3. AIM AND OBJECTIVE

Taking into consideration emergence of drug-resistant strains of malarial parasite it was considered of interest to evolve combined antimalarial drug delivery systems which will not lead to drug-resistance and secondly it will be more effective against the malarial parasite located in blood, tissue and brain, thus target specific.

Therefore, the present proposed research work entitled, “SYNTHESIS AND STUDIES ON POLYMER-LINKED COMBINED ANTIMALARIAL DRUGS TO OVERCOME THE EMERGENCE OF DRUG RESISTANCE FOR RADICAL CURE OF MALARIA”, pertains to the use of polydichlorophosphazene to have the desired drug delivery systems. Polydichlorophosphazene will be synthesized from hexachlorocyclotriphosphazene (to be obtained by reacting ammonium chloride and phosphorus pentachloride) and suitably substituted with the desired drugs effective against parasites located in the blood, tissues or brain e.g. aminoquinolines, Primaquine and artemisinin analogue. Polydichlorophosphazene will also be suitably substituted to have the desired physiochemical properties of the substituted polyphosphazenes. Therefore, the proposed polymer-linked combined drug delivery system is expected to be free from emergence of drug resistance on account of combined drug delivery approach and will also have target specificity to tissue schizontocidal and blood schizontocidal.

Methodology/Planning of work

Synthesis of Polymer-linked antimalarial drugs to overcome the emergence of drug resistance for radical cure of malaria will be carried out by using the following methodology:

1. Synthesis of Polymer-linked antimalarial drugs:

Polydichlorophosphazene will be used as polymer and will be synthesized by thermal polymerization of hexachlorocyclotriphosphazene (to be obtained by reacting ammonium chloride and phosphorus pentachloride).
Polydichlorophosphazene will be suitably substituted to have the desired physicochemical properties of the substituted polyphosphazenes. Polymer-linked antimalarial drugs (drug polymer conjugates) will be prepared by linking antimalarial drugs to the polymer. The proposed antimalarial drugs are blood schizontocidal (artemisinin) and tissue schizontocidal (primaquine).

2. Characterization of synthesized Polymer-linked antimalarial drugs:

The synthesized polymer-linked antimalarial drugs will be characterized by modern sophisticated analytical techniques such as IR, $^1$H-NMR, $^{31}$P-NMR, DSC and GPC etc.

3. Evaluation of the Polymer-linked combined antimalarial drugs:

Evaluation of the Polymer-linked combined antimalarial drugs will be carried out after preparing suitable formulations.