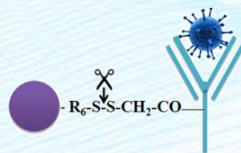


Cleavable Linker



Cleavable Linker: A Promising Strategy for Maintaining Physiological Activity in Affinity Chromatography

Affinity chromatography is one of the most popular methods that utilize a specific binding and subsequent compound recovery from an immobilized ligand. However, there is a risk of destroying the target molecule's physiological activity caused by harsh elution conditions that aim to separate the target molecule from the high-affinity matrix. A simple and effective cleavable linker may bring a promising strategy for solving this problem.

A cleavable Linker is a class of bioconjugate linkers with a built-in cleavage chemical trigger that can connect two or more molecules. Once exposed to environmental chemical signals, it can be readily cleaved.

Bioclone provides magnetic beads linked with different bioconjugate function groups through a cleavable disulfide linker. The beads can immobilize proteins, peptides, DNA/RNA, or biomolecules. The ligand and target molecule complex can be eluted from the beads using reducing agents such as dithiothreitol (DTT) and 2-mercaptoethanol (2-ME) (Fig.1) after affinity purification. These mild elution conditions offer the efficient isolation of the affinity partner from complex protein mixtures. Moreover, a long and hydrophilic cleavable linker reduces the non-specific binding proteins and is suitable for conjugating small or larger biomolecules without a steric hindrance problem. Disulfide cleavable linkers are stable at physiological pH.

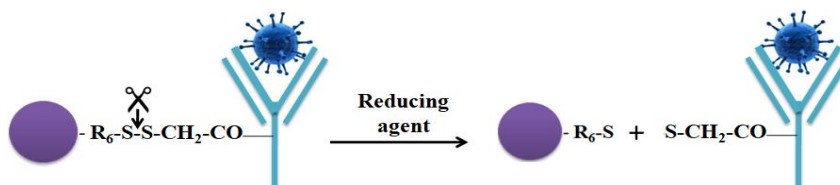

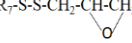







Fig.1 Cleavable disulfide linkers

Product Name	Structure
Cleavable Amine-Terminated Magnetic Beads	
Cleavable Carboxyl-Terminated Magnetic Beads	
Cleavable NHS-Activated Magnetic Beads	
Cleavable Aldehyde-activated Magnetic Beads	
Cleavable Tosyl-Activated-Magnetic Beads	
Cleavable Hydrazide-Terminated Magnetic Beads	



Cleavable Epoxy-Activated Magnetic Beads	 $-R_7-S-S-CH_2-CH-CH_2$ 
Cleavable Iodoacetyl-Activated Magnetic Beads	 $-R_6-S-S-R_3-CO-CH_2-I$
Thiol-Activated Magnetic Beads	 $-R_{17}-S-S-X$ 
Cleavable Alkyne-Activated Magnetic Beads	 $-R_7-S-S-CH_2-CO-NH \equiv CH$
Cleavable Azide-Activated Magnetic Beads	 $-R-N_3$

References

1. Ren C, Song Z, Zheng W, Chen X, Wang L, Kong D, Yang Z. Disulfide bond as a cleavable linker for molecular self-assembly and hydrogelation. Chem Commun (Camb). 2011 Feb 7;47(5):1619-21.
2. Chen X, Bai Y, Zaro JL, Shen WC. Design of an in vivo cleavable disulfide linker in recombinant fusion proteins. Biotechniques. 2010 Jul;49(1):513-8.
3. Kanoh N, Takayama H, Honda K, Moriya T, Teruya T, Simizu S, Osada H, Iwabuchi Y. Cleavable linker for photo-cross-linked small-molecule affinity matrix. Bioconjug Chem. 2010 Jan;21(1):182-6.
4. Beard HA, Korovesis D, Chen S, Verhelst SHL. Cleavable linkers and their application in MS-based target identification. Mol Omics. 2021 Apr 1;17(2):197-209.
5. Leriche G, Chisholm L, Wagner A. Cleavable linkers in chemical biology. Bioorg Med Chem. 2012 Jan 15;20(2):571-82.