

Construction of single-chain variable fragment antibodies against MCF-7 breast cancer cells.

ABSTRACT

A phage display library of single chain variable fragment (scFv) against MCF-7 breast cancer cells was constructed from C3A8 hybridoma cells. RNA from the C3A8 was isolated, cDNA was constructed, and variable heavy and light immunoglobulin chain gene region were amplified using PCR. The variable heavy and light chain gene regions were combined with flexible linker, linked to a pCANTAB 5E phagemid vector and electrophoresed into supE strain of Escherichia coli TG1 cells. Forty-eight clones demonstrated positive binding activity to MCF-7 breast cancer cell membrane fragments and the strongest of 48 clones was selected for analysis. The anti-MCF-7 library evaluated by SfiI and NotI digests demonstrated that anti-MCF-7 scFv antibodies possess individual patterns that should be able to recognize distinct human breast cancer cells. The C3A8 scFv, with an apparent molecular weight of 32 kDa, showed high homology (99%) with single chain antibody against rice stripe virus protein P20. In summary, the anti MCF-7 scFv antibody can be used for pretargeting breast cancer for clinical diagnosis of patients; it also has potential for therapeutic applications.

Keyword: C3A8; MCF-7; Recombinant antibody; scFv.