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(57) Abstract :
The present invention describes the development of surface-coated iron oxide nanoparticles with silane. The silica-coated iron oxide nanoparticles showed stability and can be used for conjugation of various biomolecules. Bioconjugated iron oxide nanoparticles have significant potential detection and diagnosis abilities in healthcare and biomedicine. The present invention indicates that the silane used for the coating over the surface of iron-oxide nanoparticles protects them from oxidation. Moreover, the silane coating also provides functional groups that facilitate the covalent binding with antibodies, nucleic acid, lipids, and small molecules. The present invention demonstrates the bioconjugation of anti-HER-2 antibodies onto the surface of silica"coated iron. oxide nanoparticles. These nanoparticles revealed the detection and capturing of HER-2 overexpressing circulating tumor cells from the peripheral blood of tumor xenograft mice.

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