Title : Cloning of Chimeric Antibody for Cancer Immunotherapy Approach

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Major : Biology

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ABSTRACT

Despite advancements in cancer treatment, Non-Hodgkin's Lymphoma (NHL) remains a challenge due to immune evasion and tumor heterogeneity. Immunotherapy using chimeric multi-specific antibody engagers such as Bispecific T-cell Engagers (BiTEs) and Trispecific Killer Engagers (TriKEs) represents a promising therapeutic by binding to tumor-associated antigens and activating immune effector cells. The aim of this study was to construct two separated recombinant pCDH plasmids encoding BiTE and TriKE constructs. The BiTE sequence was designed to engage CD3+ T-cell against CD20+ target cell, while the TriKE was engineered to activate NK-cell via CD16/IL-15 signaling against CD19+ target cell. The primary goal is to evaluate the feasibility of cloning these complex constructs into a lentiviral vector (pCDH) for future expression analysis and therapeutic application. The genetic sequences for BiTE and TriKE were integrated into the pCDH vector using molecular cloning techniques including plasmid extraction, restriction enzyme digestion and ligation. Successful insertion was verified through colony PCR and agarose gel electrophoresis. The results confirm the successful assembly of both BiTE and TriKE constructs within the pCDH backbone. The use of a multi-specific engineered protein format is expected to mitigate the risk of antigen escape commonly observed in conventional monoclonal antibody treatments. The successful cloning of these multi-specific engagers provides a robust platform for further functional assays. These constructs hold significant potential to enhance the precision and efficacy of T-cell and NK-cell mediated cytotoxicity against B-cell malignancies offering a well strategy overcome current limitations in Non-Hodgkin's Lymphoma treatment.

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