Ultrasensitive Viral Protein Detection

Tech ID: 33601 / UC Case 2024-821-0

BACKGROUND

Target biomarkers are often found at low levels (e.g., attomolar to picomolar scale) in the early stages of disease. Current biosensor technologies are limited by their ability to simply and precisely detect target biomarkers at very low concentrations though. Typical biomedical samples, like blood or urine, can also compromise the specificity and sensitivity of common diagnostic platforms without extensive sample processing to remove background contaminants. For example, there are 20,000 molecules in 30 □L specimen (finger prick of blood) at 1 fM concentration, and 100 molecules is needed to get to a statistically meaningful measurement.

TECHNOLOGY DESCRIPTION

To overcome these challenges, researchers at UC Santa Cruz (UCSC) have improved upon a diagnostic platform that uses specialized nanopore sensors to achieve attomolar detection in minutes in complex sample. Preliminary lab results demonstrated detection down to 16 aM, more than 300 events detected in 300 seconds for 100 aM concentration, and around 4000 events detected for 10 fM concentration in 300 seconds.

APPLICATIONS

- Point of care diagnostics
- Field research of viruses and other infectious agents
- Detection of environmental contaminants

ADVANTAGES

- Ultrasensitive detection down to attomolar detection capabilities
- Complex sample analysis including not being confounded by the specificity limitations of conventional nanopores
- Manufacturing advantages including silicon-compatible, high-throughput, and low-cost approaches

INTELLECTUAL PROPERTY INFORMATION

Patent Pending

RELATED MATERIALS

CONTACT

Marc Oettinger
marc.oettinger@ucsc.edu
tel: 831-502-0253.

OTHER INFORMATION

KEYWORDS

nanopore, biomarkers, diagnostics, assay, disease, early detection, viral, virus, protein

CATEGORIZED AS

- **Medical**
  - Research Tools
  - Screening
- **Research Tools**
  - Screening Assays
- **Sensors & Instrumentation**
  - Analytical
  - Biosensors
  - Medical
  - Scientific/Research

RELATED CASES

2024-821-0