

Development of Specific HbA_{1c}-binding DNA Aptamers for Point-of-care Test of Diabetes mellitus

김서경, 이상희, 박태선¹, Simranjeet Singh Sekhon,

민지호², 김양훈[†]

충북대학교 미생물학과; ¹전북대학교병원 내분비대사내과;

²전북대학교 화학공학과

Diabetes mellitus has become a major health problem worldwide, and the proportion of people who suffer from diabetes is increasing. Thus, the early diagnosis has more important for diabetes patients. Hemoglobin A_{1c} (HbA_{1c}) is a significant marker protein suitable for long-term monitoring of glycemic control. Aptamers are single-stranded DNA or RNA that can serve as antibody mimics because it has advantages of high affinity for their target molecules and high stability. In this study, ssDNA aptamers were screened by SELEX process. We demonstrated specific binding affinity of aptamers with HbA_{1c} using real-time PCR. We obtained K_d value of aptamer candidates for selection of best aptamer using SPR assay. We performed competition test between selected aptamers and antibody. These aptamers proved its potential use in rapid detection of HbA_{1c} via point-of-care diagnostic kit. This study was supported by Fund of Biomedical Research Institute, Chonbuk National University Hospital (20120700).