## Project Details

<table>
<thead>
<tr>
<th>Project Title</th>
<th>Determination of the structure of <em>Leishmania</em> haemoglobin receptor and its implication in Hb endocytosis.</th>
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### Project Summary

*Leishmania*, a protozoan pathogen, is the causative agent of various forms of leishmaniasis; of which visceral Leishmaniasis is fatal. Leishmaniasis affects about 12 million people worldwide. Drugs used for chemotherapy of leishmaniasis are very toxic, expensive and frequent resistance occurs in endemic areas. Thus, the major focus is to identify new therapeutic target.

*Leishmania* require heme from exogenous sources for growth due to lack of complete heme biosynthetic pathway. Thus, heme acquisition process in *Leishmania* could be a potential target. We have shown that *Leishmania* endocytosed hemoglobin (Hb) through a high affinity hemoglobin receptor (HbR) located on the cell surface and internalized Hb is targeted to the lysosomal compartment where it is degraded to generate intracellular heme which is used by *Leishmania* for their survival. Subsequently, we have validated that HbR is a novel therapeutic target against *Leishmania* and a potential vaccine candidate against visceral Leishmaniasis. However, detail structural analysis of the HbR is not known. The proposed project aims to determine the structure of HbR with following objectives:

1. Cloning and expression of different truncated forms of HbR.
2. Determination of the structure of HbR by NMR and/or X-ray crystallography.
3. Validation and functional significance of identified domain of HbR.

## PhD Supervisors

<table>
<thead>
<tr>
<th>Role</th>
<th>Faculty</th>
<th>Academic Unit in IITD</th>
<th>Email ID</th>
</tr>
</thead>
<tbody>
<tr>
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## Project requirements (Student qualifications, experience required, etc)

- MSc in Life Sciences/Chemistry
### Source of funding (IRD/FITT Project details, if any)

CSIR/ICMR/DBT/Institute & other fellowship

### Role of Faculty Members involved:

1. Prof Amitabha Mukhopadhyay: Cloning and expression of different truncated forms of HbR.
2. Prof Shashank Deep: Determination of the structure of HbR by NMR and/or X-ray crystallography