Selective Labeling Of Proteins On Their N-Termini With Synthetic Peptides

Tech ID: 23345 / UC Case 2006-124-0

BACKGROUND

Direct and selective labeling of α-amines or α-carboxylates of the N-terminal amino acid in proteins is a powerful approach for profiling proteins in complex mixtures. Approximately 80% of mammalian proteins are N-terminally acetylated. Thus, N-terminal labeling provides greater signal over background than does C-terminal labeling. However, such labeling must still be extremely selective for α-amines over lysine ε-amines, which are approximately 25 times more abundant in an average protein.

TECHNOLOGY DESCRIPTION

Investigators at UCSF have invented a general method to selectively label proteins on their N-termini with synthetic peptides. Briefly, this method uses an engineered enzyme subtiligase and a peptide substrate specially tailored to the proteomic workflow. The substrate comprises a peptide glycolate ester with a subtiligase cleavage site, a biotin label, and a TEV-cleavage site. The action of the subtiligase enzyme results in proteins that are selectively biotinylated on the N-terminus. The biotin label can then be used to capture these labeled proteins from a complex mixture using immobilized avidin. Finally, the TEV cleavage site allows for the enrichment of captured proteins or peptides for downstream analysis such as mass spectroscopy. Other N-terminal labels can also be used in place of biotin making the process very versatile.

APPLICATION

- Specific labeling of α-amines of N-terminal amino acid in proteins
- Global proteomic profiling of complex mixtures of proteins and polypeptides.

ADVANTAGES

- High specificity for the N-terminus of proteins
- Selective labeling of α-amines over lysine ε-amines of proteins

STAGE OF DEVELOPMENT

Pre-clinical

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OTHER INFORMATION

KEYWORDS

protein labeling, proteomics, N-termini labeling, protein profiling, synthetic peptides

CATEGORIZED AS

- Biotechnology
  - Proteomics

RELATED CASES

2006-124-0, 2017-035-0

RELATED MATERIALS

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PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,679,771	03/25/2014	2006-124

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