Opening of DNA Double Helix at Room Temperature: Application of α-cyclodextrin Nanoaggregates

Materials. The entire work was performed using herring sperm DNA (hsDNA), which was obtained as lyophilized powder from Dr. Paulraj Balaji, Department of Botany, Madurai Kamaraj University, India and used without further purification. α-CD and Tris buffer were procured from Sigma-Aldrich, St. Louis, MO, USA and used as received. HPLC grade water procured from Fisher Scientific, Pittsburgh, PA, USA was used throughout the experiment. All the other chemicals were of high purity and bought from Merck, India.

Techniques. A Varian Cary 300 Bio UV-visible spectrophotometer equipped with a Varian Cary Dual Cell Peltier accessory was used to take the absorption spectra of the samples equilibrated at 25^{o}C by the temperature controller. The obtained data were plotted using the Origin 8.0 software procured from OriginLab Corp., Northampton, MA, USA. The TEM images were taken using an FEI (Czech Republic), type FP5018/40 TECHNAI G2 SPIRIT BioTWIN transmission electron microscope.

TEM experiments. To obtain proper resolution we have used 100 kV voltage and either 8200x or 26500x magnifications. A 300 mesh copper grid coated with carbon (GSCu300C) from ProSciTech, Thuringowa, Australia was used as the substrate for the TEM experiment.

Absorbance of ds-DNA at higher concentrations of α-CD

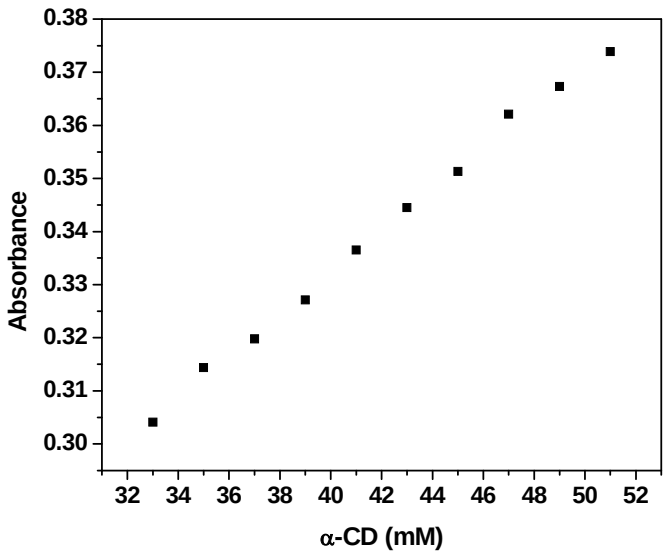

Fig. Plot of absorbance of ds-DNA at 260 nm against α-CD concentration. The linear trend shows that at higher CD concentration (above 33 mM) the DNA loses its double helicity and formation of single strand is perceived.[1]

Reference

1 H. Lodish, A. Berk, C. A. Kaiser, M. Krieger, M. P. Scott, A. Bretscher, H. Ploegh and P. Matsudaira, in *Molecular Cell Biology*, 6th ed., W. H. Freeman and Company, New York, 2008, pp. 117.