

# Click Chemistry

In 2001, Sharpless and his colleagues put forward the concept of "Click Chemistry" for the first time, that is, to rapidly synthesize useful new compounds through heteroatom linking (C - X - C)<sup>[2]</sup>. Bertozzi developed click chemistry in a new dimension i.e. its applications in the biomedical field. MCE can provide 1000+ click chemistry-related products, including Azide, Alkyne, DBCO, BCN, TCO and Tetrazine reagent types. We support the development of scientific research career by providing high quality products and services.

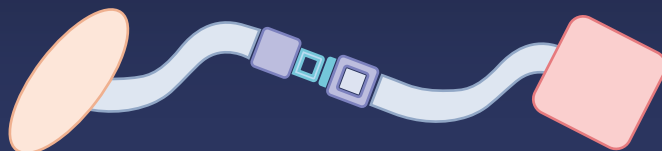


Figure. 1 The "click" in click chemistry<sup>[1]</sup>

## Three Types of Click Chemistry Reactions and Representative Reactions

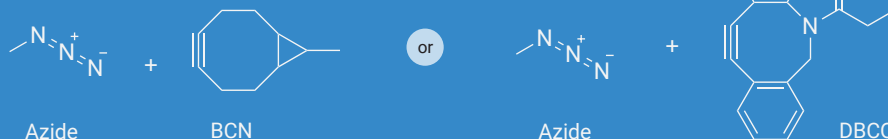
### Copper(I)-catalyzed azide-alkyne cycloaddition (CuAAC)



### Inverse-electron-demand Diels-Alder (IEDDA)



### Strain-promoted alkyne-azide cycloaddition (SPAAC)



## Applications of Click Chemistry in Biomedical Field

### Fluorescence Imaging

In the iEDDA reaction, innate target proteins (TOI) in living cells can be visualized through the treatment of a TCO-ligand conjugate and Tz containing fluorophores (FLTz)<sup>[3]</sup>.

### Targeted Drug Delivery

The fast "second-order reaction rate constant", simplicity and orthogonality of click chemistry can be exploited for polymer synthesis or positional modification of biological ligands during drug carrier development, such as targeted delivery of drug-loaded nanoparticles<sup>[3]</sup>.

### ADC and PROTAC

Click chemistry is applied to ADC synthesis such as ADCT-601<sup>[4]</sup>. It has also been applied to PROTAC molecular synthesis for linking ligands at both ends of the linker<sup>[5]</sup>.

### Diagnostic Analysis

Click chemistry can also be used to develop molecular tools to understand disease diagnosis and therapeutic monitoring<sup>[3]</sup>. For example, Lee et al. reported a microfluidic system combining iEDDA-type click chemistry and miniaturized NMR ( $\mu$ NMR)<sup>[3]</sup>.

## MCE Products

Types	Name	Research Area	Cat. No.
Azide	NAI-N3	RNA structure probe	HY-103006
	L-Azidohomoalanine (hydrochloride)	PROTAC synthesis	HY-140346A
	Biotin-azide	Biotin labeling	HY-129832
	Ac4ManNAz	Targeted drug delivery	HY-118297
Alkynes	5-Ethynyl-2'-deoxyuridine	PROTAC synthesis	HY-118411
	Alkyne tyramide	Ascorbate Peroxidase 2 (APEX2) Probe	HY-131442
DBCO	DBCO-(PEG)3-VC-PAB-MMAE	ADC synthesis	HY-111012
	DBCO-PEG4-Biotin	Biotin labeling	HY-130809
	DBCO-PEG4-NHS ester	PROTAC synthesis	HY-140272
TCO	TCO-PEG4-VC-PAB-MMAE	ADC synthesis	HY-148057
	TCO-NHS ester	PROTAC synthesis	HY-141165
Tetrazine	Methyltetrazine-acid	PROTAC synthesis	HY-141263
	Tetrazine-Ph-NHCO-C3-NHS ester	PROTAC synthesis	HY-133479
	Tetrazine-Ph-acid	PROTAC synthesis	HY-124480
BCN	BCN-PEG3-Biotin	ADC synthesis	HY-130924
	endo-BCN-PEG3-mal	PROTAC synthesis	HY-133400

### Our advantages regarding click chemistry services :

- Shorter synthesis cycle
- Short lead time
- Rich experience in the synthesis of novel and complex compounds
- High quality products
- Professional technical service

### References:

- [1] Chem. Rev. 2021, 121, 12, 6697–6698. [3] Chem Sci. 2019 Aug 16;10(34):7835-7851. [5] J Med Chem. 2018 Jan 25;61(2):453-461.  
 [2] Angew Chem Int Ed Engl. 2001 Jun 1;40(11):2004-2021. [4] Mol Cancer Ther. 2022 Apr 1;21(4):582-593.

### MedChemExpress USA

Tel: 609-228-6898

E-mail: sales@MedChemExpress.com

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Tech Support: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA

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