



Methods and Reagents for Appending Functional Groups to Proteins

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The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in a bifunctional molecule for the site-selective functionalization of peptides and proteins.

Overview

Molecules that contain two functional groups of distinct reactivity can be used to link two biomolecules or to immobilize a biomolecule on a surface, such as a protein microarray. These bifunctional molecules must react with their targets in a physiological environment, and the two functional groups must not react with each other.

The Invention

UW-Madison researchers have developed a bifunctional molecule for the site-selective functionalization of peptides and proteins. This molecule can be used to covalently link a peptide or protein to a biological or chemical entity, such as a particular functional group, a reporter molecule, a biological molecule, a ligand that in turn binds a receptor, a small molecule like an antibiotic, or a biological/substrate surface. It has the formula $H_2N-NH-CH_2-M-L-FG$, where M is a single bond or a chemical group carrying a non-bonding electron pair, L is a linker, and FG is a functional group, such as an azido group ($-N_3$), which has different reactivity than the hydrazino group (H_2NHN-). The hydrazino group reacts with a thioester group at the C-terminus of the target peptide or protein to link the protein to the bifunctional molecule, while the azido group links to a functionalized surface or other chemical species.

Applications

- Linking two biomolecules
- Immobilizing a biomolecule on a surface

Key Benefits

- Provides a superior method for making protein “chips”
- Synthesis method is elegant and easy.
- The part of the molecule that links the azido group and the hydrazino group can have a variety of characteristics—for example, it can be hydrophobic or hydrophilic, rigid or flexible, long or short.
- Reacts more rapidly than existing technology
- Hydrazino and azido groups do not react with most biomolecules.
- Reaction can take place in a physiological environment and at physiological temperatures, which minimizes the inactivation of biological molecules.

- Provides nearly 100 percent coupling yield

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Tech Fields

- [Research Tools : Protein interactions & function](#)

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