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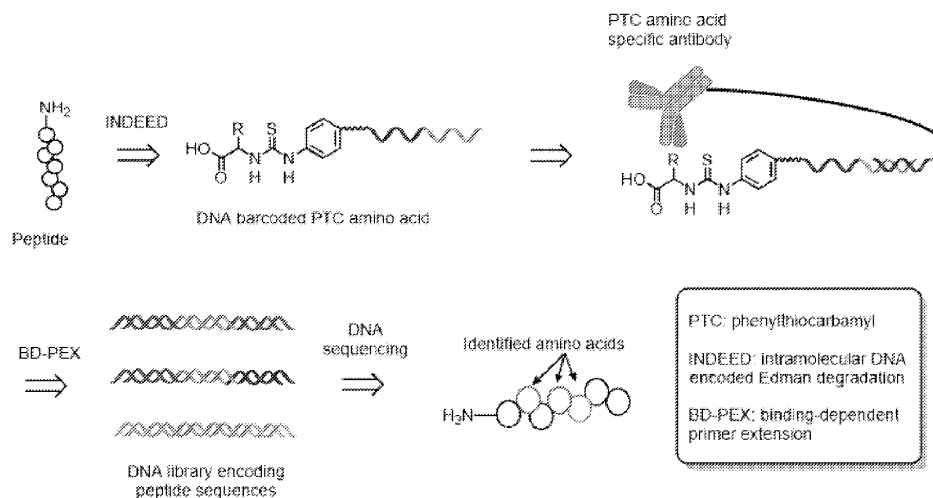
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(54) Title: METHODS OF SEQUENCING POLYPEPTIDES AND RELATED COMPOSITIONS

FIG. 1A



(57) Abstract: Provided are methods of sequencing a polypeptide. In certain embodiments, the methods comprise labeling the N-terminal amino acid of a polypeptide with a nucleic acid label comprising a unique molecular identifier and cycle number barcode; degrading the N-terminal amino acid from the polypeptide; annealing a primer to the nucleic acid label of the degraded amino acid, where the primer comprises a barcode corresponding to the identity of the degraded N-terminal amino acid; and extending the primer annealed to the nucleic acid label to produce an extension product comprising the unique molecular identifier, the cycle number barcode, and the barcode corresponding to the identity of the degraded N-terminal amino acid. The preceding steps are performed successively to produce a plurality of such extension products which are then sequenced, enabling determination of the amino acid sequence of the polypeptide. Composition and kits that find use in practicing the methods are also provided.

[Continued on next page]

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