

Phosphorothioated Primers Lead to Loop-Mediated Isothermal Amplification at Low Temperatures

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Loop-mediated isothermal amplification (LAMP) is an extremely powerful tool for the detection of nucleic acids with high sensitivity and specificity. However, LAMP shows optimal performance at around 65 °C, which limits applications in point-of-care-testing (POCT). Here, we have developed a version of LAMP that uses phosphorothioated primers (PS-LAMP) to enable more efficient hairpin formation and extension at the termini of growing concatamers, and that therefore works at much lower temperatures. By including additional factors such as chaotropes (urea) and single-stranded DNA binding protein (SSB), the sensitivities and selectivities for amplicon detection with PS-LAMP at 40 °C were comparable with a regular LAMP reaction at 65 °C.