Abstract

Advantages such as good biocompatibility, easy synthesis and connection to a variety of biomolecular ligands (e.g. DNA, RNA and proteins), antibodies and other targeting molecules, make nanoparticles very important and have many applications in our lives. The use of nanoparticles causes increasing the sensitivity, selectivity and multidimensional capacity. The nanoparticles based approaches have many advantages to current methods of molecular diagnostics. In this study, different DNA fragments with different characteristics like the length (bp) and GC content were prepared by designing appropriate primers. Genes located on the chromosome of *E. coli* bacteria and human genomes were used to prepare these fragments. Then double-stranded DNA was converted to single strand. After ensuring that PCR productions were single stranded, single-stranded DNA were placed on the surface of gold nanoparticles and the absorption spectrum of solutions containing each fragment were separately assessed and finally, the impact of various factors on the binding of nanoparticle and the DNA fragments were studied using colorimetric assay and the wavelength changes. The results showed that the decrement of DNA fragments length and increment of GC content of DNA increased the tendency of DNA to the surface of the nanoparticles.

Key words: Nucleic acid, Gold nanoparticles, Colorimetric assay

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Effect of different factors on conjugation of nucleic acid and gold nanoparticles

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