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Enrichment strategies for capturing proteins altered by protein post-translational modification

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The extensive repertoire of protein post-translational modifications (PTMs) enables the cell to orchestrate functional interplay of biomolecules. Thus, in order to understand the complexity of biological processes there is a need to dissect and characterize these PTMs. However, the extensive heterogeneity of PTMs is prohibitive to global mass spectrometry since it produces complex overlapping changes in masses. Nevertheless, we can begin to focus on PTMs by designing strategies for their selective enrichment. Column chromatography can provide a suitable means to purify and enrich certain post-translationally modified proteins, and a review of chromatography methods that considers their benefits and limitations will be undertaken. Once enriched, consideration of the stoichiometry of PTM, and ultimately the functional consequence(s) of PTM will need to be determined.

Biography

Wayne Grant Carter received his Honours degree in Biochemistry and Nutrition from the University of Southampton. He then completed a PhD at the University of Southampton studying the molecular signalling cascade elicited by insulin supervised by Dr Graham Sale. In 2003, he joined the Medical Research Council Applied Neuroscience Group at the University of Nottingham headed by Professor David Ray. He has remained at the University of Nottingham where he is currently a Principal Investigator and Lecturer at the University of Nottingham Medical School site within the Royal Derby Hospital, Derby. His research studies are concerned with an understanding of protein changes that can trigger pathology. In recent years this has focused upon hepato- and neuro- toxicological mechanisms. Current projects include an examination of biological targets of environmental pesticides in brain, hepato- and neuro-pathology of alcohol abuse, and protein aggregation in neurodegenerative diseases such as Alzheimer's disease and Parkinson's disease.

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