Development of DNA Aptamers binding Adipokine with High Affinity and Specificity

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Aptamers are ssDNA or RNA oligonucleotides bind to a wide range of target molecules such as drugs, proteins or other organic or inorganic molecules with high affinity and specificity. The target, RBP4 secreted from adipocytes is useful biomarker of type 2 diabetes. In patient who contract a type 2 diabetes, the RBP4 level is increased in their blood. Using the aptamer for RBP4, it is available to diagnose type 2 diabetes fast and sensitively. RBP4 aptamers have been selected by FluMag-SELEX process from random DNA library. Through the process, ssDNA aptamers which bind to RBP4 specifically was obtained. After cloning, six RBP4 aptamers were sequenced. To analyze aptamers' specificity and affinity for RBP4, Surface Plasmon Resonance(SPR) was applicated. Each aptamer was immobilized on gold chip surface modified by Self Assembly Monolayer and then RBP4 and other proteins as negative controls were added to chip surface respectively. As a result, No.38, No.40 aptamer show the highst specificity to the target than others. In the same way, the Kd value of No.38 aptamer was drawn by SPR datas as 226 nM. These DNA aptamers for RBP4 can be used for diagnosis tool as medical biosensor by the detection of RBP4 in serum.