

What and How Can “Nano” Do for “Medicine”?

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For the last 10 years, our group has focused on medical applications of various uniform-sized nanoparticles. We used biocompatible 2 nm-sized iron oxide nanoparticles as T1 MR contrast agent for high-resolution MR angiography of macaque monkeys. We demonstrated that ceria nanoparticles and ceria-zirconia nanoparticles can work as therapeutic antioxidants to treat various nasty diseases including ischemic stroke, Alzheimer’s disease, sepsis, and Parkinson’s disease. We introduced electromechanical cardioplasty using an epicardial mesh made of electrically conductive and mechanically elastic Ag-Au core-shell nanowire-rubber nanocomposite to resemble the innate cardiac tissue and confer cardiac conduction system function.