H10E

Innovative biochemistry conjugation method from Interchim

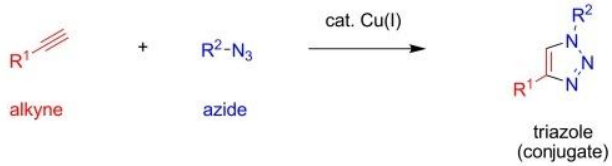
Click Chemistry (Azide / alkyne reaction)

A versatile and reliable conjugation chemistry for linking covalently in very mild conditions

Click chemistry can be used for the synthesis of a variety of conjugates. Virtually any biomolecules can be involved, and labeling with small molecules, such as fluorescent dyes, biotin, and other groups can be readily achieved.

Chemistry

The Click chemistry involves the reaction between an **azide** and an **alkyne** (i.e. acetylene), forming a covalent chemical bond.



This Cu(I) catalyzed [3+2] azide-alkyne cycloaddition is also known as CuAAC reaction. It yelds the efficient formation of a non-toxic triazole from biological building blocks that have been modified with non-perturbing azides and unactivated alkynes.

This process has unprecedented tolerance and reliability. It is pH-independent, and it can be carried out in water at ambient temperature. It applies to conjugation and solid phase immobilization.
Note: both azido and acetylenic groups are nearly never encountered in natural biomolecules. Hence, the reaction is **highly bioorthogonal and specific**.

The only needed things are azido- and alkyne-labeled biomolecules, dyes, and surfaces. Interchim BioScience provides a variety of reagents, notably in the Uptima range.

- **Standard Click Chemistry reagents** (Alkyne reagents) **- CuAAC** (-)
uses alkyne ligators and azide ligators, to activate i.e. amines (ZL5530 & ZL5540), or nucleic acids (with amidite-Alkynes)
Alkyne and Azide react in presence of Copper(II)-TBTA complex FY2780

- **Copper-free Click Chemistry reagents** (DBCO & BCN reagents) **- SPAAC** (PH)
use cyclooctynes ligators (DBCO, BCN) and azide ligators, to activate i.e. amines or other biomolecules
DBCO/BCN and azide partners react directly (SPAAC reaction).

Uptima and FluoProbes NHS reagents are useful to incorporate an alkyne, an azide or directly a label on a aminated molecule

Reagents (for CuAAC)

- **Alkyne** reagents: Fluorescent – Fluor dyes(0)
Nucleotides (0).
Alkyne-activated ligands are used for CuAAC Click chemistry.

- **Azide** reagents: Fluorescent – FluoProbes dyes(0) , Cy dyes (0)
Non Fluorescent labels (biotin) and ligands
Nucleotides (0).
Azides are useful reagents for ligation of ligands via Click chemistries, Hydrazone ligation, or via Staudinger ligation.

- **Complementary** reagents for click chemistry: Azide ou Alkyne – NHS (0) - to activate amines(proteins)
CLICK labeled molecules Capture Kit
- **Auxillary** reagents for click chemistry: Catalyzers and buffers (0)

- Please contact interbiotech@interchim;com for other molecules to bz **custom-modified by acetylene or DBCO**

■ **Alkynes** Click Chemistry reagents

● **Fluorescent Dyes - Alkynes**: see FT-*DQP790*

Alkyne-PEO$_4$-CR110 **FP-DQP790, 1mg / 5mg**
Fluor 488-Acetylene (5/6-CarboxyFluorescein); Abs/Em = 501/525 nm
Alkyne-PEO$_4$-CR6G **FP-DQP800, 1mg / 5mg**
Fluor525-Acetylene (5/6-Carboxyrhodamine 6G); Abs/Em = 522/544 nm
Alkyne-PEO$_4$-TAMRA **FP-DQP810, 1mg / 5mg**
Fluor545-Acetylene (TMRA-PEO4-Alkyne); MW:644.73; Abs/Em = 546/565 nm
Alkyne-PEO$_4$-SRB **FP-DQP820, 1mg / 5mg**
Fluor568 –Acetylene; Abs/Em = 568/584 nm
Alkyne-PEO$_4$-SR101 **FP-DQP30, 1mg / 5mg**
Fluor585 –Acetylene; Abs/Em = 584/603 nm

* (with a sulfo-propyl substituent):
Alkyne-TriSulfo-CY$_{anine}$3 **FP-1C8830, 1mg / 5mg / 25mg / 100mg**
Tri-SulfoCy3 –Acetylene; MW:761.92; Abs/Em = 550/570nm
Alkyne-TriSulfo-CY$_{anine}$5 **FP-1C8840, 1mg / 5mg / 25mg / 100mg**
Tri-SulfoCy5 –Acetylene; MW:787.96; Abs/Em = 647/663nm
Alkyne-TriSulfo-CY$_{anine}$7 **FP-1I1220, 1mg / 5mg / 25mg / 100mg**
Tri-Sulfo-CY7-Acetylene; MW:1010.22; Abs/Em = 753/775nm
* (with a ethyl substituent):
Alkyne-DiSulfo-CY$_{anine}$3 **FP-LQV030, 1mg**
DiSulfo-Eth-CY7-Acetylene, CF_3CO^{2-} salt; MW:781.86; Abs/Em.=555/565nm; Soluble in DMSO
Alkyne-DiSulfo-CY$_{anine}$5 **FP-LQV090, 1mg**
DiSulfo-Eth-CY5-Acetylene, CF_3CO^{2-} salt; MW:807.90; Abs/Em.=649/66nm; Soluble in DMSO
Alkyne-TetraSulfo-CY$_{anine}$5.5 **FP-LQV320, 1mg**
TetraSulfo-Eth-CY5.5-Acetylen, CF_3CO^{2-} salt; MW:1068.14; Abs/Em.=578/701nm; Soluble in DMSO.
Alkyne-DiSulfo-CY$_{anine}$7 **FP-LQV250, 1mg**
DiSulfo-Eth-CY7-Acetylene, CF_3CO^{2-} salt; MW:833.93; Abs/Em.=749/776m; Soluble in DMSO
* (with a methyl substituent):
Alkyne-SulfoCY$_{anine}$3 **FP-1C4620, 1mg / 5mg / 25mg / 100mg**
MonoCy3 –Acetylene; MW:573.75; Abs/Em = 550/567nm; EC:96800; QY:0.15
Alkyne-DiSulfo-CY$_{anine}$3 **FP-1A4630, 1mg / 5mg / 25mg / 100mg**
DiSulfoCy3 –Acetylene Na salt; MW:675.79; Abs/Em = 548/567nm; EC:162000; QY:0.15
Alkyne-DiSulfo-CY$_{anine}$5 **FP-OO5590, 1mg / 5mg / 25mg / 100mg**
DiSulfoCy5 –Acetylene Na salt; MW:701.83; Abs/em.=646/664nm; EC:271000; QY:0.28
* (with a methyl substituent):
Alkyne-DiSulfo-CY$_{anine}$3 **FP-0B8390, 1mg / 5mg / 25mg / 100mg**
DiSulfo-Cy3 –Acetylene K salt; MW:691.9(+653.2); Abs/Em = 548/563nm; EC:162000; QY:0.1; CF260:0.03; CF280:0.06 – Solubility is good in Water, DMF, DMSO
Alkyne-DiSulfo-CY$_{anine}$3.5 **Inquire**
DiSulfo-Cy3.5 –Acetylene
Alkyne-DiSulfo-CY$_{anine}$5 **FP-SJI060, 1mg / 5mg / 25mg / 100mg**
DiSulfo-Cy5 –Acetylene Ksalt; MW:717.94; Abs/em.=649/662nm; EC:271000; QY:0.28; CF260:0.04; CF280:0.04 – Solubility is very good in Water, DMF, DMSO
Alkyne-TetraSulfo-CY$_{anine}$5.5 **FP-0B8410, 1mg / 5mg / 25mg / 100mg**
TetraSulfo-Cy5.5 –Acetylene tri-K salt; MW:1054.36; Abs/Em = 673/691nm; EC:195000; QY:-; CF260:0.09; CF280:0.11 – Solubility is good in Water, DMF, DMSO
Alkyne-DiSulfo-CY$_{anine}$7 **FP-0B8280, 1mg / 5mg / 25mg / 100mg**
DiSulfo-Cy7 –Acetylene K salt; MW:745.3; Abs/Em = 750/773nm; EC:240600; QY:-; CF260:0.04; CF280:0.04 – Solubility is good in DMF, DMSO, significant in water
Alkyne-TetraSulfo-CY$_{anine}$7.5 **FP-AS29QA, 1mg / 5mg / 25mg / 100mg**
TetraSulfo-CY7.5-Acetylene tri-K salt; MW:1120.46(+1005.2); Abs/Em = 778/797nm; EC:222000; QY:-; CF260:0.09; CF280:0.09 – Solubility is good in Water, DMF, DMSO
* (no sulfo):
Alkyne-CY$_{anine}$3 **FP-1A6320, 1mg / 5mg / 25mg / 100mg**
Cy3 –Acetylene; MW:530.14; Abs/Em = 555/570nm; EC:150000; QY:0.31; CF260:0.04; CF280:0.09
Alkyne-CY$_{anine}$3.5 **Inquire**
Cy3.5 –Acetylene
Alkyne-CY$_{anine}$5 **FP-OO5590, 1mg / 5mg / 25mg / 100mg**
Cy5 –Acetylene; MW:556.18; Abs/em.=646/662nm; EC:250000; QY:0.2; CF260:0.03; CF280:0.04
Alkyne-CY$_{anine}$5.5 **FP-SJH910, 1mg / 5mg / 25mg / 100mg**
Cy5.5 –Acetylene; MW:656.30; Abs/Em = 684/710nm; EC:209000; QY:0.2; CF260:0.02; CF280:0.03
Alkyne-CY$_{anine}$7 **FP-WZE120, 1mg / 5mg / 25mg / 100mg**
Cy7 –Acetylene; MW:622.38; Abs/Em = 750/773nm; EC:199000; QY:0.23; CF260:0.022; CF280:0.029
Alkyne-CY$_{anine}$7.5 **FP-WZE141, 1mg / 5mg / 25mg / 100mg**
CY7.5-Acetylene; MW:722.40(+686.4); Abs/Em = 788n808nm; EC:223000

See technical sheets: FT-1A6320 (FluoProbes CYanine-Alkynes) FT-DQP790 (FluoProbes CYanine-DBCO)
FT-HO7250 (FluoProbes CYanine-Azide)
See also PH-BB060k Clickable Fluorescent dyes

● Biotin Alkynes:

Acetylene-PEO_4 -Biotin **DQP650, 25mg / 100mg / 1g**
MW:457.58; (M)

● PEO spacer(PEGs) - Alkynes:

Acetylene-PEO_4 -Amine, - Acid, -NHS, -Maleimide: inquire +*DQP61/3/4*

● Nucleotides - Alkynes: +:

Propargyl-CEP-**oligonucleotides** are used for attachment of azide-containing reporter groups such as biotin or fluorescent dyes by click chemistry. This allows the synthesis of highly-modified DNA strands carrying multiple labels in a density that is not achieved by classic labeling techniques.

propargyl is an alkyl functional group of 2-propynyl (structure: $HC{\equiv}C{-}CH_2{-}$).

CEPs (Cyanoethyl-N,N-diisopropyl Phosphoramidites) functional group is used to synthesize oligonucleotides by automated standard protocols.

5-Propargyloxy-dU CEP	More description here .
5-Octadiynyl-dU CEP	More description here .
Alkynyl-modifier-C6-dT CEP	More description here .
5-(Propargyloxy)-2'-deoxyuridine	More description here .
5-(1,7-Octadiyn-1-yl)-2'-deoxyuridine	More description here .
5'-O-(Dimethoxytrityl)-5-(propargyloxy)-2'-deoxyuridine	More description here .
5-Octadiynyl-TMS-dU CEP	More description here .
5-Octadiynyl-TMS-dC CEP	More description here .
5-Octadiynyl-dC CEP	More description here .
5-Octadiynyl-TIPS-dU CEP	More description here .

More reagents: inquire +*BA0174*; +*DQI62,DQI57,MM982,ZC68/9*|*DQP20/1*|*ZC667/8*|*IX028*|*DQO71/2/3/5* | *DQP21*
2'-O- and 3'-O-Propargyl CEPs and other alkyne-containing CEPs (C8- TIPS- and TMS- versions)

■ **Azides** Click Chemistry reagents

● Fluorescent dyes - Azides:

Standard Dyes such as Cy3, Tamra or Te xas Re d have been thoroughly selected to cover the whole UV-Vis spectrum. Novel Alternative Dyes are available as well.

• **FluoProbes – Azides** are superior fluorescent dyes (see caracteristics, protocol) +

FluoProbe488 –Azide (494/519nm)	**B38820**	see **All FluoProbes – Azides**
FluoProbe565A –Azide (563/592nm)	**YE4990**	
FluoProbe647N –Azide (653/674nm)	**YE5020**	
FluoProbe594 –Azide (591/617nm)	**FJ0800**	
FluoProbe782 –Azide (738/800nm)	**JV1940**	
FluoProbe831 –Azide (844/nm)	**JV7790**	

• **CYanine – Azides** :

See technical sheet: FT-HO7250 (FluoProbes CYanine-Azide)

• **Classic fluorescent dyes** + **:**

See PH-BB060k: incl. (Picolyl-) Azide – Fluorescent dyes.

See FT-DQP790: FluoProbes CR110, CR6G, TAMRA, SRB, SR101, Cy3/5

+

6-Carboxyfluorescein-PEO azide	More description here .
6-Carboxyfluorescein-dipivalate PEO azide	More description here .
BBQ-650®-PEO azide	More description here .
6-TET-PEO-azide	More description here .
DANSYL-TEG-N_3	**FJ5740**

● Biotin Azides

Biotin-azide	**ZC6710**.

+

Desthiobiotin-PEO azide	More description here .
Biotin-PEO azide	More description here .

● PEO spacer (PEGs) - Azides:

PEO_2 to PEO_8-Azides linkers and crosslinkers: inquire +*DQP22/3, ZC684 to ZC689* +*DQP66*

rem: PEO is also called PEG and TEG

For example:

Aminooxy-PEO-azide	More description here .
Amino-PEO azide	More description here .

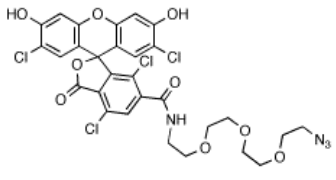
● Nucleotides - Azides: inquire +

Azide-CEP-**oligonucleotides** are used for attachment of azide-containing reporter groups such as biotin or fluorescent dyes by click chemistry. This allows the synthesis of highly-modified DNA strands carrying multiple labels in a density that is not achieved by classic labeling techniques.

Azide is a functional group for click reactino with alhynes

CEPs (Cyanoethyl-N,N-diisopropyl Phosphoramidites) functional group is used to synthesize oligonucleotides by automated standard protocols.

Inquire for a products list



● Other Azides:

Folate-PEO_3 azide	More description here .
Tocopherol-PEO azide	More description here .
Water soluble dansyl-PEO azide	More description here .
PQQ-PEO azide	More description here .
Cholesteryl-PEO azide	More description here .

+More: Ferrocene, -DNP, -DABSYL, -Pyrene : inquire +*DQO50*

■ Activators for Click Chemistry

● NHS activated Alkyne and Azide - to activate amines(proteins)

Alkyne Amine-Activator #ZL5532,

Azide Amine-Activator #ZL5542

■ Auxillary reagents for Click Chemistry: catalyzers; buffers:

● Copper sources, reduction and stabilization

The efficiency of a copper (Cu(I))-catalyzed Azide-Alkyne click chemistry reaction (CuAAC) strongly depends on the presence of copper ions in the +1 oxidation state (Cu(I)).

Different copper catalyst sources, reduction reagents and Cu(I) stabilizing ligands are available however, for most bioconjugation applications the combination of CuSO4 as copper catalyst source, sodium ascorbate as a reduction reagent and a water-soluble Cu(I) stabilizing ligand such as THPTA[1,2] or BTTAA[3,4] is recommended (Tab. 1).

An optimal balance between reaction speed and Cu(I) concentration can be achieved using THPTA or BTTAA in combination with Picolyl-Azide detection reagents (Picolyl-Azides of Biotin or Picolyl-Azides of fluorescent dyes) that contain an additional internal copper chelating moiety[4].

Presolski et. al.[1] (Download pdf) and Hong et. al.[2] provide a general protocol for CuAAC reactions that may be used as a starting point for the set up and optimization of individual assays.
Table 1: Overview of available reaction reagents for Cu(I) catalyzed Azide-Alkyne click chemistry (CuAAC).

Available reaction reagents for Cu(I) catalyzed Azide-Alkyne click chemistry (CuAAC):

Copper (Cu) catalyst	*Reduction reagent*	*Cu(I) stabilizing Ligand*
CuSO4	Sodium Ascorbate	THPTA
		BTTAA
CuBr		TBTA

Protein Reaction Buffer Kit **MRU690**
Kit Contents: 2.5 ml Reaction Buffer (250 mM), 0.6 mg Additive 1 , 11 mg Additive 2 , 0.25 ml Copper (II) Sulfate (20 mM), Reducing Agent

Click Solvent – Click chemistry grade **ZC6950, 1 ml** **ZC6951, 10x 1 ml**
(DMSO / tert-Butanol, 3:1)
CuSO4 - click chemistry grade – Click chemistry grade **1H3690, 10 mg** **1H3691, 5x 10 mg**
(Copper(II)-Sulphate)
CuBr - click chemistry grade **ZC6930, 5mg** **ZC6931, 10x 5 mg**
(Copper(I)-Bromide)
Na-Ascorbate – Click chemistry grade **10487F, 10 mg** **10487G, 10mg**
(L-Ascorbinc acid Sodium salt)
THPTA **MRU020, 100mg** **MRU021, 500mg** **MRU022, 1g**
(Tris(3-hydroxypropyltriazolylmethyl)amine)
TBTA-Ligand **ZC6940, 5mg** **ZC6941, 10mg**
(Tris[(1-benzyl-1H-1,2,3-triazol-4-yl)methyl]amine)
BTTAA
2-(4-((bis((1-(tert-butyl)-1H-1,2,3-triazol-4-yl)methyl)amino)methyl)-1H-1,2,3-triazol-1-yl)acetic acid

Copper(II)-TBTA complex #FY2780 See FT-*FY2780*

AzidoAniline Hydro. ZC6900

Selected references:
[1] Presolski et al. (2011) Copper-Catalyzed Azide-Alkyne Click Chemistry for Bioconjugation. Current Protocols in Chemical Biology 3:153.
[2] Hong et al. (2011) Analysis and Optimization of Copper-Catalyzed Azide-Alkyne Cycloaddition for Bioconjugation. Angew. Chem. Int. Ed. 48:9879.
[3] Besanceney-Webler et al. (2011) Increasing the Efficiacy of Bioorthogonal Click Reactions for Bioconjugation: A Comparative Study. Angew. Chem. Int. Ed. 50:8051.
[4] Uttamapinant et al. (2012) Fast, Cell-Compatible Click Chemistry with Copper-Chelating Azides for Biomolecular Labeling. Angew. Chem. Int. Ed. 51:5852.

●Fluorimetric assessment of Click Chemistry reaction [0].

The efficiency of Cu(I)-catalyzed Azide-terminal Alkyne Click Chemistry reactions (CuAAC) strongly depends on the presence of the copper catalyst in the +1 oxidation state (Cu(I)). While **different copper sources, reduction reagents and Cu(I) stabilizing ligands** are available, the Cu(II) salt $CuSO_4$ – in combination with sodium ascorbate (reduction reagent) and THPTA (Cu(I) stabilizing ligand) – has become the catalyst of choice for most biomolecule labeling applications[1,2].

Biomolecule labeling however, often **requires optimization of reaction conditions** (e.g. type of copper source, ligand or copper source/ligand ratio...). **Assay performance (i.e. rate of product formation) can be conveniently monitored in real time using the pro-fluorogenic dye 3-Azido-7-hydroxycoumarin.** The non-fluorescent Azide form of **3-Azido-7-hydroxycoumarin strongly increases its fluorescence upon Cu(I)-catalyzed conjugation to a terminal Alkyne** that is triggered by formation of a triazole moiety[3] (Fig. 1). Removal of unreacted dye before measurements is therefore not required.

When setting up a new CuAAC labeling assay, the general protocol provided by Presolski *et. al.*[1] and Hong *et. al.*[2] may be used as a starting point for subsequent optimization.

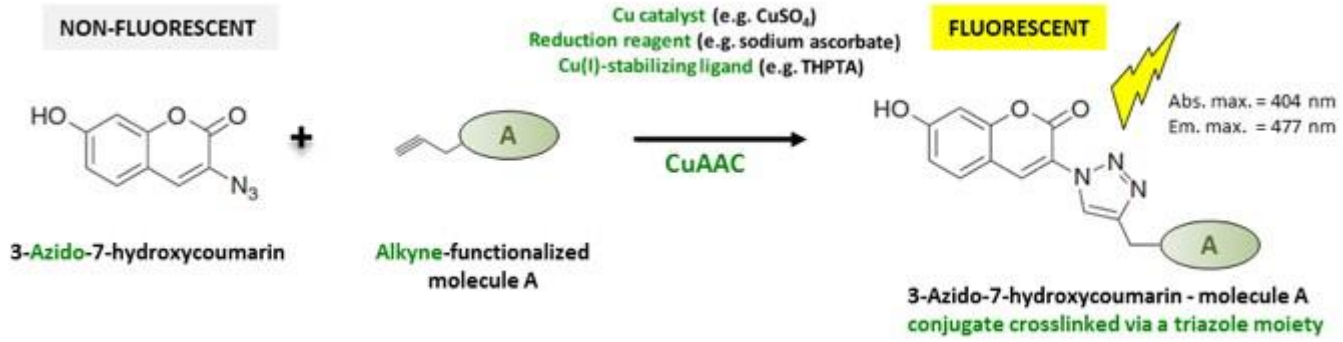


Figure 1: The pro-fluorogenic dye **3-Azido-7-hydroxycoumarin** becomes highly fluorescent upon Cu(I)-catalyzed conjugation to a terminal Alkyne moiety. Progress of product formation can be monitored by measuring the fluorescence increase at 477 nm.

3-Azido-7-hydroxycoumarin **IOK790, 1mg** **IOK791, 5mg**
3-Azido-7-hydroxy-chromen-2-one, MW: 203.15 g/mol
Abs/Em = 404/477 nm, Soluble in DMSO, DMF, MeOH, MeCN (rem: solution in DMSO and DMF are not suitable for longterm storage); (M)

Selected References:
[1] Presolski *et al.* (2011) Copper-Catalyzed Azide-Alkyne Click Chemistry for Bioconjugation. *Current Protocols in Chemical Biology* **3**:153.
[2] Stanislav *et al.* (2009) Analysis and Optimization of Copper-Catalyzed Azide-Alkyne Cycloaddition for Bioconjugation. *Angew. Chem. Int. Ed.* **48**:9879.
[3] Sivakumar *et al.* (2004) A fluorogenic 1,3-dipolar cycloaddition reaction of 3-azidocoumarins and acetylenes. *Org Lett*. **6 (24)**:4603.

■ CLICK labeled molecules Capture Kit

Click Chemistry Capture Kit **WXS271, 1kit**
The Click Chemistry Capture Kit provides all necessary reagents to covalently capture specific sub-classes of proteins by a Cu(I)-catalyzed azide-alkyne cycloaddition reaction (CuAAC). The proteins of interest need to be metabolically, enzymatically or chemically azido- or alkyne-tagged. Subsequently, the resin containing the covalently attached proteins can be washed with high stringency, virtually eliminating any non-specifically bound proteins. Upon protease digestion, this yields a highly pure peptide pool that is ideal for mass spectroscopy (e.g. LC MS/MS) based analysis.

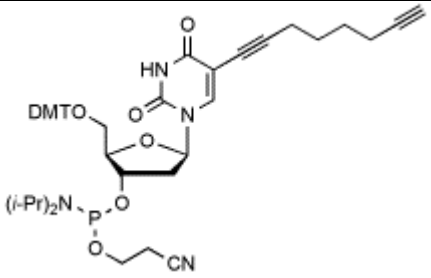
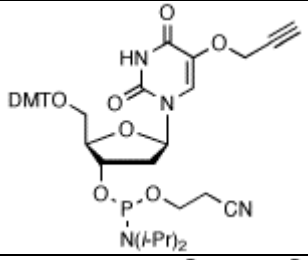
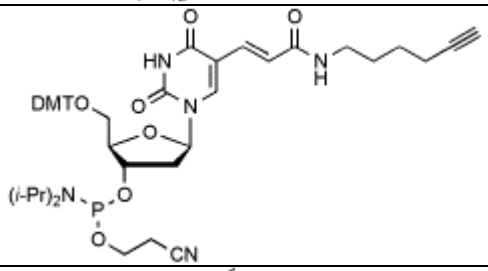
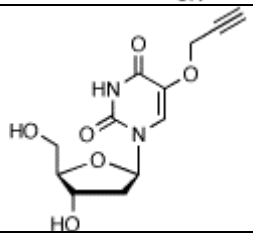
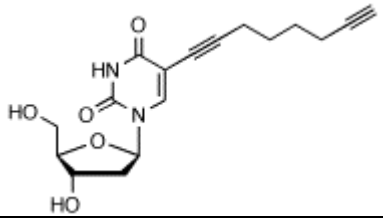
Kit Contents:
7 ml Lysis buffer - store at 4 °C
4.8 g Urea - store at ambient temperature
1.5 ml Additive 1 - store at 4 °C
0.5 ml Copper (II) Sulfate (100 mM) - store at ambient temperature
400 mg Additive 2 - store at ambient temperature
7.7 g Agarose wash buffer - - store at ambient temperature
10 Empty spin columns - store at ambient temperature

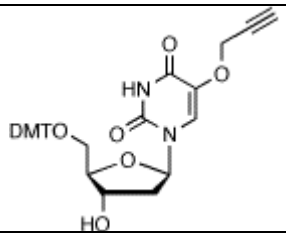
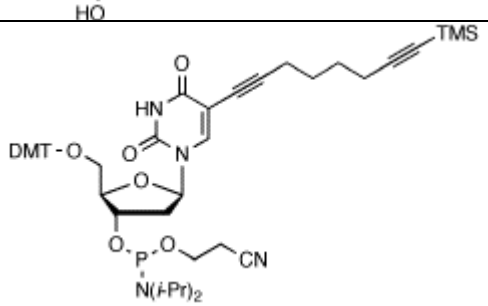
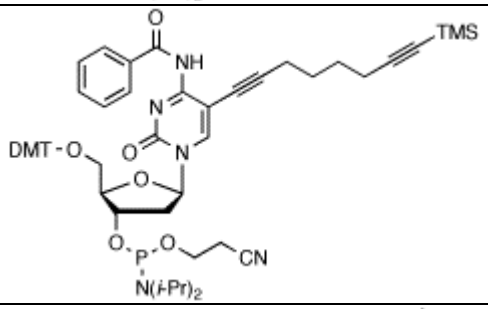
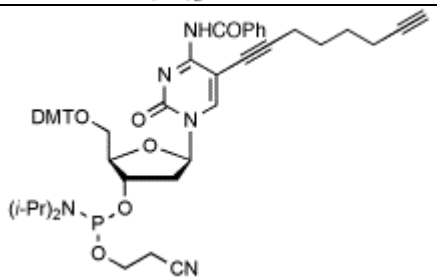
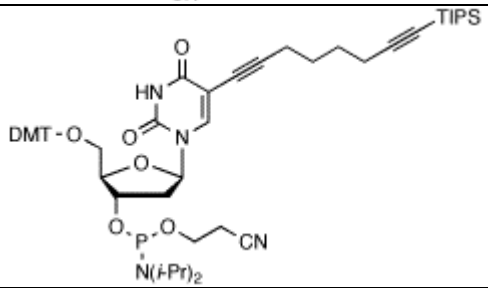
Detailled technical information

●Nucleotides – Alkynes [0].

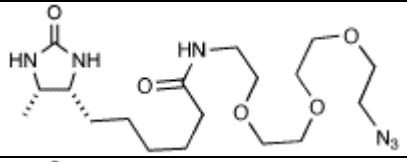
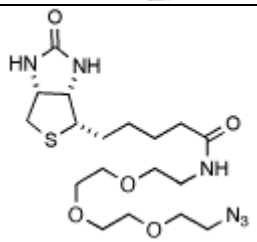
Alkyne-bearing nucleoside phosphoramidites enable click chemistry. An attractive strategy for nucleic acid conjugation involves the click reaction of alkyne-bearing oligonucleotides with azide-bearing species to join them via a triazole linkage[r]. Interchim Biosciences offers options: Ethynyl-dU CEP,8 5-Octadiynyl-dU CEP,7-10 Alkynyl-Modifier-C6-dT CEP, and other new compounds.

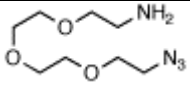
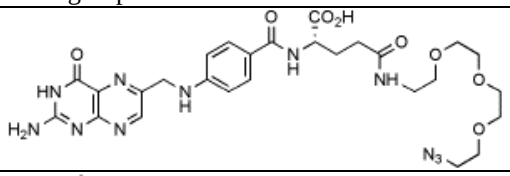
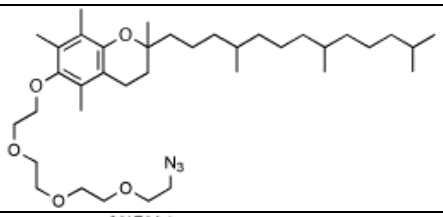
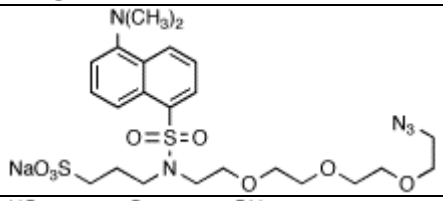
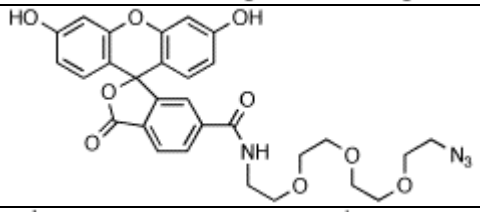
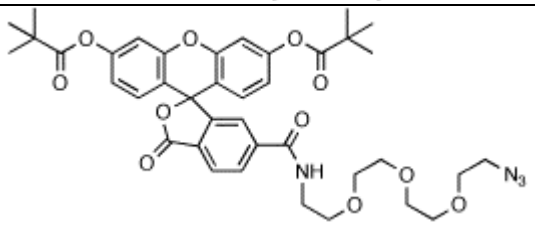
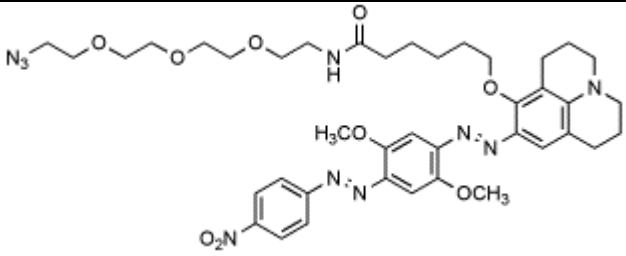
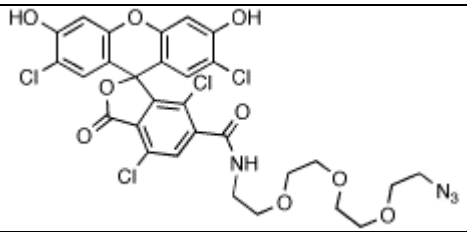
Use of **5-Propargyloxy-dU CEP**: Employ acetonitrile diluent at the concentration recommended by the synthesizer manufacturer. Use standard coupling protocols; extended coupling times are not required. Cleavage from the solid support may be carried out by standard procedures. Nucleobase deprotection should be done at 55 °C for 8-12 hours. Extended heating is not recommended due to by-product formation.

● CEPs Nucleic acids	Product #	
5-Octadiynyl-dU CEP **IV9770** CAS938186-76-6; MW: 879.98 – Store -20°C 3'-O-[(Diisopropylamino)(2-cyanoethoxy)phosphino]-5'-O-(4,4'-dimethoxytrityl)-5-[N-(hex-5-ynyl)-3-(E)-acrylamido]-2'-deoxyuridine A much superior reagent for the installation of an alkyne-bearing nucleoside into an oligonucleotide when click reactions are contemplated. The terminal alkyne is more flexible and extends farther away from the pyrimidine ring, thereby allowing more efficient ligation via click chemistry, even when multiple ligations to a single oligo are desired.	**.BA0308**	
5-Propargyloxy-dU CEP **IV9780** CAS-; MW: 784.83 – Store -20°C, dry A modified nucleotides for introducing an alkyne into an oligonucleotide internally or at the 5'-terminus.	**.BA0174**	
Alkynyl-modifier-C6-dT CEP CAS-; MW: 879.98 – Store -20°C, dry 3'-O-[(Diisopropylamino)(2-cyanoethoxy)phosphino]-5'-O-(4,4'-dimethoxytrityl)-5-[N-(hex-5-ynyl)-3-(E)-acrylamido]-2'-deoxyuridine This phosphoramidite features a well-established linker that places the alkyne at a sufficient distance from the oligonucleotide to allow efficient click conjugation.	**.BA0361**	
5-(Propargyloxy)-2'-deoxyuridine CAS[65367-85-3]; MW: 282.25 – Store at -20°C	**.PY7712**	
5-(1,7-Octadiyn-1-yl)-2'-deoxyuridine CAS NO: 909398-18-1; MW: 332.35 – Store at -20°C	**.PY7713**	

5'-O-(Dimethoxytrityl)-5-(propargyloxy)-2'-deoxyuridine CAS[]; MW: 584.62 – Store +4°C	**.PY7714**	
C8-TMS-dU CEP 5-Octadiynyl-TMS-dU CEP CAS[]; MW: 907.12 – Store at -20°C, dry A modified nucleotides for introducing a protected alkyne into an oligonucleotide	**Inquire**	
C8-TMS-dC CEP 5-Octadiynyl-TMS-dC CEP CAS[1021301-02-9] MW: 1010.24 – Store at -20°C, dry	**Inquire**	
C8-Alkyne-dC CEP CAS[-]; MW: 938.06 – Store at -20°C, dry 5-Octadiynyl-dC CEP	**Inquire**	
C8-TIPS-dU CEP 5-Octadiynyl-TIPS-dU CEP CAS[-]; MW: 991.28 - Store at -20 °C, dry	**.BA0369**	

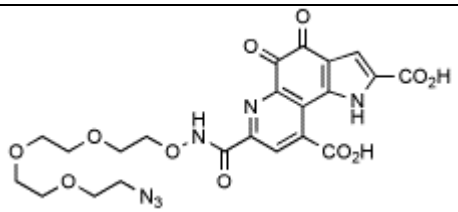
●Azides for click chemistry [0].

● Azide reagents		
Desthiobiotin-PEO azide Desthiobiotin-TEG azide CAS[1306615-47-3]; MW: 414.50 – Store at +4°C for ligation of desthiobiotin via Saudinger ligation or click chemistry.	**.BT1075**	
Biotin-PEO azide Biotin-TEG azide, N-(11-Azido-3,6,9-trioxa-undecylamine)-D-(+)-biotinamide CAS[875770-34-6]; MW: 444.55 – Store at +4°C for ligation of biotin via Staudinger ligation or click chemistry. See also : Biotin-Hydrazide FJ6741, Biotin-PEG-Azides 78631A	**.BT1085**	

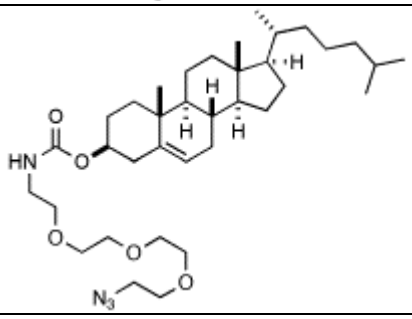
Amino-PEO$_3$-Azide Amino-TEG-Aide ; 1-Amino-11-azido-3,6,9-trioxaundecane CAS[134179-38-7]; MW: 218.25 – Store at +4°C A bi-functional linker with potential applications in oligonucleotide ligations.	**.LK4310**	
Aminooxy-PEO$_3$-Azide Aminooxy-TEG-Azide CAS[-]; MW: 234.25 – Store at +4°C A bi-functional linker, Aminooxy-PEO-azide. Other AminoOxy-PEOs: FT-JV2290	**FZ8700**	 Conjugation by azide can be used to introduce a PEO-aminooxy functionality. Acylation of the oxyamine end yields a hydroxamic acid that mimics carboxylic acid. Alternatively, the oxyamine end can condense with an aldehyde, affording an oxime that bears a PEO-linked azide group.
Folate- PEO$_3$-Azide Folate-TEG-Azide CAS[1313026-32-2]; MW: 641.64 – Store at +4°C For the introduction by Click or Staudinger ligations of the folate tag for recognition by overexpressed folate receptors in cancer cells	**070600**	
Tocopherol- PEO$_3$-Azide Tocopherol-TEG-Azide CAS[-]; MW: 631.93 – Store at -20°C Lipophilic carrier tag for Click and Staudinger ligations collection.	**.FC8160**	
Water soluble dansyl- PEO$_3$-Azide dansyl-TEG-Azide ; 4-Dansyl-(4-aza-7,10,13-trioxa-15-azido)pentadecylsulfonate C23H34N5NaO8S2; CAS[-]; MW: 595.67 – Store at +4°C, in the dark	**.FD1300**	
6-FAM-PEO$_3$-Azide 6-Carboxyfluorescein-TEG azide CAS[412319-45-0]; MW: 576.55 – Store at +4°C, in the dark fluorescein azide for fluorescein incorporation via Staudinger ligation or click chemistry. See also FP488-Azide FP-YE4970	**FJ0011**	
6-FAM-dipivalate- PEO$_3$-Azide 6-Carboxyfluorescein-dipivalate TEG azide MW: 744.79 – Store at -20°C, dark	**.FF6120**	
BBQ-650®-PEO$_3$-Azide BlackBerry® Quencher 650 - TEG - azide CAS[-]; MW: 816.90 – Store at -20°C, dark A useful long wavelength quencher for Click Chemistry and Staudinger ligation BlackBerry® Quencher technology is covered under US Patent #7,879,986, Berry & Associates, Inc. "BlackBerry is a trademark of Berry & Associates, Inc. Products derived from BlackBerry® Quencher reagents are sold exclusively for research and development use by the purchaser. They may not be used for clinical or diagnostic purposes without prior agreement and consent of Berry & Associates, Inc."	**.BL3030**	
6-TET-PEO$_3$-Azide 6-Carboxy-2',4,7,7'-tetrachlorofluorescein-TEG azide CAS[-]; MW: 714.33 – Store at -20°C, dark for tetrachloro-fluorescein incorporation via Staudinger ligation or click chemistry	**.FF6130**	

PQQ-EO_3-Azide **.FC8170**
G
for the installation of a methoxatin tag.

(201311)covered under US patent #8,198,290 B2, Berry & Associates, Inc.



Cholesteryl-PEO_3-Azide **.FC8180**
CAS[-]; MW: 630.90 – Store at -20°C, dark
for the installation of a cholesteryl tag.



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