

Spectroscopic Investigation of Tryptophan Silver Nanoparticle with DNA in DNA-Nanoparticle Conjugate

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Abstract

In recent years, DNA-NP conjugates have attracted more attention due to their synergistic properties. The present study focuses on the binding of tryptophan functionalized AgNPs (Tryp-AgNPs) to DNA in the DNA-NP conjugate using spectroscopic and hydrodynamic measurements. The observations reveal that Tryp-AgNPs bind to DNA via intercalative mode in DNA-AgNP conjugate, which is further supported by thermal denaturation and viscosimetry. Circular dichroism analysis displays considerable conformational transition by changing helicity and base stacking of DNA to accommodate tryptophan residue. The systematic analysis will pave way for the application of DNA-AgNP conjugate in the sensors and also in the recognition of a basic sites.

Keywords: DNA-NP conjugate, tryptophan, thermal stability, intercalative binding, Conformational transition