

3D Printed Microfluidic Devices for Rapid Virus Detection

ID: 2023-038

Executive Statement:

A groundbreaking diagnostic tool leveraging 3D printing to detect viral RNA without traditional amplification, streamlining pathogen identification.

Description:

This technology utilizes advanced 3D printing to create microfluidic devices for the rapid and cost-effective detection of nucleic acid biomarkers, specifically targeting mosquito-borne viruses like Chikungunya. By incorporating a porous polymer monolith, it enables the selective capture and fluorescent labeling of nucleic acids, facilitating the detection of viral RNA sequences directly, bypassing the need for PCR amplification.

Key Advantages:

- Significant reduction in detection time and reagent costs
- Requires only microliter-scale sample volumes
- High specificity and sensitivity for target RNA sequences
- Potential for automation and use in resource-limited settings

Problems Solved:

- Eliminates the need for costly and time-consuming PCR amplification
- Facilitates rapid detection of mosquito-borne diseases in point-of-care settings
- Improves diagnostic capabilities in areas with limited resources

Market Applications:

- Point-of-care diagnostic tools for mosquito-borne diseases
- Public health surveillance and disease prevention
- Research tools for virology and disease pathology