Sutezolid Liposomal Formulations to Tackle Mycobacterial Infection

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ORIGINAL ARTICLE

ABSTRACT

Introduction: Mycobacterial infections are complex diseases that lead to millions of new cases each year. Although antimycobacterial treatment regimens are effective, they can become cumbersome and associated with toxicity and inconsistent compliance, which leads to increased failure rates, relapse, or reinfection, especially in drug-resistant strains[1]. Drug development has emerged towards the use of nano-delivery systems to overcome the challenges in delivery of antimicrobials[2]. Our work encompasses the development of sutezolid (STZ)-loaded liposomes (Figure 1) to reduce mycobacterial burden *in vitro*. Resulting nanoformulations were evaluated chemically and biologically in *M. avium*-infected bone marrow-derived macrophages (BMM) and bone marrow-derived dendritic cells (BMDC).

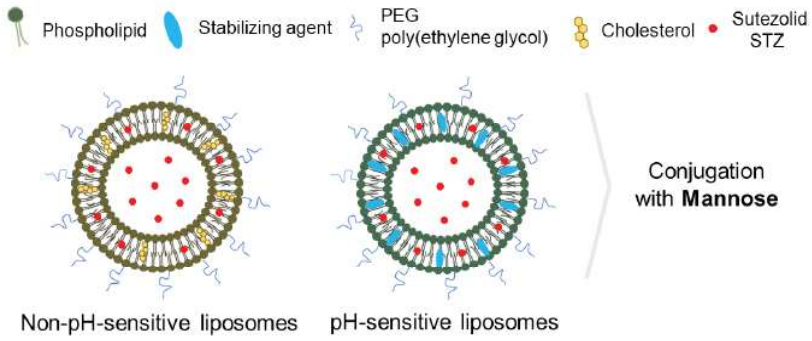


Figure 1. Schematic representation of liposome designs.

Methods: Mannose-coated non-pH-sensitive and pH-sensitive formulations were prepared. Liposome size, polydispersity, zeta potential, and entrapment efficiency were evaluated. Drug release assay was performed at pH 7.4 and 5.0 at several timepoints for 24h. Cellular uptake was analyzed by confocal laser scanning microscopy using fluorescent probe-loaded liposomes added for 15-, 30-, 60-, and 120-minutes. Cytotoxicity was evaluated by thiazolyl blue tetrazolium bromide assay in BMM and BMDC. Antimycobacterial activity was assessed using a well-studied *in vitro M. avium* 2447 infection model[3]. STZ and liposomal STZ were tested at equivalent drug concentrations.

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