

An Electrochemical Sensor Based on a Generator-collector Configuration for Rapid Single Particle Detection

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TECHNOLOGY READINESS LEVEL

4

Seeking

Investment | Licensing | Research

Keywords

- Electrochemical sensor
- Single particle
- Redox cycling

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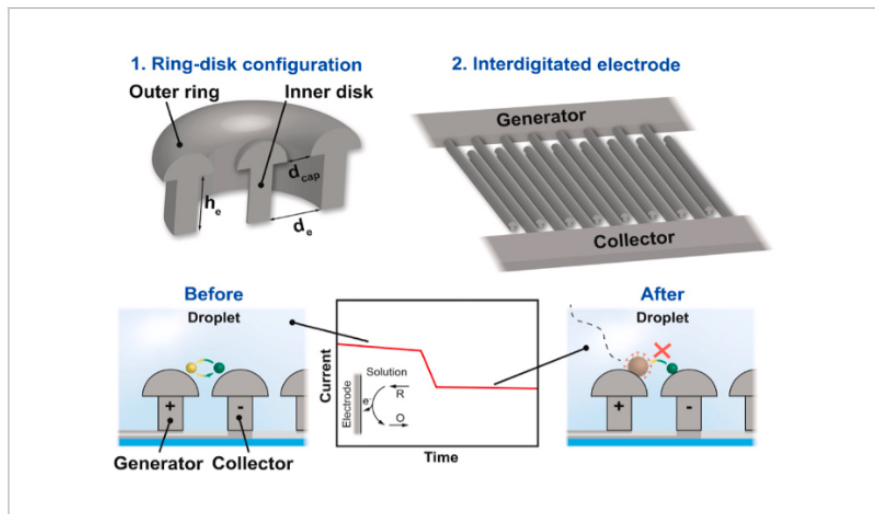


Figure 1: Ring-disk configuration and generator and collector layout

Technology Summary

The COVID-19 pandemic has highlighted the need for rapid, low-cost, and sensitive virus detection platforms to monitor and mitigate widespread outbreaks. The proposed design combines a redox-cycling amplified electrochemical current with electrophoresis-driven electrode-particle collision for rapid virus detection. The effects of experimental and geometric factors were studied to optimize the sensor design. As a result, the ring-disk configuration was found to reduce single virus capture times from 700s to approximately 20s. The proposed invention, for that reason, offers rapid virus detection.

Application & Market Utility

The proposed invention is a virus detection platform with increased efficiency and lower production cost. Compared to the original configuration, the detection platform increased its sensitivity drastically, making it a viable option for various viruses while reducing the production cost. As a result, the invention has the capability of mitigating widespread outbreaks. Currently, the market for virology testing is estimated to value at approximately \$12.5 billion dollars. The market for virology testing is suspected to grow in the future with the market reaching approximately \$14 billion dollars.

Next Steps

Researchers are further optimizing and refining their technology and are currently looking for licensing partners to bring the full potential of this innovation to the world.



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