

A dual cyclic amplification based on the phosphorothioated hairpin for sensitive detection of nucleic acid

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We herein described a sensitive and straightforward detection strategy for target nucleic acid by utilizing the phosphorothioated and self-priming hairpin amplification. This strategy is composed of two distinct amplification cycles that rely on the DNA hairpin (HP) which has 5' phosphorothioated (PS) DNA overhang, target recognition site at loop region, and 3' self-assembled primer. The self-assembled primer at 3' terminus which is partially blocked in the initial state is rearranged upon binding of target DNA and initiates extension reaction on the HP, consequently displacing and recycling the target to open another HP. Since the 5' PS-DNA in extended HP (EP) reduces the melting temperature of PS-DNA/DNA duplex, the trigger can bind to the complementary strand of PS-DNA and be extended to produce final products. Based on the unique features of PS-DNA and self-assembled primer, sensitive detection of target DNA could be achieved in a simple manner. With these advantages, this simple and sensitive approach would be a promising tool for point of care diagnostics.