Enrichment strategies for capturing proteins altered by post-translational modifications

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The extensive repertoire of protein Post-Translational Modifications (PTMs) enables the cell to orchestrate functional interplay of protein biomolecules. Indeed, alterations and/or disruptions in protein PTMs can have profound effects on cellular fates. Thus, in order to understand biological processes, there is a need to characterize all PTMs and dissect their functional roles. Recently, the advent of sensitive mass spectrometry has facilitated the detection of post-translationally modified proteins; however, the extensive heterogeneity of PTMs is prohibitive to global Mass Spectrometry (MS) since it produces complex overlapping changes in peptide masses. To circumvent this MS limitation, selective enrichment strategies can facilitate detection and characterization of specific types of protein PTMs. A review of chromatography methods that considers their benefits and limitations for isolating post-translationally modified proteins will be undertaken. Once a protein PTM is detected and isolated, there is a need to consider the stoichiometry, half-life, and ultimately, functional consequence(s) of the PTM, and methods and results that investigate these processes will also be discussed.

Biography
Wayne Grant Carter received his Honors degree and PhD in Biochemistry from the University of Southampton, studying protein post-translational modification and molecular signaling cascades. He is currently a Group Leader in the School of Medicine, University of Nottingham, with research focused upon protein post-translational modification and molecular mechanisms of hepato- and neuro-toxicology.

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