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## Hydrogen bonds are related to the thermal stability of 16S rRNA

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### ABSTRACT

The number of base pairs in the 16S rRNA secondary structures of 51 bacterial sequences was counted, and the number of hydrogen bonds was estimated. The number of hydrogen bonds was highly correlated with the optimal growth temperature (OGT) rather than with the G + C content. Paired and unpaired nucleotides in mesophiles were compared to those in thermophiles. OGT exhibited a relationship with paired nucleotides but not with unpaired nucleotides. The total number of paired as well as unpaired nucleotides in mesophiles was very similar to that in thermophiles. However, the components in base pairs in mesophiles significantly differed from those in thermophiles. As compared with mesophiles, the number of G·C base pairs in thermophiles was high whereas that of A·U base pairs was low. In this study, we showed that hydrogen bonds are important for stabilizing 16S rRNAs at high temperatures.

### KEYWORDS

Optimal Growth Temperature; 16S Ribosomal RNA; G + C Content; Hydrogen Bonds; Base Pairs; Nucleotide Compositions

### Cite this paper

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