มหาวิทยาลัยมหิดล
คณะแพทยศาสตร์
ศิริราชพยาบาล

BIOMEDICAL INNOVATIONS IN THE PANDEMIC

Prasert Auewarakul

Pandemic innovations are those responding to the emerging needs during pandemic.

In medicine, they are responding to:

- the needs of other patients in seeking medical attention when the service capacity is compromised;
- the needs specific to the pandemic disease:
  - Demand surge for hospital / ICU beds and infection control;
  - Diagnostic, drugs and vaccines.

รพ.ศิริราช ให้บริการ “เทเลเมดิซีน” พบแพทย์ออนไลน์ - ส่งยาถึงบ้าน


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ARTICLES

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Clinical validation of a Cas13-based assay for the detection of SARS-CoV-2 RNA

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Nucleic acid detection by isothermal amplification and the collateral cleavage of reporter molecules by CRISPR-associated enzymes is a promising alternative to quantitative PCR. Here, we report the clinical validation of the specific high-sensitivity enzymatic reporter unlocking (SHERLOCK) assay using the enzyme Cas13a from *Leptotrichia wadei* for the detection of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)—the virus that causes coronavirus disease 2019 (COVID-19)—in 154 nasopharyngeal and throat swab samples collected at Siriraj Hospital, Thailand. Within a detection limit of 42 RNA copies per reaction, SHERLOCK was 100% specific and 100% sensitive with a fluorescence readout, and 100% specific and 97% sensitive with a lateral-flow readout. For the full range of viral load in the clinical samples, the fluorescence readout was 100% specific and 96% sensitive. For 380 SARS-CoV-2-negative pre-operative samples from patients undergoing surgery, SHERLOCK was in 100% agreement with quantitative PCR with reverse transcription. The assay, which we show is amenable to multiplexed detection in a single lateral-flow strip incorporating an internal control for ribonuclease contamination, should facilitate SARS-CoV-2 detection in settings with limited resources.

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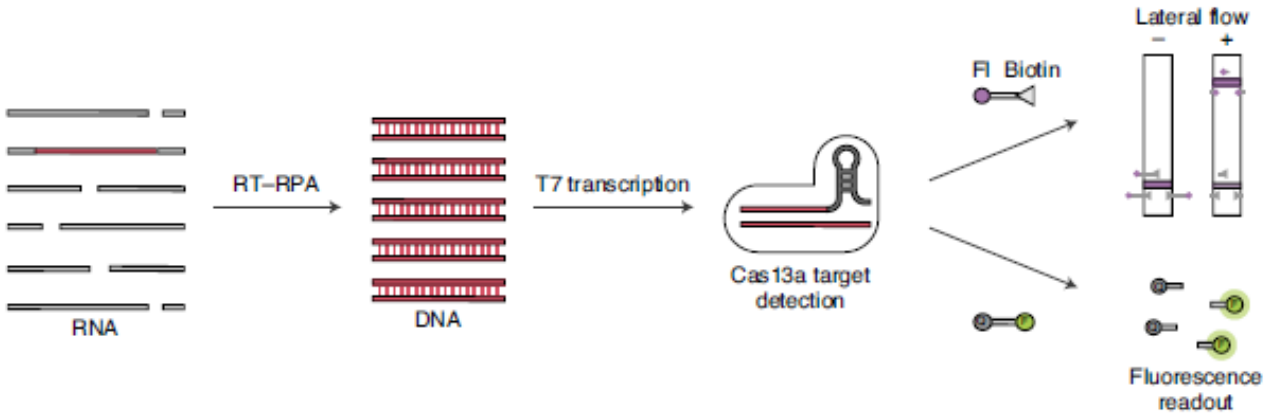

Fig. 1 | SHERLOCK detection of SARS-CoV-2 RNA. A SARS-CoV-2 RNA region of interest is isothermally amplified to DNA by RT–RPA, then converted to RNA by T7 transcription. Cognate binding of Cas13a–crRNA complex to amplified RNA targets triggers collateral activity of Cas13a, which cleaves RNA reporters. Cleaved RNA reporters can be captured on a colorimetric lateral-flow strip (biotin–fluorescein RNA reporter, top path) or visualized by fluorescence signal (molecular beacon fluorescent reporter, bottom path). Fl, fluorescein.

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Thailand's Largest Hospital to Initiates Ivermectin Clinical Trial in COVID-19 Patients

JUN 21, 2020 | COVID-19, IVERMECTIN, MAHIDOL UNIVERSITY, NEWS, SARS-COV-2, SIRIRAJ HOSPITAL, THAILAND

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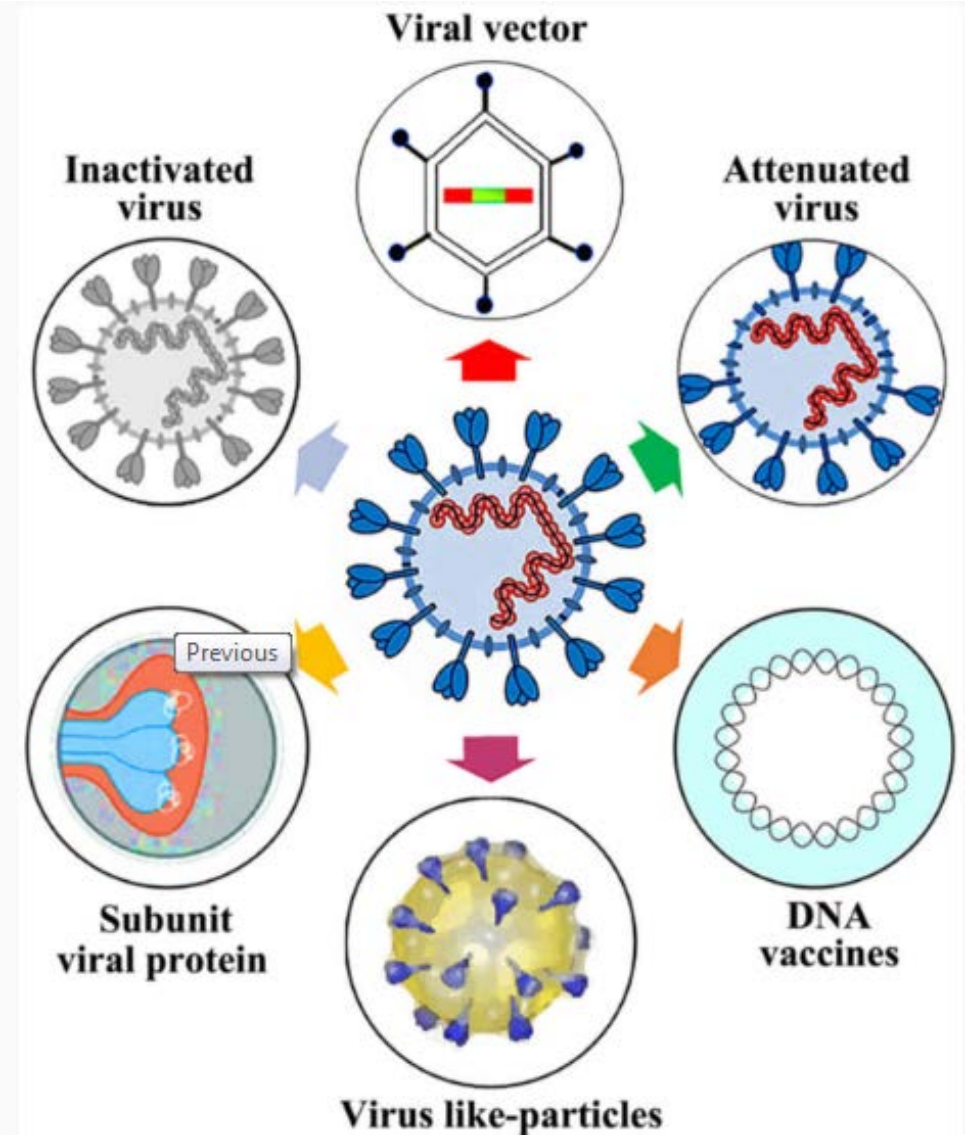
Viral vector
Inactivated virus
Attenuated virus
Previous
Subunit viral protein
DNA vaccines
Virus like-particles