Electronic Supplementary Material (ESI) for Lab on a Chip

Supplementary information

Oligonucleotide-linked gold nanoparticle aggregates for enhanced sensitivity in lateral flow assays

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Preparation of gold nanoparticles (AuNPs)

All glassware together with a magnetic stir bar used in this preparation was soaked in the sulfochromic mixture (a solution of chromic acid in sulfuric acid) overnight and then rinsed with pure water and ultrapure water prior to use. A 250 mL three-neck round-bottom flask was filled with 100 mL of ultrapure water, connected to a condenser and two stoppers, and placed on a magnetic stirring heater. After boiling, 4.5 mL of 1% trisodium citrate was added with vigorously stirring. About 3 min later, 1.2 mL of 0.825% chloroauric acid was quickly added to the solution. The color of the solution immediately changed from pale yellow to blue and then to purple, and finally to wine-red. After 20 min, the heating source was turned off and the solution was cooled to room temperature with stirring. The resulting AuNP solution was stored at 4 °C for further use.

Table S1. Oligonucleotide sequences used for the nucleic acid lateral flow (NALF) assay

Name	Sequence
Detector probe	5’-CACAACAGACGGGCACACACTACT/PEG_9/A_{10}/$(CH_2)_6$-HS-3’
Capture probe	5’-Biotin/GTCTGAGGGATCTCTAGTTACCAG-3’
Control probe	5’-AGTAGTGTGTGCCCGTCTGTTGTG/Biotin-3’
Amplification probe	5’-SH-$(CH_2)_3$/A_{10}/PEG_9/AAATTATTCGTAGCT-3’
Complementary probe	5’-SH-$(CH_2)_3$/A_{10}/PEG_9/AGCTACGAATAATTT-3’
Target nucleic acid	5’-AGTAGTGTGTGCCCGTCTGTTGTGTGACTCTGGTAACTAGAGATCCCTCAGAC-3’
Control nucleic acid	5’-GCCTCAATAAAGCTTGCCTTGAGTGCTTGTGGAAAATCTCTAGCAGTGGCGCC-3’

Note: PEG_9 is a chain of nine polyethylene glycol (PEG) and A_{10} is a sequence of ten oligo(dA). PEG_9 and A_{10} together are used as a spacer. SH-$(CH_2)_6$- and SH-$(CH_2)_3$- are alkanethios.