Macrophages are central to the development of atherosclerosis by absorbing lipids, causing inflammation and increasing plaque deposition. Nanoparticles are becoming increasingly common in a variety of applications including the treatment of numerous diseases. This project investigated the influence of nanoparticles on macrophage-mediated atherosclerotic development. This project used two experiments to simulate different conditions. In the first experiment, macrophages were exposed to one of three nanoparticles (20 nm Ag, 110 nm Ag, or 20 nm Fe) for two hours and challenged with cholesterol for 24 hours. Nanoparticle uptake, cytotoxicity, and cholesterol uptake of the macrophages were assessed following the 24 hours. Nanoparticles were found to be internalized by macrophages while none induced significant cytotoxicity. Macrophage exposure to nanoparticles was found to alter subsequent cholesterol uptake. A second experiment was conducted to simulate a 24 hour nanoparticle exposure in a cholesterol-rich environment and its influence on macrophage parameters. Again nanoparticles were found to be internalized by macrophages and were found to not induce cytotoxicity. Exposure to nanoparticles was found to alter cholesterol uptake. These experiments suggest that treatments utilizing 20 nm Ag will not result in increased cholesterol uptake by macrophages and will not lead to the exacerbation of atherosclerosis.