

Mediator displacement LAMP

Isothermal real-time multiplex detection using mediator displacement probes and universal reporters

We offer a rapid and highly specific method for nucleic acid detection based on mediator displacement loop-mediated isothermal amplification (MD LAMP). The novel universal mediator-reporter set allows easy adaption to different targets and enables the detection of various diagnostic panels in a multiplex format.

The MD LAMP features a mediator displacement (MD) probe and a universal reporter. During amplification of target DNA, the mediator is displaced from the MD probe. The free mediator hybridizes to the reporter generating a fluorescence signal (Fig. 1).

MD LAMP is capable of detecting multiple targets simultaneously with high analytical performance, as shown previously on the example of HIV-1 and HTLV-1 (Fig. 2).¹

Moreover, the clinical validation of the biplex MD LAMP for the detection of yaws, an infection causing skin lesions, demonstrated high diagnostic sensitivities and specificities.² This powerful detection method proved to be highly suitable for the analysis of complex sample material.

References

- ¹ L. Becherer et al., Anal. Chem., 2018, 90, 7, 4741-4748
- ² L. Becherer et al., Emerg. Infect. Dis., 2020, 26, 2, 282-288

Features

- Highly specific towards the target
- Fast: Time to result in < 10 min
- Quantitative and real-time detection
- Standardized multiplex format
- Short development cycles & approval process

Service + Competence

- Assay design & optimization
- Kit development
- Out-licensing of MD LAMP
- Digital LAMP
- Microfluidic platform integration

Applications

- Diagnostics of infectious diseases
- Therapy monitoring
- Environmental monitoring
- Food safety and quality control

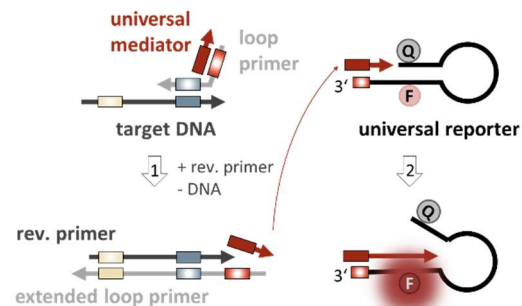


Fig. 1 Reaction mechanism of the mediator displacement detection of LAMP. (1) Primer annealing to the target and subsequent elongation induces the displacement of the universal mediator. (2) Free mediator hybridizes with the universal reporter and generates a fluorescence signal due to the extension of the mediator.¹

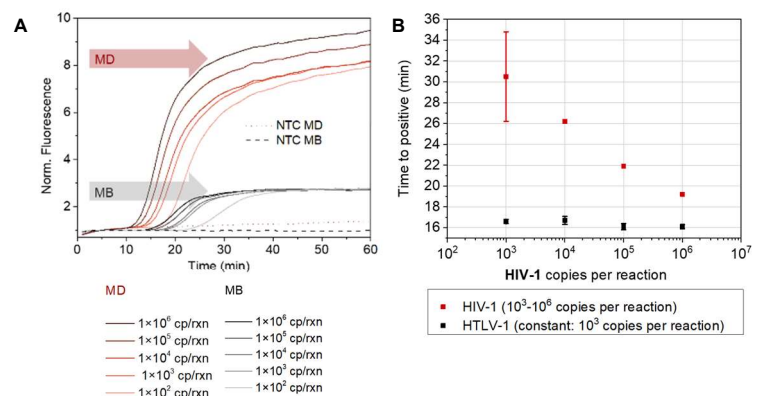


Fig. 2 A HIV-1 RNA detected by mediator displacement (MD) and molecular beacon (MB) LAMP: MD is 4.1 ± 0.1 minutes faster and the signal-to-noise ratio is two times higher than MB-based detection. **B**) Successful co-amplification of various amounts of target RNA by biplex MD RT-LAMP of HIV-1 and HTLV-1. Correlation between template concentration and time to positive enables quantification.¹