

Synthesis and Isolation of Specific DNA Aptamer Against Ovarian Cancer Cell Line

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Abstract

Introduction: Identification and targeting of cancer cell surface biomarkers is highly important for targeted drug delivery and reduction of chemotherapy side effect. Aptamer or chemical antibody is single-stranded DNA or RNA sequences that fold into secondary and tertiary structures making them bind to certain targets with extremely high specificity. Aptamer is a useful tool for biomarker discovery, drug targeted delivery or applied to make a biosensor.

Methods and Results: In this study, the Cell-based Systematic Evolution of Liganeds by Exponential Enrichment (Cell-SELEX) was used to develop aptamer against ovarian cancer cell lines. Monitor Pool enrichment was done by flow cytometry. SSDNA of Round 12 was cloned in to pTZ57R\T vector and was sequenced. Specificity and affinity of isolated Aptamer were determined by flow cytometry...

Aptamer selection was performed for 14 rounds. Round 12 selected as appropriate round for cloning. sixty aptamers were sequenced and alignment by DNAMAN software. homology of isolated aptamer was 34.1 percent. Eight aptamer were selected after phylogenic tree generated among these aptamers Mana88 sequences was specific against ovarian cancer cell line. Mana14 and Mana94 did not attached to normal cell line but they recognized other cancer cell line. Kd of isolated aptamer were 41, 250 and 2500 for Mana88, Mana14 and Mana94 respectively

Conclusions: Chemotherapy is the main technique of cancer therapy; however, its side effects make it a toxic and invasive procedure. The goal of targeted chemotherapy is to overcome at least some of these nonspecific side effects. Aptamers are a class of molecule which rival antibodies in therapeutic and diagnostic applications. Mana 88 isolated in this study could use for targeted drug delivery and diagnostic ovarian cancer. Mana14 could use for targeted drug delivery ovarian and breast cancers. Isolation. Target of isolated aptamer on the cell surface will be recognized by proteomics approaches

Key words: Aptamer, Ovarian cancer, Targeted drug delivery.

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