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In vitro evolving of a breast cancer cell-specific DNA aptamer by cell-based SELEX method and its applications



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Breast cancer is a highly heterogeneous tumor with four major molecular subtypes, which has become the second leading cause of death among women in the world. In clinic medicine, different breast cancer subtypes show distinct response to the therapy and prognosis and the molecular classification of breast cancer remain a challenge, which depend on highly specific molecular probes. In this study, a ssDNA aptamer with high specificity and binding affinity to SK-BR-3 cells was obtained by Cell-SELEX method. Followed *in vitro* studies demonstrated that the aptamer can not only distinguish SK-BR-3 breast cancer cell line from MDA-MB-231, MCF-7 breast cancer cell lines and MCF-10A human normal mammary epithelial cell line, but also can differentiate HER2-positive breast cancer tissues from Luminal A, Luminal B, triple-negative breast cancer tissues and adjacent normal breast tissues, indicating its great potential for the molecular classification of breast cancer subtypes. Moreover, the *in vivo* experiments of the aptamer also demonstrated its good targeting ability against tumour-bearing mice of SK-BR-3 breast cancer cells. All these results demonstrated that the aptamer could be further developed into a novel molecular probe for the precise diagnosis and a highly effective biological missile for the targeted therapy of breast cancer.

Biography

Mei Liu received his Master degree from School of Biological Science and Medical Engineering, Southeast University in 2017, and is now a PhD student in Southeast University. His research interests include aptamer selection, nucleic acid nanotechnology and their applications for the diagnosis and therapy of cancer. He has published six SCI papers eight as first author or co-author.

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