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Reagent for Dual Protein Labeling (20130255, Dr. Mark Distefano)

Technology No. 20130255

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Simultaneous, Site-Specific Protein Modification

A new, versatile reagent can make dual, simultaneous site-specific protein modifications in one reaction and a wide range of conjugates, including protein-protein, protein-nucleotide, protein polymers, and protein-small molecule couplings. The reagent uses the enzyme PFTase, which is small, specific, and fast acting. The reagent is non-toxic and allows nearby biological processes to continue undisrupted.

Versatile Labeling Reagent

This reagent has several distinct advantages over similar protein modification methods. Most current methods for site-specific protein modifications only allow one modification at a time. Many methods utilize copper, which can be toxic to surrounding biological processes. Current protein tagging methods often use organic solvents and cytotoxic catalysts that are expensive, difficult to obtain, and result in uncontrolled modification at nonspecific sites.

The new reagent allows for multiple modifications at one time, does not require copper, utilizes more accessible materials, and achieves highly specific site modifications. In addition, this reagent is attachable to nearly any protein, further broadening potential applications.

Protein Modification Vital to Research and Biotherapeutics

Protein modification is an important process for studying protein function, developing protein tags, and drug development. Adding conjugates or chemical modifications such as PEG or fluorophores to proteins is a crucial step in protein visualization. For protein biotherapeutics, protein tags can improve specificity, potency, and the pharmacokinetic profile of a drug.

BENEFITS AND FEATURES OF DUAL PROTEIN LABELING REAGENT:

- Allows simultaneous, dual modifications; other methods allow only one
- Results in site-specific modifications
- Non-toxic
- Can be useful for protein tagging, biotherapeutics, and drug development
- Attachable to nearly any protein

Phase of Development Proof of concept: demonstrated by adding dual protein labels to multiple proteins

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