# Thermodynamics of Folding

## Thermodynamics of Folding: $\Delta G = \Delta H - T\Delta S$

- ΔG = 1.19 kcal/mol at 54 °C
- ΔH = -43.20 kcal/mol
- ΔS = -135.6 cal/(K·mol)
- $T_m$ = 45.2 °C assuming a 2 state model.
- linear DNA folding.
- Ionic conditions: [$Na^+$] = 0.05 M, [$Mg^{++}$] = 0 M.
- Standard errors are roughly ±5%, ±10%, ±11% and 2-4 °C for free energy, enthalpy, entropy and $T_m$, respectively.

Structure 4
0F_CGTGT_end
ΔG = 1.19

| Structural element | δG | Information |
|---|---|---|
| External loop | 0.00 | 1 ss bases & 1 closing helices. |
| Stack | -0.70 | External closing pair is c $^{1}$-G $^{23}$ |
| Stack | -0.70 | External closing pair is a $^{2}$-T $^{22}$ |
| Stack | -1.35 | External closing pair is c $^{3}$-G $^{21}$ |
| Stack | -0.56 | External closing pair is g $^{4}$-C $^{20}$ |
| **Helix** | -3.31 | 5 base pairs. |
| Hairpin loop | 4.50 | Closing pair is A $^{5}$-T $^{19}$ |