

The Summer Undergraduate Research Fellowship (SURF) Symposium
3 August 2017
Purdue University, West Lafayette, Indiana, USA

Low-Cost Diagnostics: A Novel Aptamer Screening Process

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ABSTRACT

Low-Cost diagnostic and screening tools are of vital importance for low resources countries like those in Africa. DNA aptamers are becoming an important detection analytical tool to recognize small molecule targets, drugs and metabolites. Compared to alternative recognition motifs, such as antibody, protein and peptides, aptamers are cheaper to produce via chemical synthesis, stable at room temperature and relatively faster in R&D lead time (<1 year). Over the past 15 years, various aptamer based sensors have been developed. Conventionally, aptamers were screened via a Systematic Evolution of Ligands by EXponential enrichment(SELEX) process. We have improved the SELEX process to improve the binding affinity of aptamers. A novel aptamer was discovered for α -KG; an oncometabolite which are showing connections with the mutations occurring frequently in gliomas and acute myeloid leukemia. Combined with a fluorescent assay, the aptamer can potentially quantify the concentration of α -KG with high accuracy.

KEYWORDS

Biosensor, Fluorescence spectroscopy, SELEX, Aptamers, Oligonucleotide