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Visual detection of nucleic acids based on lateral flow biosensor and hybridization chain reaction amplification

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Abstract

In this study, a new lateral flow nucleic acid biosensor (LFNAB) using hybridization chain reaction (HCR) for signal amplification was developed for visual detection of nucleic acids with high sensitivity and low cost. A “sandwich-type” detection strategy was employed in our design. The sandwich system of capture probe (CP)/target DNA/reporter probe (RP)-HCR complexes was fabricated as the sensing platform. As the initiator strand, reporter probe propagated a chain reaction of hybridization events between the two hairpin probes modified with biotin, and determined whether long nicked DNA polymers were formed. The biotin-labeled double-strand