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Buffers for coupling mass spectrometric immunoassay (MSIA) with electrospray ionization-based mass spectrometry

Mass spectrometry (MS) analysis is a ubiquitous and important analytical technique in protein research and analysis. Some of the most common technical issues involve low-concentration solutions (sub-μM) with their attendant adsorptive loss and oxidation of proteins to be analyzed. Carrier proteins are sometimes used to prevent adsorptive protein loss; however, they may not prevent oxidation issues and are not always MS-friendly. There is a pressing need to maintain analytical sensitivity and oxidative stability of low concentration protein solutions for longer time frames prior to MS analysis.

Researchers at the Biodesign Institute of Arizona State University have developed unique buffers that are capable of simultaneously preventing adsorptive protein loss and artifactual oxidation in low-concentration protein solutions. Additionally, the buffers do not interfere with the analysis of the proteins, making them mass spectrometry friendly.

These buffers allow protein solutions to sit for hours and possibly even days in test tubes or autosampler vials prior to analysis without any degradation to the sample or proteins of interest.

Potential Applications

- Minimizing protein loss and degradation for mass spectrometry analysis

Benefits and Advantages

- Allows for high throughput ESI-based mass spectrometric immunoassay (MSIA); indispensable for the analysis of both intact proteins and peptides with oxidizable amino acid residues
- Prevent adsorptive protein loss
- Reduce artifactual oxidation
- Mass spectrometry compatible

For more information about the inventor(s) and their research, please see Dr. Borges' research webpage