

عنوان مقاله:

Lateral Flow Genochromatographic Strip for Naked-Eye Detection of Mycobacterium Tuberculosis PCR Products with Gold Nanoparticles as a Reporter

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خلاصه مقاله:

Background: Mycobacterium tuberculosis (MTB) is a pathogen causing tuberculosis (TB) in human, and TB can cause enormous social and economic disruptions. Lateral flow test strips (LFTSs) are inexpensive, portable, disposable, rapid, and easy-to-use analytical tools. Objective: LFTSs were prepared for the detection of MTB. LFTSs were fabricated using a new specific probe for MTB H₃VRv, based on IS₆₁₁₀ sequence gene, and tailed with poly deoxyadenine (dA). Material and Methods: In this experimental study, to create test and control zones, streptavidin (STP) and a 15-mer dA were dotted on a nitrocellulose membrane. Gold nanoparticles (GNPs) were conjugated with poly deoxythymidine sequence and placed on the conjugate pad. The composition of immersion buffers for sample pad and conjugate pad, running solution, solutions of GNPs-S-dT₁₅ and STP were introduced. DNA genome of MTB and Mycobacterium bovis in clinical samples was amplified with PCR, and then detected by the LFTSs. During the assay, samples were firstly hybridized in two steps and then placed on a conjugate pad in a manner that positive and negative samples provided two and one red lines, respectively, on the detection pad. Results: After PCR reaction with biotinylated primer, hybridization process with specific MTB probe-dA₁₅-100 took 10 min, and running process on the strip was performed within 5 min. Conclusion: We showed that LFTS can discriminate a particular bacteria strain from others. The LFTSs can be redesigned for detection of other pathogenic genomes.

کلمات کلیدی:

Lateral Flow, Test Strip, Tuberculosis, Nucleic Acid Hybridization, Metal Nanoparticles, Gold

