

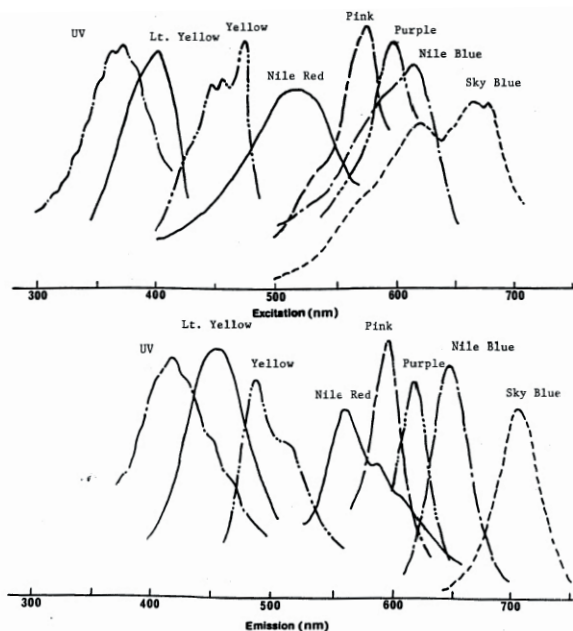
SPHERO™ Fluorescent Particles

The SPHERO™ fluorescent microparticles are prepared by either staining the polystyrene particles with a solution of appropriate fluorophore 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. Most of 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 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 and flow cytometry. The flow cytometry data of SPHERO™ fluorescent particles is shown in the Technical Information Section. The flow cytometer histograms of 2.9 μm Nile Red Particles (Catalog # FP-3056-2) at four channels are shown in Figure 2.

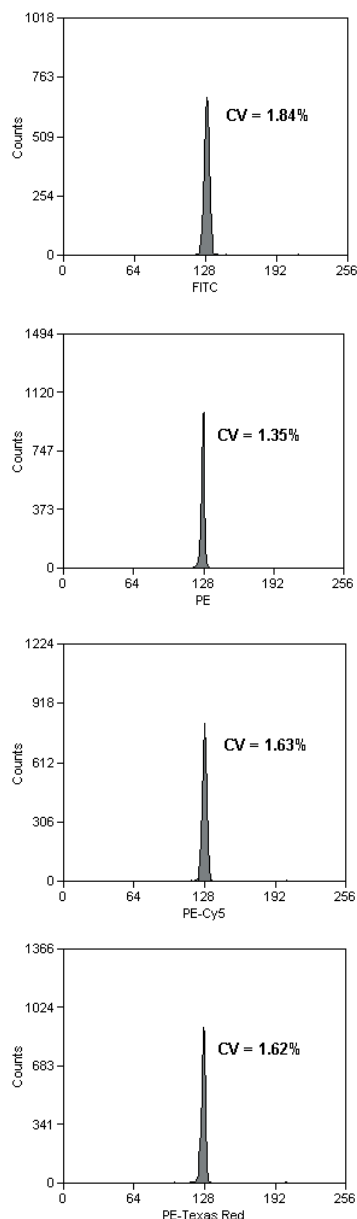
The excitation and emission spectra of some of the fluorophores used in the SPHERO™ fluorescent particles are shown in Figure 1.

Figure 1
EXCITATION & EMISSION SPECTRA



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

Figure 2



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The flow cytometry data of some of the fluorescent particles are shown in Table 1.

Table 1

Fluorophores (Intensity)	Catalog No.	Size (μm)	%CV*					
			UV	FL	PE	TR	APC	
SPHERO™ Fluorescent Particles, 1,7-2.2 μm.								
UV, low (L)	FL-2040-2	1.8	4.0					
UV, high (H)	FH-2040-2	2.1	2.7					
Light yellow (L)	FL-2045-2	2.1	2.2					
Light yellow (H)	FH-2045-2	2.2	1.9					
Yellow (L)	FL-2052-2	1.8		2.4	4.5			
Yellow (H)	FH-2052-2	1.8		2.3	3.3			
Nile red (L)	FL-2056-2	2.1		3.4	2.6	4.7		
Nile red (H)	FH-2056-2	2.1			2.8			
Pink	FP-2058-2	1.8			2.8	2.4	3.4	
Purple (L)	FL-2062-2	1.9				2.9	4.2	
Purple (M)	FP-2062-2	2.0				2.4	3.0	
Purple (H)	FH-2062-2	1.8				2.2		
Nile blue	FP-2065-2	2.2				3.6	4.1	
Sky blue	FP-2070-2	2.1						4.3
SPHERO™ Fluorescent Particles, 2.5-4.5 μm.								
Yellow	FP-4052-2	4.1		2.9				
Nile red	FP-3056-2	2.9		1.9	1.7	2.9		
Nile blue	FP-3065-2	3.0						3.6
Blue	FP-3068-2	3.3						2.7
SPHERO™ Multiple Fluorophore Particles, 1.7-2.2 μm.								
UV/LY	FP-2042-2	2.0	1.6					
PR/Y (L)	FL-2060-2	2.2		1.9	2.8	3.9	4.5	
PR/Y (M)	FP-2060-2	2.2		2.4		4.6		
PR/Y (H)	FH-2060-2	2.0		3.0		4.2		
SPHERO™ Multiple Fluorophore Particles, 2.5-5.0 μm.								
UV/LY	FP-3042-2	3.2	2.2					
PK/Y	FP-3055-2	3.0		2.7	3.2			
PR/Y	FP-4060-2	4.0		2.2		5.1		
SPHERO™ Fluorescent Particles, 0.7-0.9 μm.								
Yellow	FP-0852-2	0.85		3.3				
Pink	FP-0858-2	0.91				6.0		
Purple	FP-0862-2	0.84				2.9		

*Data obtained by Dr. David R. Parks, Dept. of Genetics, Stanford University Medical Center using a modified FACSII with the following Excitation and Emission wavelength:

UV: Ex 350-360, Em. 400-560 nm; FL: Ex. 488, Em. 515-545 nm;

PE: Ex. 488, Em. 560-590 nm; TR: Ex 590, Em. 615-640 nm;

APC: Ex. 590, Em. > 640 nm

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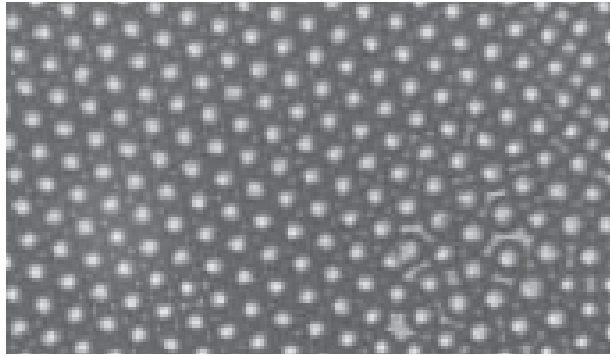
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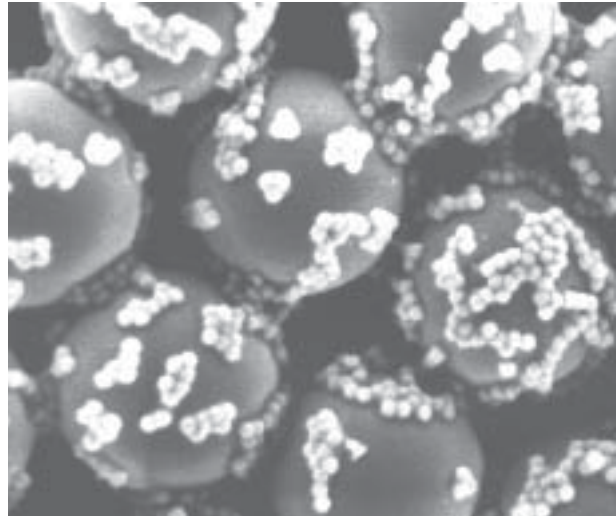
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Scanning Electron Microscope (SEM) photos showing (a) 10 μm Nile Red particles as seen under fluorescence microscope (40x), (b) 0.4 μm Avidin coated fluorescent particles binding to the surface of 6.0 μm Biotin coated polystyrene particles (5000x).

(a)



(b)



SPHERO™ Fluorescent Polystyrene Particles

Product	Size, μm	% w/v	Catalog No.	Unit
Yellow	0.04-0.06	1.0	FP-00552-2	2 mL
Nile Red	0.04-0.06	1.0	FP-00556-2	2 mL
Pink	0.04-0.06	1.0	FP-00558-2	2 mL
Purple	0.04-0.06	1.0	FP-00562-2	2 mL
Sky Blue	0.04-0.09	0.25	FP-00570-2	2 mL
Light Yellow	0.1-0.3	1.0	FP-0245-2	2 mL
Yellow	0.1-0.3	1.0	FP-0252-2	2 mL
Nile Red	0.1-0.3	1.0	FP-0256-2	2 mL
Purple	0.1-0.3	1.0	FP-0262-2	2 mL
Sky Blue	0.1-0.3	0.25	FP-0270-2	2 mL
Light Yellow	0.4-0.6	1.0	FP-0545-2	2 mL
Yellow	0.4-0.6	1.0	FP-0552-2	2 mL
Nile Red	0.4-0.6	1.0	FP-0556-2	2 mL
Pink	0.4-0.6	1.0	FP-0558-2	2 mL
Purple	0.4-0.6	1.0	FP-0562-2	2 mL
Sky Blue	0.4-0.6	1.0	FP-0570-2	2 mL
Light Yellow	0.7-0.9	1.0	FP-0845-2	2 mL
Yellow	0.7-0.9	1.0	FP-0852-2	2 mL
Nile Red	0.7-0.9	1.0	FP-0856-2	2 mL
Pink	0.7-0.9	1.0	FP-0858-2	2 mL
Purple	0.7-0.9	1.0	FP-0862-2	2 mL
Blue	0.7-0.9	1.0	FP-0868-2	2 mL
Sky Blue	0.7-0.9	1.0	FP-0870-2	2 mL
Light Yellow, Medium Intensity	1.7-2.2	1.0	FP-2045-2	2 mL
Nile Red	1.7-2.2	1.0	FP-2056-2	2 mL
Pink, Medium Intensity,	1.7-2.2	1.0	FP-2058-2	2 mL
Purple , Medium Intensity	1.7-2.2	1.0	FP-2062-2	2 mL

Product	Size, μm	% w/v	Catalog No.	Unit
Nile Blue	1.7-2.2	1.0	FP-2065-2	2 mL
Blue	1.7-2.2	1.0	FP-2068-2	2 mL
Sky Blue	1.7-2.2	1.0	FP-2070-2	2 mL
Yellow	2.5-3.5	1.0	FP-3052-2	2 mL
Nile Red	2.5-3.5	1.0	FP-3056-2	2 mL
Pink	2.5-3.5	1.0	FP-3058-2	2 mL
Nile Blue	2.5-3.5	1.0	FP-3065-2	2 mL
Blue	2.5-3.5	1.0	FP-3068-2	2 mL
Ocean Blue	2.5-3.5	1.0	FP-3069-2	2 mL
Sky Blue	2.5-3.5	1.0	FP-3070-2	2 mL
Yellow	3.6-4.5	1.0	FP-4052-2	2 mL
Nile Red	3.6-4.5	1.0	FP-4056-2	2 mL
Pink	3.6-4.5	1.0	FP-4058-2	2 mL
Purple	3.6-4.5	1.0	FP-4062-2	2 mL
Sky Blue	3.6-4.5	0.2	FP-4070-2	2 mL
Yellow	6.0-7.9	1.0	FP-6052-2	2 mL
Nile Red	6.0-7.9	1.0	FP-6056-2	2 mL
Pink	6.0-8.0	1.0	FP-6058-2	2 mL
Ocean Blue	5.0-7.9	0.2	FP-6069-2	2 mL
Yellow	7.0-7.9	1.0	FP-7052-2	2 mL
Sky Blue	7.0-7.9	0.25	FP-7070-2	2 mL
Nile Red	8.1-9.9	1.0	FP-9056-2	2 mL
Yellow	10.0-14.0	1.0	FP-10052-2	2 mL
Nile Red	10.0-14.0	1.0	FP-10056-2	2 mL
Sky Blue	10.0-14.0	0.2	FP-10070-2	2 mL
Yellow	15.0-19.0	1.0	FP-15052-2	2 mL
Nile Red	15.0-19.0	1.0	FP-15056-2	2 mL
Sky Blue	15.0-19.0	0.2	FP-15070-2	2 mL

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SPHERO™ High Intensity Fluorescent Polystyrene

Product	Size, µm	% 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	10.0-14.0	1.0	FH-10056-2	2 mL

SPHERO™ Low Intensity Fluorescent Polystyrene

Product	Size, µm	% w/v	Catalog No.	Unit
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	2.5-3.5	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	6.0-7.9	1.0	FL-6068-2	2 mL
Nile Red	10.0-14.0	1.0	FL-10056-2	2 mL

SPHERO™ Functionalized Fluorescent Particles

The carboxyl and amino fluorescent particles are used for covalent coupling of proteins or ligands. These fluorescent particles can be coated with Avidin, Biotin, Protein A, Goat anti-mouse IgG, or the protein of your interest. The coated fluorescent particles can then be used as fluorescent tracers for cell surface markers in fluorescence microscopy and flow cytometry.

SPHERO™ Amino Fluorescent Particles

Product	Size, µm	% w/v	Catalog No.	Unit
Yellow	0.09-0.3	1.0	AFP-0252-2	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
Nile Blue	0.7-0.9	1.0	AFP-0865-2	2 mL

SPHERO™ Carboxyl High Intensity Fluorescent Particles

Product	Size, µm	% 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 Fluorescent Particles

Product	Size, µm	% 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
Yellow	0.09-0.3	1.0	CFP-0252-2	2 mL
Nile Red	0.09-0.3	1.0	CFP-0256-2	2.2 mL
Pink	0.09-0.3	1.0	CFP-0258-2	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
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
Sky Blue	5.0-5.9	0.5	CFP-5070-2	2 mL

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SPHERO™ Carboxyl Low Intensity Fluorescent Particles

Product	Size, µm	% 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™ Multiple Fluorophore Fluorescent Particles

Product	Size, µm	% 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	0.2	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
Purple / Yellow, Medium Intensity	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 Intensity	1.7-2.2	1.0	FH-2060-2	2 mL
Purple / Yellow, Low Intensity	1.7-2.2	1.0	FL-2060-2	2 mL

SPHERO™ Dimethylamino Fluorescent Particles

Product	Size, µm	% w/v	Catalog No.	Unit
Purple	2.5-3.5	1.0	DFP-3062-2	2 mL

SPHERO™ Carboxyl Multiple Fluorophore Fluorescent Particles

Product	Size, µm	% w/v	Catalog No.	Unit
UV / Light Yellow / Yellow	0.04-0.08	1.0	CFP-00546-2	2 mL

SPHERO™ FITC Polystyrene Particles

The FITC labeled polystyrene particles are used as calibration particles for flow cytometry. They also are used to cross calibrate different flow cytometers so that data can be normalized.

Product	Size, µm	% w/v	Catalog No.	Unit
FITC	0.7-0.9	0.1	F1CP-08-2	2 mL
FITC	2.0-2.9	0.1	F1CP-20-2	2 mL
FITC	3.0-3.9	0.1	F1CP-30-2	2 mL
FITC	5.0-5.9	0.1	F1CP-50-2	2 mL
FITC	7.0-7.9	0.1	F1CP-70-2	2 mL
FITC	8.0-8.9	0.1	F1CP-80-2	2 mL