

MICROSPHERE HANDLING

Washing

Washes are conducted as needed to normalize the buffer system, remove residuals that could interfere with ligand coating or activity, and transition microspheres through sequential steps of coating or use protocols.

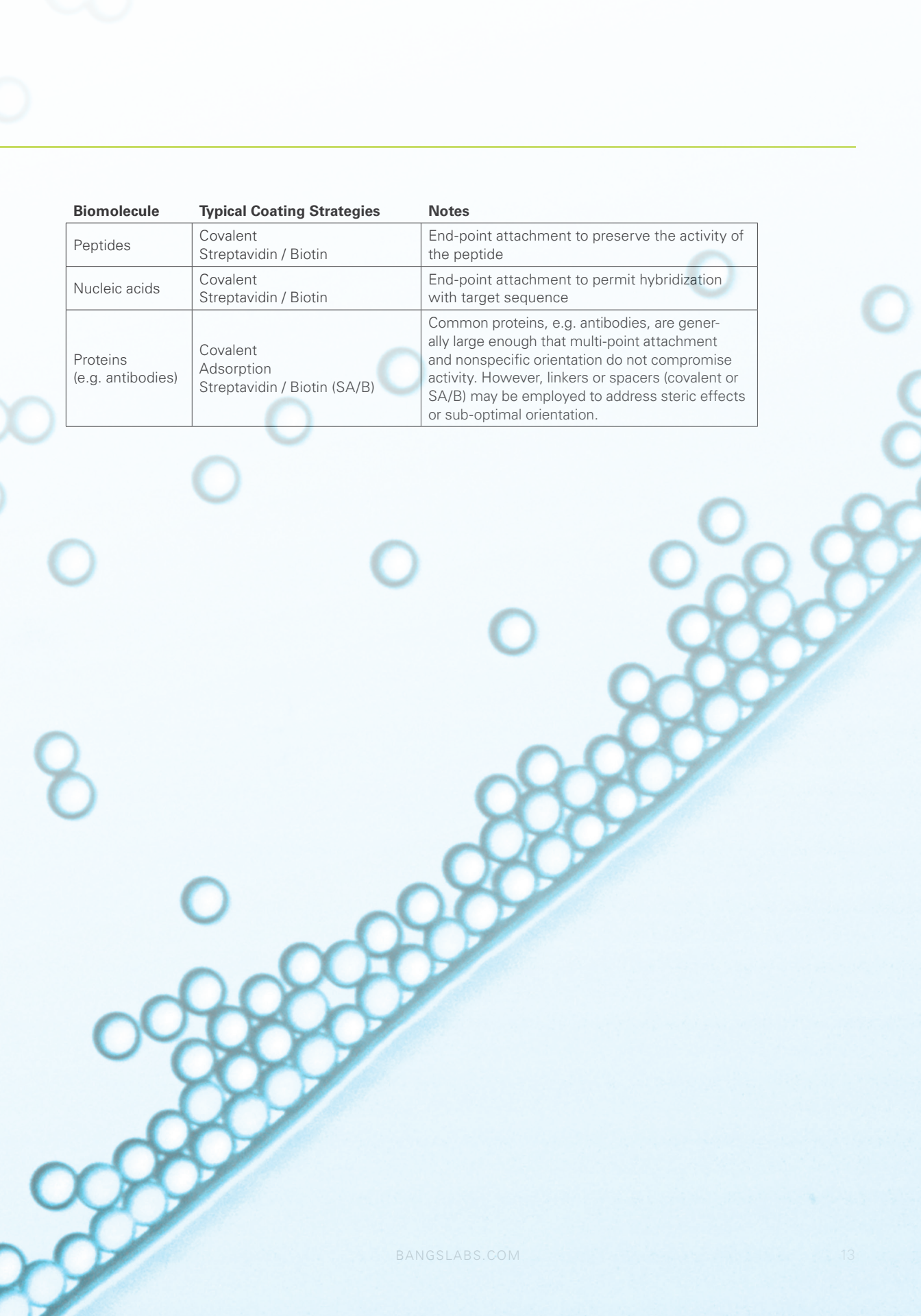
Rare earth or electromagnetic separators are used to perform washes for superparamagnetic microspheres; see our Biomagnetic Separators (pages 52-54) for options including single- and multi-tube and 96-well plate magnetic separators.

For non-magnetic microspheres, the wash method(s) should be selected with both microsphere size and throughput in mind. Centrifugation is commonly used for microspheres 0.5µm+, while centrifugal filter devices*, dialysis or cross-flow filtration is typically employed for smaller (<0.5µm) diameters. (*Cat. AA022, Vivaspin® 2mL Ultrafiltration Device, page 55)

A single wash may consist of microsphere separation/settling (centrifugation), supernatant removal, reconstitution of microspheres in buffer, with ~2-3 repetitions performed for a given wash step. See TN203, Washing Microspheres.

Aggregation

Our microspheres are available in a variety of compositions, including polystyrene, poly(methyl methacrylate), and silica. Though polymer microspheres are more susceptible to hydrophobic-mediated aggregation, there are several factors that may influence dispersity of the suspension. For example, low surface charge, small diameter (high surface area : volume ratio), high microsphere concentration, and sub-optimal buffer composition or pH may promote aggregation. Strategies that are effective in addressing aggregation thus counter these conditions, i.e. use of surfactant to reduce hydrophobicity (e.g. 0.01 – 0.1 % Tween® 20 or SDS), sonication and rotation to disrupt and disperse aggregates, and adjusting microsphere concentration or buffer pH to deter contact between individual spheres. See TN 202, Microsphere Aggregation, and PDS 699 (Cat. ROTAT) for details about our Tube Rotator.



Biomolecule	Typical Coating Strategies	Notes
Peptides	Covalent Streptavidin / Biotin	End-point attachment to preserve the activity of the peptide
Nucleic acids	Covalent Streptavidin / Biotin	End-point attachment to permit hybridization with target sequence
Proteins (e.g. antibodies)	Covalent Adsorption Streptavidin / Biotin (SA/B)	Common proteins, e.g. antibodies, are generally large enough that multi-point attachment and nonspecific orientation do not compromise activity. However, linkers or spacers (covalent or SA/B) may be employed to address steric effects or sub-optimal orientation.

POLYMER MICROSPHERES

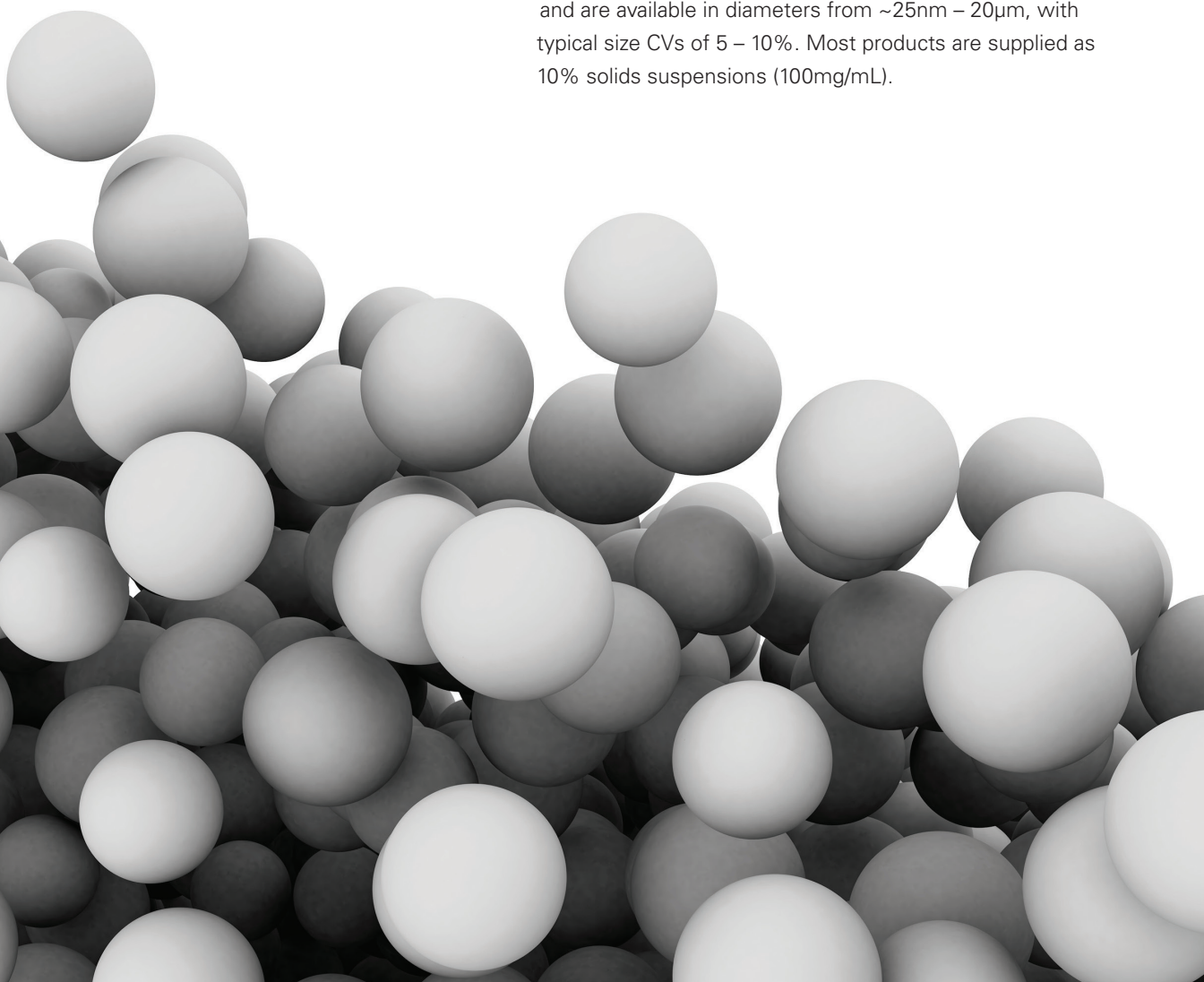
Polymer microspheres present a flexible platform for applications in diagnostics and bioseparations. They may be coated with ligands such as antibodies, antigens, peptides, or nucleic acids, and can be loaded with hydrophobic dyes and other compounds. Polymer microspheres also find extensive use as standards for instrument validation, set-up, and routine quality control.

Polystyrene Properties	
Refractive Index (589nm)*	1.59
Density (g/cm³)*	1.05
Softening Point, T _d (°C)*	95

*Reported value for bulk polymer.

NON-FUNCTIONALIZED POLYMER MICROSPHERES

We offer uniform polystyrene (PS) and crosslinked poly(styrene/divinylbenzene) (PS / DVB) microspheres that may be used as-is for standards or markers, or coated with proteins via adsorption for use in diagnostic tests and assays. (See TechNote 204, Adsorption to Microspheres.) Our spheres are synthesized via emulsion polymerization, and are available in diameters from ~25nm – 20µm, with typical size CVs of 5 – 10%. Most products are supplied as 10% solids suspensions (100mg/mL).

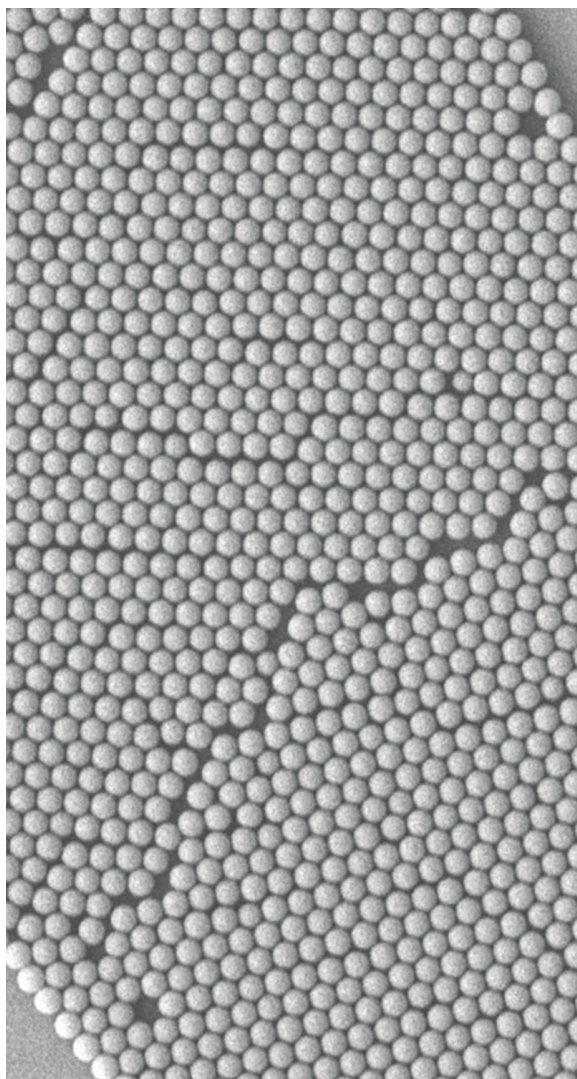


Plain Polystyrene

Antibodies and other proteins may be easily and stably adsorbed to hydrophobic, non-functionalized PS microspheres. Some products are crosslinked with divinylbenzene (DVB), which confers additional solvent and heat resistance. See TN204, Adsorption to Microspheres.

Catalog Number	Nominal Diameter	Specification Range
PS02001	0.025µm	0.015 - 0.035µm
PS02002	0.050µm	0.040 - 0.060µm
PS02003	0.075µm	0.065 - 0.085µm
PS02004	0.100µm	0.090 - 0.110µm
PS02005	0.125µm	0.115 - 0.135µm
PS02006	0.150µm	0.140 - 0.160µm
PS02007	0.175µm	0.165 - 1.185µm
PS02008	0.200µm	0.190 - 0.210µm
PS02009	0.300µm	0.270 - 0.330µm
PS02010	0.400µm	0.370 - 0.430µm
PS03001	0.500µm	0.470 - 0.530µm
PS03002	0.600µm	0.570 - 0.630µm
PS03003	0.700µm	0.670 - 0.730µm
PS03004	0.800µm	0.770 - 0.830µm
PS03005	0.900µm	0.870 - 0.930µm
PS04001	1.00µm	0.95 - 1.05µm
PS05001	2.00µm	1.80 - 2.20µm
PS05002	3.00µm	2.80 - 3.20µm
PS05003	4.00µm	3.80 - 4.20µm
PS06001	5.00µm	4.80 - 5.20µm
PS06002	5.50µm	5.30 - 5.70µm
PS06003	6.00µm	5.80 - 6.20µm
PS06004	7.00µm	6.80 - 7.20µm
PS06005	7.50µm	7.30 - 7.70µm
PS07001	10.00µm	9.50 - 10.50µm
PS07002	15.00µm	14.50 - 15.50µm
PS07003	20.00µm	19.00 - 21.00µm
PS08001	>25µm	>25µm

Plain polystyrene comes in units of 0.5, 1.0, 1.5, or 5.0 grams. (~10% solids 100 mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

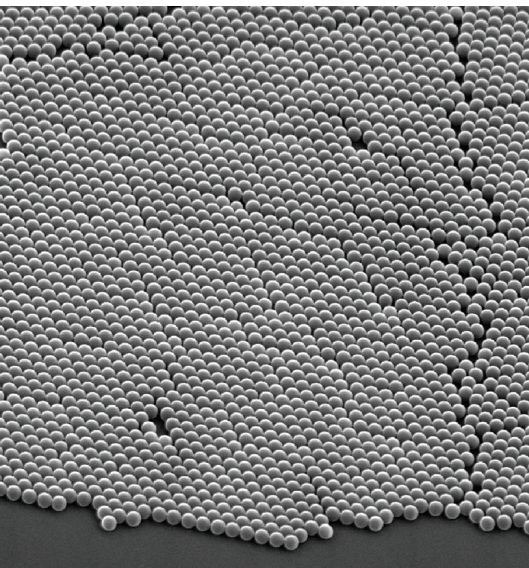


POLYMER MICROSPHERES

FUNCTIONALIZED POLYMER MICROSPHERES

Functionalized microspheres possess surface groups that may be used to generate covalently-bound coatings. These surface groups are also hydrophilic and potentially bear a charge, which may reduce hydrophobicity and contribute to ease of handling.

Our functionalized PS microspheres are suitable for the covalent immobilization of proteins, peptides, and nucleic acids. (See TN 205, Covalent Coupling.) They are synthesized via emulsion polymerization and are available in diameters up to ~20µm, with typical size CVs of 10%. Most products are supplied as 10% solids suspensions (100 mg/mL).



Amine Polymer

Amine-functionalized microspheres offer a trusted chemistry for the immobilization of biomolecules. Glutaraldehyde (Cat. # AA012) is often used to bind amine-containing compounds, and specialized linkers are available for targeted coupling of thiol or carbohydrate moieties to amine-functionalized microspheres. See TN 205, Covalent Coupling.

Catalog Number	Nominal Diameter	Specification Range
PA02001	0.200µm	0.190 - 0.210µm
PA03001	0.500µm	0.470 - 0.530µm
PA03002	0.750µm	0.740 - 0.760µm
PA04001	1.00µm	0.95 -1 .05µm

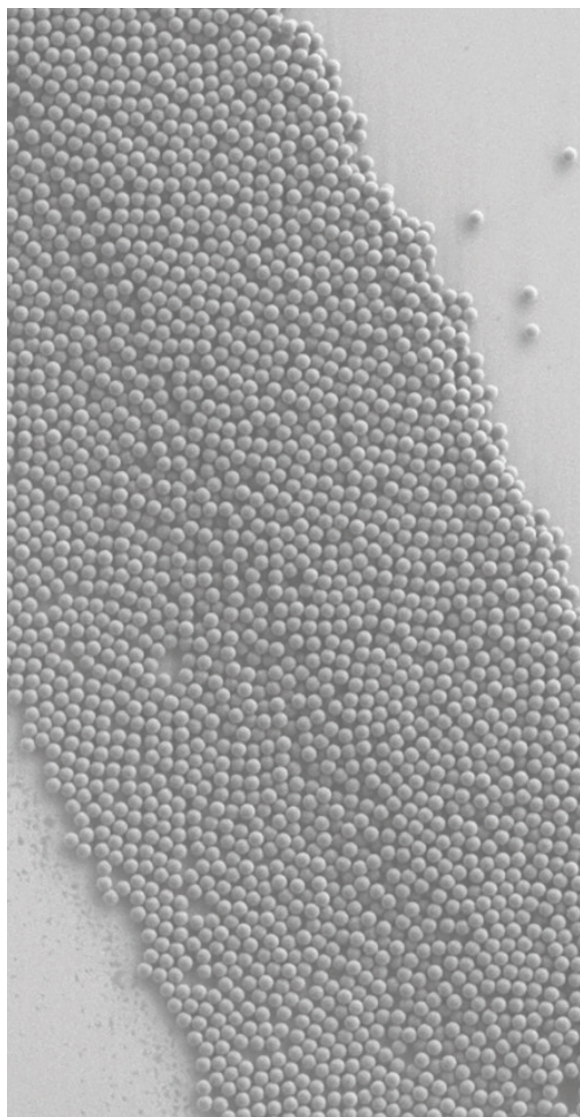
Amine polystyrene comes in units of 0.5, 1.0, 1.5, or 5.0 grams. (~10% solids 100 mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Carboxyl Polymer

EDAC-mediated coupling is commonly used for the covalent immobilization of amine-terminated proteins, DNA, or other molecules to carboxyl-functionalized polymer [PS and P(S/DVB)] microspheres (EDAC Cat. # AA010). See TN 205, Covalent Coupling, for a protocol and tips on coating optimization and QC, or our PolyLink Protein Coupling Kit, page 46.

Catalog Number	Nominal Diameter	Specification Range
PC02001	0.025µm	0.015 - 0.035µm
PC02002	0.050µm	0.040 - 0.060µm
PC02003	0.070µm	0.061 - 0.080µm
PC02004	0.100µm	0.090 - 0.110µm
PC02005	0.125µm	0.115 - 0.135µm
PC02006	0.150µm	0.140 - 0.160µm
PC02007	0.175µm	0.165 - 0.185µm
PC02008	0.200µm	0.190 - 0.210µm
PC02009	0.300µm	0.270 - 0.330µm
PC02010	0.350µm	0.340 - 0.360µm
PC02011	0.400µm	0.370 - 0.430µm
PC03001	0.500µm	0.470 - 0.530µm
PC03002	0.600µm	0.570 - 0.630µm
PC03003	0.800µm	0.770 - 0.830µm
PC03004	0.900µm	0.870 - 0.930µm
PC04001	1.00µm	0.95 - 1.05µm
PC05001	2.00µm	1.80 - 2.20µm
PC05002	2.50µm	2.30 - 2.70µm
PC05003	3.00µm	2.80 - 3.20µm
PC05004	4.00µm	3.80 - 4.20µm
PC05005	4.50µm	4.30 - 4.70µm
PC06001	5.00µm	4.80 - 5.20µm
PC06002	5.50µm	5.30 - 5.70µm
PC06003	6.00µm	5.80 - 6.20µm
PC06004	7.00µm	6.80 - 7.20µm
PC07001	10.00µm	9.50 - 10.50µm
PC07002	15.00µm	14.50 - 15.50µm
PC07003	20.00µm	19.00 - 21.00µm
PC08001	>25µm	>25µm

Carboxyl polystyrene comes in units of 0.5, 1.0, 1.5, or 5.0 grams. (~10% solids 100 mg/mL) Please see BangsLabs.com for pricing or contact a local agent.



POLYMER MICROSPHERES

DYED MICROSPHERES

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.



Standard Visible Dye Colors

We offer polystyrene-based microspheres labeled with vibrant dyes for optimal visualization. Non-functionalized and carboxyl-functionalized surfaces are available to support adsorption and covalent immobilization strategies. Our visibly dyed microspheres are typically supplied as 5% solids suspensions (50mg/mL).

The adjacent color palette is provided to serve as a general reference only. Actual product hue may vary due to differences in microsphere composition and size, as well as the concentration of the suspension.

Dyed Polymer

Non-functionalized microspheres are suitable for coating with antibody or other large proteins via adsorption. See TN 204, Adsorption to Microspheres, for a general adsorption protocol.

Catalog Number	Dye	Nominal Diameter	Specification Range
DSCR001	Crimson Red	0.050µm	0.040 - 0.060µm
DSCB002	Cabo Blue	0.200µm	0.190 - 0.210µm
DSCR002	Crimson Red	0.200µm	0.190 - 0.210µm
DSSG002	Shamrock Green	0.200µm	0.190 - 0.210µm
DSBK002	Basic Black	0.200µm	0.190 - 0.210µm
DSCR003	Crimson Red	0.300µm	0.270 - 0.330µm
DSCR004	Crimson Red	0.400µm	0.370 - 0.430µm
DSCB005	Cabo Blue	0.800µm	0.770 - 0.830µm
DSCR005	Crimson Red	0.800µm	0.770 - 0.830µm
DSSG005	Shamrock Green	0.800µm	0.770 - 0.830µm
DSBK005	Basic Black	0.800µm	0.770 - 0.830µm
DSCR006	Crimson Red	5.00µm	4.80 - 5.20µm

Dyed polystyrene comes in units of 0.5, 1.0, 1.5, or 5.0 grams. (~5% solids 50mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Dyed Carboxyl Polymer

Biomolecules may be covalently immobilized to carboxyl-functionalized microspheres. A general coupling protocol is provided within TN205, Covalent Coupling; see also PolyLink Protein Coupling Kit, page 46.

Catalog Number	Dye	Nominal Diameter	Specification Range
DCCB001	Cabo Blue	0.200µm	0.190 - 0.210µm
DCCR001	Crimson Red	0.200µm	0.190 - 0.210µm
DCSG001	Shamrock Green	0.200µm	0.190 - 0.210µm
DCBK001	Basic Black	0.200µm	0.190 - 0.210µm
DCCB002	Cabo Blue	0.500µm	0.470 - 0.530µm
DCCR002	Crimson Red	0.500µm	0.470 - 0.530µm
DCCB004	Cabo Blue	1.00µm	0.95 - 1.05µm
DCCR004	Crimson Red	1.00µm	0.95 - 1.05µm
DCTA004	Tangerine Orange	1.00µm	0.95 - 1.05µm
DCSG004	Shamrock Green	1.00µm	0.95 - 1.05µm
DCCB005	Cabo Blue	5.00µm	4.80 - 5.20µm
DCCR005	Crimson Red	5.00µm	4.80 - 5.20µm
DCBK005	Basic Black	5.00µm	4.80 - 5.20µm

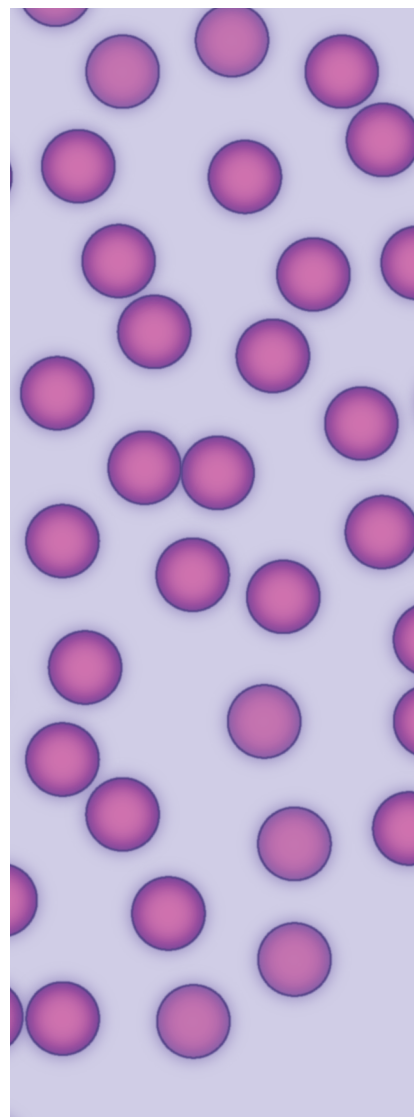
Dyed carboxyl polystyrene comes in units of 0.5, 1.0, 1.5, or 5.0 grams. (~5% solids 50mg/mL)
Please see BangsLabs.com for pricing or contact a local agent.

Dyed Streptavidin-Coated Polymer

Our inventory includes a number of streptavidin-coated submicron to micron-sized visibly dyed (see fluorescent, page 24) spheres. Visit our website or contact us for specific availability.

Catalog Number	Coating / Dye	Nominal Diameter	Specification Range
CDCR001	SA / Crimson Red	0.200µm	0.190 - 0.210µm
CDCB001	SA / Cabo Blue	0.200µm	0.190 - 0.210µm

Dyed protein coated polystyrene comes in units of 1mL, 2mL, 5mL or 10mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.



~5µm red dyed microspheres

POLYMER MICROSPHERES

FLUORESCENT MICROSPHERES

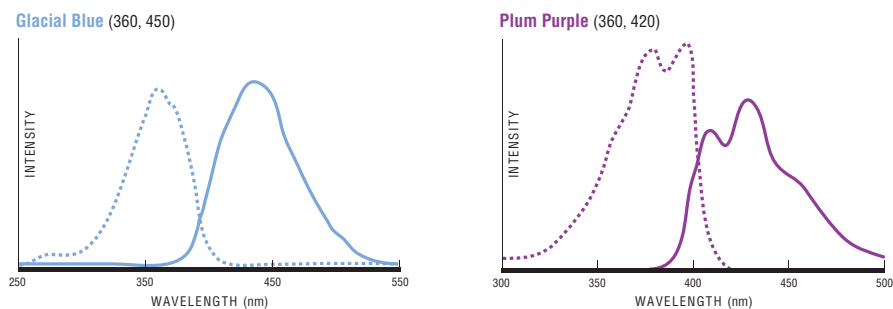
Many diagnostic and imaging applications rely on fluorescent microspheres for detection of binding events or signal enhancement. Addressable bead populations may be created with different intensities of fluorescence for the development of multiplexed suspension arrays, and small fluorescent spheres can function as the reporter for ELISA-type assays. Fluorescent microspheres are also useful for fluid tracing, cell tracking, or phagocytosis studies.

We offer polystyrene and crosslinked poly(styrene/divinylbenzene) microspheres as well as magnetic microspheres internally dyed with a variety of fluorescent dyes. Non-functionalized and carboxyl-functionalized surfaces are available to support adsorption and covalent immobilization strategies. Our fluorescent microspheres are supplied as 1% solids suspensions (10mg/mL).

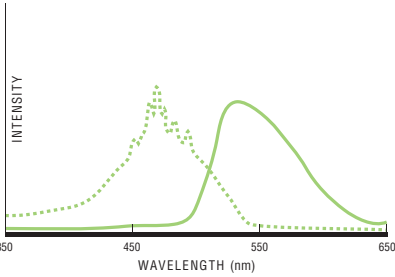
Fluorescence Spectra

Bangs offers many diameters of microspheres dyed with our standard fluorophores including PS, PS-COOH, and magnetic versions. The excitation and emission maxima are noted with each set of spectra. For example, Glacial Blue (360, 450) excites maximally at 360nm and has its greatest emission at 450nm.

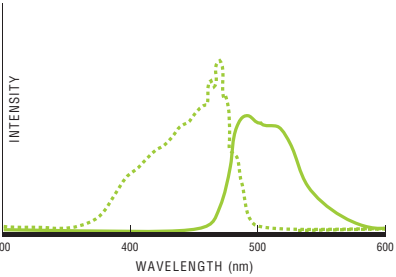
Spectra are provided to assist customers with the selection of appropriate fluorescent microspheres, and are not offered as a guarantee of performance.



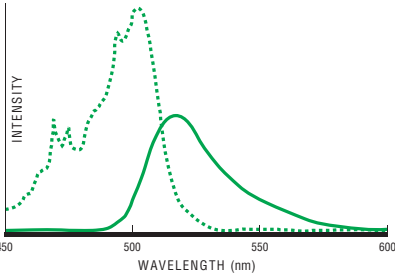
Surf Green (470, 525)



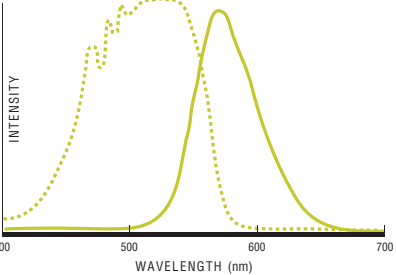
Yellow Green (YG) (441, 486)



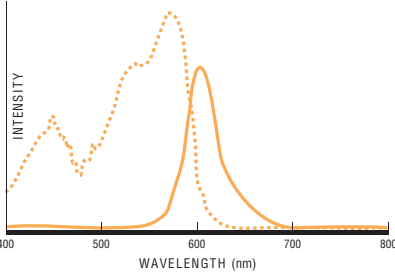
Dragon Green (480, 520)



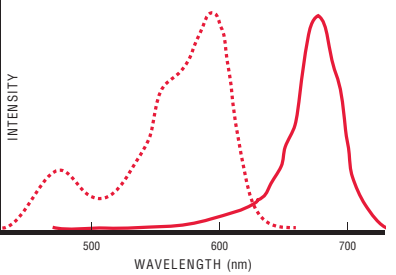
Envy Green (525, 565)



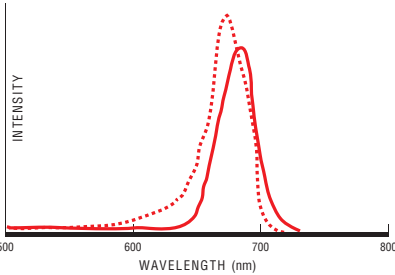
Suncoast Yellow (540, 600)



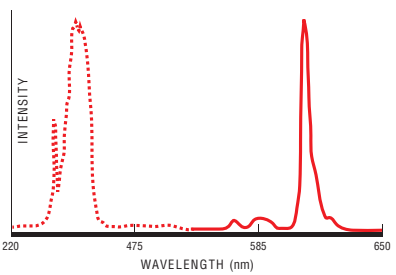
Far-Out Red (475, 590; 663)



Flash Red (660, 690)



Europium Chelate (365, 610)



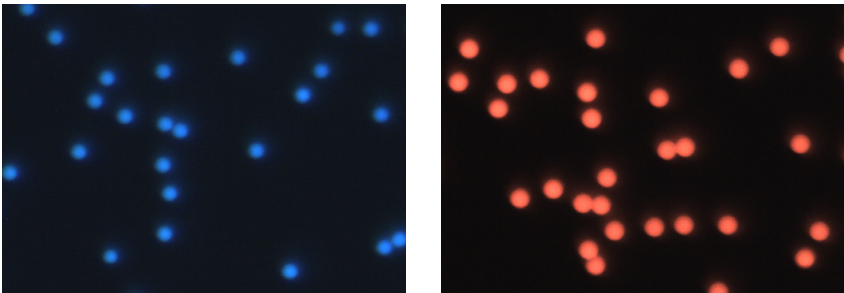
POLYMER MICROSPHERES

Fluorescent Polymer

Non-functionalized microspheres are suitable for coating via adsorption. See TN 204, Adsorption to Microspheres, for a general adsorption protocol.

Catalog Number	Fluorescence Color	Nominal Diameter	Specification Range
FSDG001	Dragon Green	0.050µm	0.040 - 0.060µm
FSFR001	Flash Red	0.050µm	0.040 - 0.060µm
FSDG002	Dragon Green	0.200µm	0.190 - 0.210µm
FSSY002	Suncoast Yellow	0.200µm	0.190 - 0.210µm
FSFR002	Flash Red	0.200µm	0.190 - 0.210µm
FSDG003	Dragon Green	0.500µm	0.470 - 0.530µm
FSP003	Plum Purple	0.500µm	0.470 - 0.530µm
FSFR003	Flash Red	0.500µm	0.470 - 0.530µm
FSDG004	Dragon Green	1.00µm	0.95 - 1.05µm
FSEG004	Envy Green	1.00µm	0.95 - 1.05µm
FSP004	Plum Purple	1.00µm	0.95 - 1.05µm
FSFR004	Flash Red	1.00µm	0.95 - 1.05µm
FSDG005	Dragon Green	2.00µm	1.80 - 2.20µm
FSP005	Plum Purple	2.00µm	1.80 - 2.20µm
FSFR005	Flash Red	2.00µm	1.80 - 2.20µm
FSDG006	Dragon Green	4.00µm	3.80 - 4.20µm
FSEG006	Envy Green	4.00µm	3.80 - 4.20µm
FSFR006	Flash Red	4.00µm	3.80 - 4.20µm
FSDG007	Dragon Green	7.50µm	7.30 - 7.70µm
FSSY007	Suncoast Yellow	7.50µm	7.30 - 7.70µm
FSFR007	Flash Red	7.50µm	7.30 - 7.70µm
FSEG008	Envy Green	10.00µm	9.50 - 10.50µm
FSDG009	Dragon Green	15.00µm	14.50 - 15.50µm
FSDG011	Dragon Green	>25.00µm	>25.00µm

Fluorescent polystyrene comes in units of 1mL, 5mL, 10mL or 100mL. (~1% solids 10mg/mL)
Please see BangsLabs.com for pricing or contact a local agent.

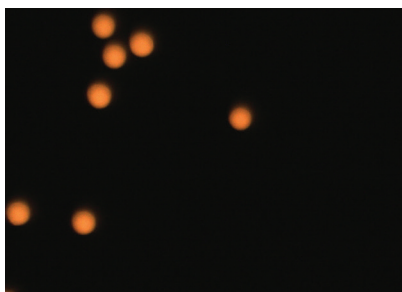
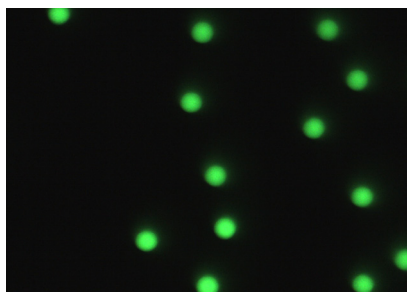


Fluorescent Carboxyl Polymer

Biomolecules may be covalently immobilized to carboxyl-functionalized microspheres. A general coupling protocol is provided in TN205, Covalent Coupling, or with our PolyLink Protein Coupling Kit, page 46.

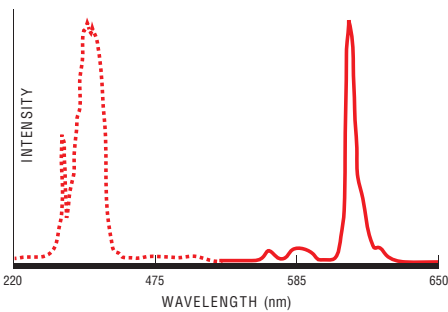
Catalog Number	Fluorescence Color	Nominal Diameter	Specification Range
FCDG001	Dragon Green	0.050µm	0.040 - 0.060µm
FCFR001	Flash Red	0.050µm	0.040 - 0.060µm
FCDG002	Dragon Green	0.100µm	0.090 - 0.110µm
FCDG003	Dragon Green	0.200µm	0.190 - 0.210µm
FCSG003	Surf Green	0.200µm	0.190 - 0.210µm
FCFR003	Flash Red	0.200µm	0.190 - 0.210µm
FCGB003	Glacial Blue	0.200µm	0.190 - 0.210µm
FCDG004	Dragon Green	0.400µm	0.370 - 0.430µm
FCFR004	Flash Red	0.400µm	0.370 - 0.430µm
FCDG005	Dragon Green	0.500µm	0.470 - 0.530µm
FCFR005	Flash Red	0.500µm	0.470 - 0.530µm
FCDG006	Dragon Green	1.00µm	0.95 - 1.05µm
FCEG006	Envy Green	1.00µm	0.95 - 1.05µm
FCSY006	Suncoast Yellow	1.00µm	0.95 - 1.05µm
FCGB006	Glacial Blue	1.00µm	0.95 - 1.05µm
FCFR006	Flash Red	1.00µm	0.95 - 1.05µm
FCSY007	Suncoast Yellow	2.00µm	1.80 - 2.20µm
FCDG008	Dragon Green	5.00µm	4.80 - 5.20µm
FCEG008	Envy Green	5.00µm	4.80 - 5.20µm
FCGB008	Glacial Blue	5.00µm	4.80 - 5.20µm
FCFR008	Flash Red	5.00µm	4.80 - 5.20µm
FCDG009	Dragon Green	10.00µm	9.50 - 10.50µm
FCDG011	Dragon Green	15.00µm	14.50 - 15.50µm

Fluorescent carboxyl polystyrene comes in units of 1mL, 5mL, 10mL or 100mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.



POLYMER MICROSPHERES

Europium Chelate (365, 610)



Europium Chelate

Our Europium Chelate products offer extremely bright fluorescence and exceptional stability, in addition to well-functionalized carboxylated surfaces for the covalent attachment of ligand. Rare earth lanthanide chelates exhibit longer (microsecond) lifetimes, allowing fluorescence decay to be monitored in time-resolved fluorescence (TRF) based assays. Europium Chelate products are characterized by long Stokes shifts, or intervals between fluorescence excitation and emission maxima. This property lends itself to low background signal, and avoids regions of fluorescence overlap with other common reporters in multicolor assays.

Catalog Number	Description	Nominal Diameter	Specification Range
FCEU001	Europium Chelate - COOH	0.100µm	0.090 - 0.110µm
FCEU002	Europium Chelate - COOH	0.200µm	0.190 - 0.210µm
FCEU003	Europium Chelate - COOH	0.300µm	0.270 - 0.330µm
21960	Europium Chelate - COOH Sampler Pack	1mL of 0.100µm, 0.200µm, 0.300µm	

Fluorescent carboxyl polystyrene comes in units of 1mL, 5mL, 10mL or 100mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Fluorescent Streptavidin-Coated Polymer

Our inventory typically includes streptavidin-coated fluorescent microspheres available in 0.2µm, 0.4µm, 0.5µm, and 1.0µm diameters. Visit our online Products section or contact us for specific availability.

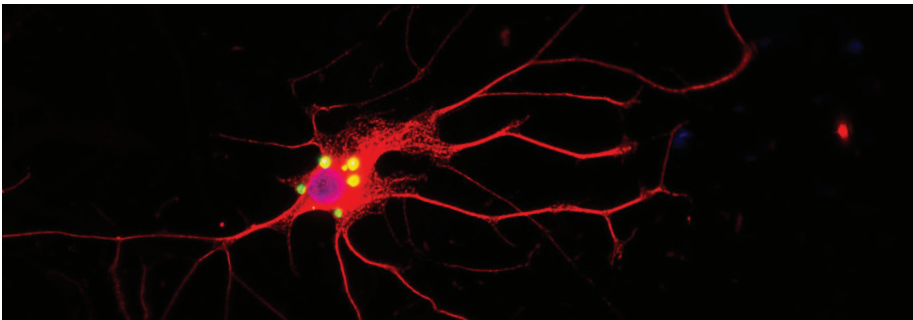
Catalog Number	Coating / Dye	Nominal Diameter	Specification Range
CFDG000	SA / Dragon Green	0.200µm	0.190 - 0.210µm
CFDG001	SA / Dragon Green	0.400µm	0.370 - 0.430µm
CFFR001	SA / Flash Red	0.400µm	0.370 - 0.430µm
CFDG002	SA / Dragon Green	0.500µm	0.470 - 0.530µm
CFDG003	SA / Dragon Green	1.00µm	0.95 - 1.05µm
CFFR003	SA / Flash Red	1.00µm	0.95 - 1.05µm

Fluorescent streptavidin polystyrene comes in units of 1mL, 5mL, 10mL or 100mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Fluorescent Magnetic

Our fluorescent magnetic microspheres have been used for cell tracking and assay development.

QuantumPlex™M offers a ready platform for suspension array development, page 27.



Catalog Number	Description	Fluorescence Color	Nominal Diameter	Specification Range
MCDG001	Classical Magnetic - COOH	Dragon Green	0.90µm	0.50 - 2.00µm
MCFR001	Classical Magnetic - COOH	Flash Red	0.90µm	0.50 - 2.00µm
MEDG001	Encapsulated Magnetic - COOH	Dragon Green	0.86µm	0.50 - 2.00µm
MEFR001	Encapsulated Magnetic - COOH	Flash Red	0.86µm	0.50 - 2.00µm
MEDG002	Encapsulated Magnetic - COOH	Dragon Green	1.63µm	0.50 - 2.00µm
MESY002	Encapsulated Magnetic - COOH	Suncoast Yellow	1.63µm	0.50 - 2.00µm
MEGB002	Encapsulated Magnetic - COOH	Glacial Blue	1.63µm	0.50 - 2.00µm
MEFR002	Encapsulated Magnetic - COOH	Flash Red	1.63µm	0.50 - 2.00µm
UMGB001	COMPEL - COOH	Glacial Blue	3µm	2.50 - 3.50µm
UMDG001	COMPEL - COOH	Dragon Green	3µm	2.50 - 3.50µm
UMEG001	COMPEL - COOH	Envy Green	3µm	2.50 - 3.50µm
UMFR001	COMPEL - COOH	Flash Red	3µm	2.50 - 3.50µm
UMGB002	COMPEL - COOH	Glacial Blue	6µm	5.50 - 6.50µm
UMDG002	COMPEL - COOH	Dragon Green	6µm	5.50 - 6.50µm
UMFR002	COMPEL - COOH	Flash Red	6µm	5.50 - 6.50µm
UMGB003	COMPEL - COOH	Glacial Blue	8µm	7.50 - 8.50µm
UMDG003	COMPEL - COOH	Dragon Green	8µm	7.50 - 8.50µm
UMFR003	COMPEL - COOH	Flash Red	8µm	7.50 - 8.50µm

Fluorescent magnetic polymer comes in units of 1mL, 5mL, 10mL or 100mL. (~1% solids 10mg/mL) Please see Bangslabs.com for pricing or contact a local agent.

POLYMER MICROSPHERES

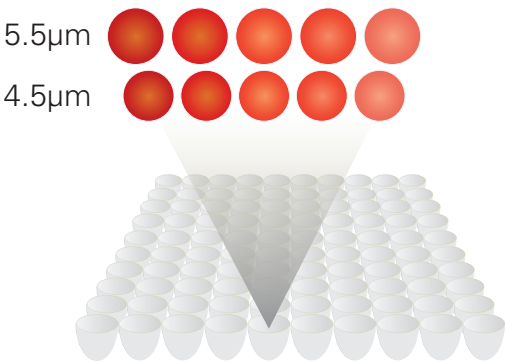
SUSPENSION ARRAYS

Suspension arrays for the flow cytometer feature populations of microspheres coated with different ligands for the interrogation of multiple targets within a given sample. Ligand-specific microsphere populations are encoded so that results for corresponding individual targets may be discerned. Encoding may be in the form of microsphere size and/or fluorescence signature, as with our QuantumPlex™ and QuantumPlex™M platforms.

QUANTUMPLEX™

Our QuantumPlex kits provide a general platform for multiplexed assay development on standard flow cytometers. Microsphere populations in 5 - bead kits are encoded with different intensities of Starfire Red™ and the two size kits (4.4 μm, 5.5 μm) may be combined to extend the array. Starfire Red™ excites at 488nm or 635nm, and emits in the red channel (e.g., PE-Cy™5, APC) with very little carryover into lower wavelengths, which leaves other detectors available for determination of positive binding events via common reporters such as FITC and PE.

QuantumPlex kits are available with two different surfaces to accommodate the coating strategy of choice: carboxyl (COOH) and streptavidin (SA).



Catalog Number	Description
235	QuantumPlex COOH 4.4μm, 5 populations
238	QuantumPlex COOH 5.5μm, 5 populations
239	QuantumPlex COOH 4.4μm and 5.5μm, 10 populations
215	QuantumPlex SA 4.4μm, 5 populations
218	QuantumPlex SA 5.5μm, 5 populations
219	QuantumPlex SA 4.4μm and 5.5μm, 10 populations

QuantumPlex comes in 1mL(pop 5 x 100 data points), 5mL(pop 5 x 500 data points), and 10mL(pop 5 x 1000 data points).

QuantumPlex™ SP

QuantumPlex SP (Single Population) is useful for the development of simplex flow cytometric assays or for the optimization of attachment chemistry and assay parameters before transitioning to a multiplexed format. Like QuantumPlex, they are dyed with Starfire Red™ and are suitable for use on standard flow cytometers.

Catalog Number	Description
234	QuantumPlex SP COOH 4.4µm
237	QuantumPlex SP COOH 5.5µm
214	QuantumPlex SP SA 4.4µm
217	QuantumPlex SP SA 5.5µm

QuantumPlex SP comes in 1mL (100 data points) and 3mL (300 data points)

QuantumPlex™ M

QuantumPlex M (Magnetic) kits consist of five populations of ~6µm highly uniform superparamagnetic microspheres encoded with different intensities of Starfire Red™. Like QuantumPlex, they are suitable for use on standard flow cytometers. Highly efficient separations may be performed using rare earth magnetic separators.

Catalog Number	Description
250	QuantumPlex M COOH 5 populations
252	QuantumPlex M SA 5 populations

QuantumPlex M comes in 1mL (pop 5 x 100 data points), 5mL (pop 5 x 500 data points), and 10mL (pop 5 x 1000 data points).

QuantumPlex™ M SP

QuantumPlex M SP is useful for the development of simplex flow cytometric assays, or for the optimization of attachment chemistry and assay parameters before transitioning to a multiplexed format. Like QuantumPlex M, they are ~6µm highly uniform superparamagnetic microspheres dyed with Starfire Red™ and are suitable for use on standard flow cytometers.

Catalog Number	Description
251	QuantumPlex M SP COOH
253	QuantumPlex M SP SA

QuantumPlex M SP comes in 1mL (100 data points) and 3mL (300 data points)

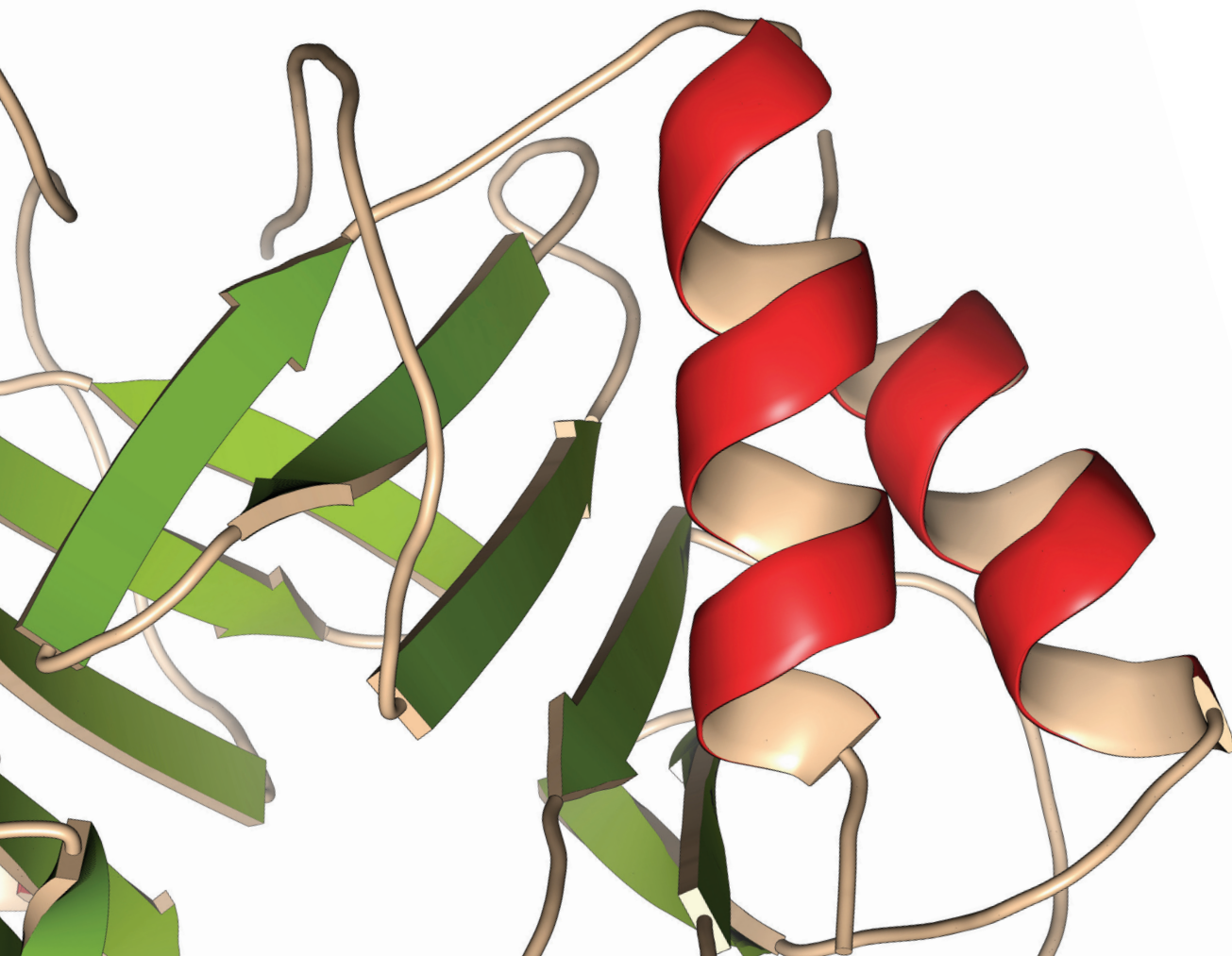
POLYMER MICROSPHERES

AFFINITY LIGAND COATED MICROSPHERES

When circumstances call for the rapid development of microsphere reagents, particles coated with affinity ligands offer a ready solution. Affinity binding protocols are straightforward, typically involving a simple incubation of the coated spheres with the appropriate binding protein. Binding proteins also provide an opportunity to optimally orient the ligand, as with the end-point immobilization of biotinylated oligonucleotides to streptavidin-coated microspheres, or the Fc-specific immobilization of antibodies via Protein A or G.

Particles coated with binding proteins also find significant use in purifications. Streptavidin-coated microspheres are often used in the isolation of biotinylated PCR amplicons. Protein A and Protein G microspheres are utilized for purification of antibodies and Fc-tagged fusion proteins, as well as for the recovery of Ab/Ag complexes in immunoprecipitation.

The activity of each Lot of coated microspheres is determined through binding of an appropriate fluorophore-conjugated ligand and spectrofluorimetric assay. The resulting binding capacity is reported on the Certificate of Analysis that accompanies product shipment.



Streptavidin

Our streptavidin- and SuperAvidin™- coated polystyrene microspheres offer simple and extremely stable binding of biotinylated molecules such as antibodies, peptides, and oligonucleotides for use in diagnostics, screening, and affinity purifications. See TN 101, Affinity Ligand Microspheres, and PDS 721.

Catalog Number	Nominal Diameter	Specification Range
CP01000	0.100µm	0.090 - 0.110µm
CP01001	0.200µm	0.190 - 0.210µm
CP01003	0.500µm	0.470 - 0.530µm
CP01004	1.00µm	0.95 - 1.05µm
CP01005	3.00µm	2.80 - 3.20µm
CP01006	5.00µm	4.80 - 5.20µm
CP01007	10.00µm	9.50 - 10.50µm
CP01008	15.00µm	14.50 - 15.50µm

Streptavidin coated polystyrene comes in units of 1mL, 2mL, 5mL or 10mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Catalog Number	Description	Nominal Diameter	Specification Range
CMC0100	SA Classical Magnetic	0.2 - 0.5µm	0.2 - 0.5µm
CME0101	SA Encapsulated Magnetic	0.7 - 1.2µm	0.7 - 1.2µm
UMC0100	SA COMPEL Magnetic	3µm	2.50 - 3.50µm
UMC0101	SA COMPEL Magnetic	6µm	5.50 - 6.50µm
UMC0102	SA COMPEL Magnetic	8µm	7.50 - 8.50µm

Streptavidin coated magnetic polystyrene comes in units of 1mL, 2mL, 5mL or 10mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.

Biotin

The avidin / biotin interaction is one of the strongest non-covalent bonds ($K_a=10^{15}/M$ vs. 10^7 - $10^{11}/M$ for antibody-antigen interactions). This secure bond, combined with the small size of biotin (MW=244.3), yields an ideal system for affinity binding, with numerous applications in areas such as immunology and cell / molecular biology. See TN101 and PDS 724.

Catalog Number	Nominal Diameter	Specification Range
CP10000	10.00µm	9.50 - 10.50µm

Biotin coated polystyrene comes in units of 1mL, 2mL, 5mL or 10mL. (~1% solids 10mg/mL) Please see BangsLabs.com for pricing or contact a local agent.