Characterization of flagellin-coated liposomes for adjuvant and vaccine delivery purposes

Abstract: Since the recognition that the adjuvant capacity of flagellin is better harnessed when both flagellin and the antigen is delivered to the same cell, there has been a need to exploit flagellin in ways that fulfil this opportunity. We propose a liposomal delivery system functionalized with *Salmonella typhimurium* flagellin (fliC) as a way to meet this need. Our goal is to characterize flic-functionalized liposomes as vaccine adjuvants and evaluate their ability to simultaneously target cells expressing TLR5 to ultimately enhance vaccine potential of a liposome-encapsulated antigen. We report that fliC-functionalized liposomes are able to elicit the proinflammatory cytokine, IL-6, with comparable efficacy to soluble protein in an alveolar macrophage cell line (MHS), and the ability of the cells to respond to the liposomes is mediated by the TLR5. When fluorescently labeled, the functionalized liposomes exhibit preferential cell-association with MH-S cells. Studies of the functionalized liposomes encapsulating the pore-forming, Listeriolysin O are underway to evaluate the adjuvant capacity of these liposomes when exposed to the cytosol to engage a TLR5-independent adjuvant function. The results of the aforementioned studies will inform the humoral and cellular adjuvant capabilities of these functionalized liposomes in both TLR-5-dependent and independent pathways *in vivo*.