Trypsin Coatings on Magnetically-Separable Nanomaterials for Protein Digestion

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In the bottom-up proteomic analysis, proteins are digested before LC-MS analysis is performed for the protein identification. However, the poor stability of protease (such as trypsin) has hampered the efficient and automated process of protein digestion. This presentation will introduce the enzyme coating approach that consists of covalent enzyme attachment and enzyme crosslinking. The resulting enzyme coatings are highly stable with high enzyme loadings. The trypsin coatings on nanofibers (1) and magnetic nanoparticles (2) will be introduced as a successful example of enzyme coatings. Their potential application in protein digestion will be discussed with several examples of successful protein digestion results. Facile capture of trypsin coatings on magnetically-separable nanomaterials will enable an easy recycle and potentially development of automated protein digestion process for proteomic analysis.