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# ***IN VITRO AND IN VIVO TOXICOLOGY OF SILICA AND DENDRITIC NANOPARTICLES***

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**A**dvances in the fabrication of nanoparticles with exquisite control over shape, surface chemistry and three-dimensional architecture have not been matched by a detailed understanding of their biological fate. Recent efforts in our lab have focused on investigating the influence of particle size, core chemistry, porosity, shape, density, and surface functionality of silica and dendritic nanoparticles on interactions with macrophages, epithelial barriers and blood cells. A series of nonporous, mesoporous, spherical and rod or worm shaped silica nanoparticles were synthesized and characterized. Their cellular uptake, cytotoxicity, biodistribution, and hemocompatibility were investigated and compared to polymeric dendrimers with variations in size and surface functional groups. In the size regimes studied, results demonstrate that variations in geometry can influence mode of cellular uptake, surface functionality is a predominant factor in biological fate, cationic poly (amido amine) dendrimers result in disseminated intravascular coagulopathy, and particle density and porosity influence the rate of uptake and toxicity.

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