

Multicolor, Multiplexed Lateral Flow Assays with i-colloid Au, AuPt, AuAg, and Blue Au Nanoparticles

i-colloid gold-platinum and gold-silver alloy nanoparticles

i-colloid alloy nanoparticles produced by IMRA's pulsed-laser ablation process using corresponding alloy targets can have distinct optical signatures due to shifted surface plasmon resonance. For example, gold-platinum (AuPt) and gold-silver (AuAg) nanoparticles exhibit black and yellow-orange optical signatures, respectively, which are easily distinguishable from the brilliant red of colloidal gold (Au). Antibodies can be conjugated by passive adsorption to both AuPt and AuAg, making them ideal candidates for multicolor multiplex lateral flow applications.



Au, AuPt, AuAg, and Blue Au

i-colloid blue-gold nanoparticles

i-colloid blue-gold (Blue Au) consists of clustered Au nanoparticles and exhibits a strong blue optical signature distinguishable from those of Au, AuPt, and AuAg. Proteins can be conjugated to Blue Au via thiol-Au bonding.

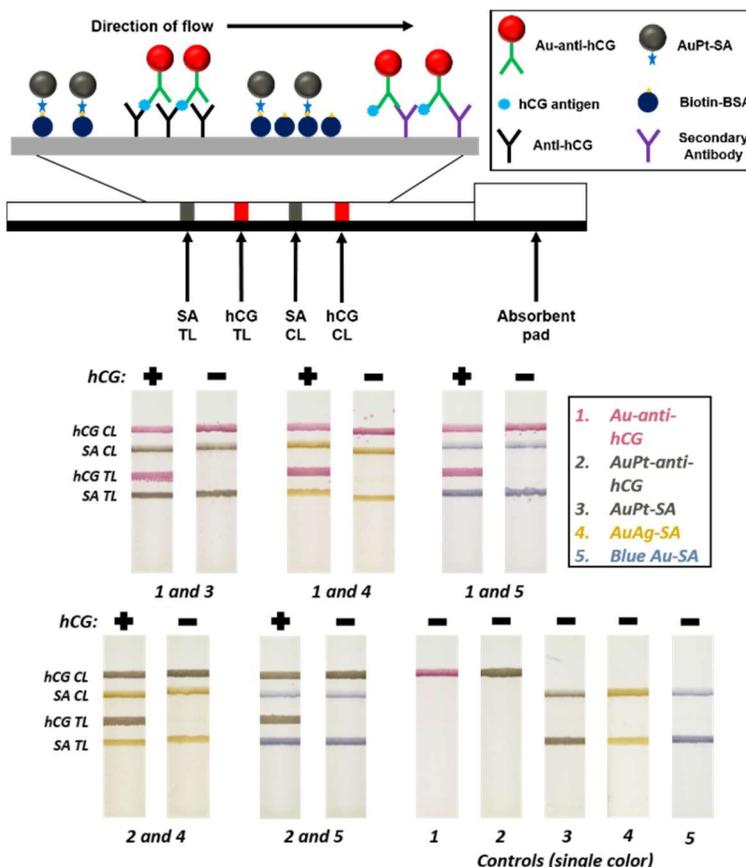
Multicolor, multiplexed lateral flow assays

Au, AuPt, AuAg, and Blue Au were evaluated as colorimetric tags in multiplexed lateral flow assays to detect biotin-BSA (bBSA) and human chorionic gonadotropin (hCG). Nitrocellulose membranes were striped with bBSA at two concentrations (test and control lines) and with antibodies specific to either hCG antigen (test line) or anti-hCG antibody (control line) and assembled into strips.

To perform dual-color lateral flow assays, Au-anti-hCG conjugates were mixed with AuPt-streptavidin (SA), AuAg-SA, or Blue Au-SA conjugates in running buffer with or without hCG antigen. AuPt-anti-hCG conjugates were also mixed with AuAg-SA and Blue Au-SA conjugates in running buffer with or without antigen.

Au-anti-hCG and AuPt-anti-hCG conjugates had strong, specific signals in the presence of the hCG target antigen with color retained. SA conjugates had strong test and control line signals. For each dual-color lateral flow assay, both colors were strongly and distinctly visible.

i-colloid gold-alloys and Blue Au nanoparticles represent high-contrast, spectrally-differentiable alternative to Au for multicolor, multiplexed immunoassay applications.



Au and AuPt available now
AuAg and Blue Au in development