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Role of Adhesion of Functionalized Biosynthesized Magnetite Nanoparticles for the specific Targeting of Breast Cancer J. D. OBAYEMI, Princeton University — We present the results of adhesion studies between components of model ligand-conjugated magnetite nanoparticle systems and breast cancer cells (MDA-MB- 231) or normal breast cells (MCF 10A). Adhesion forces between biosynthesized magnetite nanoparticles (BMNPs), chemically synthesized magnetite nanoparticles (CMNPs), as well as their ligand-conjugated systems to MDA-MB-231 or MCF 10A are elucidated at a nanoscale. The results showed that ligand-conjugated BMNPs had over six times higher adhesion forces to breast cancer cells than to normal breast cells. The increase in adhesion forces are mainly attributed to van der Waals interactions and the receptors (revealed via immunofluorescence staining) that are over- expressed on the surfaces of the breast cancer cells. The implications of the results are discussed for the specific targeting of breast cancer cells.

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