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(54) **ISOTOPIC RECODING FOR TARGETED TANDEM MASS SPECTROMETRY**

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See application file for complete search history.

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(57) **ABSTRACT**

Aspects of the present disclosure include methods for detecting a low abundance protein and methods for identifying a site of N-glycosylation on a protein. In practicing methods according to certain embodiments, a eukaryotic cell is contacted with an isotopic labeling composition and isotopically labeled N-glycosylated peptides obtained from the eukaryotic cell are assessed by liquid chromatography-tandem mass spectrometry. A predetermined isotopic pattern in the mass spectrum is identified and amino acid sequences of the peptides containing the predetermined isotopic pattern are determined. Systems for identifying a predetermined isotopic pattern in mass spectra and determining amino acid sequences of peptides containing the predetermined isotopic pattern are also described.

18 Claims, 34 Drawing Sheets