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CHEMICAL TOOLS FOR SELECTIVE DETECTION OF MONOMETHYL LYSINE PTMS

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Selective modification of biomolecules provides scientists with an effective tool for a multitude of bio analytical, therapeutic, biological and bioengineering applications. However, chemical strategies that can target a particular functional group at a single site in the presence of reactive amino acid side chains on protein surfaces are limited. We have developed a multicomponent bioconjugation approach for selective labelling of proteins containing secondary amines. This method does not require any genetic engineering of the protein target and protection of the side chains of other amino acids. The resulting bioconjugation reaction leads to the formation of a highly stable C-C bond at the site of the conjugation. The broad utility of the bioconjugation reaction is demonstrated by conjugation of various probes such as dye, peptides and PEG on different proteins containing a proline at the N-terminus such as creatine kinase and aldolase. This method is employed for labelling monomethyl lysine containing post-translational modifications (PTMs) on proteins with various cargoes. The dysregulation of monomethyl lysine PTMs has been linked to a variety of different biological malfunctions, yet the chemical methods for selective detection of monomethyl lysine PTMs are still lacking. This selective tagging methodology can effectively detect monomethyl lysine PTMs thus has a potential to further our understanding of the role of monomethylated lysine containing PTMs in regulating various cellular signalling processes.

BIOGRAPHY

Monika R has completed her PhD in 2009 from Indian Institute of Technology, Kanpur, India and she completed her Postdoctoral from New York University, USA. Currently she is working as a Professor at Auburn University, USA.

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