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Bioconjugation of N-terminal Functionalized Ca²⁺/Calmodulin-Dependent Protein Kinase II (CaMKII) on Magnetic Beads

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ABSTRACT

Protein purification is a fundamental step that commonly precedes structural and functional characterization of proteins. Most of the current protein purification methods are laborious and time consuming due to the multistep nature of the process. Searching for alternative methods that are capable of shortening the purification time and simultaneously enhancing the purity of the purified proteins is therefore needed. The method described in this paper entails surface immobilization of the protein of interest on alkyne-functionalized magnetic beads following selective labeling of the protein's N-terminus with an azide tag. The utility of this method was tested using Ca²⁺/calmodulin-dependent protein kinase II (CaMKII). Four variants of azide-tagged CaMKII were used in our study. The four proteins readily conjugated to alkyne-functionalized magnetic beads. Additionally, conjugated proteins retain functionality comparable to purified proteins. This method can therefore advance the research industry by providing a reliable and easy way to purify proteins and perform rapid enzyme assays. It also allows researchers to focus on the actual work instead of struggling with protein isolation.

KEYWORDS

Bioconjugation, magnetic beads, click chemistry