Preface

Neglected tropical diseases (NTDs) are the most prevalent diseases, keeping an estimated 2.7 billion people. NTDs include, among others, Schistosomiasis, Cysticercosis and Hydatoidosis. Praziquantel (PZQ) is a drug of choice against many parasitic diseases such as Schistosomiasis and Neurocysticercosis. PZQ is included in the WHO model list of essential drugs. Although PZQ is a very effective anthelmintic, it exhibits poor oral bioavailability due to low aqueous solubility, extensive hepatic first-pass metabolism and the short plasma half-life.

The present work is an attempt to seek alternative routes of administration such as parenterals to reduce pharmacokinetic and therapeutic variability. PZQ was successfully incorporated in to two types of nanoparticulate systems i.e. Cyclodextrin based Nanosponges (NS) and Solid lipid nanoparticles (SLN). Out of the duo, NS were principally increased the dissolution of the PZQ in the physiological media while SLN increased the intestinal solubilization and targeting to the intestinal lymphatics and thereby avoiding the first pass metabolism. The drug entrapment efficiency was further improved by formulation binary lipid nanoparticles. The pharmacokinetic study after oral and parenteral administration of SLN in rats showed that SLN changed pharmacokinetic parameters and resulted in significant improvement in the bioavailability of PZQ. Moreover, the present thesis has also covered the vitro and in vivo efficacy studies.PZQ - SLN significantly enhanced the drug diffusion through hydatid cyst membrane and protoscolicidal activity and *in vivo* anticestodal activity against *H.Diminuta*.

The experimental results indicate that Praziquantel loaded SLN may offer a promising strategy for improving the therapeutic efficacy, reducing the dose and better patient compliance.