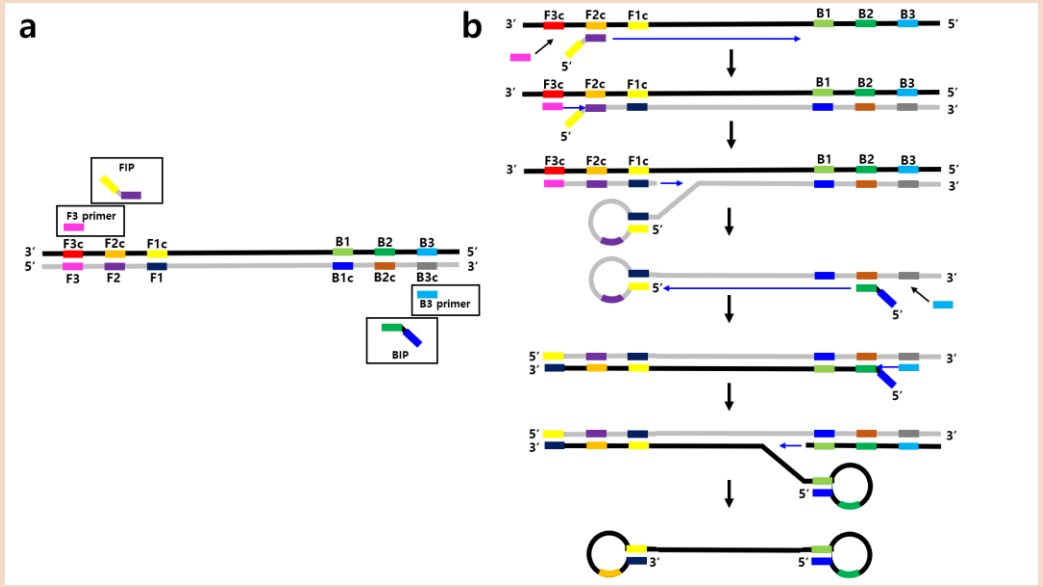
LAMP & Colormetric based COVID-19 detection kit

Rapid and sensitive visual detection of severe acute respiratory syndrome coronavirus 2 (SARS-COV-2) by reverse-transcription loop-mediated isothermal amplification with calcein and hydroxynaphthol blue

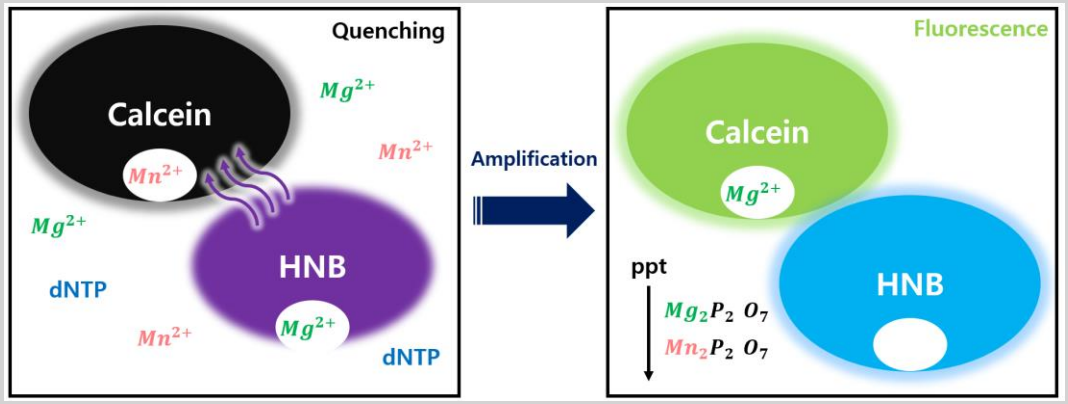
- Loop-mediated isothermal amplification (LAMP)



Loop-mediated isothermal amplification (LAMP) uses 4-6 primers that recognize 6-8 regions of target DNA.

DNA polymerase, which displaces the strand, starts synthesis and two of the primers form a loop structure to facilitate subsequent rounds of amplification.

- Colormetric : Calcein + Hydroxynaphthol blue



-Calcein-
pH 12↑ : Formation of a yellow-green chelation with Mg^{2+}
Combined with Mn^{2+} : Black color(Quenching)
Combined with Mg^{2+} : Yellow−green color

-HNB-
pH 12~13 : Changes from purple to blue when Mg^{2+} is present
Combined with Mg^{2+} : Purple color
Non-combined with Mg^{2+} : Blue color

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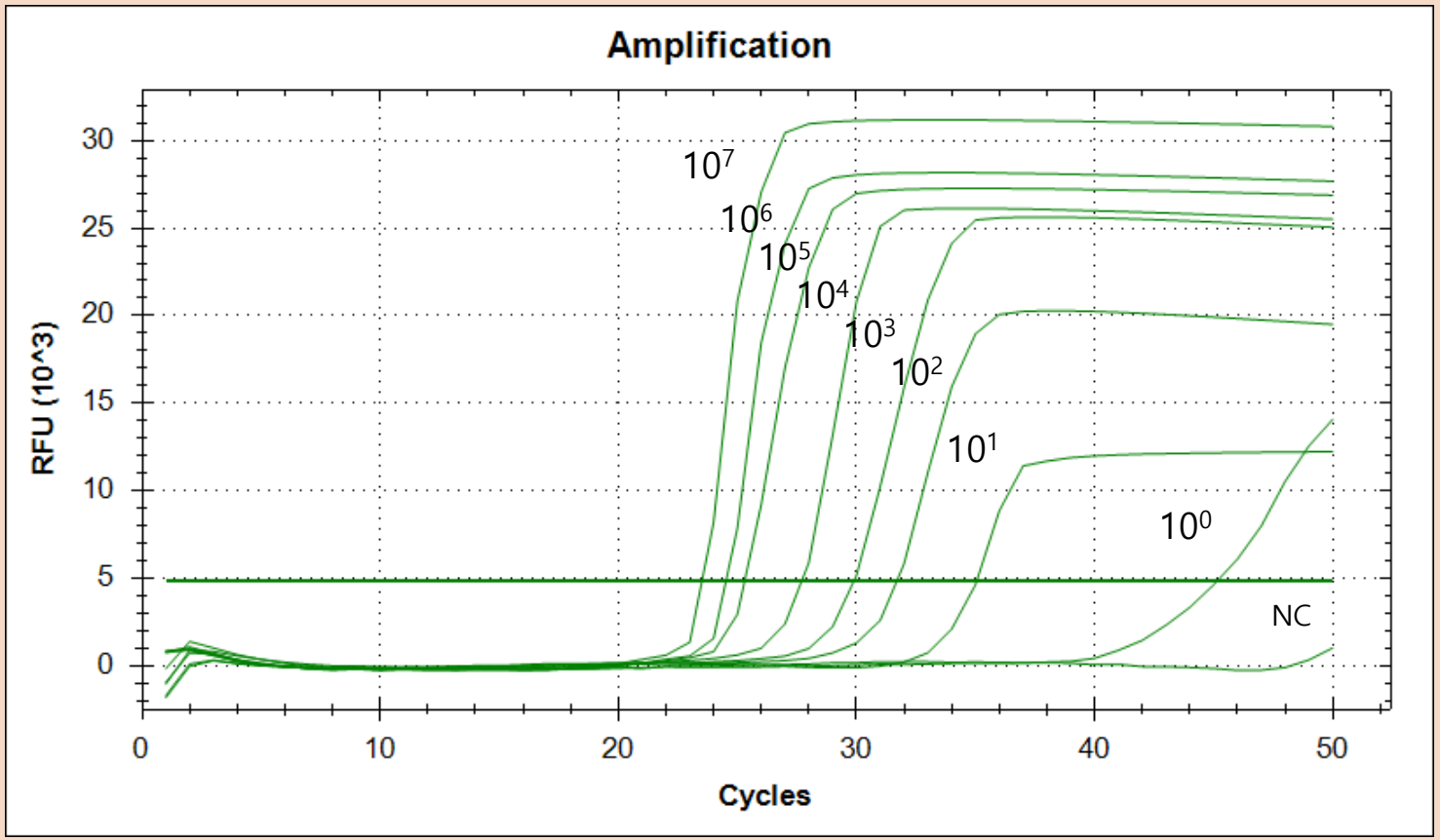
- PCR results



Copies/5ul	Results
	Ct Mean
1 x 10^7	23.06
1 x 10^6	24.24
1 x 10^5	25.46
1 x 10^4	27.78
1 x 10^3	30.92
1 x 10^2	31.95
1 x 10^1	34.11
1 x 10^0	45.37
PC	22.01
NC	N/A

As a result of the PCR sensitivity test, it can be detected even at the level of 1 copy

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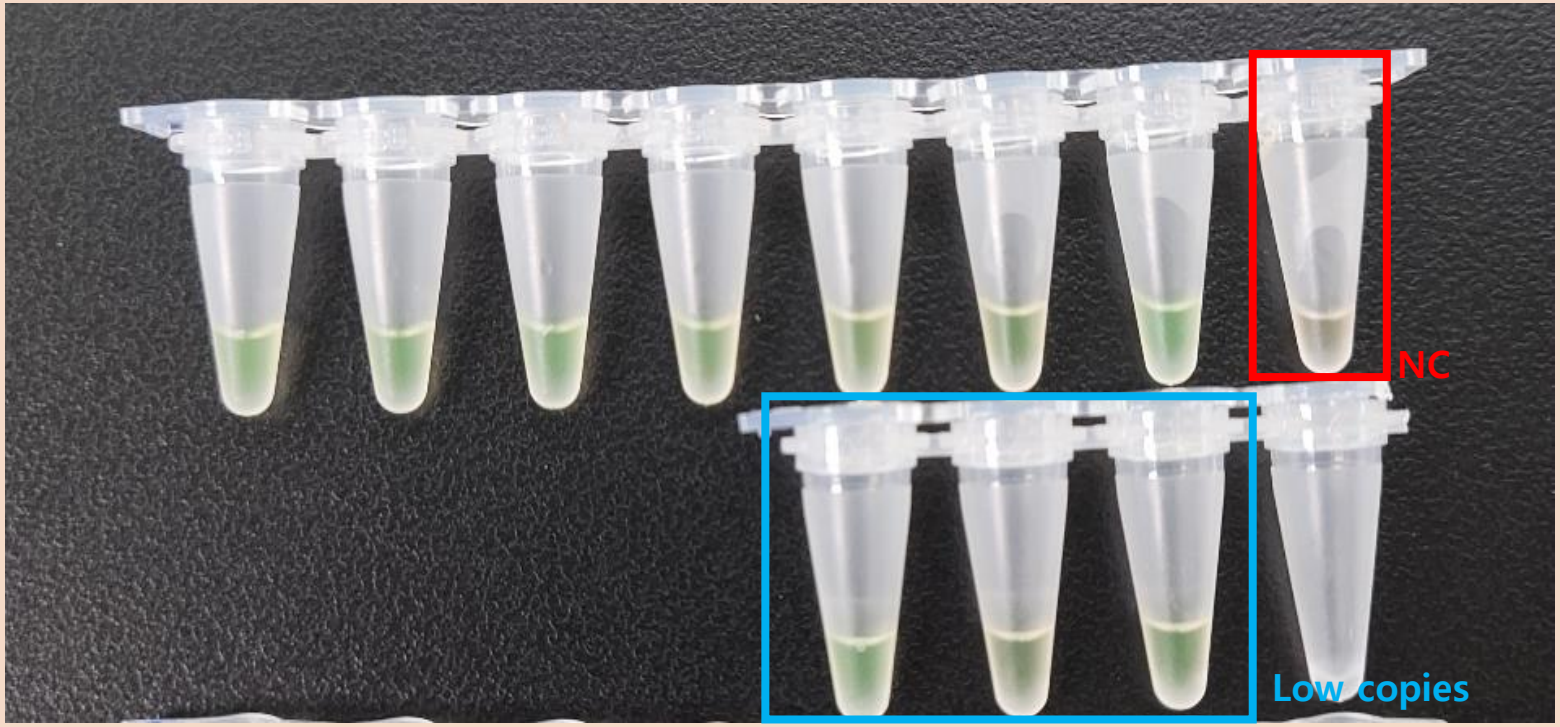
- Colormetric results



Distinction between positive and negative colors
&
clear color change even in low-concentration samples