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Letter to the Editor

Going One Up with Paper-based Chemiluminescent Assay Technology

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Quick Response Code:

Dear Sir,

We have read with interest the article by Khan *et al.* (Global Journal of Medical, Pharmaceutical, and Biochemical Update, Volume 18,[1] Year 2023) comparing and contrasting enzyme-linked immunosorbent assay (ELISA) and chemiluminescent immunoassay (CLIA) techniques.[1] As inferred by the authors, it is indeed true that CLIA offers a better detection range than ELISA. Considering this detection superiority of CLIA, it is pertinent to highlight that in recent times, a combination of CLIA detection and paper-based technology has surfaced as a promising solution for creating advanced analytical devices for point-of-care (POC) applications.[2] Paper-based CLIA is a diagnostic tool that uses a paper substrate to detect disease markers through chemiluminescence reactions. This approach allows for high selectivity and specificity while maintaining the simplicity of the instrumentation necessary for measuring the light signal. This technology can detect disease markers at low concentrations, making it a valuable tool for the early detection and monitoring of diseases such as cancer, infectious diseases, allergic disorders, and autoimmune disorders. The specificity of the technology allows for accurate diagnosis and differentiation of diseases with similar symptoms. Moreover, paper-based CLIA offers the advantages of portability, versatility, ease of use, compactness, and low cost.[3] The paper substrate is inexpensive, widely available, and biodegradable, making it an accessible option for healthcare settings with limited resources. In addition, the technology requires only a small amount of samples, reducing the cost and invasiveness of the diagnostic process.[4]

However, the limited stability of bioreagents and the need to add reagents manually during the analytical protocol have hindered the commercialization of paper-based CLIA. The paper substrate may also be susceptible to interference from other substances in the sample, thus potentially reducing accuracy. Paper-based CLIA has limited multiplexing capabilities, and at present, the technology is only able to detect a single disease marker at a time, which can be time-consuming and impractical for monitoring multiple diseases or disease progression over time. This limitation may be particularly relevant for diseases with multiple biomarkers or for monitoring response to treatment.[5,6] Researchers are continuously improving paper-based CLIA to meet the ideal POC requirements for successful market implementation. With optical signal measurement using smartphones,[7] paper-based CLIA may find widespread use as a bioanalytic tool.

Declaration of patient consent

Patient's consent not required as there are no patients in this study.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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