Predicting DNA Melting Temperature from composition

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# List of Symbols and Abbreviations

|  |  |
| --- | --- |
| Abbreviation | Definition |
| bp | base pair |
| oC | Celsius degree |
| DNA | Deoxyribonucleic acid |
| dNTPS | Deoxynucleotide Triphosphates |
|  | Enthalpy |
|  | Entropy |
| %GC | GC content |
|  | Gibbs free energy |
|  | Magnesium(II) |
|  | Melting Temperature |
| mM | milliMolar |
| g | microgram |
| NN | Nearest-Neighbour |
| PCR | Polymerase Chain Reaction |
| KCl | Potassium chloride |
| qPCR | quantitative Polymerase Chain Reaction |
| RNA | Ribonucleic acid |
| R | Boltzmann's gas constant |
|  | Sodium(I) |
| Taq | *Thermus aquaticus* |

# Summary

The melting temperature should be correctly determined for polymerase chain reaction primers. Methods for estimating are important to determine the appropriate temperatures to use in a protocol because they are one of the factors that affect the function of oligonucleotides.

The main factors to consider in a PCR assay are melting temperature and primers. The choice of the oligonucleotide primer is critical for the success of the PCR assay. Manual primer

In addition, we compared the results obtained by placing additional information (the main factors affecting are such as , % GC content, base pair) from the von Ahsen's article into the calculation formulas. We observed the relation between these two and made a regression analysis.

**Figure 1. Predictions using all the formulas described on the text.** We assumed 0.2M salt concentation, 20 base pairs () and reasonable %GC content in the range 30%-70%.