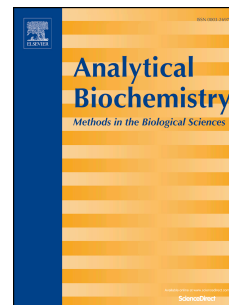


Accepted Manuscript

Selection of DNA aptamers to *Streptococcus pneumonia* and fabrication of graphene oxide based fluorescent assay

Abdullah Tahir Bayraç, Sultan Ilayda Donmez



PII: S0003-2697(18)30485-8

DOI: [10.1016/j.ab.2018.06.024](https://doi.org/10.1016/j.ab.2018.06.024)

Reference: YABIO 13061

To appear in: *Analytical Biochemistry*

Received Date: 3 May 2018

Revised Date: 23 June 2018

Accepted Date: 25 June 2018

Please cite this article as: A.T. Bayraç, S.I. Donmez, Selection of DNA aptamers to *Streptococcus pneumonia* and fabrication of graphene oxide based fluorescent assay, *Analytical Biochemistry* (2018), doi: 10.1016/j.ab.2018.06.024.

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Selection of DNA Aptamers to *Streptococcus pneumoniae* and fabrication of graphene oxide based fluorescent assay

Abdullah Tahir BAYRAÇ¹, Sultan Ilayda DONMEZ¹

¹Department of Bioengineering, Karamanoglu Mehmetbey University, Yunus Emre Campus, 70100

Karaman, Turkey

bayrac@kmu.edu.tr

Abstract

Pneumococci are one of the leading causes of infections throughout the world causing problems mainly in children, elderly, and immune-deficient patients. In recent years antibiotic resistant *Streptococcus pneumoniae* strains become widespread. Therefore simple, rapid, and specific detection methods are needed for public health. In this study, DNA aptamer probes against *S. pneumoniae* were selected using bacterial Systematic Evolution of Ligands by Exponential Enrichment (SELEX) and these probes were integrated in to a graphene oxide (GO) based fluorescent assay. Among the tested aptamers three candidates Lyd-1, Lyd-2 and Lyd-3 showed K_d values of 844.7 ± 123.6 , 1984.8 ± 347.5 , and 661.8 ± 111.3 nM, respectively. These candidates showed binding affinity to *S. pneumoniae* and no specific binding to the bacteria used in negative selection. The binding of aptamers were showed by fluorescence spectroscopy and flow cytometry. GO based label-free fluorescent assay developed using Lyd-3 aptamer had a unique detection limit of 15 cfu.mL^{-1} . Thus we believe that the selected aptamers and fabricated GO based assay has potential to be used in the detection of *S. pneumoniae*. Selected aptamers selectively bind to *S. pneumoniae* with anti-pneumococcal potential and holds great potential to be used as molecular probes for identifying and targeting.

Key words: Aptamer; *pneumoniae*; SELEX; pathogen biosensor; biofilm

Download English Version:

<https://daneshyari.com/en/article/7556644>

Download Persian Version:

<https://daneshyari.com/article/7556644>

[Daneshyari.com](https://daneshyari.com)