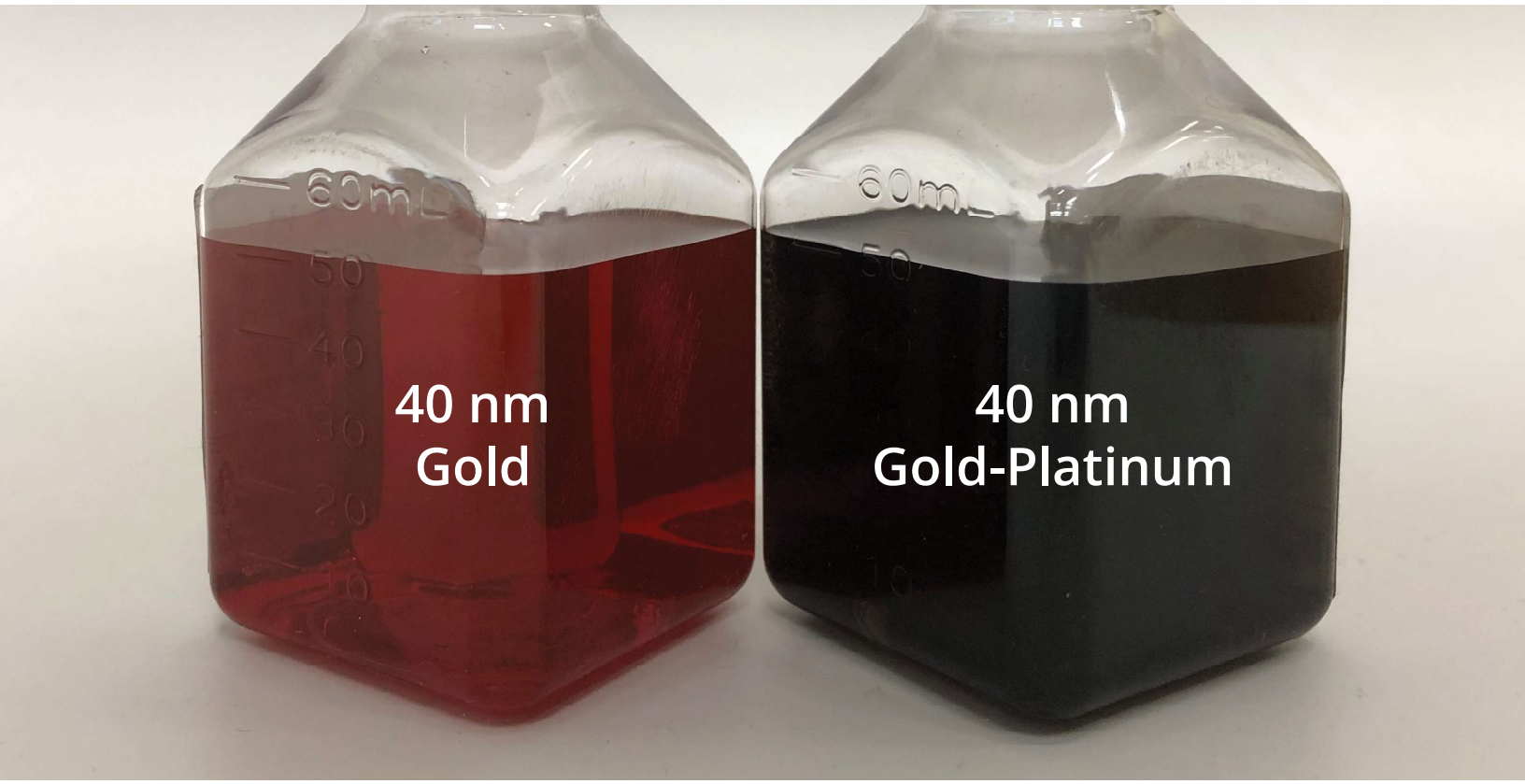
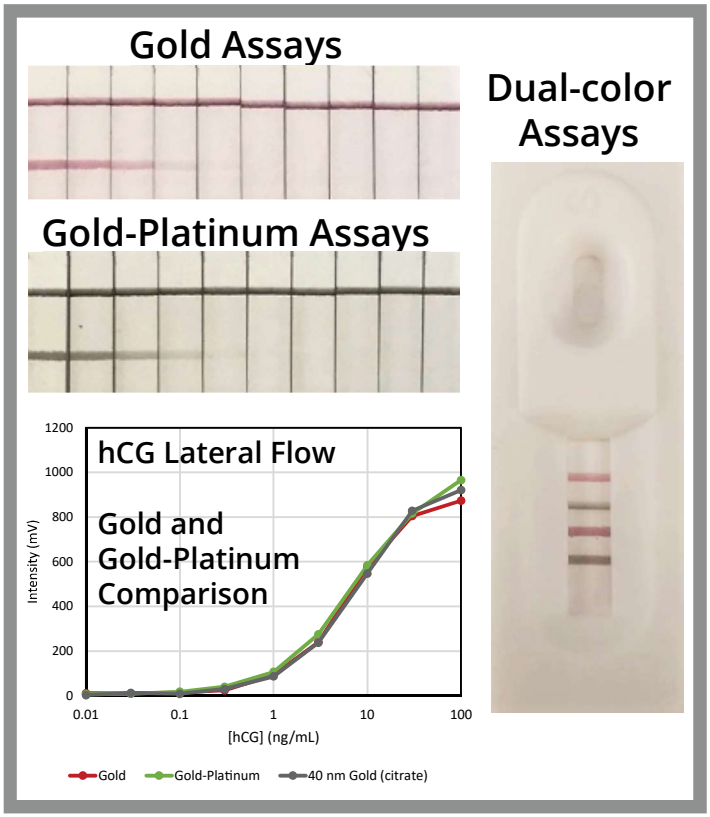
Laser-Fabricated Nanoparticles



Reproducible • Easy to Use • Distinct Color Options • Stable



- Common handling and processing
  - Same passive conjugation method
  - Same lateral flow conditions
  - Same reader settings
- No sonication or heating required during conjugation
- No surfactants or capping agents
- Unique gold-platinum alloy structure only possible by laser fabrication
- Use both particles for dual-color multiplex assays

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i-colloid production by pulsed-laser ablation

i-colloid is produced by pulsed-laser ablation in liquid (PLAL), a top-down fabrication method in which a bulk target such as gold is fragmented directly in a solvent by high power laser pulses (Figure 1).

During PLAL a focused laser beam produces intense transient heat and pressure within the target material at the focal spot. As the material heats and breaks down (boils), nanoparticles mixed with low density ionized vapor (plasma) are expelled into the solvent, resulting in a colloidal solution.

Varying the target and laser conditions allows the production of nanoparticles with different compositions, sizes, and features, and IMRA has developed patented and optimized PLAL processes for manufacturing diverse families of colloids.

Stability without surfactants or capping agents

i-colloid noble metal nanoparticle surafaces are slightly oxidized at ~1% coverage during PLAL, and hydroxyl groups (OH-) in the solvent attach to the oxidation sites, electrically charging the surfaces and stabilizing the colloids without need for additional surfactants or capping agents. Ligands can bind directly to the surfaces with high efficiency, as no surfactant or capping agent displacement is required. Figure 2 compares i-colloid hydroxyl stabilization with citrate stabilization typical of nanoparticles produced by conventional chemical synthesis.

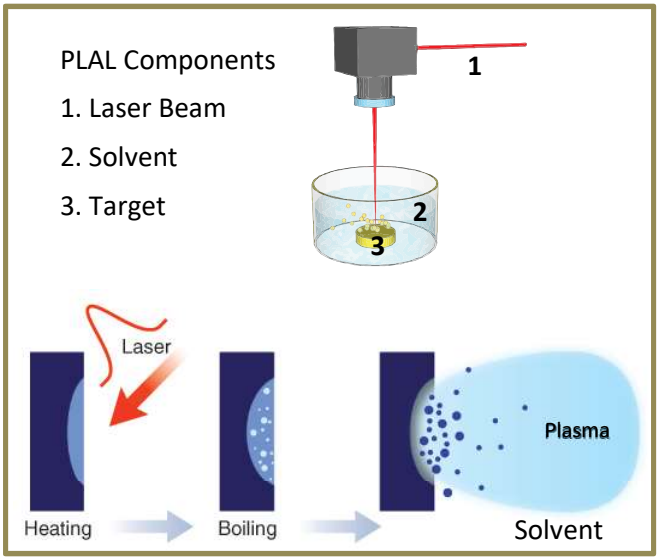

Fig. 1. During pulse-laser ablation in liquid (PLAL), the target material is fragmented, leaving a colloidal suspension of nanoparticles.

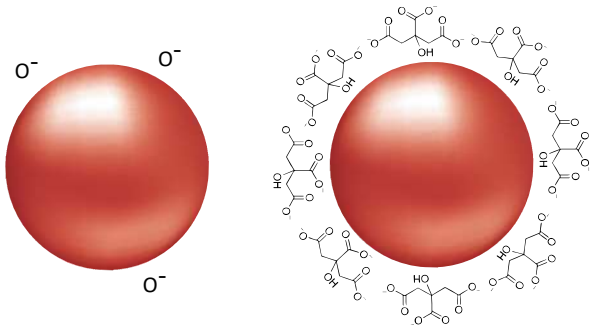

Fig. 2. i-colloid hydroxyl stabilization (left) and citrate stabilization (right)

Particle Type	Catalog Number	Optical density	Volume (mL)
40 nm Gold	AU40-1-50	1	50
	AU40-1-100	1	100
	AU40-5-50	5	50
	AU40-5-100	5	100
	AU40-5-200	5	200
	AU40-10-100	10	100
40 nm Gold-Platinum	AP40-1-50	1	50
	AP40-1-100	1	100

Contact us for higher OD and bulk order options

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