Conclusions
CONCLUSIONS

1. A new and efficient route for the synthesis of the conserved glycan core of lipophosphoglycan (LPG) of *Leishmania donovani* has been designed. Using reterosynthetic analysis, the choice of the protecting groups has been selected such that it enables us to plan the total synthesis of LPG. The *p*-methoxy benzyl (PMB) group at the 6-OH position of the terminal galactose at the non-reducing end of the pentasaccharide can be easily removed in presence of other protecting groups (acetate, benzoyl and benzyl). The selective removal of the anomeric benzyl of the terminal (reducing) mannose has already been standardized. The final glycosylation between the Galα(1,6)Galα(1,3)Galf and Manα(1,3)Man using trichloroacetimidate coupling conditions will be completed shortly.

2. The synthesis of the core has given us a route to synthesize all the Type-2 GIPL molecules of *L. major*. The headgroup of iM2 [Manα(1,3)Man] and GIPL-1 [Galf β(1,3)Manα(1,3)Man] has been synthesized. Glycosylation of these headgroups with GlcNPI intermediate would now be used for total synthesis of these biologically important molecules.

3. We have achieved an efficient synthesis of the headgroups of antigenic hybrid-type GIPLs (iM3 and iM4) of *L. donovani*. The iM3 headgroup is a trisaccharide with a third mannose attached in a α(1,6) configuration to the mannose at the reducing end in iM2. The tetrasaccharide headgroup of iM4 GIPLs has a Manα(1,2)Man attached at the same position. Presently, we are working towards the coupling of these headgroups with the GlcNPI intermediate in order to achieve complete synthesis of these antigenic GIPLs.

4. An efficient chemical synthesis of the unstable nucleotide sugar donor UDP-α-Galactofuranose has been standardized. Using this method, UDP-α-Galf can be prepared in couple of mg scale. As it is tedious to obtain this molecule
biosynthetically at such scales, this synthesis becomes important for obtaining this molecule required for several biochemical assays and experiments.

5. UDP-β-Galactofuranose, a new analogue of UDP-α-Galf has been synthesized. This synthetic substrate is postulated to have an inhibitory activity in the galactofuranose metabolism esp. in inhibiting the galactofuranosyl transferase or the putative UDP-α-Galf transporter activity.

6. Though we could not characterize the UDP-Galp mutase activity directly in cell-free system of Leishmania donovani, either with UDP-Galp/UDP-3H-Galp or with UDP-α-Galf as substrates. However we have shown some preliminary results showing the presence of this mutase activity in conjunction with the transferase activity using UDP-3H-Galp as the substrate and a synthetic lipid linked mannobiose (decenyl Manα(1,3)mannopyranoside) as the acceptor.