

Integrating Aptamer Technology with Paper-Based Point-of-Care Devices for Biomedical Monitoring

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DNA aptamers and DNA enzymes (denoted as functional nucleic acids or FNA) are an emerging platform for development of point-of-care (POC) diagnostic devices. In this presentation, I will first focus on the development of new DNA aptamers and DNA enzymes for a range of key biomarkers and their integration into colorimetric and fluorimetric assays for a variety of targets, mainly in the area of infectious disease. Methods to transduce the binding of a target to a FNA into the production of a DNA strand as an output will then be described (Figure 1). The use of the output DNA to directly initiate color production or produce room temperature isothermal amplification through rolling circle amplification methods will then be outlined.^[1-3] Finally, the integration of the FNA assays into paper devices will be described as a platform for a range of new POC devices that allow facile detection of clinical analytes. Examples will be provided outlining paper-based devices for ultra-sensitive detection of bacteria such as *Escherichia coli*,^[4,5] *Clostridium difficile*,^[6,7] *Helicobacter pylori*^[8] and methicillin resistant *Staphylococcus Aureus* will be described. Finally, I will highlight our recent work on the development of a rapid home-based test for SARS-CoV-2.

References

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Figures

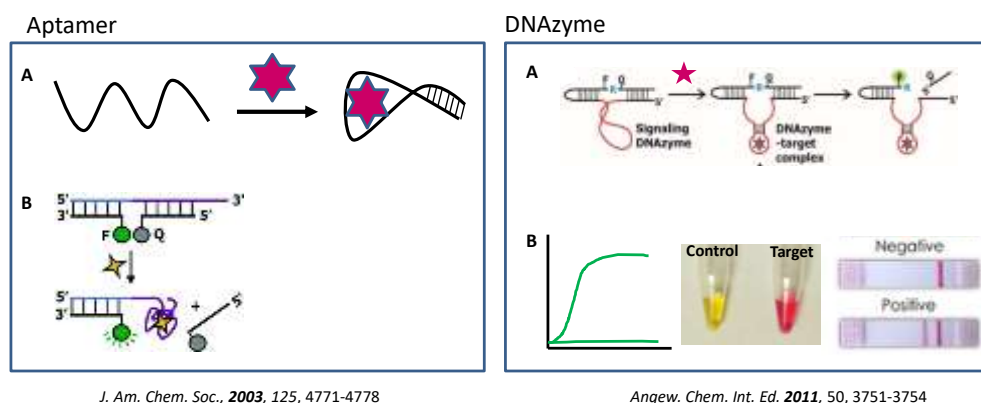


Figure 1. Examples of methods to transduce target binding to a DNA output using an aptamer or DNAzyme.