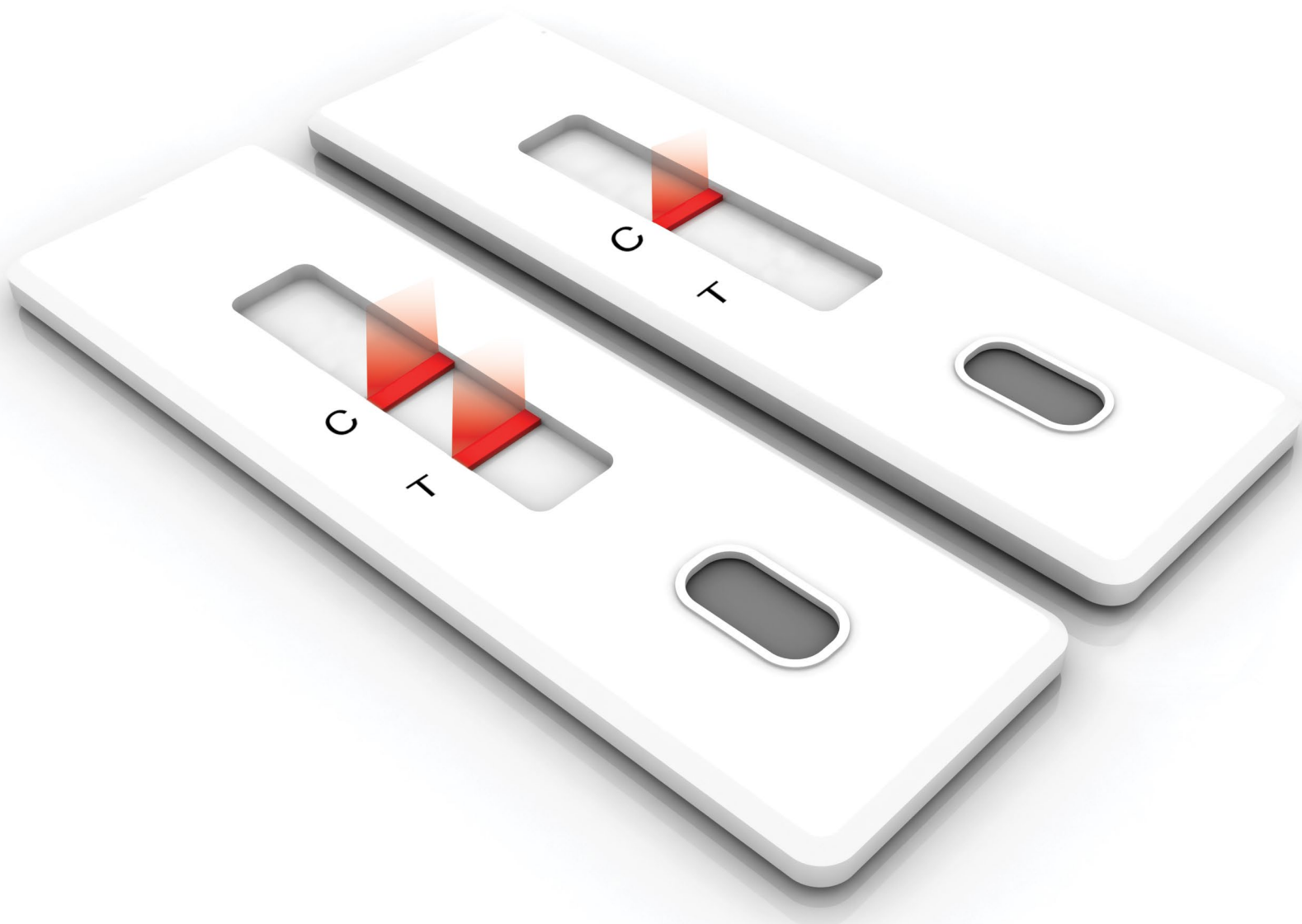


NANOPARTICLES FOR LATERAL FLOW

Fluorescent, Dyed, Colloidal Gold



WHO WE ARE...

Bangs Laboratories' 35 years of experience in microsphere synthesis and fine particle analysis have established us as a leading manufacturer of polymer, silica, and magnetic microspheres for laboratory instrument manufacturers and diagnostic assay developers. We understand the steps needed to get assays and platforms to market, and we have the products and the know-how to support you throughout the development and commercialization process. We manufacture at scales that will carry you from R&D through product launch and beyond, and under an ISO 13485:2016 Quality Management System that will meet your regulatory needs.

Our proven synthesis and analytical methods ensure consistent manufacturing so you receive microspheres made to specification time after time. If you require a product that is highly specialized, we are up to the challenge—our dyeing, coating, and surface modification expertise is demonstrated in our specialty products for bioseparations and instrument standardization. We are also pleased to offer custom formulations, concentrations, and packaging to support OEM and private label needs. Engage with us today and let us put our decades of real-world experience to work for you!



INTRODUCTION

Lateral flow assays (LFA) and other membrane-based rapid tests are popular because they have

- User-friendly formats**
- Quick turnaround times**
- Long-term stability**
- Overall inexpensive construction**

These tests fulfill important roles in the diagnostic landscape. Affordable and easy to use, they are particularly important for delivering diagnostic capability to programs with critical need, limited resources, or remote / de-centralized laboratories.

This format can be used in fields as diverse as diagnostic applications for medical or veterinary applications, agricultural or food safety testing, and/or environmental monitoring of pollutants, nutrients, or endangered species identification via eDNA. The diversity of application stems from the types of molecules that can be assayed in this format, which range from blood, urine, and saliva to nucleic acids, small molecules, and metabolites. No matter the sample type that is assayed, there needs to be a way to report whether the target is in the sample and if the LFA functioned as expected.

That's where we can help!

WHAT WE OFFER FOR YOUR LFA:			
Product	Description	Diameter	Concentration
COLLOIDAL GOLD	High sensitivity & visible signal	40 nm	OD1 & OD5
EUROPIUM CHELATE COOH/SAMPLE PACK	Longer fluorescence signal with a large separation of excitation and emission wavelengths (365/610nm)	0.1, 0.2, 0.3, and 0.4 µm	1% solids (w/v)
VISIBLY DYED POLYSTYRENE	Internally dyed with black, dark blue, bright red, bright blue, green, etc.	0.40 µm	5% solids (w/v)
DYED CARBOXYL POLYSTYRENE	Carboxylated surface for covalent attachment	0.20, 0.50 µm	5% solids (w/v)
DYED STREPTAVIDIN-COATED POLYSTYRENE	High-affinity attachment to biotinylated targets	0.20 µm	1% solids (w/v)

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GOLD NANOPARTICLES



Bangs Labs™ Gold Nanoparticles (AuNPs) are supplied in OD1 and OD5 (0.01% and 0.05%, respectively) with a 40 nm diameter that is compatible with LFAs. The highly uniform spherical gold particles are supplied in preservative-free, deionized water. OD5 formulation allows the customer to dilute the particles into buffers that are compatible with their system. For lateral flow immunoassays, our gold nanoparticles bind antibodies via simple direct adsorption methods and other ligands may be attached covalently via the surface carboxyl groups. For more information, see [PDS900, Colloidal Gold](#).

Highly visible color intensity

Nontoxic

Cost effective

Stable in dried form

GOLD NANOPARTICLES		
Catalog #	Product Name	Available volumes (mL)
GOLD40-OD1	40 nm Gold Colloid OD1	25, 100, 500
GOLD40-OD5	40 nm Gold Colloid OD5	5, 20, 100

REFERENCES

Das, M, Shim, KH, An, SSA, et al. (2012). Review on gold nanoparticles and their applications. *Toxicology and Environmental Health Sciences*, 3(4), 193-205. <https://doi.org/10.1007/s13530-011-0109-y>

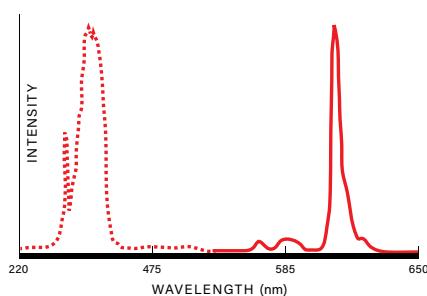
Hermanson, GT. (2013). *Bioconjugate techniques*. Elsevier. <https://doi.org/10.1016/C2009-0-64240-9>

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Singh, V, Nair, SPN, Aradhyam, GK, et al. (2013). Chemistry of conjugation to gold nanoparticles affects G-protein activity differently. *Journal of Nanobiotechnology*, 11(1), Article 7. <https://doi.org/10.1186/1477-3155-11-7>

EUROPIUM CHELATE FOR LATERAL FLOW

Europium Chelate (365, 610)



While many significant tests have been developed using conventional particles (e.g. colloidal gold), the use of europium chelate (Eu[III]) nanoparticles has made it possible to develop rapid assays that offer far greater sensitivity and quantitative results.

The europium chelate complex possesses a longer fluorescence lifetime (μ s) than traditional fluorophores (ns), allowing signal to be collected beyond the lifetime of background fluorescence. Moreover, its long Stokes shift ensures that incident light from the excitation source ($\lambda \sim 330$ -340 nm) does not interfere with collection of light by the detector ($\lambda \sim 610$ -620 nm). These traits, coupled with the availability of small, portable time-resolved fluorescence (TRF) readers leads to an evolution in rapid diagnostics.

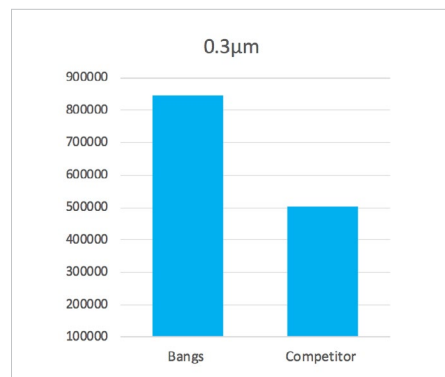
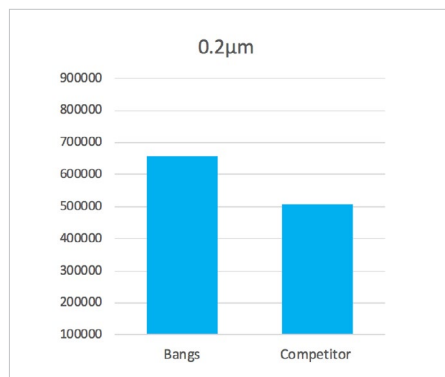
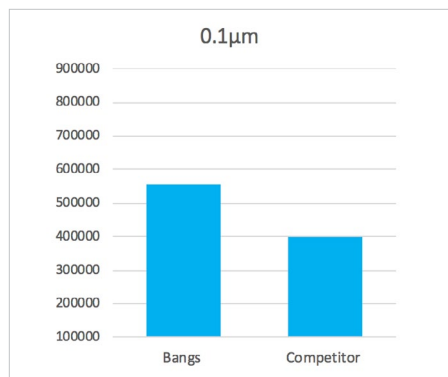
Our highly-fluorescent europium(III) nanoparticles offer exceptional functionality and stability for the development of diagnostic reagents. They have been utilized to develop highly sensitive assays in lateral flow and microplate formats and are compatible with commercial europium chelate TRF readers. Carboxylated particles in nominal diameters of 0.10, 0.20, 0.30, and 0.40 μ m or Sampler Packs are available. They are supplied in aqueous suspension at 1% solids (10 mg/mL). See [PDS741, Europium Chelate Microspheres](#) for additional product details.

EUROPIUM CHELATE

Catalog Number	Product Description
FCEU001	0.10 μ m PS-COOH Europium Chelate
FCEU002	0.20 μ m PS-COOH Europium Chelate
FCEU003	0.30 μ m PS-COOH Europium Chelate
FCEU004	0.40 μ m PS-COOH Europium Chelate
21960	0.10 μ m, 0.20 μ m, 0.30 μ m, 0.40 μ m Europium Chelate COOH Sampler Pack

COMPARISON DATA

As shown below, Bangs' europium chelate microspheres exhibit exceptional fluorescence intensity levels when compared to a leading competitor (1:60,000 dilutions, 350 nm excitation, 610 nm detection).



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DYED MICROSPHERES FOR LATERAL FLOW

Visibly dyed microspheres are frequently used in lateral flow tests and "latex" agglutination tests. They are available in a range of intense colors that are suitable for visual or microscopic identification of positive test results. We offer polystyrene-based microspheres that are impregnated with vibrant dyes for optimal visualization. Non-functionalized and functionalized versions are available to support adsorption and covalent binding strategies.

DYED METHOD

Microspheres are internally dyed, and as such remain stable in aqueous systems. Internal labeling affords many benefits, including:

High dye loading

Availability of surface groups for coupling reactions

Excellent stability

Large selection of dyes

Wide range of base bead sizes available

CUSTOM SERVICES

Our custom capabilities include color matching, custom color formulation, or use of the client's dye. Dyed spheres may also be coated (e.g. streptavidin) on a custom basis. We welcome inquiries regarding these and other types of projects. Please contact us to learn how we may be of assistance in formulating solutions to meet your specific requirements.



VISIBLE DYE COLOR PALETTE

Raspberry Purple
Crimson Red
Tangerine Orange
Basic Black
Slate Blue
Sapphire Blue
Cabo Blue
Shamrock Green

DYED POLYSTYRENE

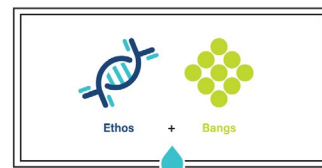
Catalog Number	Product Description
DSCR001	0.05 μ m Crimson Red
DSCB002	0.20 μ m Cabo Blue
DSCR002	0.20 μ m Crimson Red
DSSG002	0.20 μ m Shamrock Green
DSCR003	0.30 μ m Crimson Red
DSCR004	0.40 μ m Crimson Red

DYED POLYSTYRENE CARBOXYL

Catalog Number	Product Description
DCCB001	0.20 μ m Cabo Blue - COOH
DCCR001	0.20 μ m Crimson Red - COOH
DCSG001	0.20 μ m Shamrock Green - COOH
DCBK001	0.20 μ m Basic Black - COOH
DCCB002	0.50 μ m Cabo Blue - COOH
DCCR002	0.50 μ m Crimson Red - COOH

DYED PROTEIN-COATED POLYSTYRENE

Catalog Number	Product Description
CDCR001	0.20 μ m Crimson Red Streptavidin
CDCB001	0.20 μ m Cabo Blue Streptavidin



Ask about our Lateral Flow CDMO capabilities.



AND THAT'S NOT ALL...

Bangs manufactures polymeric, silica, and superparamagnetic particles that are additionally offered with a variety of surface functional groups, visibly colored or fluorescent dyes, and affinity ligand coatings to meet the diverse needs of the diagnostics market. We synthesize at scales that will carry you from R&D through manufacturing, and under an ISO 13485 Quality Manufacturing System that will meet your regulatory needs.

We offer many types of particle standards and calibrators for laboratory instruments, including flow cytometers, particulate contamination detectors, cell viability counters, and more. Our Flow Cytometry products provide standardization and calibration tools that lead the industry in quantitative fluorescence detection.

If a product that you require is not listed here, please check out website www.BangsLabs.com as our offerings are continually expanding. For special requirements, please contact us regarding our custom bulk synthesis and OEM contract manufacturing services. We also provide many technical resources on our website such as curated references, TechNotes, infographics, and videos.

We are here for you - let us know how we can help
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