DNA Melting [pln89]

During melting the two strands of ds-DNA come apart. The bonds of base pairing and base stacking are broken in the process.

Melting is facilitated at high T, low salinity, high pH. Charged phosphate groups in backbone have destabilizing effect. This effect can be controlled by ion concentration in fluid medium. DNA melting via thermal fluctuations observed to occur above $\sim 50°$C.

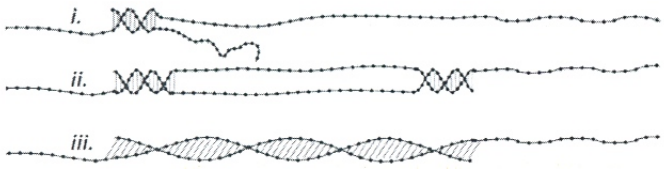
DNA melting transition is, in general, sharper than the coil-helix transition in polypeptides. The difference is attributable to the loop effect present in melting bubbles with no equivalent counterpart in polypeptides.

Force-induced melting (FIM) is a controlled mechanism of DNA melting by way of overstretching. Overstretching B-DNA without torsional constraint may produce three different kinds of conformational change:

(ii) peeling (with free ends separating),

(ii) internal melting (nucleation and growth of melting bubbles),

(iii) B-S transition (structural transition with cooperativity).



[image from Bosaeus et al. 2014]

Experiments show evidence for all three alternatives. Peeling is associated with effects of hysteresis or irreversibility.