Technology bulletin

CSIR-Indian Institute of Chemical Biology

Title: Anti-Leishmanial Activity Of Paromomycin Entrapped In Cationic Liposomal Formulation

INTRODUCTION: The major problems behind a successful anti-Leishmanial chemotherapy are limited availability of drugs, toxicity, prolonged treatment duration and inability to control relapse due to immune suppression, which ultimately turns expensive. A low-cost monotherapy of parenteral formulation of paromomycin sulfate (PM) is a well known anti leishmanial therapeutic approach but it has the risk of developing resistance. Therefore, PM was formulated with stearyl amine (SA)-bearing phosphatidylcholine (PC) liposomes for low-dose therapy, to shorten the duration of treatment and prolong the effective life of the drug.

CHALLENGE/APPLICATION DOMAIN:

- Single shot application of liposomes
- Synergistic effect of immune activating cationic liposome and PM
- Combination therapy of PC-SA and PM induce Th1 response in host which reduces relapse of VL.

OPPORTUNITY:

- PC-SA and PM act synergistically tilting the immunological balance in favor of protective Th1 immune responses, thus resulting in profound antileishmanial activity and long term resistance to relapse and treatment failure.
- PC-SA-associated PM induces a prophylactic effect.
- This formulation has very good antileishmanial activity, so there is a good possibility for its commercialization.

STAGE OF TECHNOLOGY DEVELOPMENT: Patent granted on 27.06.2018: 012NF2007/IN
No commercialization agreement has been done yet. There is ongoing search for industrial partner to prepare this formulation for commercial standard.

REFERENCES:

Banerjee A, De M, Ali N. Combination therapy with paromomycin-associated stearylamine-bearing liposomes cures experimental visceral leishmaniasis through Th1-biased immunomodulation. Antimicrob Agents Chemother. 2011 Apr;55(4):1661-70. doi: 10.1128/AAC.00524-10.

PATENT: US 298145

PROJECT INVESTIGATORS: **Dr. Nahid Ali**