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The Effects of Ion Concentration and pH on the  
Stability of Double and Triple Helical DNA

This study examines the effects of ion concentration ( $\text{Na}^+$  and  $\text{Mg}^{2+}$ ), pH, and temperature on the stability of a certain DNA triple helix, as well as its parent hairpin and duplex structures. DNA triple helices are composed of two strands that bind in the standard Watson-Crick fashion, as well as a third strand that binds within the major groove through Hoogsteen base pairing. Triplexes are present *in vivo*, and are believed to have multiple functions in the body, including regulation of transcription, regulation of translation, and mediation of chromosome folding. In this study, UV spectroscopy and circular dichroism were used to study changes in DNA structure. Low pH increases stability of the triplex, but has little effect on stability of the parent hairpin structure. Increasing ion concentration increases stability of triplexes and hairpins, and  $\text{Mg}^{2+}$  appears to have a much larger effect on stability than does  $\text{Na}^+$ .