In vitro studies on impression of EGFR (epidermal growth factor receptor) gene expression with plasmid-based micro RNA-7 / chitosan complexes in breast cancer cell lines.

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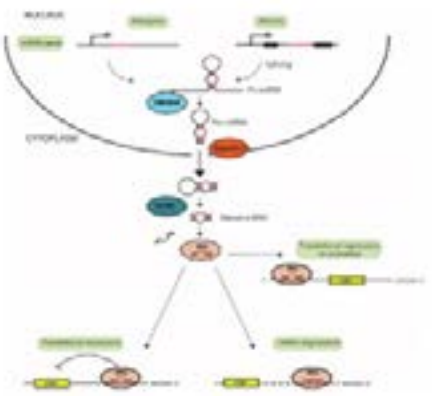
Objective: MicroRNAs are RNA molecules of protein encoding that form a class of endogenous small RNAs of 20-21 nucleotides in length, and are defined as RNA regulators that control gene expression at the posttranscriptional level. In a large number of miRNA-driven breast cancers, the miR-7 family has been identified as an important miRNA group with tumor suppressor activity. However, there are some important obstacles to the use of miRNAs in treatment; they are difficult to get by the cells and resistant to physiological conditions. Therefore, it is important to treat the cells with a suitable transport system. The aim of this study is to prepare plasmid-based miRNA-7/chitosan complexes using chitosan, which is a biopolymer with a natural cationic structure, and with successful results as a gene delivery system. The effect of complexes on the suppression of EGFR gene expression in various breast cancer cell lines in vitro to investigate.

Material and Method: Plasmid-based miRNA-7/chitosan complexes were prepared and various characterizations such as particle size, zeta potential, TEM study, and serum stability were determined in vitro. The appropriate dose for each cell and each miRNA-7 in breast cancer cell lines was determined using the Real Time PCR method. After the transfection of chitosan/miRNA-7 complexes into the breast cancer cell lines with determined appropriate doses, invasion, apoptosis and cell proliferation tests were performed.

Result: Complete complex formation of miRNA-7 with chitosan was achieved. Epidermal growth factor (EGFR) gene expression, angiogenesis and invasion were suppressed by in vitro transfection of complexes.

Conclusion: In our study, it was shown that hsa-mir-7 was transported stably to the cells with chitosan complexes, decreased the invasiveness of cancer cells by treating miRNA regulation deteriorated in cancer cells internalized to the cell and that chitosan complexes were a reliable and effective carrier system for miRNA.



Recent Publications

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Biography

Pelin has her expertise in evaluation and passion in improving the pharmaceutical biotechnology knowing and gene therapy systems. Her open and contextual evaluation model based on responsive constructivists creates new pathways for improving healthcare. She has built this model after years of experience in research, evaluation, teaching and administration both in pharmaceutical sector and education institutions..

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