

Immunological properties of engineered nanomaterials

Marina A. Dobrovolskaia,

Nanotechnology Characterization Laboratory, Advanced Technology Program, SAIC-Frederick Inc., NCI-Frederick, Frederick, MD 21702; marina@mail.nih.gov

Nanotechnology is finding growing applications in industry, biology and medicine. The clear benefits of using nanosized products in various biological and medical applications are often challenged by questions regarding toxicity of these materials. One area of interest involves the interactions between nanoparticles and the components of the immune system. Nanoparticles can be engineered to either avoid immune system recognition or to specifically interact with components of the immune responses. This presentation will review data regarding nanoparticle-mediated immunostimulation and immunosuppression; how manipulation of particle physicochemical properties can influence their interaction with components of the immune system (specifically interaction with erythrocytes, effects on blood coagulation system, activation of complement and effects on immune cell function), and discuss challenges with preclinical immunological characterization of engineered nanomaterials (specifically endotoxin contamination, depyrogenation, sterility and sterilization, and nanoparticle interference with traditional immunological tests).

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