HEPATITIS C VIRUS DIAGNOSIS USING MICROFLUIDICS TECHNIQUE

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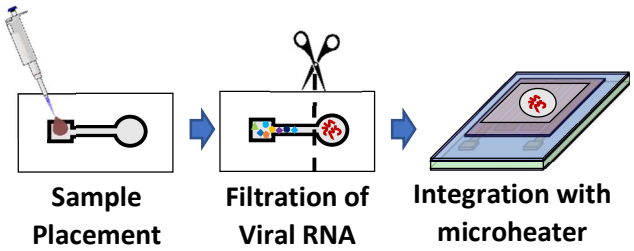
Product Background

- Conventional techniques for HCV detection required highly sophisticated equipment, huge samples, reagents, and human resources and highly time-consuming.
- Rapid test kits detect only HCV Ab and even after no active infection, antibodies can be detected.
- In RNA detection, filtering of unwanted particles in blood is difficult.
- Filtration can be achieved using the suitable grade filter paper.
- The overall results reveal that the large particles are filtered, and HCV particles alone reached the outlet to commence the RT-LAMP reaction.

Research Objective

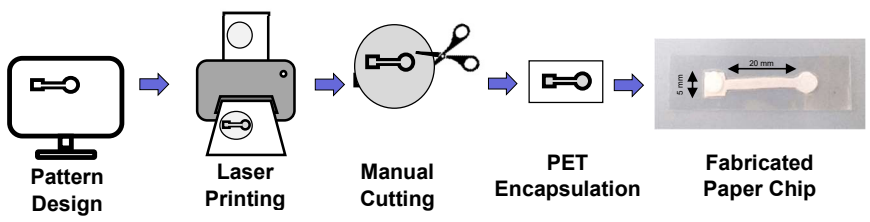
- Analysing the effective filtration of HCV particles via paper chip.
- Integrate the paper-chips with microheater and evaluate the temperature distribution to initiate RT-LAMP for the direct detection of HCV RNA.

State of the Art/ Methods

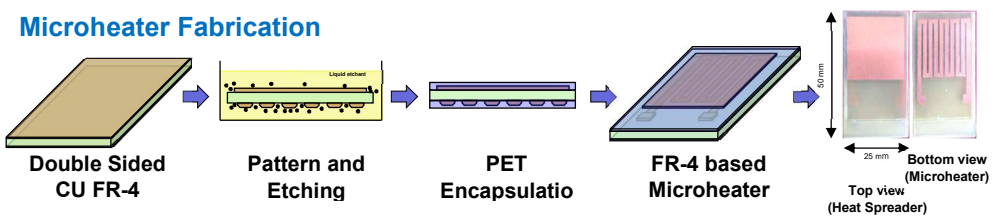


Product Image

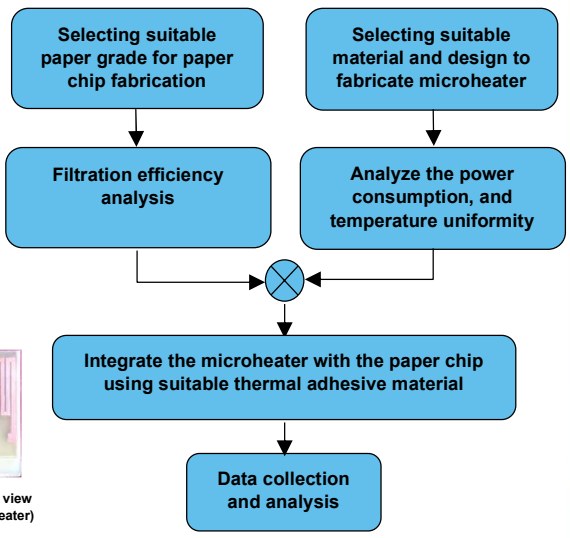
Paper Chip Fabrication



Microheater Fabrication

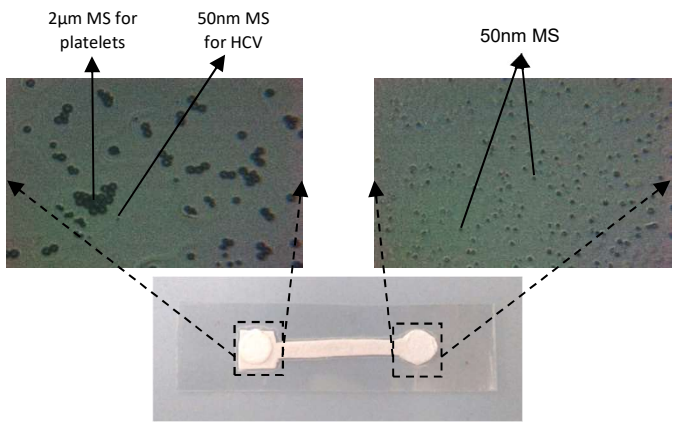


Flow Chart

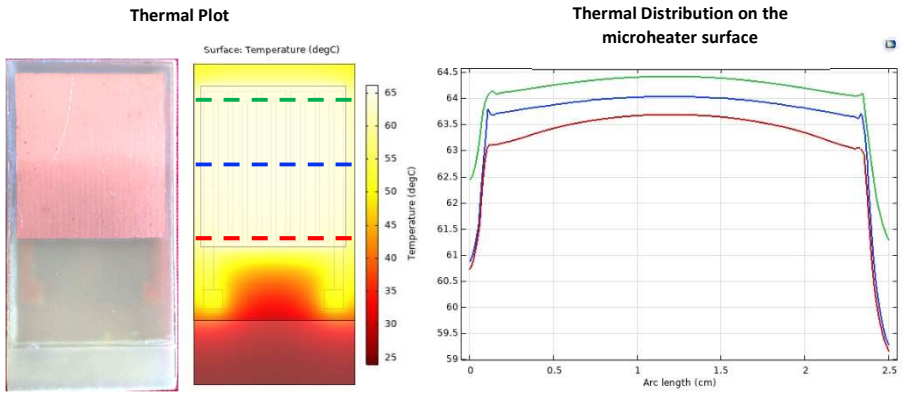


Product Characteristics/Results

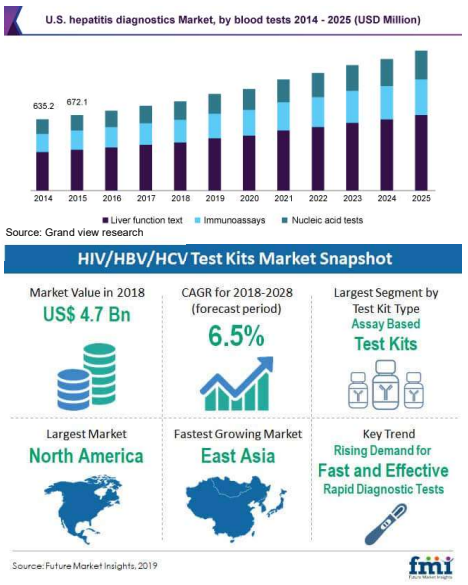
Filtration Analysis of Paper Chip



Thermal Analysis of Microheater



Marketability & Commercialisation



Novelty/ Originality/ Inventiveness

- HCV viral isolation in less than 3 min.

Environmental Impact

- Alternative to PCR test.
- Enhances the quality of initiating treatment at the early stage.
- Less wastage of detection kits.

Status of Innovation

- Product is under development and undergoing analysis.

Cost Analysis

Benefits/Usefulness/ Applicability

- Inexpensive and requires less work force.
- Does not required any sophisticated equipment.
- Detect HCV RNA in ~30 min.
- Simple and quick fabrication procedure.

Publications

- Z.E.Jeroish, K.S.Bhuvaneshwari, Fahmi Samsuri, and Vigneswaran Narayanamurthy, Computational Analysis of Microheater, *Journal of Mechanical Engineering & Sciences*, 2021. (Accepted for publication)
- Vigneswaran Narayanamurthy, Z.E.Jeroish, K.S.Bhuvaneshwari, and Fahmi Samsuri, Hepatitis C Virus (HCV) Diagnosis via Microfluidics, *Analytical Methods*, Advance Article, 2021.