Handheld Device For Quick DNA Extraction

Tech ID: 33819 / UC Case 2025-658-0

BACKGROUND

Current lab procedures for DNA extraction and analysis include multiple steps, such as manual tissue homogenization and nucleic acid extraction, followed by downstream assays like qPCR and sequencing. The entire process can take from a few days to several weeks, depending on the schedule and the specimen amount. Although this standard practice provides reliable results due to high-quality nucleic acids, the long turnaround times and labor intensiveness make it inefficient for applications that need a faster turnaround time like disease control.

BRIEF DESCRIPTION

Professor Hideaki Tsutsui and colleagues from the University of California, Riverside have developed a portable handheld device for nucleic acid extraction. With its high-speed motor, knurled lysis chamber for rapid sample lysis, and quick nucleic acid extraction using paper disks, this device can yield ready-to-use extracts in just 12 minutes, significantly reducing the time required for sample preparation. This technology is advantageous over current methods as it can be expedited without the need for cumbersome specimen collection, packaging, and submission, shortening the turnaround time.

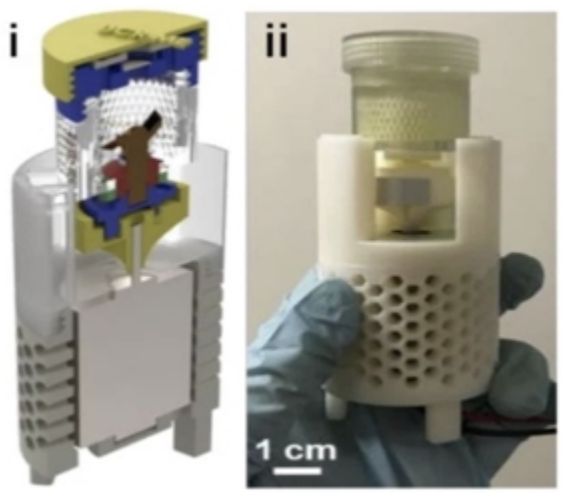

Fig 1: The UCR device: i) cutaway drawing and ii) 3D-printed device.

SUGGESTED USES

- A potential alternative to standard lab protocol, allowing individuals to rapidly prepare ready-to-use nucleic acids in the field for analysis.
- For use in various industries including agriculture, food safety, healthcare, disease control, and research and development.

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OTHER INFORMATION

KEYWORDS

3D-printed handheld device; portable DNA extraction; rapid nucleic acid extraction; plant disease diagnostics

CATEGORIZED AS

- **Research Tools**
  - Nucleic Acids/DNA/RNA
  - Other
- **Sensors & Instrumentation**
  - Scientific/Research

RELATED CASES

2025-658-0

PATENT STATUS

Patent Pending

RELATED MATERIALS

- Liu, Chia-Wei, et al. A 3D-Printed Handheld Device for Quick Citrus Tissue Lysis and Nucleic Acid Extraction, 27 Aug. 2024 - 08/27/2024

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