

Rapid Reviews COVID-19

Review 2: "Ultrasensitive and Selective Detection of SARS-CoV-2 Using Thermotropic Liquid Crystals and Image-Based Machine Learning"

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RR:C19 Evidence Scale rating by reviewer:

- **Reliable.** The main study claims are generally justified by its methods and data. The results and conclusions are likely to be similar to the hypothetical ideal study. There are some minor caveats or limitations, but they would/do not change the major claims of the study. The study provides sufficient strength of evidence on its own that its main claims should be considered actionable, with some room for future revision.

Review:

The manuscript titled "Ultrasensitive and Selective Detection of SARS-CoV-2 using Thermotropic Liquid Crystals and Image-based Machine Learning" presents an interesting and fairly innovative approach to rapid, point-of-care detection of single-stranded ribonucleic acid (ssRNA) of SARS-CoV-2 based on transitions in liquid crystal (LC) films following interaction with complementary single-stranded deoxyribonucleic acid (ssDNA) probes. The authors claim that the assay has a high sensitivity (30 fM), a relatively high speed (7-20 min), and, at the same time, claim that it is quite selective (tolerant only for a 3 bp mismatch). It must be emphasized that the manuscript presents a proof-of-concept study, which is interesting, well-documented, and well-presented. It bears potential for future application and, therefore, I suggest its acceptance for publication.