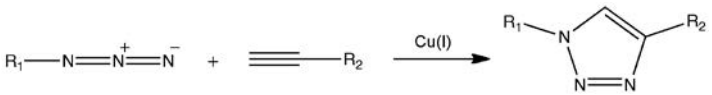
Alfa Aesar

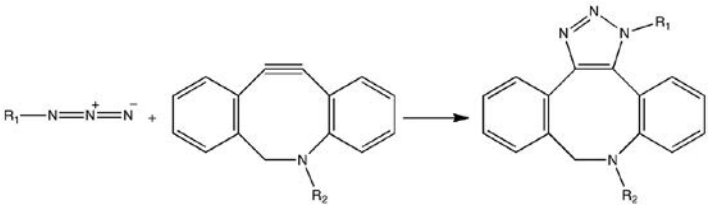
Click chemistry reagents

Click chemistry is a newer approach to synthesis that makes use of rapid and reliable reactions.[1] The term “click chemistry” was first coined to describe efficient and highly selective reactions that join molecules together in high yield. To date, the most popular reaction which fulfills click reaction criteria is the 1,3-dipolar cycloaddition of an alkyne to an azide to yield a triazole moiety. Azide and alkyne functional groups are biologically unique in addition to being stable and inert. The triazole has similarities to the amide moiety, but unlike amides, is not susceptible to cleavage. Additionally, triazoles are nearly impossible to oxidize or reduce.

The cycloaddition reaction proceeds with great efficiency and selectivity in aqueous media and in most cases this cycloaddition reaction is catalyed by copper (I). The copper(I)-catalyzed reaction is mild and very efficient. In most cases, it requires no protecting groups or purification after the reaction is completed. The azide and alkyne functional groups are largely nonreactive towards biological molecules and in aqueous environments,[2] making them ideal for introducing labels and affinity tags in biological systems. Using Cu(II) salts with ascorbate has been the preferred method for carrying out the cycloaddition reaction, but this method can be problematic in some biocojugation applications. Tris[(1-benzyl-1H-1,2,3-triazol-4-yl)methyl]amine, or TBTA, enhances the copper-catalyzed cycloaddition and prevents damage to biological scaffolds.[3] But even so, copper (I) is toxic to bacteria and mammalian cells and can damage fluorescent proteins, limiting the biological applications of this approach.



The strain-promoted or Cu(I)-free azide-alkyne cycloaddition reaction is another option. These reactions usually rely on the use of strained cyclooctynes. With this strategy the activation energy for the cycloaddition process is lowered, allowing the cycloaddition to proceed out without a need for catalysis at low temperatures, and with greater efficiency than Cu(I)-catalyzed ligation. One such class of reagents is comprised of the so-called ADIBO (azadibenzocyclooctyne) compounds. Using ADIBO reagents allows for chemical modification without the need for toxic metal catalyst, giving it a wider range of biological applications.



References

1. Kolb, H. C.; Sharpless, K. B. *Drug Discovery Today* **2003**, *8*, 1128.
2. Speers, A. E. *J. Am. Chem. Soc*. **2003,** *125*, 4686.
3. Chan, T.R. et al. *Org. Lett* **2004**, *6*, 2853.

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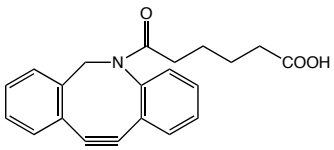
Click chemisty reagents

Alfa Aesar offers a selection of compounds for use in click chemistry reactions. 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. These 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. The following is a selection of bifunctional linkers, fluorescent tags and chemical modifications that can be used with the azide-alkyne click chemistry technique.



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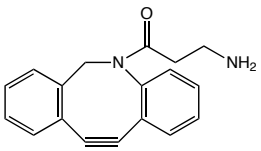
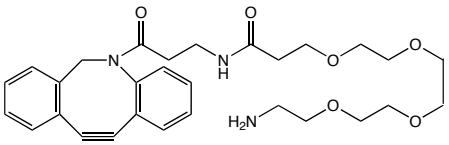
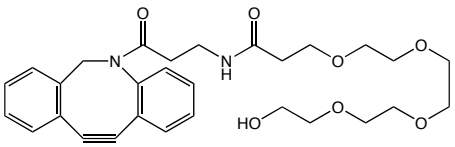
Azadibenzocyclooctyne acid



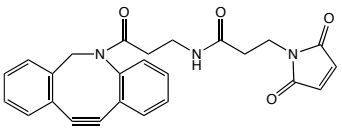
J65637
Azadibenzocyclooctyne-amine



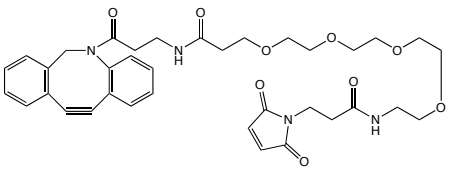
J65301
Azadibenzocyclooctyne-PEG4 amine



J64617
Azadibenzocyclooctyne-PEG4-alcohol



J65377
Azadibenzocyclooctyne-maleimide



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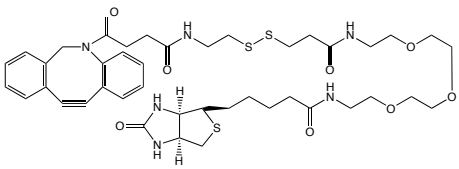
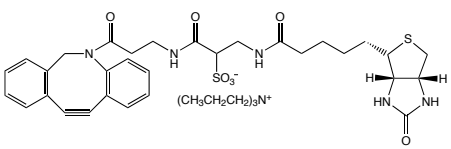
Azadibenzocyclooctyne-maleimide



J64256
Azadibenzocyclooctyne-S-S-PEG3-biotin conjugate



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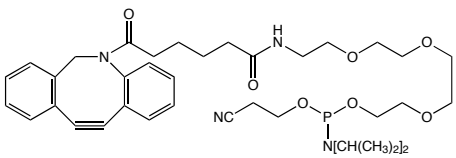
Azadibenzocyclooctyne-sulfobiotin conjugate



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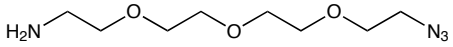
Azadibenzocyclooctyne-PEG4-phorphoramidite



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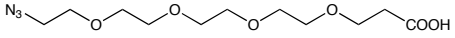
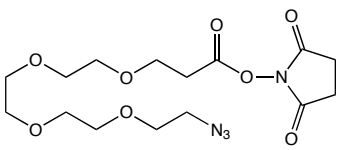
1-Amino-11-azido-3,6,9-trioxaundecane



J64030
15-Azido-4,7,10,13-tetraoxapentadecanoic acid



J64834
N-Succinimidyl 15-azido-4,7,10,13-tetraoxapentadecanoate

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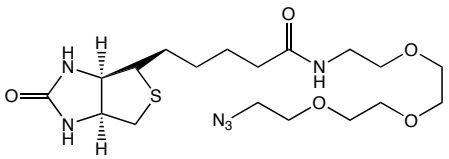

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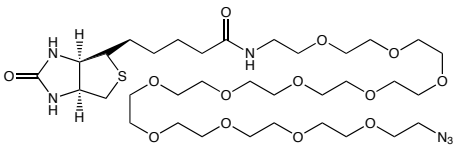
3-Azido-PEG3-biotin conjugate



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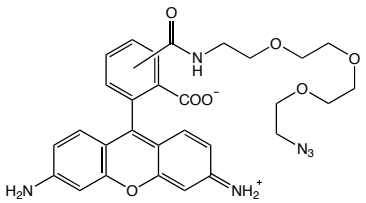
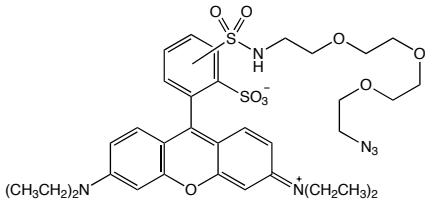
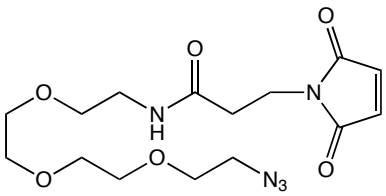
Azido-PEG11-biotin conjugate



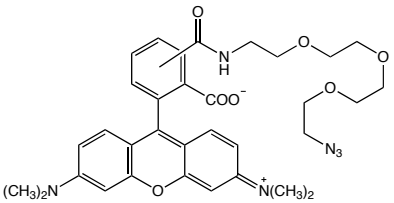
J65107
Azido-PEG3-carboxyrhodamine 110 conjugate



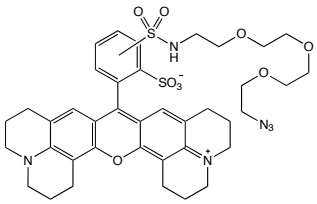
J65529
Azido-PEG3-sulforhodamine B conjugate



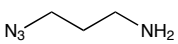
J65984
Azido-PEG3-maleimide kit



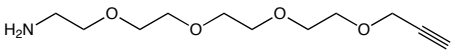
J64510
Azido-PEG3-carboxytetramethylrhodamine 110 conjugate



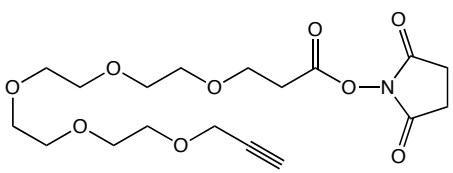
J65476
Azido-PEG3-sulforhodamine 101 conjugate



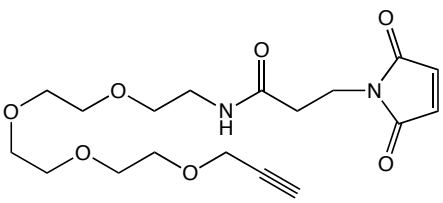
J65668
3-Azido-1-propylamine



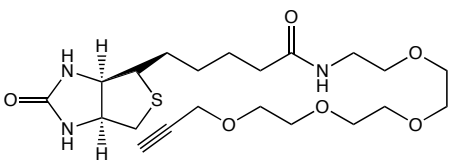
J64527
1-Amino-3,6,9,12-tetraoxapentadec-14-yne



J64902
N-Succinimidyl 4,7,10,13,16-pentaoxanonadec-18-ynoate



J64859
Acetylene-PEG4-maleimide



J65577
Acetylene-PEG4-biotin conjugate

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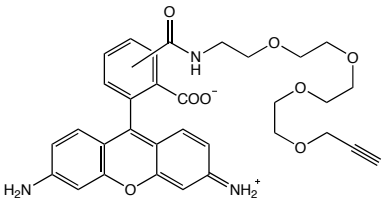
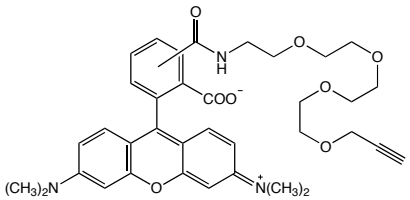


J64892
Acetylene-PEG4-carboxyrhodamine 110 conjugate



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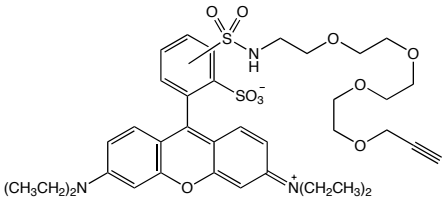
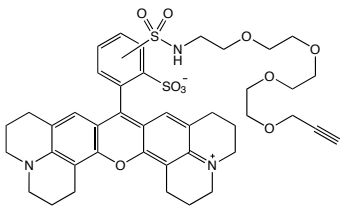
Acetylene-PEG4-carboxytetramethylrhodamine 110 conjugate



J64948
Acetylene-PEG4-sulforhodamine B conjugate



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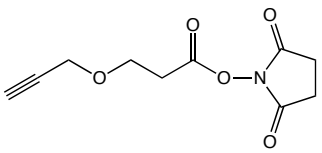

J64496
N-Succinimidyl 3-(propargyloxy)propionate

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