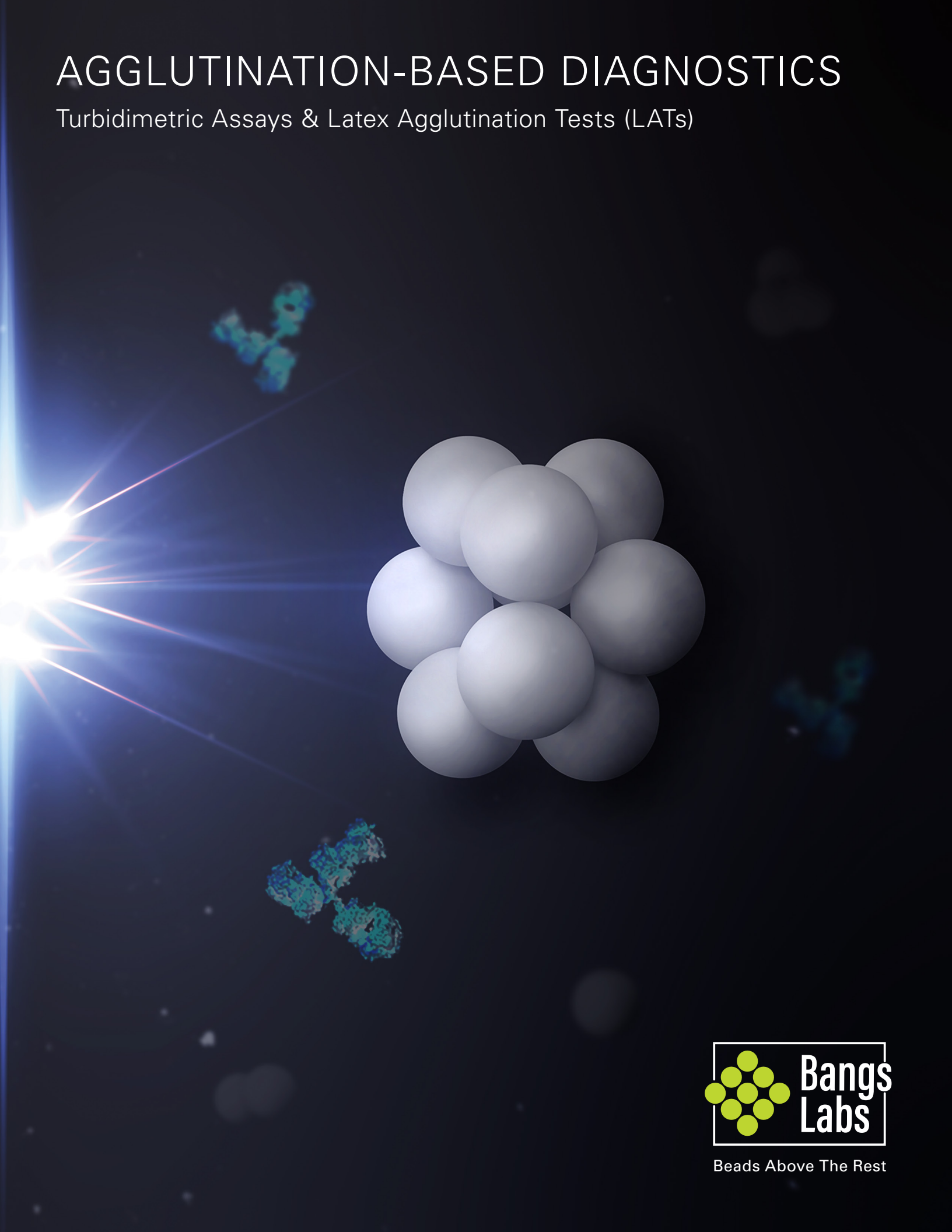
AGGLUTINATION-BASED DIAGNOSTICS

Turbidimetric Assays & Latex Agglutination Tests (LATs)



Bangs Labs

Beads Above The Rest

Bangs Laboratories' 35 years of experience in microparticle synthesis and fine particle analysis have established us as a leading microsphere supplier and expert resource to diagnostic assay developers.

CARBOXYLATED POLYSTYRENE (CML)

Catalog Number	Nominal Diameter
PC02002	0.050 µm
PC02003	0.070 µm
PC02004	0.100 µm
PC02005	0.125 µm
PC02006	0.150 µm
PC02007	0.175 µm
PC02008	0.200 µm
PC02009	0.300 µm
PC02010	0.350 µm
PC02011	0.400 µm
PC03001	0.500 µm

Our offerings include options for different levels of carboxylation.

PLAIN POLYSTYRENE

Catalog Number	Nominal Diameter
PS02002	0.050 µm
PS02003	0.075 µm
PS02004	0.100 µm
PS02005	0.125 µm
PS02006	0.150 µm
PS02007	0.175 µm
PS02008	0.200 µm
PS02009	0.300 µm
PS02010	0.400 µm
PS03001	0.500 µm
PS03002	0.600 µm

Please see BangsLabs.com for all available sizes of plain & carboxylated polystyrene microspheres or contact us to discuss your specific needs.

TURBIDIMETRIC & NEPHELOMETRIC ASSAYS

The assay of clinically-relevant analytes is important for treating critical medical conditions such as cardiovascular disease, thrombosis, bacterial infections and active inflammatory conditions. Light-scattering methods such as turbidimetric and nephelometric assays permit the rapid and quantitative assessment of the patient's condition, and the development of particle-enhanced versions has been known to increase sensitivities by 10- to 100-fold.

Bangs Labs offers carboxylated and plain polystyrene ("latex") microspheres in the submicron diameters (0.05µm – 0.5µm) that are widely used for turbidimetric reagent development. The different surfaces support both covalent and adsorption protocols, allowing for the highly tailored coatings that are important to agglutination reactions. Moreover, our synthesis capabilities permit the manufacture of reproducible lots at the scales needed by OEM customers. See TN304, Light-Scattering Assays and our Turbidimetric Assay brochure.

REFERENCES

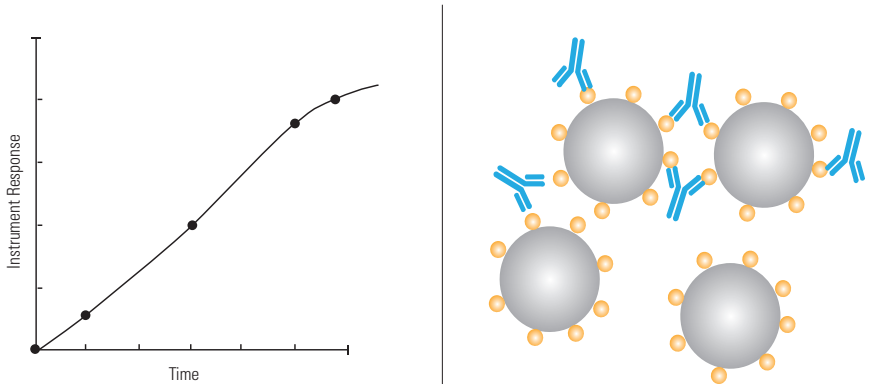
Borque L, Olivan V, Iquaz F. (1995) Development and validation of an automated particle-enhanced nephelometric immunoassay method for the measurement of human plasma C1q. J Clin Lab Anal; 9(5):302-7.

Eda S, Kaufman J, Roos W, Pohl S. (1998) Development of a new microparticle-enhanced turbidimetric assay for C-reactive protein with superior features in analytical sensitivity and dynamic range. J Clin Lab Anal; 12(3):137-44.

Molina-Bolívar JA, Galisteo-González F, Hidalgo-Álvarez R. (1998) Particle enhanced immunoassays stabilized by hydration forces: a comparative study between IgG and F(ab')$_2$ immunoreactivity. J Immunol Methods; 211(1-2):87-95.

Thakkar H, Cornelius J, Dronfield DM, Medcalf EA, Newman DJ, Price CP. (1991) Development of a rapid latex enhanced turbidimetric assay for retinol binding protein in urine. Ann Clin Biochem; 28(Pt.4):407-11.

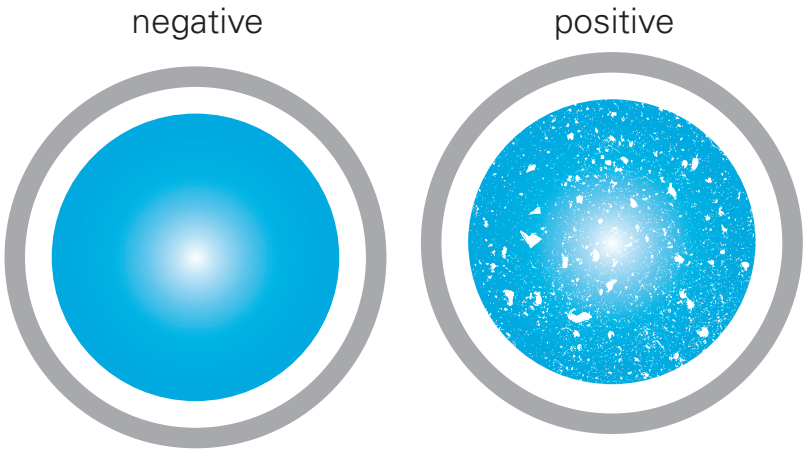
Thakkar H, Newman DJ, Holownia P, Davey CL, Wang CC, Lloyd J, Craig AR, Price CP. (1997) Development and validation of a particle-enhanced turbidimetric inhibition assay for urine albumin on the Dade aca® analyzer. Clin Chem; 43(1):109-13.



Ab /Ag-mediated agglutination in a turbidimetric assay.

LATEX AGGLUTINATION TESTS

Though not quantitative like instrumental (e.g. turbidimetric) diagnostic formats, traditional latex agglutination tests (LATs) are critical for field-, agro- and lab-based testing programs that rely on simple, rapid and portable methods. The basis of the test is simple: classic LATs feature antigen-coated spheres that are are mixed with the sample of interest. If present, The target is captured by and bridges the spheres. Because the surface density of the bead-immobilized antigen is carefully optimized, antibody in the sample bridges particles, causing agglutination.



Positive results are visibly apparent as the homogeneous suspension takes on a grainy or sandy appearance. Undyed ("white") spheres are often spotted on black cards, and dyed spheres may be applied to slides or white cards to visualize the agglutination reaction. Though conventional LATs are limited in terms of sensitivity and capacity for quantitation, variations featuring multiple populations of colored or fluorescent microspheres (that effect a color change with agglutination) have extended the capabilities of these easy-to-conduct and highly portable tests.

REFERENCES

Chhina SK, Perez CF, Parameswaran M. (2012) Microfluidics system to detect DNA amplicons using agglutination technique. J Micromech Micoreng; 22:115038.

Rocha LB, Santos ARR, Munhoz DD, Cardoso LTA, Luz DE, Andrade FB, Horton DSPQ, Elias WP, Piazza RMF. (2014) Development of a rapid agglutination latex test for diagnosis of enteropathogenic and enterohemorrhagic Escherichia coli infection in developing world: Defining the biomarker, antibody, and method. PLoS Negl Trop Dis; 8(9):e3150.

CARBOXYLATED POLYSTYRENE (CML)

Catalog Number	Nominal Diameter
PC02008	0.200 µm
PC02009	0.300 µm
PC02010	0.350 µm
PC02011	0.400 µm
PC03001	0.500 µm
PC03002	0.600 µm
PC03003	0.800 µm
PC03004	0.900 µm
PC04001	1.0 µm

VISIBLE DYE COLOR PALETTE

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

DYED CARBOXYLATED POLYSTYRENE

Catalog Number	Dye	Nominal Diameter
DCCB001	Cabo Blue	0.20 µm
DCCR001	Crimson Red	0.20 µm
DCSG001	Shamrock Green	0.20 µm
DCBK001	Basic Black	0.20 µm
DCCB002	Cabo Blue	0.50 µm
DCCR002	Crimson Red	0.50 µm
DCCB004	Cabo Blue	1.00 µm
DCCR004	Crimson Red	1.00 µm
DCTA004	Tangerine Orange	1.00 µm
DCSG004	Shamrock Green	1.00 µm
DCCB005	Cabo Blue	5.00 µm
DCCR005	Crimson Red	5.00 µm
DCBK005	Basic Black	5.00 µm

We synthesize at scales that will carry you from R&D through manufacturing, and under an ISO 13485 Quality System that will meet your regulatory needs. Visit **BangsLabs.com**

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