

Multiplexed Lateral Flow Immunoassays Using i-colloid™ Au and AuPt Nanoparticles

i-colloid™ gold and gold-platinum alloys

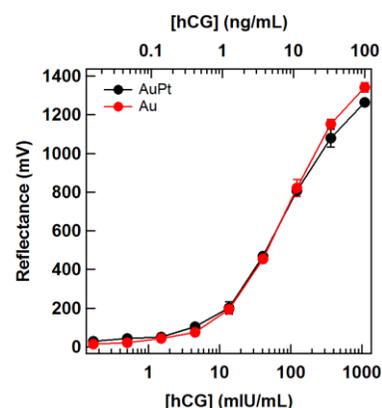
Gold-platinum nanoparticles, which exhibit a black optical signature distinguishable from the brilliant red of colloidal gold, can be produced by changing the target composition in pulsed laser ablation (see Technical note T01). **These particles cannot be fabricated with precise control by any other means** and have great potential as optical tags, as they are more photostable and intense than organic dyes.



i-colloid™ Au and AuPt

i-colloid™ nanoparticles in multiplexed lateral flow immunoassays

Au and AuPt alloy nanoparticles were evaluated as colorimetric tags in a lateral flow immunoassay to detect human chorionic gonadotropin (hCG). Antibodies specific to either hCG or anti-hCG antibody were striped on a nitrocellulose membrane, which was then laminated onto a backing card along with an absorbent pad and cut into strips. i-colloid™ Au and AuPt nanoparticles bearing anti-hCG antibodies (see Technical note T04) were introduced to different concentrations of hCG antigen and allowed to flow up a strip for 15 minutes. Au and AuPt retained their red and black colors on-strip, respectively. Both particles exhibited identical performance when evaluated on a reflectance reader.



The high signaling ability of these particles was evaluated in a multiplexed lateral flow immunoassay for hCG and cardiac troponin I (cTnI). Nitrocellulose membranes were striped with anti-hCG and anti-cTnI antibodies and assembled into strips as above. i-colloid Au-anti-cTnI and AuPt-anti-hCG conjugates were mixed together with different permutations of cTnI and hCG protein targets (either one, both, or neither). Signals of both particles in the presence of their designated targets was high, with color retained and little nonspecific binding observed. AuPt represents a high-contrast, spectrally-differentiable alternative to Au for multiplexed immunoassay applications.

