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In Vitro Studies on Impression of EGFR (Epidermal Growth Factor Receptor) Gene Expression with Plasmid-based MicroRNA-7 / Chitosan Complexes in Breast Cancer Cell Lines

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Abstract

MicroRNAs are RNA molecules of protein encoding that form a class of endogenous small RNAs that control gene expression. 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 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. Accordingly, plasmid-based miRNA-7/ chitosan complexes were prepared and particle size, zeta potential, TEM study, and serum stability were determined in vitro. 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. 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. ıt 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.

Biography:

Pelin has completed her master's degree from Marmara University Department of Pharmaceutical Biotechnology, Turkey. She has her expertise in evaluation and passion in improving the pharmaceutical biotechnology knowing and gene therapy systems. She has built this model after years of experience in research, evaluation, teaching and administration both in pharmaceutical sector and education institutions.

Speaker Publications:

1. "Analysis of the DOK1 gene in breast cancer"; Molecular Biology Reports volume 47, pages1605–1612(2020)
2. "Downregulation of TCEAL7 expression induces CCND1 expression in non-small cell lung cancer"; Molecular Biology Reports, 46, pages5251–5256(2019)
3. "The EMSY gene collaborates with CCND1 in non-small cell lung carcinogenesis"; International journal of medical sciences 14(7):675-679.
4. "CHD5 is a potential tumor suppressor in non small cell lung cancer (NSCLC)"; Gene/Volume 618, 30 June 2017, Pages 65-68
5. "Abstract A60: DOK1 gene may act as a tumor suppressor in breast cancer"; Molecular Cancer Research, Volume 14, Issue 2.

7th European Biopharma Congress; Webinar- April 27-28, 2020.

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