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Lateral Flow Assays: Principles, Designs and LabelsElif Burcu Bahadır^a, Mustafa Kemal Sezgintürk^{b*}^aNamık Kemal University, Scientific and Technological Research Center, Tekirdağ-TÜRKİYE^bNamık Kemal University, Faculty of Science, Chemistry Department, Biochemistry Division, Tekirdağ-TÜRKİYE***Corresponding Author:**e-mail: msezginturk@hotmail.commsezginturk@nku.edu.tr

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Highlights

- Lateral flow assays are reviewed in terms of their all aspects.
- Lateral flow assays are low-cost, user friendly, and easy operated.
- More than 220 research papers are compared to their analytical characteristics.

Abstract

Lateral flow assays (LFAs) have attracted interest **due to** their friendly user formats, short assay times, little interferences, low costs, and **being easy by operated by non-specialized personnel**. This technique is based on biochemical interaction of antigen-antibody or probe DNA-target DNA hybridization. A **lateral flow assay (LFA)** is composed of four parts: a sample pad, **which is** the area **on which** sample is dropped; conjugate pad, **on which** labeled tags combined with biorecognition elements; **reaction membrane containing** test line and control line for target DNA-probe DNA hybridization or antigen-antibody interaction; **and** absorbent pad, which reserves waste. For the construction of LFAs gold nanoparticles, colored latex beads, carbon nanoparticles, quantum dots, and enzymes are used as a label for increasing the sensitivity. In this **work**, the principle of LFAs, biorecognition elements, analytical performances, **limits of detection (LODs)**, linear ranges of developed LFAs in different fields are summarized. Future **perspectives** in this area are also discussed.

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