Researchers at the University of South Florida have designed a novel method to selectively extract and enrich polypeptides obtained from phosphoproteins using niobia-based sorbents.

Phosphorylation, a process by which the activity of a protein is altered by the addition of a phosphate group, is an important component in cell regulation and signaling. Phosphopeptide enrichment is used to obtain and identify substantial amounts of phosphorylated species within a protein mixture. Therefore, due to the importance in understanding the phosphorylation process, more sensitive ways to study phosphopeptide enrichment and synthesis are necessary.

USF researchers have developed a method which uses a niobia-based sorbent to extract and enrich phosphorylated proteins or peptides. This method is used in replacement of the more standard titania-based sorbents. Niobia-based sorbents have a greater water tolerance than current methods, which decreases the chances of nonspecific interactions with non-targeted molecules. This method increases sensitivity by 60% when compared with current methods for phosphate enrichment. Additionally, in early stages of a disease, biomarkers exist only in extremely small concentrations. However, with effective enrichment of trace levels, detection of these biomarkers can be enhanced. The increased sensitivity of this novel method has the potential to provide early detection of significant diseases to those with certain biological characteristics. This highlights the possibility for this technology to be used as an effective tool for early disease diagnosis as well as a powerful research tool.

**ADVANTAGES:**
- 60% higher sensitivity
- Decreased nonspecific interactions
- Greater water tolerance
- May be used for early disease detection

**A Novel Method to Selectively Extract and Enrich Polypeptides Using Niobia-Based Sorbents**

*The Microextraction of VYKA Phosphopeptide Using Sol-Gel Niobia-Based Coating (Nb_2O_5) vs. Sol-Gel Titania-Based Coating (TiO_2)*

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