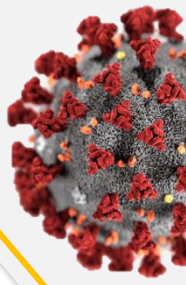
FLUIDIGM MICROFLUIDICS TECHNOLOGY FOR LARGE SCALE SCREENING OF COVID-19

Based on available evidence up to 15 April 2020



INTRODUCTION

Microfluidics technology has practical applications in the design of systems that process small scale, low volumes of fluids (typically sub-millimeter) to achieve multiplexing, automation, and high-throughput screening. Fluidigm Corporation is an innovative biotechnology tools provider that utilizes this technology to create an epigenetic test for early detection of the novel coronavirus that causes COVID-19. Fluidigm microfluidics technology has the ability to rapidly screen a large number of samples, which enhance capabilities in identification and management of infected individuals, including those who are asymptomatic.[1] Based on the information poster by the company, diagnostic labs will be able to generate more than 6,000 individual test results per day with just one hour of hands-on time, representing a scale and parallel processing of assays not possible using microwell plates.[2] In particular, it enables the automated assembly of PCRs at the nanoscale level in a massively parallel manner, as compared with more traditional, microwell plate-based PCR technology. However, it was stated that Fluidigm products are provided for research use only and not for use in diagnostic procedures.[2]

Among the advantages claimed for the benefits of using microfluidics technology / systems are miniscule amounts of samples and reagents in the lab, reduction of the cost due to lesser use of expensive reagents, high resolution and sensitivity in the detection and separation of molecules, reduced in footprint of analytical and diagnostic systems, shorter analysis times and faster results, smooth flow of fluids in tiny channels allows greater flow control and greater control of experimental parameters and sample concentration at the micro-scale.[3]

EVIDENCE ON EFFECTIVENESS AND SAFETY

There was no article retrieved from the scientific databases such as Medline, EBM Reviews, EMBASE via OVID, PubMed and from the general search engines [Google Scholar and US Food and Drug Administration (USFDA)] on the use of Fluidigm microfluidics technology for large scale screening of COVID-19.

CONCLUSION

Based on the review, no evidence retrieved from scientific databases on the effectiveness of Fluidigm microfluidics technology for screening or diagnostic purposes of COVID-19. However, as this innovative biotechnology may have potential for early detection of novel coronavirus and affordable point-of-care diagnostic tool, it is suggested further evaluation and validation to be done by the Institute of Medical Research (IMR) Malaysia for the purpose of large scale screening for COVID-19 using Fluidigm microfluidics technology.

REFERENCE

1. Consortium of Medical Schools Led by Mount Sinai Fast-Tracking COVID-19 Detection Test Utilizing Fluidigm Microfluidics Technology. Fluidigm Corporation. Available from : http://investors.fluidigm.com/news-releases/news-release-details/consortium-med ical-schools-led-mount-sinai-fast-tracking-covid (accessed online on 15 April 2020)
2. Detection of Human and Viral Full-Length RNA Using a Nanoscale Microfluidic Platform. Fluidigm Corporation. Available from : https://www.fluidigm.com/singlearticles/covid-19 (accessed online on 15 April 2020)
3. Cheriyedath S. What is microfluidics? Available from: https://www.news-medical.net/life-sciences/What-is-Microfluidics.aspx (accessed online on 15 April 2020)

Based on available evidence up to 15th April 2020.

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Disclaimer: This rapid assessment was prepared to provide urgent evidence-based input during COVID-19 pandemic. The report is prepared based on information available at the time of research and a limited literature. It is not a definitive statement on the safety, effectiveness or cost effectiveness of the health technology covered. Additionally, other relevant scientific findings may have been reported since completion of this report.

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