



## TECHNOLOGY

# Dialysis Driven Real-Time PCR with Surface Enhanced Raman Spectroscopy in a Thermoplastic Chip

## OVERVIEW

### Background

Over the past decade, there has been a push for the use of microfluidic devices as ideal point of care of diagnostic tools as a result of their portability and simplicity. These devices allow for the manipulation of small volumes of liquid in microfabricated channels thereby, facilitating the analyses of disease biomarkers such as nucleic acids, proteins and lipids. These platforms however are plagued with the challenges of fluidic interfacing which requires complex and costly equipment for signal output analyses. This is especially the case for microdevices using fluorescence based detection which is the golden standard for highly sensitive analyses requiring costly filters and detectors. Alternative detection modalities to fluorescence detection have been interfaced with microfluidic platforms such as surface enhanced raman spectroscopy (SERS). SERS associated hardware is portable and less costly. Efforts to make SERS detection sensitivity and specificity mirror that of fluorescence detection have progressed significantly in recent years.

### Innovation

The market of microfluidic diagnostic devices will be 10.8 billion USD by 2020 with a growth rate of 65.6%. Researchers at the University of Maryland College Park have developed a polymer based microfluidic platform whose features enable the diagnostic capability of querying and quantifying multiple signature gene copies using SERS mode of detection. Its geometrical configuration and assembly facilitates the sensitive detection of a nucleic based assay with greater efficacy than conventional devices. This device is scalable and would be highly amenable for clinical applications.

### Advantages

- Portable and field deployable
- Quick read out of data
- Compatible with the diagnoses of a myriad diseases
- Cheaper to produce due to low cost of fabrication and high reproducibility
- Low volumes of samples and reagents thus saving cost
- Integration and automation of analysis steps

### Applications

- Point of care diagnostic device for clinical samples
- Sampling device for environmental samples
- Research tools

## CONTACT INFO

UM Ventures  
0134 Lee Building  
7809 Regents Drive  
College Park, MD 20742  
Email: [umdtechtransfer@umd.edu](mailto:umdtechtransfer@umd.edu)  
Phone: (301) 405-3947 | Fax: (301) 314-9502

## **Additional Information**

### **INSTITUTION**

University of Maryland, College Park

### **PATENT STATUS**

Pending

### **EXTERNAL RESOURCES**

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