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Enhanced gene delivery by lipid triblock nanocarriers

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N on-viral vectors system is the prerequisite for the efficient gene delivery with minimal toxicity, against many incurable diseases. Polyamidoamine (PAMAM) dendrimers with a positive charge has a great tendency to complex nucleic acid (dendriplexes) like plasmid DNA (pDNA) and small interfering RNA (siRNA). They shield them from enzymatic degradation, thus facilitate endocytosis and endosomal release. The current study was aimed to develop a delivery system by using lipid modified nanocarrier to enhance gene delivery and knock downing of targeted gene. These liposomal encapsulated dendriplex system can further reduce the unwanted cytotoxicity of this cationic system, which enhance cellular uptake of nucleic acid. Broad range of lipid combination were used to optimize the lipodendriplexes and tested for their physicochemical characterization including size, shape and zeta potential. The optimized lipodendriplexes were tested for anti-proliferation, pDNA transfection, cellular uptake, siRNA knock downing and heparin stability. The optimized system has shown significant improvement in cytotoxicity (p<0.05), pDNA transfection (p<0.01), with higher cellular uptake and gene knockdown efficiency, as compared to parent dendriplexes system in biological environment. Therefore, further *in vivo* studies can be a done to explore the full potential of this platform, using ligand specific targeted system, against different cancer and genetic disorders.

Biography

Imran Tariq is working as an Assistant Professor at University of Punjab, Lahore, Pakistan. He has completed his Master's in Pharmaceutics from University of the Punjab. Currently, he is pursuing his PhD at the Philipps University of Marburg, Germany. He has published more than 25 research papers in well reputed journals and has served as a Member in Scientific Editorial Board of reputable journals.

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