

Lateral flow assay for diagnosis of viral infectious diseases (AIDS, hepatitis C, and hepatitis A)  
using engineered proteinticles

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Lateral flow assay (LFA) is useful point of care diagnosis that rapid, simple, and cost-effective. This LFA-based system can diagnose three different viral intractable diseases (acquired immune deficiency syndrome and hepatitis C and A). here we developed proteinticle-based 7 different 3D probes that display different viral antigens on their surface. This proteinticles were synthesized in Escherichia coli by self-assembly of human ferritin heavy chain. Each of the three test lines on LFA strip contains the proteinticle-based 3D probes to detect specific antibodies that disease-specific anti-viral. This proteinticle-based LFA more sensitive than peptide-based system. The proteinticle probe-based LFA diagnosed all the 20 patient sera per each disease without a false negative signal that is problem of commercial LFA system. In case of peptide probe-based LFAs has sensitivity about 65~90%. Duplex and triplex assays performed only true positive signals for all the 20 serum mixtures that randomly mixed patient sera with different viral disease without any false positive signals, indicating 100% sensitivity and specificity.