Executive Summary

File no : **35-103/2008 (SR)**

Project Title : **Biopharmaceutical modifications of lipid particulate carriers for delivery of Anti-Leishmanial agents**

Principal Investigator : **Dr.(Mrs.) Mangal S. Nagarsenker**
Prof. and HOD of Pharmaceutics
Bombay College of Pharmacy

Staff (project Fellow) : **Ms. Shilpa Patere**

Date of Commencement : **19/05/2009**

Date of Termination : **19/05/2012**

Executive Summary

Successful homing of drugs to the target can be achieved by design of the carrier which delivers drug to specific sites in the body to ensure optimal interaction of the drug with the site(s) of its action at the right rate and frequency. Secondly,by reducing the drug dose as well as by increasing the target specificity, the potential for any side effects is greatly diminished. In the present project, design of drug delivery system is proposed which is expected to optimise the action of the drug by targeting to Reticulo-endothelial system (RES) system /macrophages.

Novel hydrophobized polysaccharide ligand (NL1) was successfully synthesized as confirmed by analytical tools like FTIR, NMR and SEC. Solubility of NL1 in organic solvent faciliated ease in incorporation to design surface modified liposomes(SML). Successful co-encapsulation of Amphotericin B (Amp B) and Berberine hydrochloride (BERN) within the SML was achieved by employing both active and passive loading methods. The vesicular formulations were stable with respect to particle size (200-350 nm) and encapsulation efficiency (> 90% for AmpB and > 80% for BERN). Cellular uptake using inverted fluroscence microscope by employing Nile red as fluroscent probe illustrated enhanced uptake of SML by RAW 264.7 macrophage cells compared to solution and CL formulations. Improved *in vitro* cyto-toxicity of SML and liposomes without ligand(CL) formulations were observed in RAW 264.7 and J774 A.1 cell lines compared to Amp B solution. *In vivo* safety studies of NL1 incorporated surface modified liposome (SML) was performed in mice which showed that the NL1 were safe and non-toxic at the concentrations incorporated in liposomes. Pharmacokinetics in rats revealed similar plasma half life of Amp B SML (3%) compared to Amp B CL. Amp B SML (3%) was more effective *in vitro* against promastigote and amastigote model compared to AmpB solution and CL.