Labeling and Detection

Labelling biomolecules with fluorophores allows researchers to detect specific components biological systems. Fluorescent detection provides sensitivity in applications ranging from micrsocsopy and imaging, to flow cytometry, to Western blots. Fluorescent labelling is an efficient method for bioanalytical purposes. Fluorophores can easily be attached to many peptides and proteins through conjugation of free thiols or amine side chains. For nucleic acids, introducing modified nucleotides with amine, thiol, or other groups allows fluorescent probes to be covalently attached to DNA and RNA strands. Certain fluorophores can also intercalate into DNA strands allowing for easy detection. Recently, click chemistry has emerged as a convenient method for labelling biomolecules. It involves the reaction of a pair of reagents that are inert to naturally occurring functional groups. Alfa Aesar can provide a variety of fluorophores for labelling biological molecules for fluorescent detection.

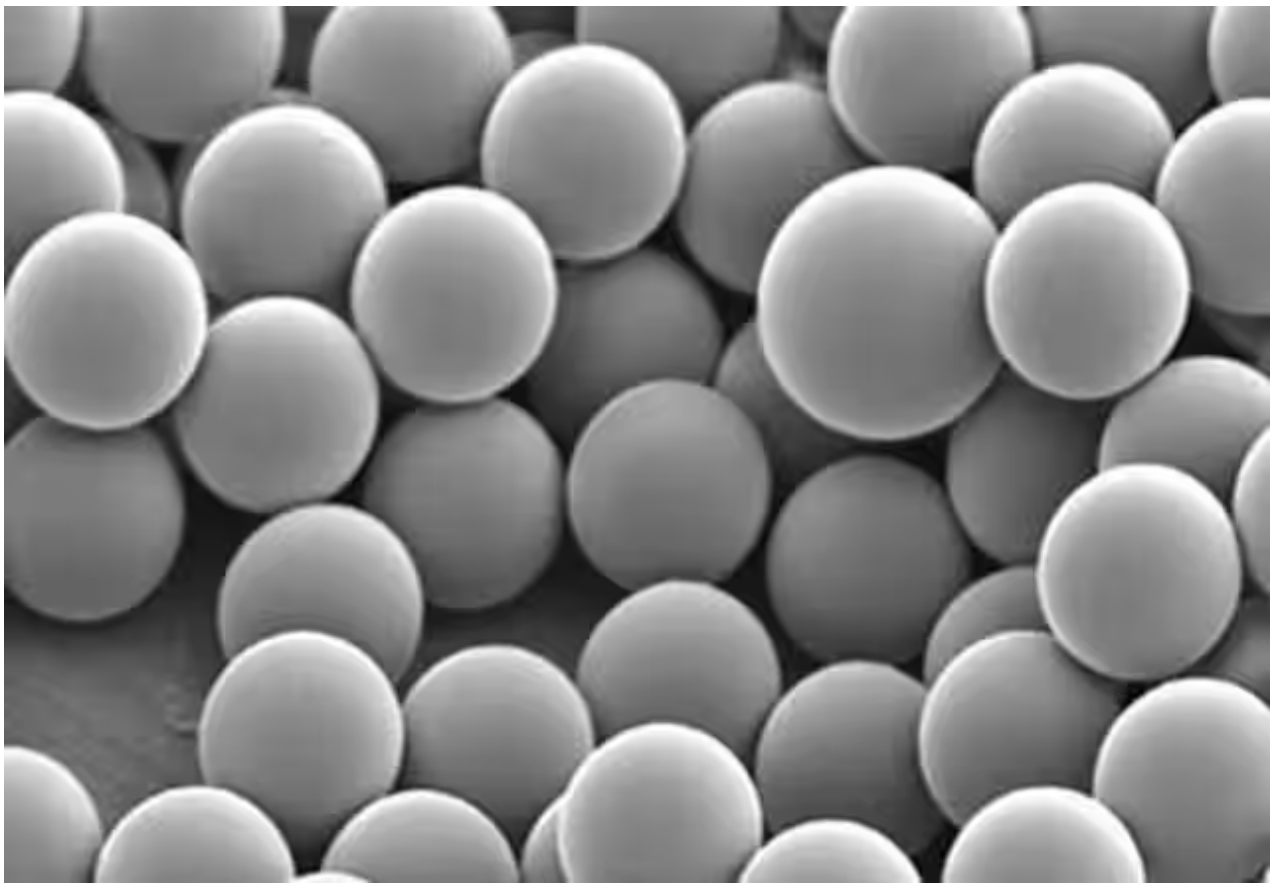
Click Chemistry Reagents

Click chemistry is a newer approach to synthesis that makes use of simple, rapid and reliable reactions. It has several benefits over other synthesis approaches such as being orthogonal to conventional methods and occurring under relatively mild conditions. Click functionalities are inert to most biological macromolecules. The reactions also proceed with high, almost quantitative yields. These benefits have made click chemistry reactions a popular method of introducing labels and other tags to biomolecules. The most popular click chemistry reaction is the Huisgen 1,3-dipolar cycloaddition of alkynes to azides, which is generally carried out with catalysis by copper (I), or by introduction of an azide to a strain-promoted cyclooctyne. Alfa Aesar offers a range of products designed for conjugating and labelling biological molecules through click reactions.

J64030	15-Azido-4,7,10,13-tetraoxapentadecanoic acid
J64308	1-Amino-11-azido-3,6,9-trioxaundecane
J64527	1-Amino-3,6,9,12-tetraoxapentadec-14-yne
J65668	3-Azido-1-propylamine
J65127	3'-Azido-3'-deoxythymidine, 98%
J65577	Acetylene-PEG4-biotin conjugate
J64892	Acetylene-PEG4-carboxyrhodamine 110 conjugate
J64859	Acetylene-PEG4-maleimide
J64948	Acetylene-PEG4-sulforhodamine B conjugate
J64549	Azadibenzocyclooctyne acid
J65637	Azadibenzocyclooctyne-amine
J65377	Azadibenzocyclooctyne-maleimide
J64128	Azadibenzocyclooctyne-NHS ester, with 4 carbon linker

	J64617	Azadibenzocyclooctyne-PEG4-alcohol
	J65673	Azadibenzocyclooctyne-PEG4-maleimide
	J64126	Azadibenzocyclooctyne-PEG4-NHS ester
	J64977	Azadibenzocyclooctyne-PEG, MW 5,000
	J64996	Azido-PEG3-biotin conjugate
	J65107	Azido-PEG3-carboxyrhodamine 110 conjugate
	J64510	Azido-PEG3-carboxytetramethylrhodamine 110 conjugate
	J65984	Azido-PEG3-maleimide Kit
	J65476	Azido-PEG3-sulforhodamine 101 conjugate
	H65798	D-Propargylglycine, 97%
	J64834	N-Succinimidyl 15-azido-4,7,10,13-tetraoxapentadecanoate, 90+%
	J64496	N-Succinimidyl 3-(propargyloxy)propionate
	J64902	N-Succinimidyl 4,7,10,13,16-pentaoxanonadec-18-ynoate
	A10295	Propargyl alcohol, 99%
	H53495	Propargylamine, 98%
	43775	Propargylamine hydrochloride, 95%
	H52103	(R)-3-Amino-5-hexynoic acid hydrochloride, 95%
	H52010	(S)-3-Amino-5-hexynoic acid hydrochloride, 95%

Microspheres

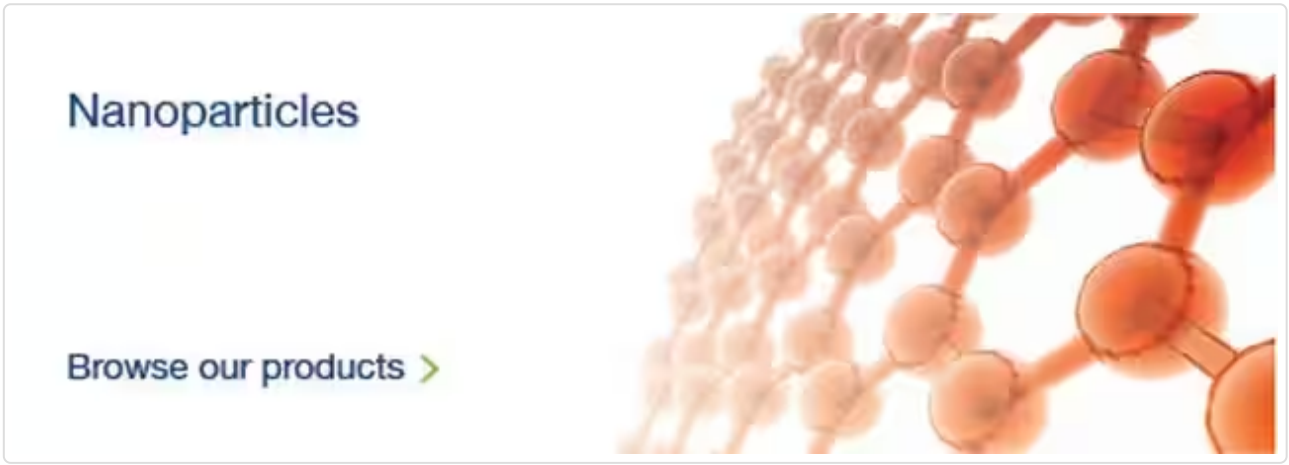


Microspheres are spherical particles with diameters in the micrometer range. Microspheres can be made from natural or synthetic materials. Polyethylene and polystyrene are common materials for synthetic microspheres. In biological research, microspheres can be used as size standards or for adsorbing macromolecules on their surface. These particles can also be used to facilitate cell sorting experiments and immunoprecipitations. Alfa Aesar is pleased to offer a range of microspheres with various life science applications.

	J67531	NIST traceable size standard, polystyrene monodisperse, 2µm, 1% wt%, aqueous suspension in dropper-tipped bottles

Nanoparticles

Nanoparticles are microscopic particles with sizes in the nanometer scale. Due to their small size, the physical and chemical properties of nanoparticles can differ from the properties of the same materials with micron- or mm-scale dimensions. Nanomaterials often have unique optical, electronic, and mechanical properties. Most life science applications exploit the local surface plasmon resonance effects of nanomaterials for imaging or photonics applications. In biological systems, nanoparticle based biosensors have the distinct advantage of being able to penetrate into environments that normal sensors cannot reach. Gold nanoparticles have proven to be excellent biosensors and labels due to their unique optical properties. Silver nanoparticles are also useful biosensors, especially when paired with fluorescent detection methods. Alfa Aesar provides a range of both gold and silver nanoparticles for life science research. These products include particles that are unfunctionalized and also functionalized particles for easy conjugation to proteins, peptides and DNA.



J67484	Gold nanoparticles, 100nm, amine-functionalized, 3kDa PEGylated, OD50, 572nm absorption
J67145	Gold nanoparticles, 100nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 572nm absorption
J67153	Gold nanoparticles, 100nm, carboxy-functionalized, 3kDa PEGylated, OD50, 572nm absorption
J67095	Gold nanoparticles, 100nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 572nm absorption
J67348	Gold nanoparticles, 100nm, supplied in 0.1mM PBS, 95%, OD1, 572nm absorption
J67004	Gold nanoparticles, 100nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 572nm absorption
J67310	Gold nanoparticles, 10nm, amine-functionalized, 3kDa PEGylated, D50, 520nm absorption
J67408	Gold nanoparticles, 10nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 520 nm absorption
J67062	Gold nanoparticles, 10nm, carboxy-functionalized, 3kDa PEGylated, OD50, 520nm absorption
J67188	Gold nanoparticles, 10nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 520nm absorption
J67029	Gold nanoparticles, 10nm, supplied in 0.1mM PBS, 95%, OD1, 520nm absorption
J67238	Gold nanoparticles, 10nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 520nm absorption
J67342	Gold nanoparticles, 150nm, supplied in 0.1 mg/ml sodium citrate with stabilizer
J67276	Gold nanoparticles, 150nm, supplied in 0.1mM PBS, 95%

J67040	Gold nanoparticles, 150nm, supplied in 0.1mM PBS, reactant-free, 99%
J67326	Gold nanoparticles, 15nm, amine-functionalized, 3kDa PEGylated, 0D50, 520nm absorption
J67101	Gold nanoparticles, 15nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 520nm absorption
J67217	Gold nanoparticles, 15nm, carboxy-functionalized, 3kDa PEGylated, OD50, 520nm absorption
J67307	Gold nanoparticles, 15nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 520nm absorption
J67141	Gold nanoparticles, 15nm, supplied in 0.1mM PBS, 95%, OD1, 520nm absorption
J67286	Gold nanoparticles, 15nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 520nm absorption
J67305	Gold nanoparticles, 15nm, Transferrin conjugated, OD3, supplied in 0.01M PBS (pH 7.4), 20% glycerol v/v, 1% BSA
J67327	Gold nanoparticles, 200nm, supplied in 0.1 mg/ml sodium citrate with stabilizer
J67483	Gold nanoparticles, 200nm, supplied in 0.1mM PBS, 95%
J67446	Gold nanoparticles, 200nm, supplied in 0.1mM PBS, reactant-free, 99%
J67465	Gold nanoparticles, 20nm, amine-functionalized, 3kDa PEGylated, OD50, 524nm absorption
J67061	Gold nanoparticles, 20nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 524nm absorption
J67386	Gold nanoparticles, 20nm, carboxy-functionalized, 3kDa PEGylated, OD50, 524nm absorption
J67269	Gold nanoparticles, 20nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 524nm absorption
J67318	Gold nanoparticles, 20nm, supplied in 0.1mM PBS, 95%, OD1, 524 nm absorption
J67370	Gold nanoparticles, 20nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 524nm absorption
J67490	Gold nanoparticles, 250nm, supplied in 0.1 mg/ml sodium citrate with stabilizer
J67290	Gold nanoparticles, 250nm, supplied in 0.1mM PBS, 95%

J67457	Gold nanoparticles, 250nm, supplied in 0.1mM PBS, reactant-free, 99%
J67066	Gold nanoparticles, 300nm, supplied in 0.1 mg/ml sodium citrate with stabilizer
J67400	Gold nanoparticles, 300nm, supplied in 0.1mM PBS ,95%
J67137	Gold nanoparticles, 300nm, supplied in 0.1mM PBS, reactant-free, 99%
J67391	Gold nanoparticles, 30nm, amine-functionalized, 3kDa PEGylated, OD50, 526nm absorption
J67328	Gold nanoparticles, 30nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 526nm absorption
J67075	Gold nanoparticles, 30nm, carboxy-functionalized, 3kDa PEGylated, OD50, 526nm absorption
J67284	Gold nanoparticles, 30nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 526nm absorption
J67368	Gold nanoparticles, 30nm, supplied in 0.1mM PBS, 95%, OD1, 526nm absorption
J67118	Gold nanoparticles, 30nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 526nm absorption
J67213	Gold nanoparticles, 400nm, supplied in 0.1 mg/ml sodium citrate with stabilizer
J67106	Gold nanoparticles, 400nm, supplied in 0.1mM PBS, 95%
J67324	Gold nanoparticles, 400nm, supplied in 0.1mM PBS, reactant-free, 99%
J67042	Gold nanoparticles, 40nm, amine-functionalized, 3kDa PEGylated, OD50, 530nm absorption
J67026	Gold nanoparticles, 40nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 530nm absorption
J67440	Gold nanoparticles, 40nm, carboxy-functionalized, 3kDa PEGylated, OD50, 530nm absorption
J67001	Gold nanoparticles, 40nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 530nm absorption

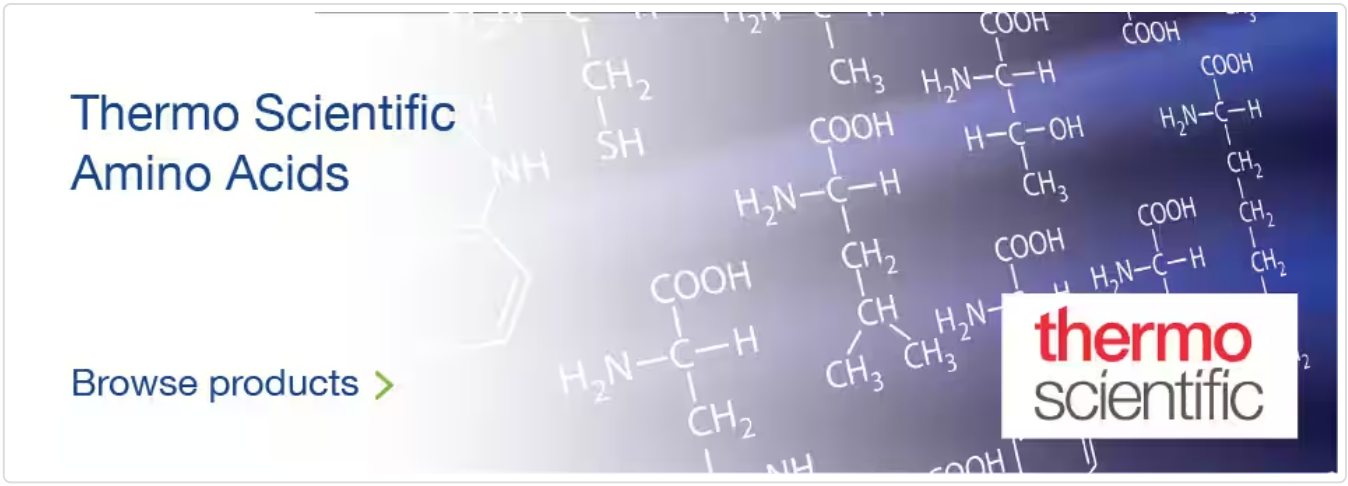
J67409	Gold nanoparticles, 40nm, supplied in 0.1mM PBS, 95%, OD1, 530 nm absorption
J67421	Gold nanoparticles, 40nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 530nm absorption
J67036	Gold nanoparticles, 50nm, amine-functionalized, 3kDa PEGylated, OD50, 535nm absorption
J67205	Gold nanoparticles, 50nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 535nm absorption
J67227	Gold nanoparticles, 50nm, carboxy-functionalized, 3kDa PEGylated, OD50, 535nm absorption
J67433	Gold nanoparticles, 50nm, supplied in 0.1 mg/ml sodium citrate with stabilizer OD1, 535nm absorption
J67157	Gold nanoparticles, 50nm, supplied in 0.1mM PBS, 95%, OD1, 535nm absorption
J67432	Gold nanoparticles, 50nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 535nm absorption
J67053	Gold nanoparticles, 5nm, amine functionalized, 3kDa PEGylated, OD50, 515-520nm absorption
J67413	Gold nanoparticles, 5nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 515-520 nm absorption
J67301	Gold nanoparticles, 5nm, carboxy-functionalized, 3kDa PEGylated, OD50, 515-520nm absorption
J67085	Gold nanoparticles, 5nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 515-525nm absorption
J67089	Gold nanoparticles, 5nm, supplied in 0.1mM PBS, 95%, OD1, 515-520nm absorption
J67448	Gold nanoparticles, 5nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 515-520nm absorption
J67365	Gold nanoparticles, 60nm, amine-functionalized, 3kDa PEGylated, OD50, 540nm absorption
J67210	Gold nanoparticles, 60nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 540nm absorption
J67237	Gold nanoparticles, 60nm, carboxy-functionalized, 3kDa PEGylated, OD50, 540nm absorption
J67306	Gold nanoparticles, 60nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 540nm absorption

J67438	Gold nanoparticles, 60nm, supplied in 0.1mM PBS, 95%, OD1, 540nm absorption
J67022	Gold nanoparticles, 60nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 540nm absorption
J67169	Gold nanoparticles, 70nm, amine-functionalized, 3kDa PEGylated, OD50, 548nm absorption
J67374	Gold nanoparticles, 70nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 548 nm absorption
J67335	Gold nanoparticles, 70nm, carboxy-functionalized, 3kDa PEGylated, OD50, 548nm absorption
J67195	Gold nanoparticles, 70nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 548nm absorption
J67073	Gold nanoparticles, 70nm, supplied in 0.1mM PBS, 95%, OD1, 548nm absorption
J67314	Gold nanoparticles, 70nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 548nm absorption
J67367	Gold nanoparticles, 80nm, amine-functionalized, 3kDa PEGylated, OD50, 553nm absorption
J67403	Gold nanoparticles, 80nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 553 nm absorption
J67108	Gold nanoparticles, 80nm, carboxy-functionalized, 3kDa PEGylated, OD50, 553nm absorption
J67109	Gold nanoparticles, 80nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 553nm absorption
J67285	Gold nanoparticles, 80nm, supplied in 0.1mM PBS, 95%, OD1, 553 nm absorption
J67068	Gold nanoparticles, 80nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 553nm absorption
J67114	Gold nanoparticles, 90nm, amine-functionalized, 3kDa PEGylated, OD50, 564nm absorption
J67449	Gold nanoparticles, 90nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 564nm absorption
J67300	Gold nanoparticles, 90nm, carboxy-functionalized, 3kDa PEGylated, OD50, 564nm absorption
J67184	Gold nanoparticles, 90nm, supplied in 0.1 mg/ml sodium citrate with stabilizer, OD1, 564nm absorption

J67426	Gold nanoparticles, 90nm, supplied in 0.1mM PBS 95%, OD1, 564nm absorption
J67417	Gold nanoparticles, 90nm, supplied in 0.1mM PBS, reactant-free, 99%, OD1, 564nm absorption
J66691	Hydroxyapatite nanoparticles, 5-10% (w/v) aqueous colloidal dispersion, 20-50nm particles
J67099	Silver nanoparticles, 100nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 490nm absorption
J67111	Silver nanoparticles, 10nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 390-400nm absorption
J67161	Silver nanoparticles, 10nm, supplied in 2mM citrate, conjugated to Protein A
J67067	Silver nanoparticles, 20nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 405nm absorption
J67467	Silver nanoparticles, 20nm, supplied in 2mM citrate, conjugated to Protein A
J67207	Silver nanoparticles, 30nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 410nm absorption
J67030	Silver nanoparticles, 30nm, supplied in 2mM citrate, conjugated to Protein A
J67090	Silver nanoparticles, 40nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 416nm absorption
J67065	Silver nanoparticles, 50nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 425nm absorption
J67208	Silver nanoparticles, 60nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 430nm absorption
J67252	Silver nanoparticles, 80nm, 0.02 mg/ml, supplied in 2mM sodium citrate, 457nm absorption

Protein and DNA Labeling

In many life science experiments, protein, DNA and antibody labelling is useful for detection, isolation and analysis of biomolecules of interest. Labeled nucleotides are commonly used for detection of specific nucleic acid sequences. The incorporation of fluorophores to biomolecules is commonly used in life science research especially in genomics, proteomics and immunohistochemistry. These labels are covalently bound to a targeted molecule and these labels are very useful in imaging the biomolecules in living systems. Bioconjugation methods are also being used for nucleic acid/protein/antibody probe generation which facilitates targeted delivery, immobilization etc. In addition detecting the specific biomolecules will be enabled by various labeling. Alfa Aesar offers various reagents and kits for labelling biomolecules like proteins, DNA and antibodies.



J67484	Gold nanoparticles, 100nm, amine-functionalized, 3kDa PEGylated, OD50, 572nm absorption
J67145	Gold nanoparticles, 100nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 572nm absorption
J67153	Gold nanoparticles, 100nm, carboxy-functionalized, 3kDa PEGylated, OD50, 572nm absorption
J67310	Gold nanoparticles, 10nm, amine-functionalized, 3kDa PEGylated, D50, 520nm absorption
J67408	Gold nanoparticles, 10nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 520 nm absorption
J67062	Gold nanoparticles, 10nm, carboxy-functionalized, 3kDa PEGylated, OD50, 520nm absorption
J67326	Gold nanoparticles, 15nm, amine-functionalized, 3kDa PEGylated, 0D50, 520nm absorption
J67101	Gold nanoparticles, 15nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 520nm absorption
J67217	Gold nanoparticles, 15nm, carboxy-functionalized, 3kDa PEGylated, OD50, 520nm absorption
J67465	Gold nanoparticles, 20nm, amine-functionalized, 3kDa PEGylated, OD50, 524nm absorption
J67061	Gold nanoparticles, 20nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 524nm absorption
J67386	Gold nanoparticles, 20nm, carboxy-functionalized, 3kDa PEGylated, OD50, 524nm absorption
J67391	Gold nanoparticles, 30nm, amine-functionalized, 3kDa PEGylated, OD50, 526nm absorption
J67328	Gold nanoparticles, 30nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 526nm absorption

J67075	Gold nanoparticles, 30nm, carboxy-functionalized, 3kDa PEGylated, OD50, 526nm absorption
J67042	Gold nanoparticles, 40nm, amine-functionalized, 3kDa PEGylated, OD50, 530nm absorption
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J67227	Gold nanoparticles, 50nm, carboxy-functionalized, 3kDa PEGylated, OD50, 535nm absorption
J67413	Gold nanoparticles, 5nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 515-520 nm absorption
J67301	Gold nanoparticles, 5nm, carboxy-functionalized, 3kDa PEGylated, OD50, 515-520nm absorption
J67365	Gold nanoparticles, 60nm, amine-functionalized, 3kDa PEGylated, OD50, 540nm absorption
J67210	Gold nanoparticles, 60nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 540nm absorption
J67237	Gold nanoparticles, 60nm, carboxy-functionalized, 3kDa PEGylated, OD50, 540nm absorption
J67169	Gold nanoparticles, 70nm, amine-functionalized, 3kDa PEGylated, OD50, 548nm absorption
J67374	Gold nanoparticles, 70nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 548 nm absorption
J67335	Gold nanoparticles, 70nm, carboxy-functionalized, 3kDa PEGylated, OD50, 548nm absorption
J67367	Gold nanoparticles, 80nm, amine-functionalized, 3kDa PEGylated, OD50, 553nm absorption
J67403	Gold nanoparticles, 80nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 553 nm absorption
J67108	Gold nanoparticles, 80nm, carboxy-functionalized, 3kDa PEGylated, OD50, 553nm absorption
J67114	Gold nanoparticles, 90nm, amine-functionalized, 3kDa PEGylated, OD50, 564nm absorption

	J67449	Gold nanoparticles, 90nm, biotin-functionalized, PEGylated, OD50, supplied in purified water, 564nm absorption
	J67300	Gold nanoparticles, 90nm, carboxy-functionalized, 3kDa PEGylated, OD50, 564nm absorption

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