

Title: Phagocytosis of Drug Delivery Systems: the after-effects

Abstract: Nano- and micro-particulate based drug delivery systems are being developed for several clinical applications. Following their intended therapeutic use, it is expected that these particulates would be excreted out with the help of phagocytic immune cells. The question that interests us what happens to the phagocytic immune cells after they take up these particulates. We answer this question by determining the phenotyping and functional changes to immune cells following the uptake of non-degradable particulates. Our experiments demonstrate that the process of phagocytosis primes immune cells to become more phagocytic. This priming appears to be independent of the toll-like receptor (TLR) activation and is not associated with any increase in inflammatory cytokine expression (mRNA level). The priming also appears to be independent of size and surface modification. We are currently exploring the mechanisms that lead to improved phagocytosis capacity of immune cells, and how this might affect the in vivo half-lives of drug delivery systems.