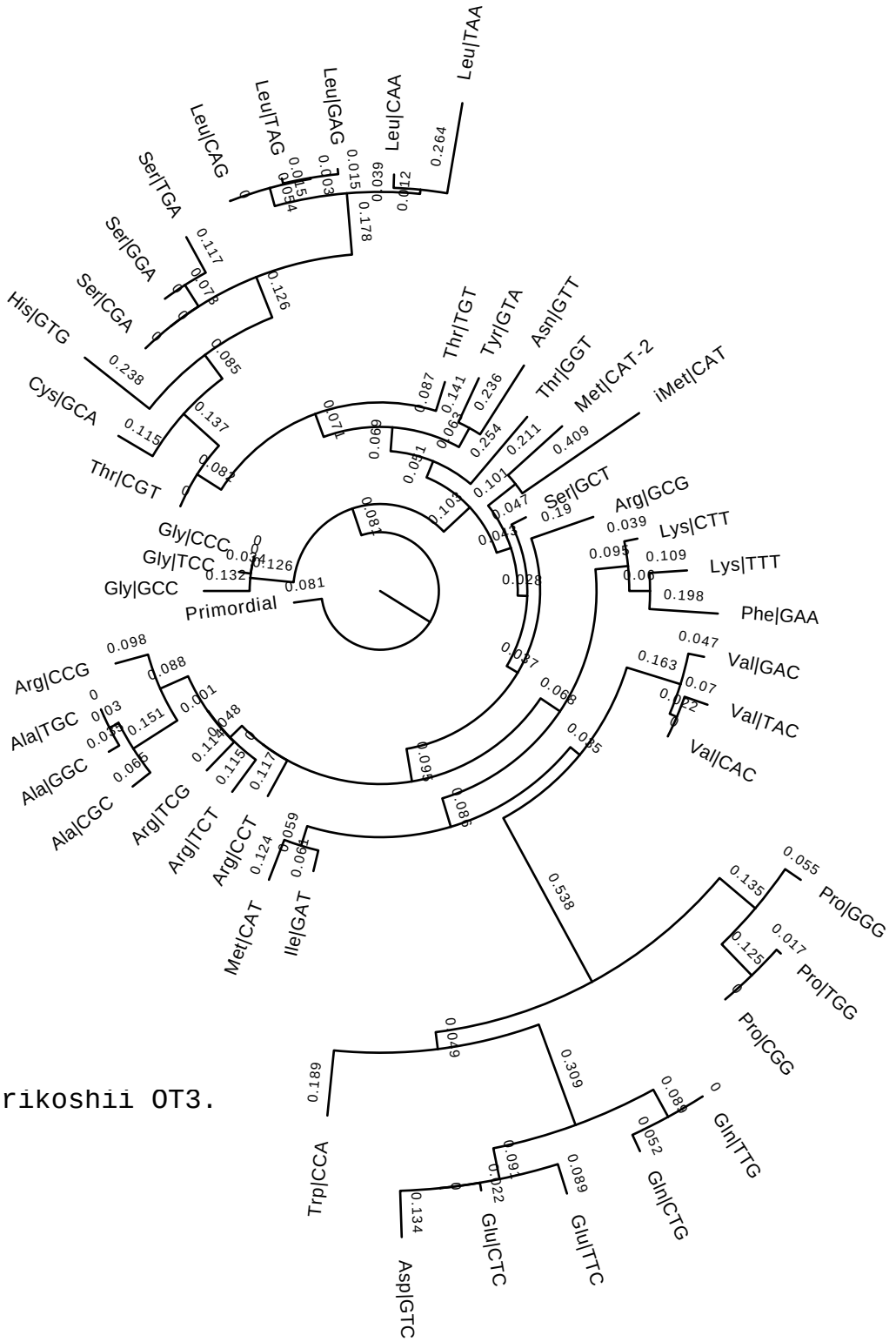


Figure S3. Pyrococcus horikoshii OT3.

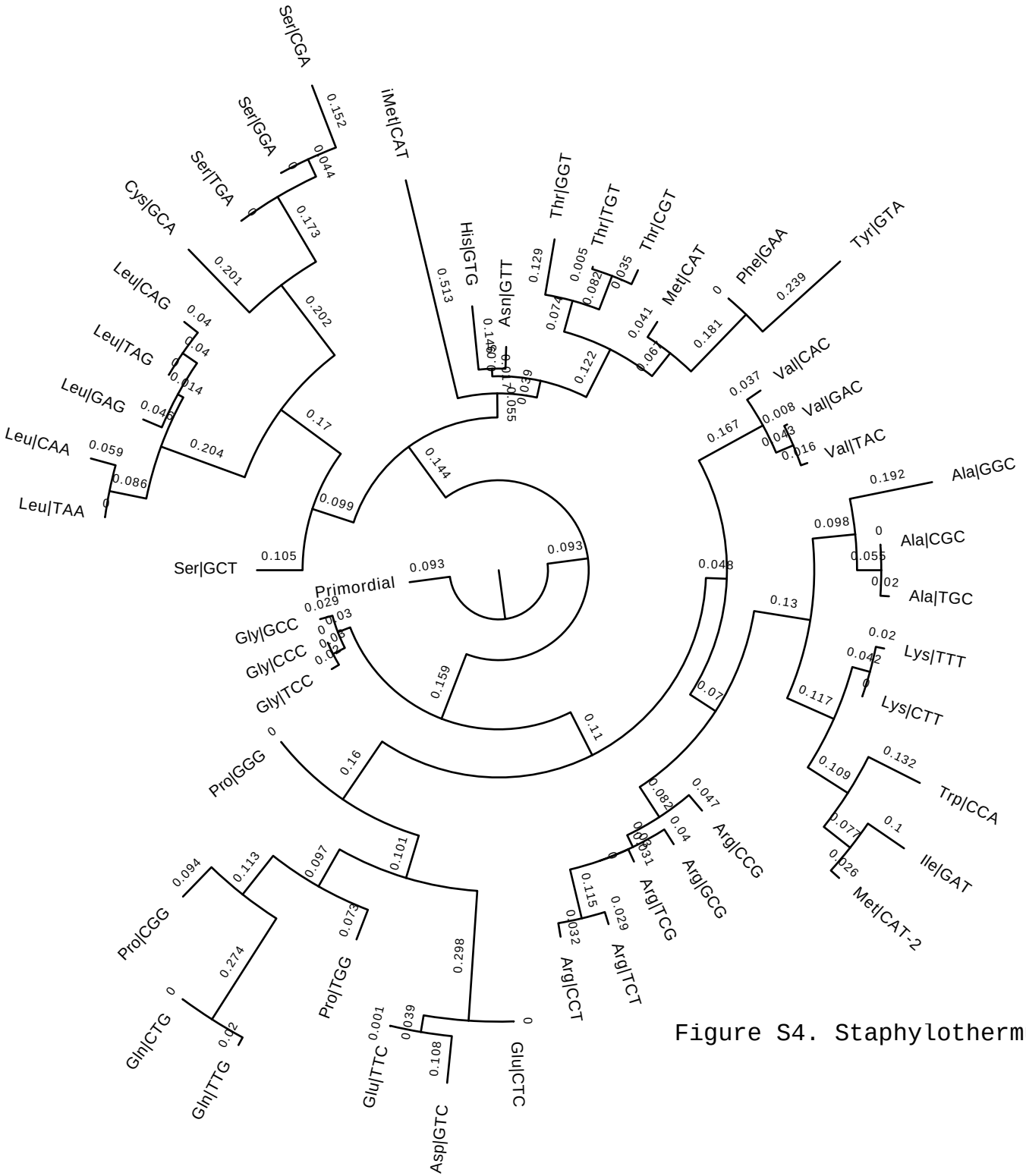


Figure S4. Staphylothermus marinus F1.

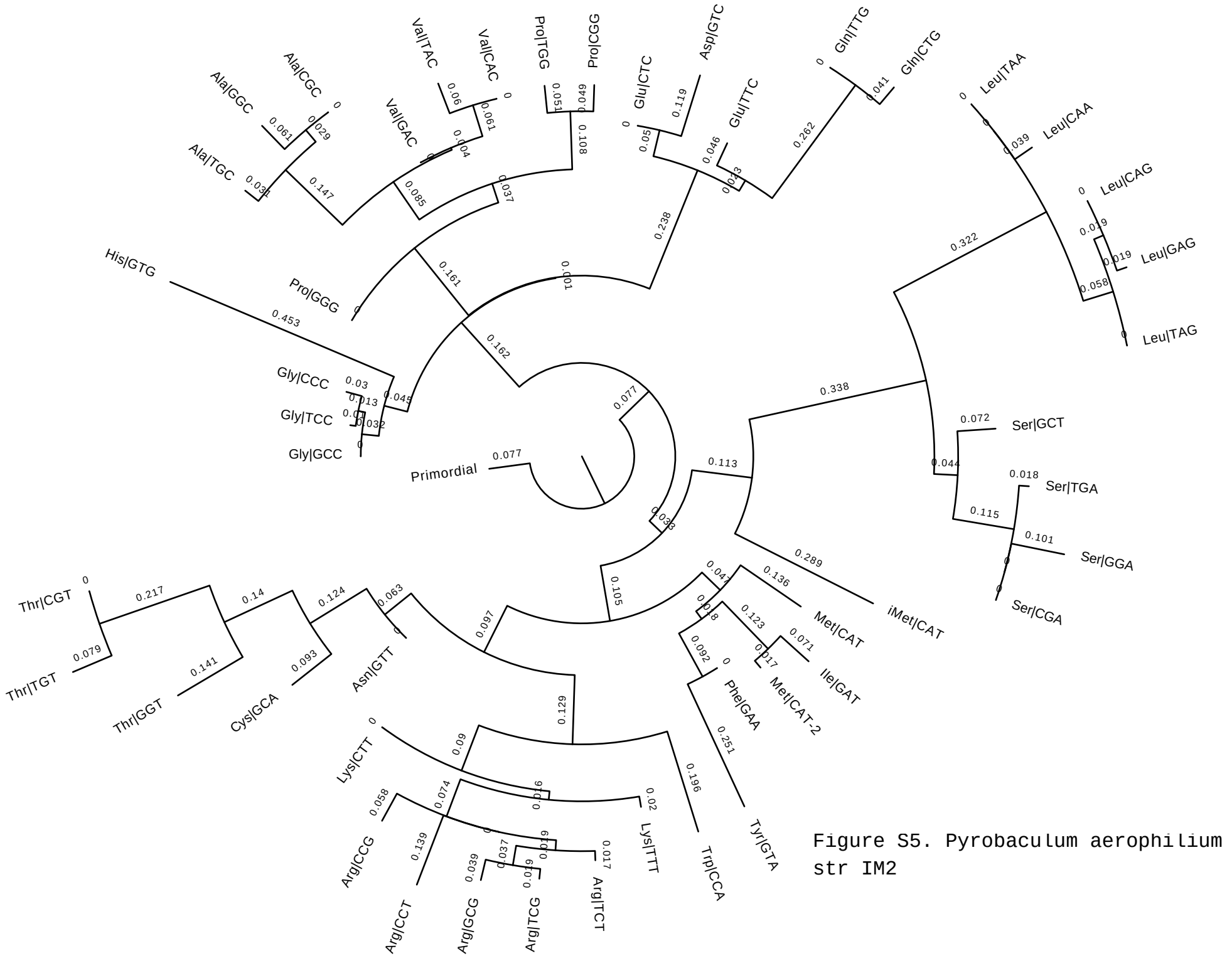
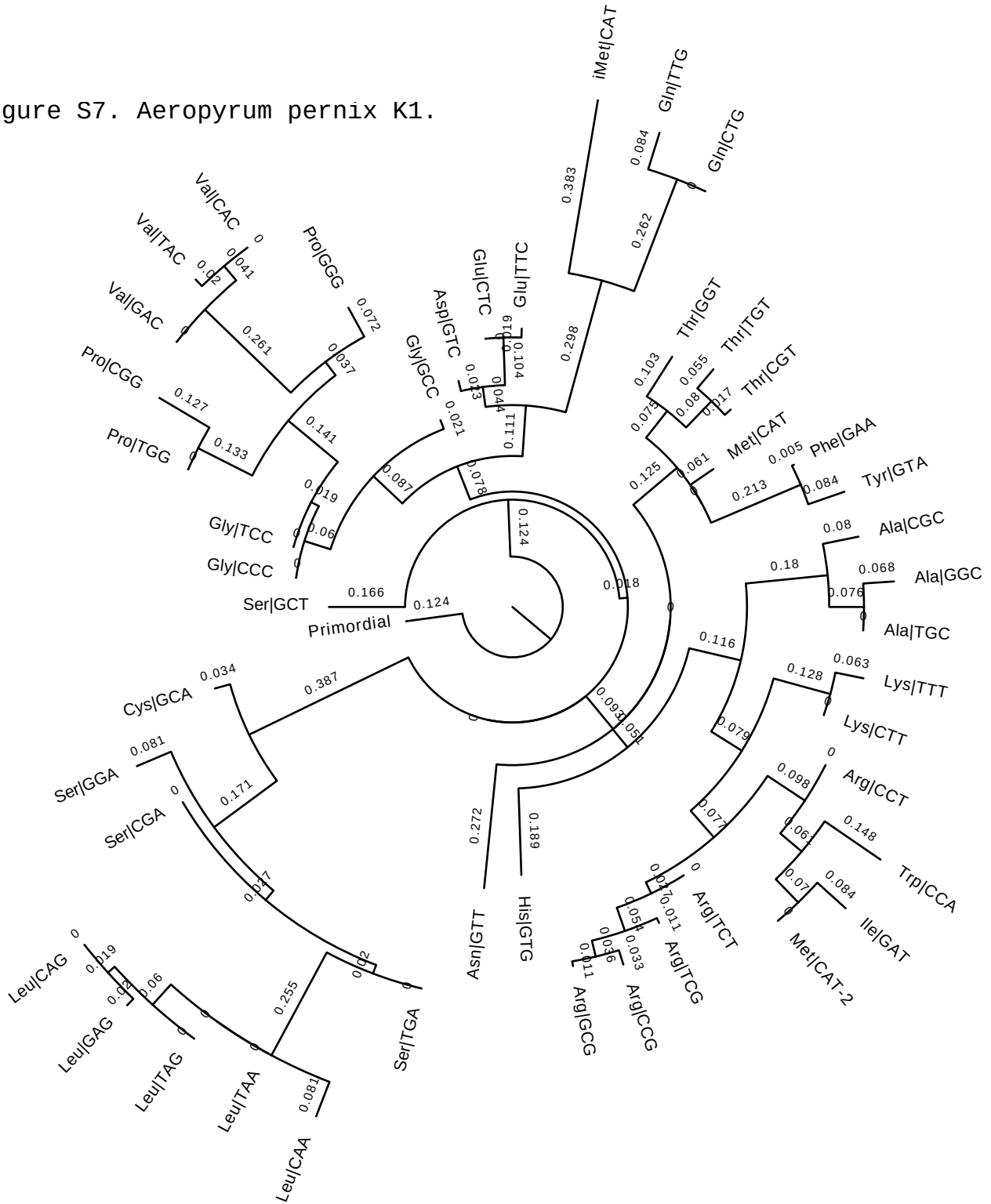


Figure S5. Pyrobaculum aerophilium str IM2

Figure S6. Sulfolobus solfataricus P2.

Figure S7. Aeropyrum pernix K1.



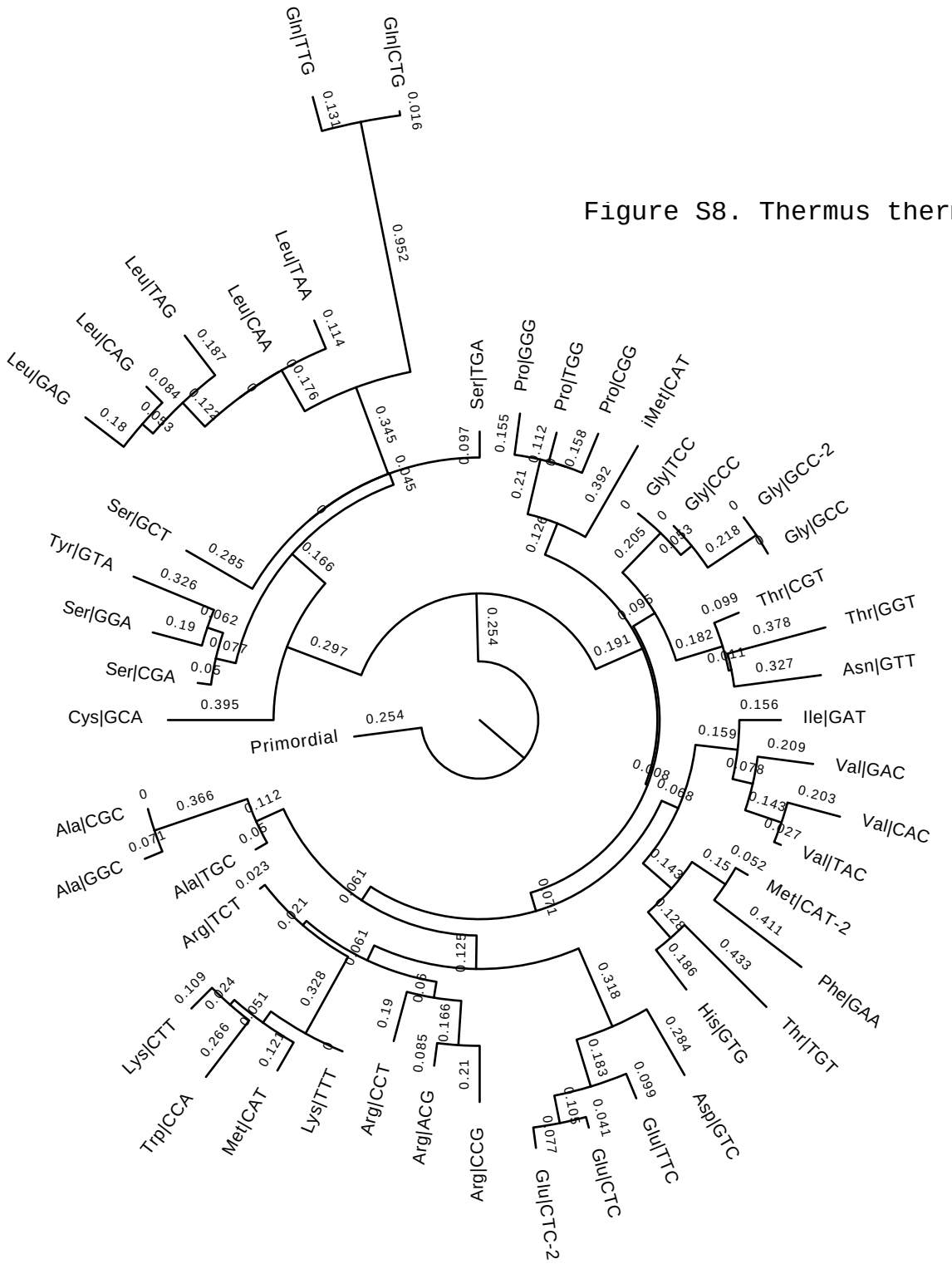
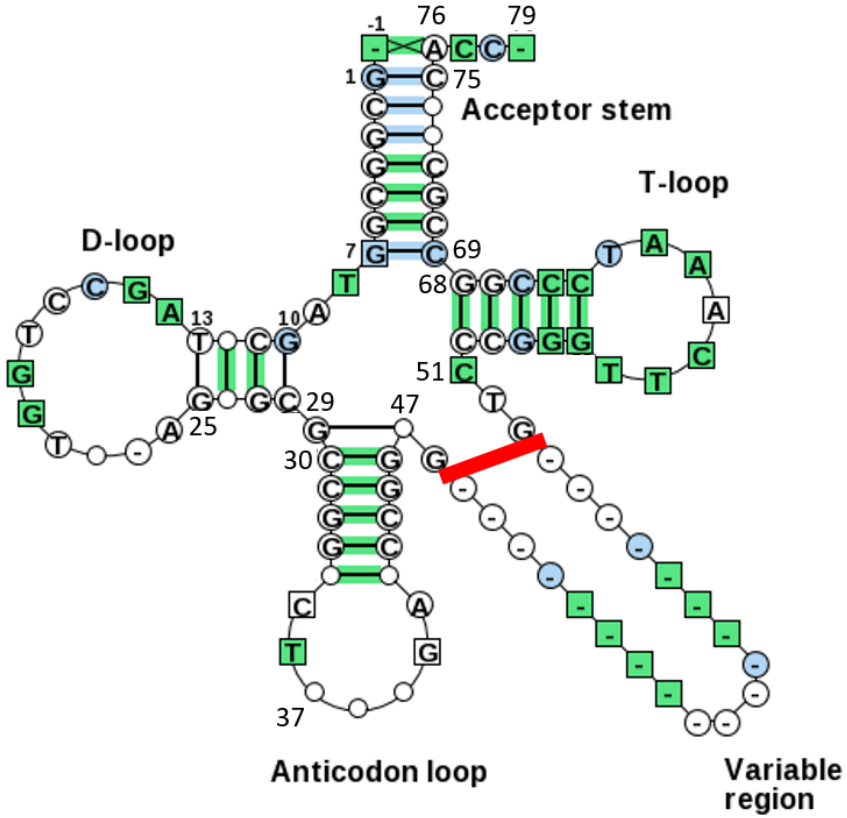
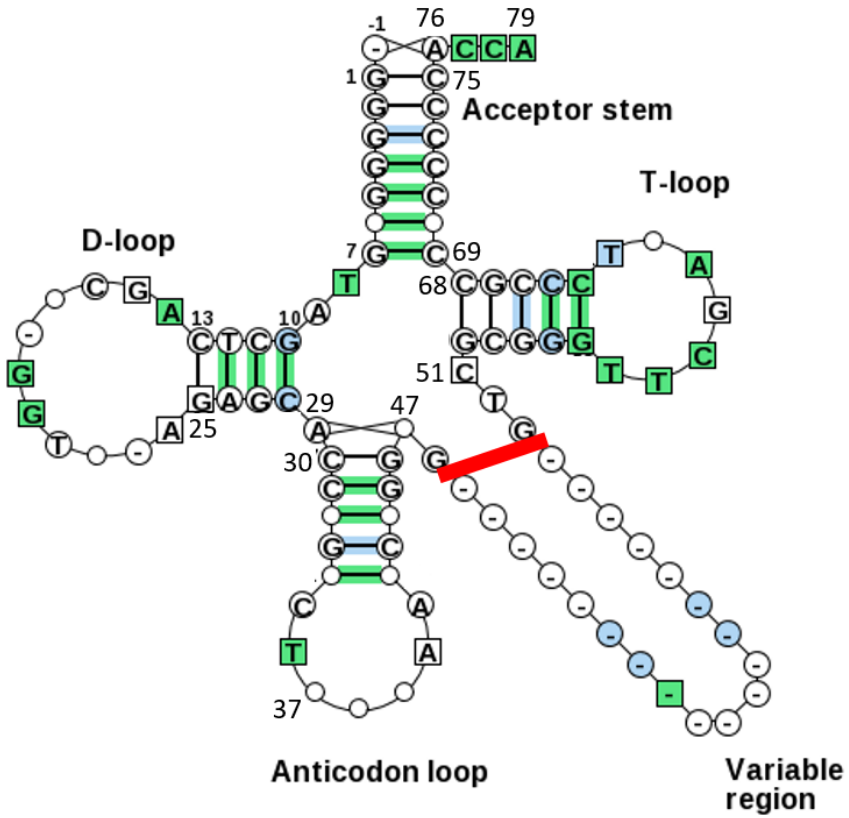


Figure S8. Thermus thermophilus HB27.

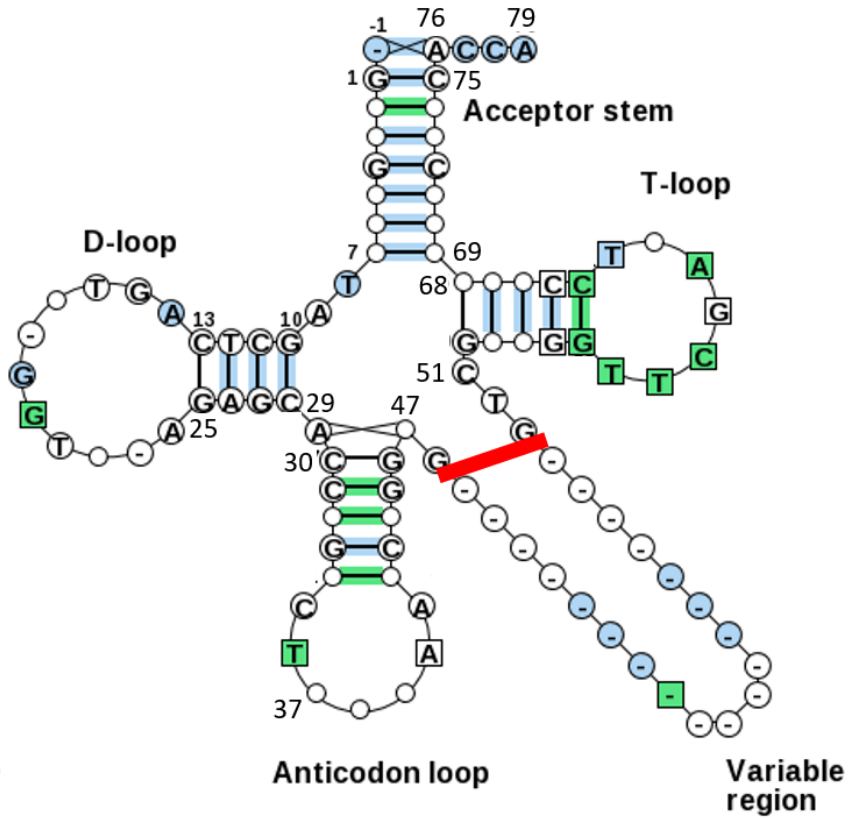
Figure S9. Typical tRNAs.



Pyrococcus furiosis DSM 3638

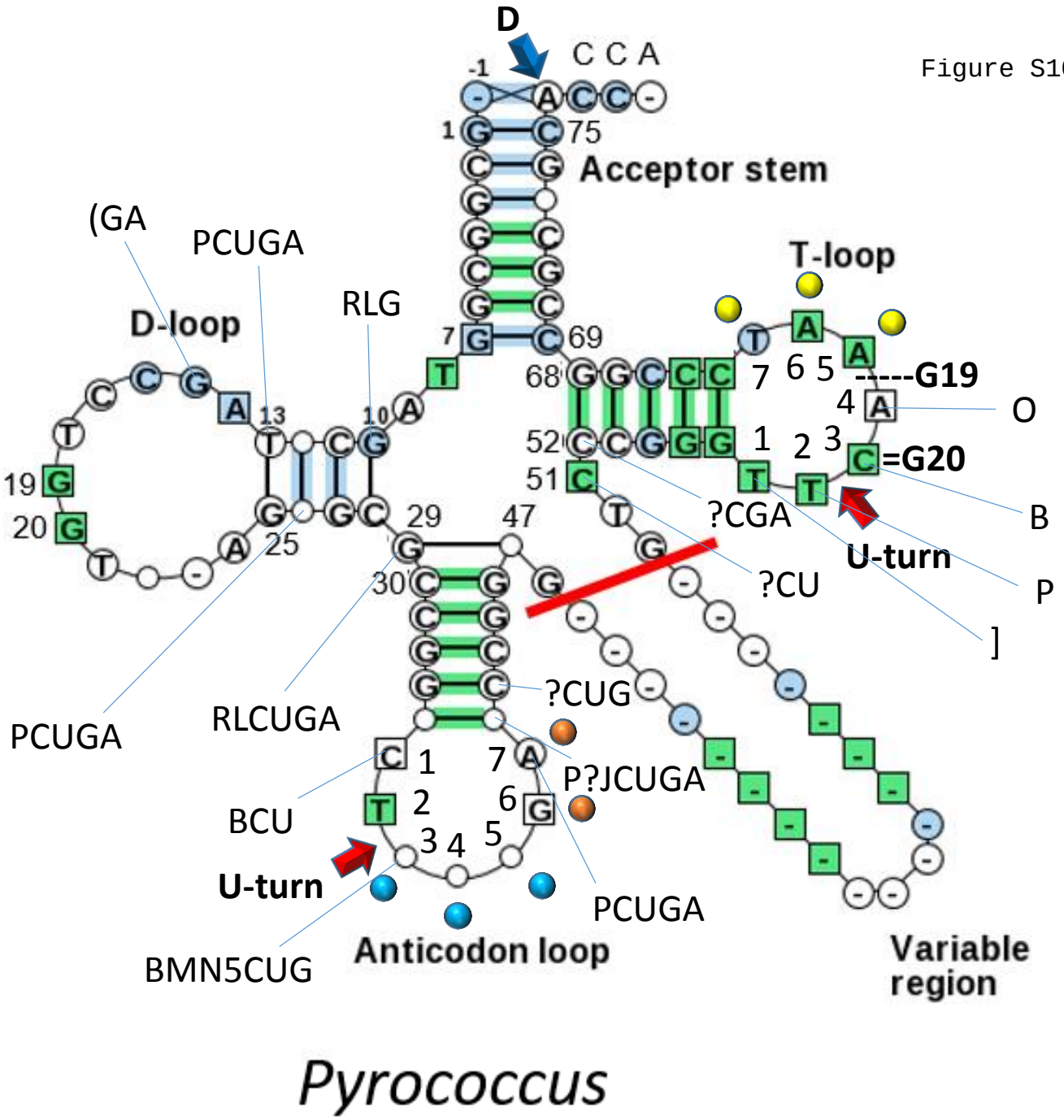


Thermus thermophilus HB27



Escherichia coli K12

Figure S10. tRNA modifications in archaea.



Key:

R	N2-N2-dimethylguanosine
L	N2-methylguanosine
P	pseudouridine
(	archaeosine
B	2’-O-methylcytidine
M	N4-acetylcytidine
N	unknown modified uridine
5	5-methoxyuridine
?	5-methylcytidine
J	2’-O-methyluridine
]	1-methylpseudouridine
O	1-methylinosine

Modifications from *Haloferax volcanii*