Magnetic nanoparticle formulations for DNA and siRNA delivery

Abstract:
Newly synthesized magnetic nanomaterials possess high DNA binding capacity either itself or in the presence of a positively charged lipid-based Metafectene (TM) reagent or branched polyethylene imine 25 kDa. Polyethylene imine (PEI)-modified nanomaterials are able to deliver nucleic acids in cell culture in duplexes. Magnetofection with triplexes of nanomaterials results in higher transduction efficiencies compared to optimal PEI or Metafectene formulations. 90% transient down-regulation of the target protein in HeLa-green fluorescence protein cells was achieved at short interfering RNA concentrations as low as 8 nM with a formulation of PEI-modified nanoparticles. (c) 2006 Elsevier B.V. All rights reserved.