

The Influence of Osmolytes on the Stability of UNCG Hairpins

Osmolytes, an essential part of the cellular response to environmental stresses, are small, chemically diverse organic solutes. Although much is known about the effects of osmolytes on higher-order protein and nucleic acid structures, the effects of osmolytes on RNA secondary structure motifs, is generally less-well defined. To begin quantifying these effects, we selected hairpins containing tetraloops of the UNCG family (where N is any nucleotide) as model sequences. UNCG tetraloops are the common loops found in RNA structures, and this abundance is due to the high stability of the loops and their functional roles as folding nucleation sites for more complex RNA structures. In this study we investigate the folding thermodynamics of UNCG loops in the presence and absence of a neutral cosolute (PEG 200) using UV-Vis and Circular Dichroism spectroscopy. We will present our current findings as well proposed future directions for this work.