

## Hepatoprotective and pharmacokinetic studies of Silymarin liposomes in alcohol and D-galactosamine induced toxic models

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Extensive studies have been made for improving bioavailability of silymarin through various dosage forms, however not much information is available to target hepatocytes and immune cells. Thus, the present study was designed to develop a formulation with a combination of liposomes and phytosomes. Conventional, PEGylated and charged liposomes (Dicetyl phosphate and Stearyl amine) of silymarin were prepared by film hydration method. Based on the entrapment of silymarin, 6:1 lipid-cholesterol molar ratio was selected for development of various liposomal formulations. Formulations were optimised for their particle size using high-pressure homogenizer and stability during freeze drying using 5%w/v sucrose as cryo protectant. Conventional, DP and PEGylated formulations showed better release profile at pH 1.2 and 7.4 compared to silymarin alone. These liposomes were screened *in vitro* on Chang liver cells and *in vivo* in Wistar rats against toxicities of D-galactosamine and alcohol. Cell cycle analysis showed that the formulations were better in preventing D-galactosamine induced cell cycle arrest in S-Phase. Conventional and PEGylated liposomal formulations showed better protection in Chang liver cells and screened *in vivo*. Conventional liposomes of silymarin showed better hepato protection, and better anti-inflammatory effects when compared to silymarin suspension in both models. The pharmacokinetic results upon oral administration of silymarin and its conventional liposomes showed that conventional liposomes increased  $C_{max}$  more than five times compared to silymarin suspension in normal rats and almost six times in alcohol induced diseased rat.

### Biography

C Mallikarjuna Rao, is the Principal and Professor of Pharmacology at Manipal College of Pharmaceutical Sciences, Manipal University, Manipal, India. He has research experience of 29 years and has published 83 papers in reputed journals. His areas of research interest are pharmacology of inflammation, tissue repair, cancer and metabolic disorders. He guided seven PhDs and over 60 postgraduate students. He has peer-reviewed papers from journals like *Pharmaceutical Biology*, *Indian Journal of Pharmacology*, and *Indian Drugs* etc.

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