

2.1 Objective of the proposed work

The objective of the proposed investigation is to develop and characterise therapeutic gene delivery system for the treatment of depression.

2.2 Hypothesis

Preparation of therapeutic p11 gene entrapped cationic liposomal nano carrier formulated from alkali amino acid modified lipid, will provide a better and safe delivery vector for gene delivery as compared to viral delivery vectors. In addition, this will provide better stability to therapeutic gene from nuclease mediated degradation. Also surface modification with a targeting ligand via intravenous route and local targeting of liposomes in form of nasal spray via intranasal route will provide brain targeted delivery of gene providing higher concentration of gene at the target site.

2.3 Plan of work

- Synthesis and characterization of novel cationic lipids based on alkaline amino acids histidine, lysine and arginine;
- Preparation and characterization of the cationic lipoplex based on synthesised lipids;
- *In vitro* cell line studies of developed formulations to assess the effect of developed carrier on cell line (screening of above formulated lipoplex for the further studies);
- Targeting of screened lipoplex
 - intranasal route: development of nasal spray for nose to brain delivery of liposomes;
 - intravenous route: surface modification of liposomes using IGF-II mAb (monoclonal antibodies) for active targeting;
- *In vivo* studies of developed formulations to compare the efficacy through intranasal and intravenous route.

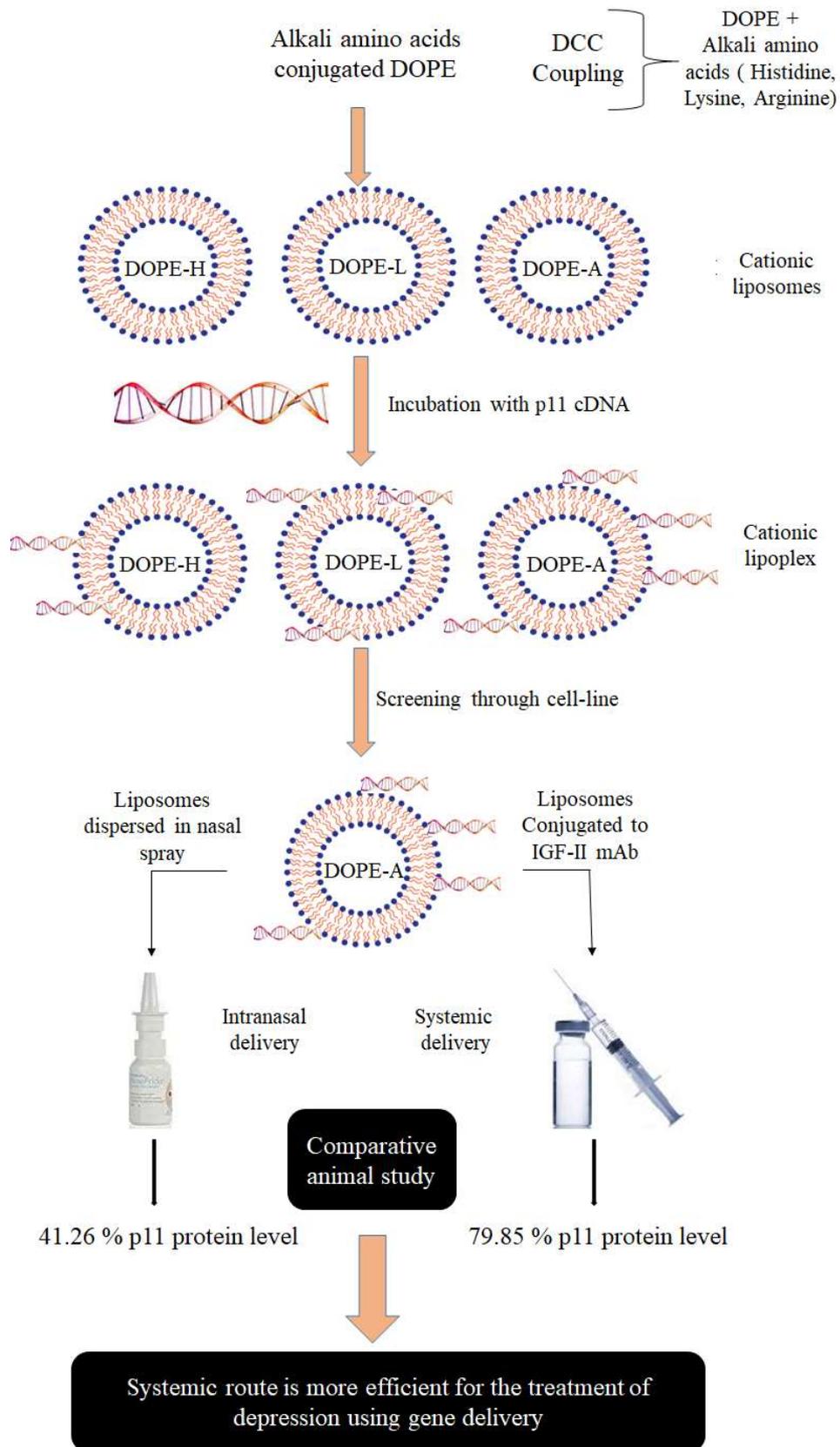


Figure 2. 1 Graphical representation