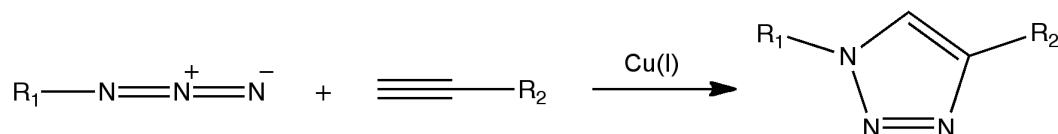


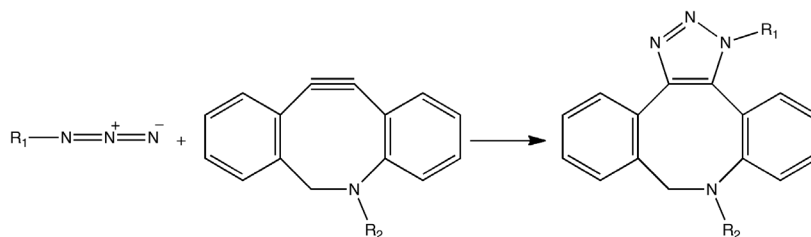
# Click Chemistry Reagents

Click chemistry is a newer approach to synthesis that makes use of rapid and reliable reactions.<sup>1</sup> 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 catalyzed 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,<sup>2</sup> 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.<sup>3</sup> 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:

<sup>1</sup>Kolb, H. C.; Sharpless, K. B. *Drug Discovery Today* **2003**, *8*, 1128

<sup>2</sup>Speers, A. E. J. *Am. Chem. Soc.* **2003**, *125*, 4686

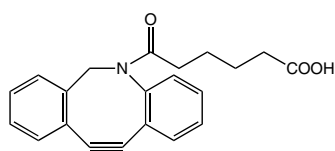
<sup>3</sup>Chan, T.R. et al. *Org. Lett* **2004**, *6*, 2853.

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# Click Chemistry Reagents

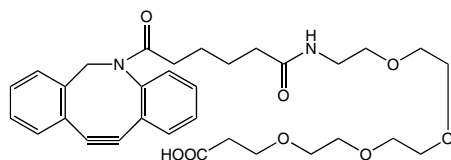
Alfa Aesar offers a selection of compounds for use in click chemistry reactions.

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.



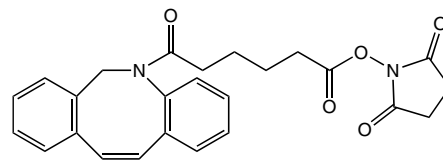
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Azadibenzocyclooctyne acid



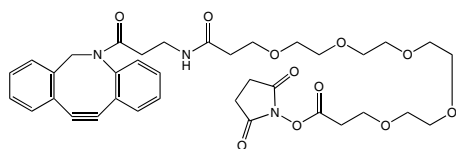
**J65338**

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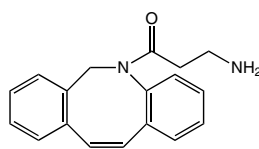
**J65981**

Azadibenzocyclooctyne-NHS ester



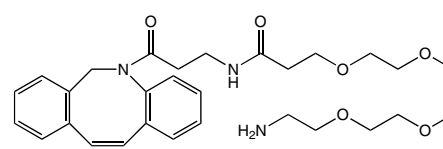
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Azadibenzocyclooctyne-PEG5-NHS ester



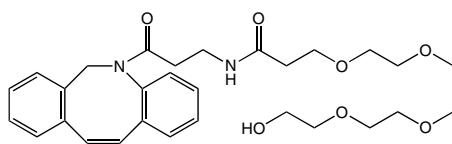
**J65637**

Azadibenzocyclooctyne-amine



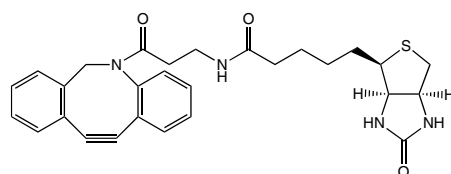
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Azadibenzocyclooctyne-PEG4 amine



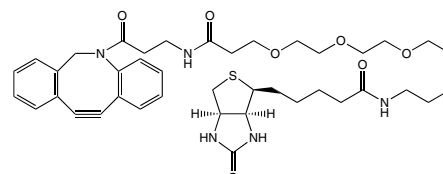
**J64617**

Azadibenzocyclooctyne-PEG4-alcohol



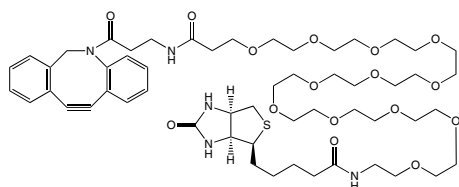
**J65472**

Azadibenzocyclooctyne-Biotin conjugate



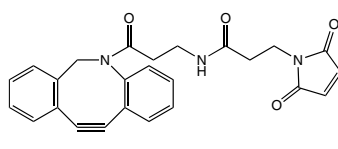
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Azadibenzocyclooctyne-PEG4 biotin conjugate



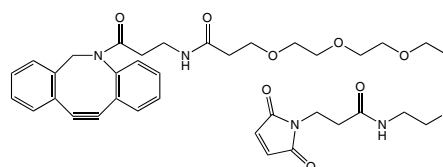
**J65780**

Azadibenzocyclooctyne-PEG12 biotin conjugate



**J65377**

Azadibenzocyclooctyne-maleimide

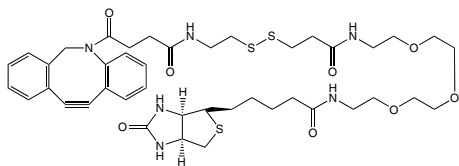


**J65673**

Azadibenzocyclooctyne-maleimide

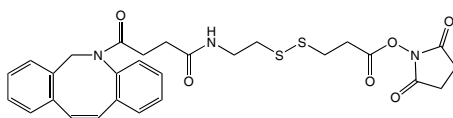
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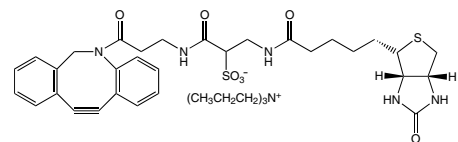
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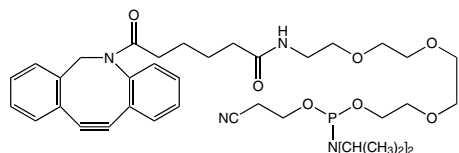
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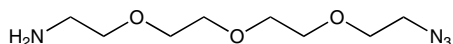
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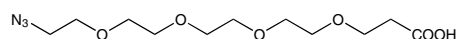
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Azadibenzocyclooctyne-PEG4-phosphoramidite



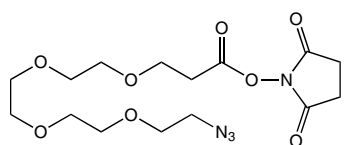
**J64308**

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



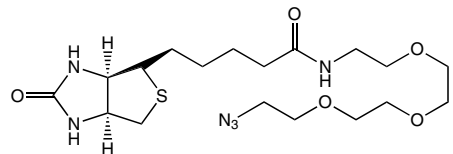
**J64030**

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



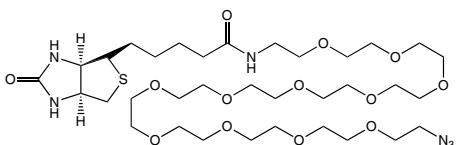
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N-Succinimidyl 15-azido-4,7,10,13-tetraoxapentadecanoate



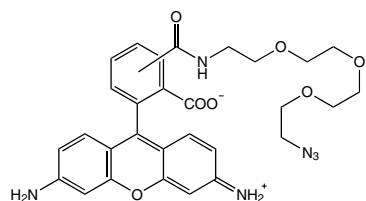
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3-Azido-PEG3-biotin conjugate



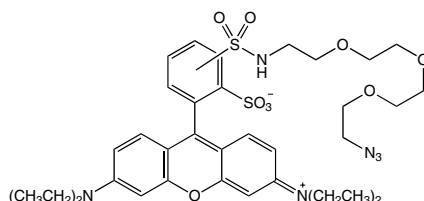
**J65147**

Azido-PEG11-biotin conjugate



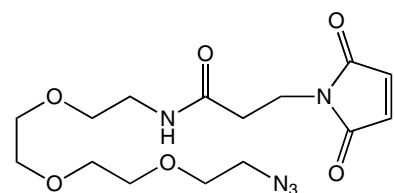
**J65107**

Azido-PEG3-carboxyrhodamine 110 conjugate



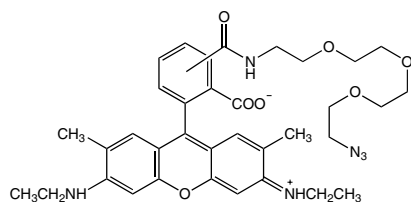
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Azido-PEG3-sulforhodamine B conjugate



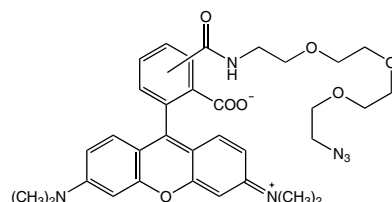
**J65984**

Azido-PEG3-maleimide kit



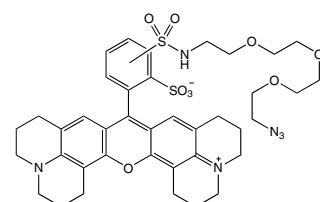
**J64906**

Azido-PEG3-carboxytetramethylrhodamine 6G conjugate



**J64510**

Azido-PEG3-carboxytetramethylrhodamine 110 conjugate

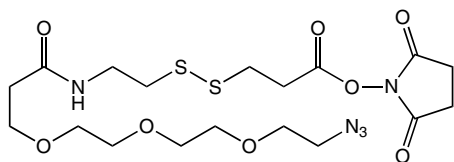


**J65476**

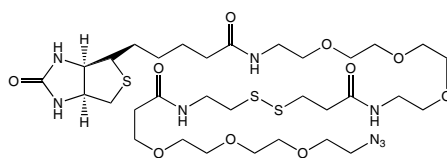
Azido-PEG3-sulforhodamine 101 conjugate

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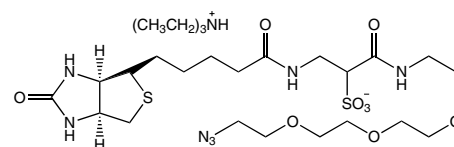
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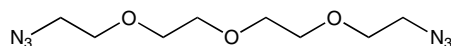
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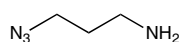
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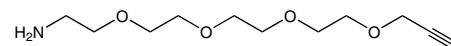
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Azido-PEG3-sulfo-biotin conjugate  
triethylammonium salt



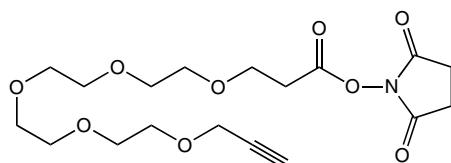
**J64863**  
1,11-Diazido-3,6,9-trioxaundecane



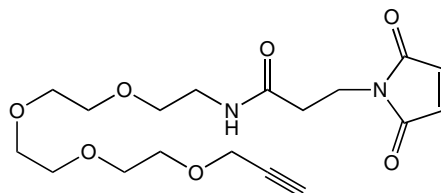
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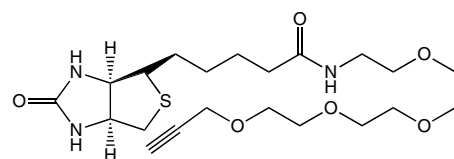
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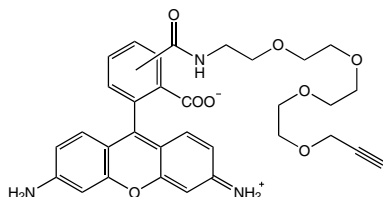
**J64902**  
N-Succinimidyl 4,7,10,13,16-  
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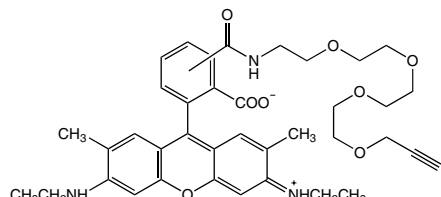
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Acetylene-PEG4-maleimide



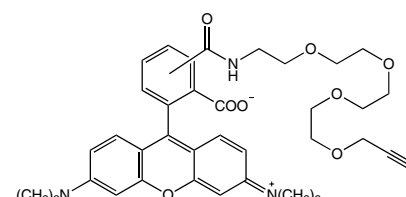
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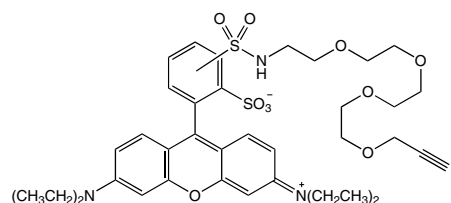
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Acetylene-PEG4-carboxyrhodamine 110  
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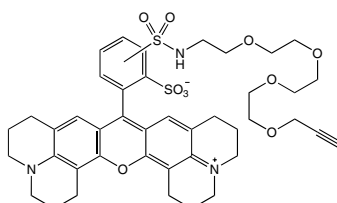
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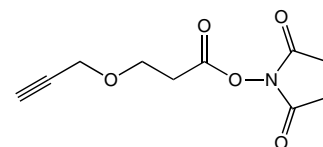
**J64523**  
Acetylene-PEG4-carboxytetramethyl-  
rhodamine 110 conjugate



**J64948**  
Acetylene-PEG4-sulforhodamine  
B conjugate



**J65924**  
Acetylene-PEG4-sulforhodamine  
101 conjugate



**J64496**  
N-Succinimidyl 3-(propargyloxy)propionate

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