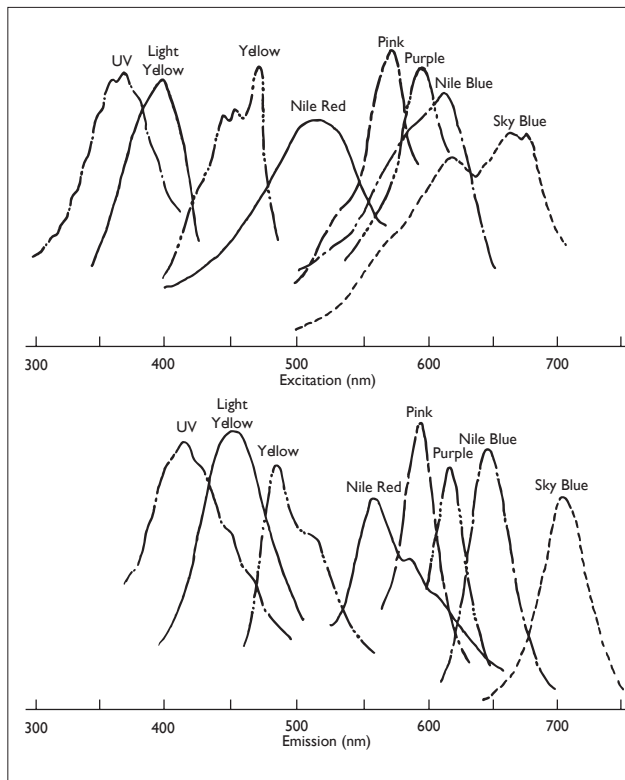


**SPHERO™ Fluorescent Particles**

- Beneficial to bioimaging and biosensing applications
- Uniform and stable fluorescence
- Available with functional groups for covalent binding

The SPHERO™ fluorescent microparticles are prepared by either staining polystyrene particles with a fluorophore solution or by polymerizing a fluorophore in styrene in the presence of polystyrene core particles. As a result, a wide variety of fluorescent particles can be prepared ranging in size, type of fluorophore, fluorescence intensity and surface functional groups. The fluorophores chosen for use in the preparation of SPHERO™ fluorescent particles are water insoluble and therefore are very stable. These fluorophores, once incorporated into the particles, do not leach and their color and fluorescence remains stable for long periods of time under proper storage conditions.

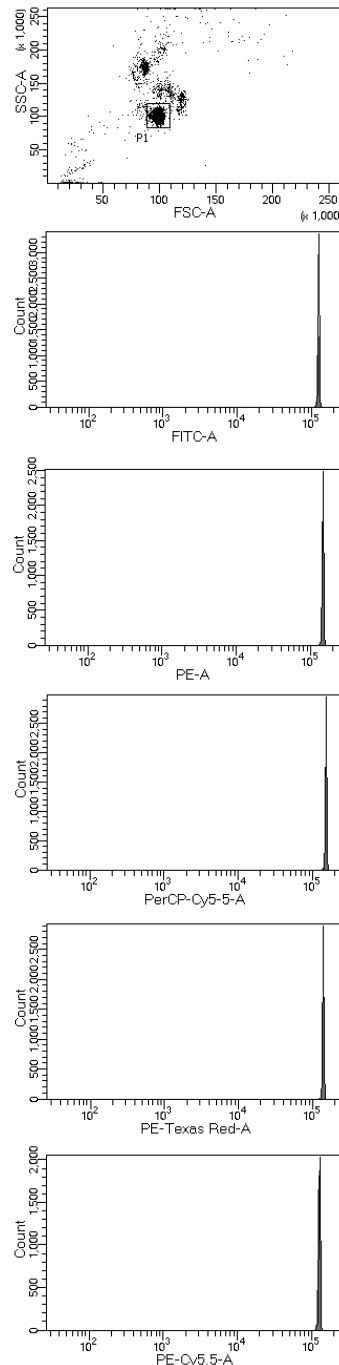
The excitation and emission spectra of some of the fluorophores used in the SPHERO™ fluorescent particles are shown below.



*Excitation & Emission Spectra of the fluorophores used in SPHERO™ fluorescent particles.*

**NOTE:** All spectra are taken with fluorescent particles in aqueous suspension.

The SPHERO™ fluorescent particles are available in single or multiple fluorophores of various sizes and fluorescence intensities with very small coefficient of variation in both size and fluorescence. They can be used for latex agglutination, fluorescence microscopy, confocal fluorescence microscopy. Many of these particles can also be used for flow cytometry.

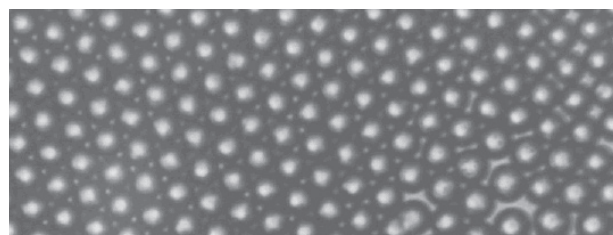


*Flow cytometry histograms of FP-3056-2*

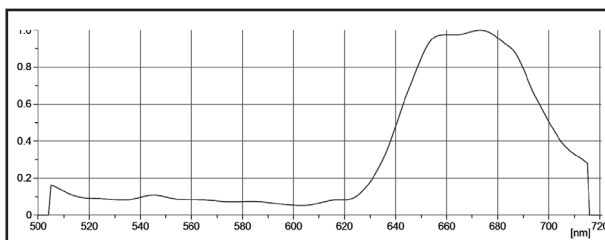
### SPHERO™ Fluorescent Polystyrene

Particle Type and Surface	Size, $\mu\text{m}$	Conc.	Catalog No.	Unit
Yellow	0.04-0.09	1.0% w/v	FP-00552-2	2 mL
Nile Red	0.04-0.06	1.0% w/v	FP-00556-2	2 mL
Pink	0.04-0.09	1.0% w/v	FP-00558-2	2 mL
Purple	0.04-0.09	1.0% w/v	FP-00562-2	2 mL
Sky Blue	0.04-0.09	0.25% w/v	FP-00570-2	2 mL
Light Yellow	0.1-0.3	1.0% w/v	FP-0245-2	2 mL
Yellow	0.1-0.3	1.0% w/v	FP-0252-2	2 mL
Nile Red	0.1-0.3	1.0% w/v	FP-0256-2	2 mL
Purple	0.1-0.3	1.0% w/v	FP-0262-2	2 mL
Sky Blue	0.1-0.3	0.25% w/v	FP-0270-2	2 mL
Light Yellow	0.4-0.6	1.0% w/v	FP-0545-2	2 mL
Yellow	0.4-0.6	1.0% w/v	FP-0552-2	2 mL
Nile Red	0.4-0.6	1.0% w/v	FP-0556-2	2 mL
Pink	0.4-0.6	1.0% w/v	FP-0558-2	2 mL
Purple	0.4-0.6	1.0% w/v	FP-0562-2	2 mL
PAK Blue	0.4-0.6	1.0% w/v	FP-0567-2	2 mL
Sky Blue	0.4-0.6	1.0% w/v	FP-0570-2	2 mL
Light Yellow	0.7-0.9	1.0% w/v	FP-0845-2	2 mL
Yellow	0.7-0.9	1.0% w/v	FP-0852-2	2 mL
Nile Red	0.7-0.9	1.0% w/v	FP-0856-2	2 mL
Pink	0.7-0.9	1.0% w/v	FP-0858-2	2 mL
Purple	0.7-0.9	1.0% w/v	FP-0862-2	2 mL
Blue	0.7-0.9	1.0% w/v	FP-0868-2	2 mL
Sky Blue	0.7-0.9	1.0% w/v	FP-0870-2	2 mL
Jade Green	0.7-0.9	1.0% w/v	FP-0878-2	2 mL
Yellow	1.0-1.9	1.0% w/v	FP-1552-2	2 mL
Light Yellow, Med. Intensity	1.7-2.2	1.0% w/v	FP-2045-2	2 mL
Nile Red	1.7-2.2	1.0% w/v	FP-2056-2	2 mL
Pink, Medium Intensity	1.7-2.2	1.0% w/v	FP-2058-2	2 mL
Purple, Medium Intensity	1.7-2.4	1.0% w/v	FP-2062-2	2 mL
Nile Blue	1.7-2.2	1.0% w/v	FP-2065-2	2 mL
Blue	1.7-2.2	1.0% w/v	FP-2068-2	2 mL
Sky Blue	1.7-2.2	1.0% w/v	FP-2070-2	2 mL
Light Yellow	3.0-3.9	1E7/mL	FP-3045-5	5 mL
Yellow	2.5-4.5	1.0% w/v	FP-3052-2	2 mL
Nile Red	2.5-4.5	1.0% w/v	FP-3056-2	2 mL
Pink	2.5-3.4	1.0% w/v	FP-3058-2	2 mL
Nile Blue	2.5-3.4	1.0% w/v	FP-3065-2	2 mL
Blue	2.5-4.5	1.0% w/v	FP-3068-2	2 mL

Particle Type and Surface	Size, $\mu\text{m}$	Conc.	Catalog No.	Unit
Ocean Blue	2.5-4.5	1.0% w/v	FP-3069-2	2 mL
Sky Blue	2.5-4.5	1.0% w/v	FP-3070-2	2 mL
Yellow	2.5-4.5	1.0% w/v	FP-4052-2	2 mL
Nile Red	3.6-4.5	1.0% w/v	FP-4056-2	2 mL
Pink	2.5-4.5	1.0% w/v	FP-4058-2	2 mL
Purple	2.5-4.5	1.0% w/v	FP-4062-2	2 mL
Sky Blue	2.5-4.5	0.2% w/v	FP-4070-2	2 mL
Nile Red	5.0-7.9	1.0% w/v	FP-5056-10	10 mL
Yellow	5.0-7.9	1.0% w/v	FP-6052-2	2 mL
Nile Red	5.0-7.9	1.0% w/v	FP-6056-2	2 mL
Pink	6.0-8.0	1.0% w/v	FP-6058-2	2 mL
Ocean Blue	5.0-7.9	0.2% w/v	FP-6069-2	2 mL
Yellow	7.0-7.9	1.0% w/v	FP-7052-2	2 mL
Sky Blue	7.0-7.9	0.25% w/v	FP-7070-2	2 mL
UV	10.0-14.0	1.0% w/v	FP-10040-2	2 mL
Light Yellow	10.0-14.0	1.0% w/v	FP-10045-2	2 mL
Yellow	10.0-14.0	1.0% w/v	FP-10052-2	2 mL
Nile Red	10.0-14.0	1.0% w/v	FP-10056-10	10 mL
Nile Red	10.0-14.0	1.0% w/v	FP-10056-2	2 mL
Pink	10.0-14.0	1.0% w/v	FP-10058-2	2 mL
Purple	10.0-14.0	1.0% w/v	FP-10062-2	2 mL
CyBlue	8.1-12.0	10 <sup>7</sup> /mL	FP-10066-2	2 mL
PAK Blue	10.0-14.0	10 <sup>7</sup> /mL	FP-10067-2	2 mL
Sky Blue	10.0-14.0	0.2% w/v	FP-10070-2	2 mL
UV	15.0-19.0	1.0% w/v	FP-15040-2	2 mL
Light Yellow	15.0-19.0	1.0% w/v	FP-15045-2	2 mL
Yellow	15.0-19.0	1.0% w/v	FP-15052-2	2 mL
Nile Red	15.0-19.0	1.0% w/v	FP-15056-2	2 mL
Purple	15.0-19.0	1.0% w/v	FP-15062-2	2 mL
CyBlue	15.0-19.0	10 <sup>7</sup> /mL	FP-15066-2	2 mL
PAK Blue	15.0-19.0	1.0% w/v	FP-15067-2	2 mL
Sky Blue	15.0-19.0	0.2% w/v	FP-15070-2	2 mL
Yellow	18.0-24.9	1.0% w/v	FP-20052-5	5 mL
Nile Red	18.0-24.9	1.0% w/v	FP-20056-5	5 mL
Yellow	25.0-35.0	1.0% w/v	FP-30052-5	5 mL
Nile Red	25.0-35.0	1.0% w/v	FP-30056-5	5 mL
Purple	25.0-35.0	1.0% w/v	FP-30062-5	5 mL
Sky Blue	70.0-89.0	5.0% w/v	FP5-80070-5	5 mL
Sky Blue	90-105	5.0% w/v	FP5-100070-5	5 mL



Microscope photos 10 $\mu\text{m}$  Nile Red beads (40x)



Spectra for peak FP-10066-2 at 488nm Ex

### SPHERO™ Low Intensity Fluorescent Polystyrene

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Light Yellow	0.7-0.9	1.0	FL-0845-2	2 mL
Yellow	0.7-0.9	1.0	FL-0852-2	2 mL
UV	1.7-2.2	1.0	FL-2040-2	2 mL
Light Yellow	1.7-2.2	1.0	FL-2045-2	2 mL
Yellow	1.7-2.2	1.0	FL-2052-2	2 mL
Nile Red	1.7-2.2	1.0	FL-2056-2	2 mL
Purple	1.7-2.2	1.0	FL-2062-2	2 mL
Blue	1.7-2.2	1.0	FL-2068-2	2 mL
Blue	2.5-4.5	1.0	FL-3068-2	2 mL
Sky Blue	3.6-4.5	1.0	FL-4070-2	2 mL
Nile Red	5.0-7.9	1.0	FL-6056-2	2 mL
Blue	6.0-8.0	1.0	FL-6068-2	2 mL
Nile Red	10.0-14.0	1.0	FL-10056-2	2 mL

### SPHERO™ Fluorescent PMMA

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Nile Red	0.1-0.3	0.2	FPMA-0256-2	2 mL
Yellow/Purple/Sky Blue	0.1-0.3	0.2	FPMA-0261-2	2 mL
Yellow	38.0-44.0	1.0	FPMA-40052-5	5 mL
Nile Red	38.0-44.0	1.0	FPMA-40056-5	5 mL
Purple	38.0-44.0	1.0	FPMA-40062-5	5 mL
Nile Red	45.0-52.0	1.0	FPMA-50056-5	5 mL
Purple	53.0-62.0	1.0	FPMA-60062-5	5 mL

### SPHERO™ Multiple Fluorophore Fluorescent Particles

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Multiple Fluorophore	0.1-0.3	0.2	FP-0257-2	2 mL
Multiple Fluorophore	0.4-0.6	0.2	FP-0557-2	2 mL
Multiple Fluorophore	0.7-0.9	0.2	FP-0857-2	2 mL
Multiple Fluorophore	1.7-2.2	0.2	FP-2057-2	2 mL
Multiple Fluorophore	2.5-5.0	0.2	FP-3057-2	2 mL
Multiple Fluorophore	6.0-7.9	1.0	FP-6057-2	2 mL
UV / Light Yellow	0.7-0.9	1.0	FP-0842-2	2 mL
UV / Light Yellow	1.7-2.2	1.0	FP-2042-2	2 mL
UV / Purple / Yellow / Pink / Nile Blue	1.7-2.2	1.0	FP-2054-2	2 mL
Purple / Yellow	1.7-2.2	1.0	FP-2060-2	2 mL
UV / Light Yellow	2.5-5.0	1.0	FP-3042-2	2 mL
Pink / Yellow	2.5-5.0	1.0	FP-3055-2	2 mL
Nile Red / Blue	2.5-4.5	1.0	FP-3066-2	2 mL
Purple / Yellow	2.5-5.0	1.0	FP-4060-2	2 mL
Nile Red / Blue	4.6-5.9	1.0	FP-5066-2	2 mL
Purple / Yellow, High Int.	1.7-2.2	1.0	FH-2060-2	2 mL
Purple / Yellow, Low Int.	1.7-2.2	1.0	FL-2060-2	2 mL

### SPHERO™ High Intensity Fluorescent Polystyrene

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
UV	1.7-2.2	1.0	FH-2040-2	2 mL
Light Yellow	1.7-2.2	1.0	FH-2045-2	2 mL
Yellow	1.7-2.2	1.0	FH-2052-2	2 mL
Nile Red	1.7-2.2	1.0	FH-2056-2	2 mL
Purple	1.7-2.2	1.0	FH-2062-2	2 mL
Sky Blue	1.7-2.2	0.2	FH-2070-2	2 mL
Nile Red	2.5-4.5	1.0	FH-3056-2	2 mL
Nile Red	2.5-4.5	1.0	FH-3056-10	10 mL
Nile Red	5.0-7.9	1.0	FH-5056-2	2 mL
UV	10.0-14.0	1.0	FH-10040-2	2 mL
Yellow	10.0-14.0	1.0	FH-10052-2	2 mL
Nile Red	10.0-14.0	1.0	FH-10056-10	10 mL
Nile Red	10.0-14.0	1.0	FH-10056-2	2 mL
Purple	10.0-14.0	1.0	FH-10062-2	2 mL
Purple	15.0-19.0	1.0	FH-15062-2	2 mL

### SPHERO™ FITC Polystyrene Particles

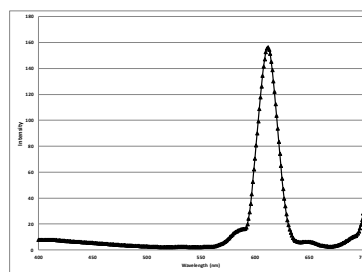
- Surfaced labeled with FITC
- Used as calibration particles for flow cytometry
- Also used to cross calibrate different flow cytometers for data normalization.

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
FITC	0.7-0.9	0.1	FICP-08-2	2 mL
FITC	2.0-2.9	0.1	FICP-20-2	2 mL
FITC	3.0-3.9	0.1	FICP-30-2	2 mL
FITC	5.0-5.9	0.1	FICP-50-2	2 mL
FITC	8.0-8.9	0.1	FICP-80-2	2 mL

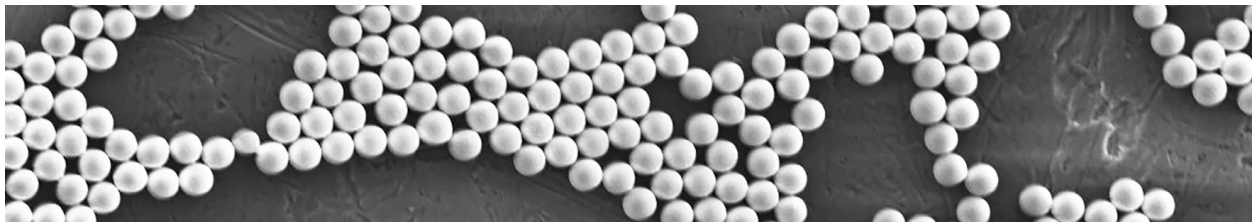
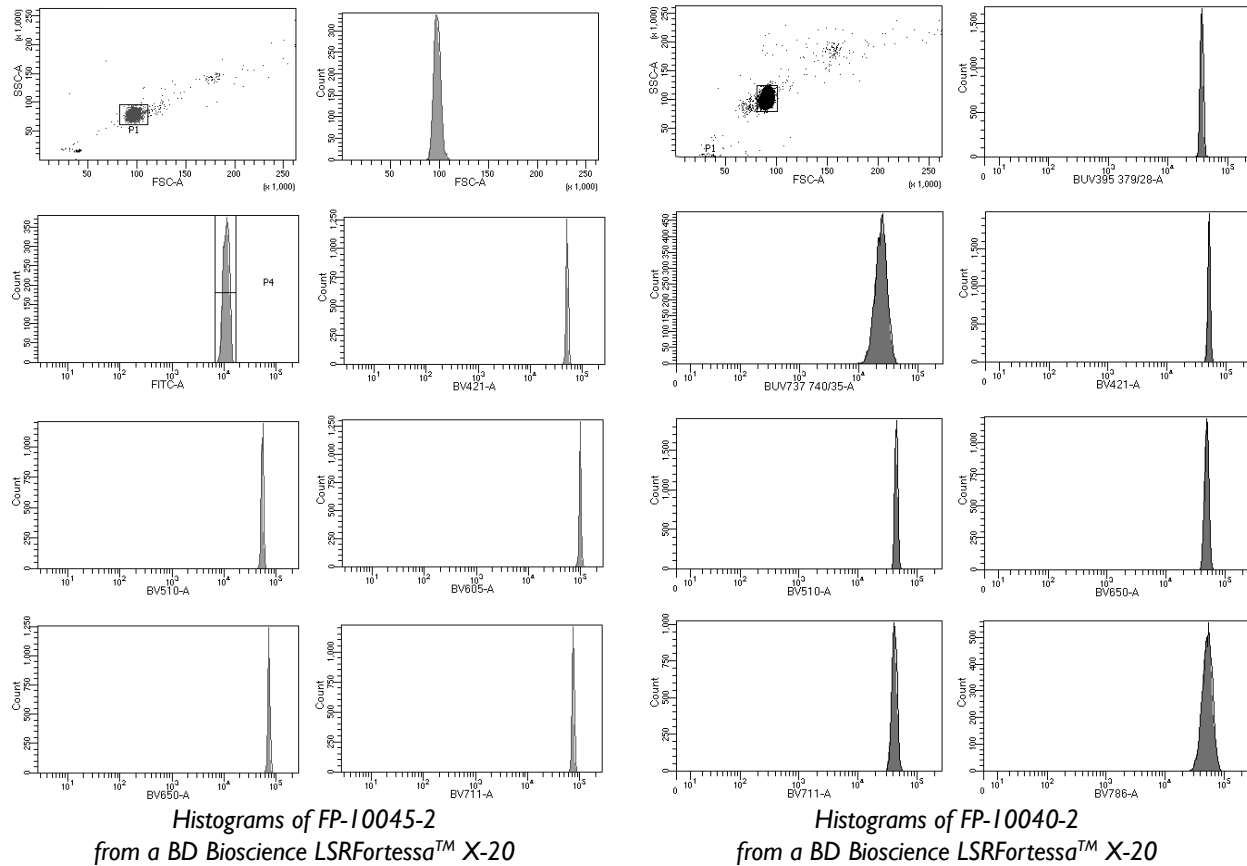
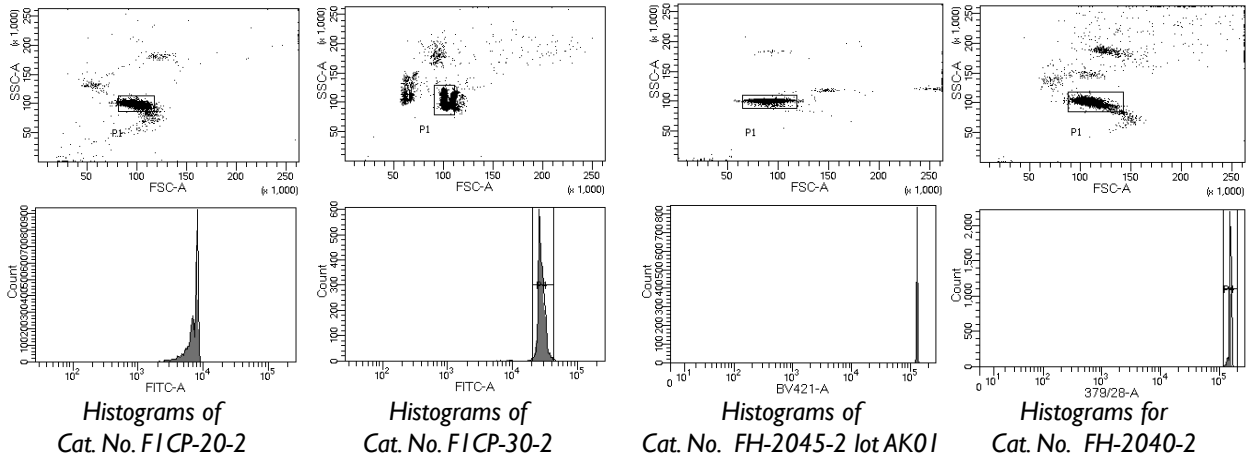
### SPHERO™ Europium Particles

- Nonfunctionalized particles designed for passive absorption in fluorometric-based applications.
- Extremely broad Stokes shift to prevent nonspecific fluorescence interference.

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Europium	0.2-0.4	1.0	EUP-025-5	5 mL
Europium	3.0-3.9	1.0	EUP-30-5	5 mL



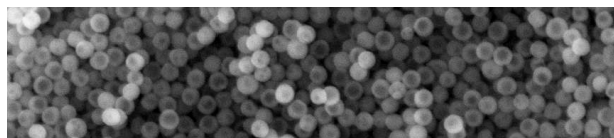
Spectral response of EUP-30-5 at 365nm excitation



SEM of FP-10045-2

### SPHERO™ Functionalized Fluorescent Particles

- Used for covalent coupling of proteins or ligands
- Can be coated with Avidin, Biotin, Protein A, Goat anti-Mouse IgG, or other protein of interest
- Used as fluorescent tracers for cell surface markers in fluorescence microscopy and flow cytometry.



SEM of CFP-0870-2

### SPHERO™ Amino Fluorescent Particles

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Yellow	0.09-0.3	1.0	AFP-0252-2	2 mL
Nile Red	0.09-0.3	1.0	AFP-0256-2	2 mL
Yellow	0.4-0.6	1.0	AFP-0552-2	2 mL
Pink	0.4-0.6	1.0	AFP-0558-2	2 mL
Yellow	0.7-0.9	1.0	AFP-0852-2	2 mL
Nile Red	0.7-0.9	1.0	AFP-0856-2	2 mL
Pink	0.7-0.9	1.0	AFP-0858-2	2 mL
Purple	0.7-0.9	1.0	AFP-0862-2	2 mL
Nile Blue	0.7-0.9	1.0	AFP-0865-2	2 mL

### SPHERO™ Carboxyl High Intensity Fluorescent Particles

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Yellow	5.0-5.9	0.5	CFH-5052-2	2 mL
Nile Red	5.0-5.9	0.5	CFH-5056-2	2 mL
Pink	5.0-5.9	0.5	CFH-5058-2	2 mL
Nile Blue	5.0-5.9	0.5	CFH-5065-2	2 mL

### SPHERO™ Carboxyl Low Intensity Fluorescent Particles

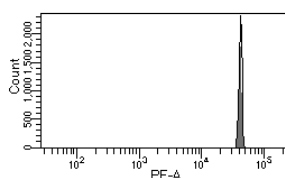
Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Yellow	0.7-0.9	1.0	CFL-0852-2	2 mL
Yellow	5.0-5.9	0.5	CFL-5052-2	2 mL
Pink	5.0-5.9	0.5	CFL-5058-2	2 mL
Nile Blue	5.0-5.9	0.5	CFL-5065-2	2 mL

### SPHERO™ Carboxyl Multiple Fluorophore Fluorescent Particles

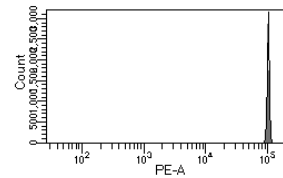
Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
UV / Light Yellow / Yellow	0.04-0.08	1.0	CFP-00546-2	2 mL

### SPHERO™ Carboxyl Fluorescent Particles

Particle Type and Surface	Size, $\mu\text{m}$	% w/v	Catalog No.	Unit
Yellow	0.04-0.08	1.0	CFP-00552-2	2 mL
Nile Red	0.04-0.08	1.0	CFP-00556-2	2 mL
Pink	0.04-0.08	1.0	CFP-00558-2	2 mL
Sky Blue	0.04-0.08	0.5	CFP-00570-2	2 mL
Yellow	0.09-0.3	1.0	CFP-0252-2	2 mL
Nile Red	0.09-0.3	1.0	CFP-0256-2	2 mL
Pink	0.09-0.3	1.0	CFP-0258-2	2 mL
Purple	0.09-0.3	1.0	CFP-0262-2	2 mL
Light Yellow	0.4-0.6	1.0	CFP-0545-2	2 mL
Yellow	0.4-0.6	1.0	CFP-0552-2	2 mL
Nile Red	0.4-0.6	1.0	CFP-0556-2	2 mL
Pink	0.4-0.6	1.0	CFP-0558-2	2 mL
Purple	0.4-0.6	1.0	CFP-0562-2	2 mL
Sky Blue	0.4-0.6	0.25	CFP-0570-2	2 mL
Yellow	0.7-0.9	1.0	CFP-0852-2	2 mL
Nile Red	0.7-0.9	1.0	CFP-0856-2	2 mL
Pink	0.7-0.9	1.0	CFP-0858-2	2 mL
Purple	0.7-0.9	1.0	CFP-0862-2	2 mL
Sky Blue	0.7-0.9	1.0	CFP-0870-2	2 mL
Yellow	1.7-2.2	1.0	CFP-2052-2	2 mL
Pink	1.7-2.2	1.0	CFP-2058-2	2 mL
Purple	1.7-2.2	1.0	CFP-2062-2	2 mL
CyBlue	1.7-2.2	0.5	CFP-2066-2	2 mL
Sky Blue	1.7-2.2	0.5	CFP-2070-2	2 mL
InfraBlue	1.7-2.2	1.0	CFP-2072-2	2 mL
UV	4.0-4.5	1E8/mL	CFP-4041-2	2 mL
Purple	4.0-4.5	1.0	CFP-4062-2	2 mL
Light Yellow	5.0-5.9	0.5	CFP-5045-2	2 mL
Yellow	5.0-5.9	0.5	CFP-5052-2	2 mL
Nile Red	5.0-5.9	0.5	CFP-5056-2	2 mL
Pink	5.0-5.9	0.5	CFP-5058-2	2 mL
Nile Blue	5.0-5.9	0.5	CFP-5065-2	2 mL
CyBlue	5.0-5.9	1.0	CFP-5066-2	2 mL
Sky Blue	5.0-5.9	0.5	CFP-5070-2	2 mL
Nile Red	10.0-14.0	0.5	CFP-10056-2	2 mL
Nile Red	15.0-19.0	0.5	CFP-15056-2	2 mL



Histograms of CFP-5056-2



Histograms of CFH-5056-2