Researchers at the University of South Florida have developed a metal oxide-based biocompatible hybrid sorbent for the extraction and enrichment of catecholamine neurotransmitters.

Catecholamine sample pretreatments are predominantly performed by solid phase extraction (SPE) utilizing two types of sorbents: (a) polymeric reversed-phase materials and (b) phenylboronic acid-functionalized silica particles. Each of these sorbents have their own drawbacks – polymeric sorbents being characterized by slow mass transfer, incomplete desorption and sample carryover problems while silica-based sorbents show poor stability under acidic and basic conditions typically employed in the catecholamine extraction and desorption processes.

The metal oxide-based sol-gel hybrid sorbent method of production developed by our scientists overcomes the shortcomings inherent in conventional sorbents and provides a facile capillary microextraction procedure for effective extraction and enrichments of catecholamines and related molecules. Such sorbents incorporate structural and compositional features that are important for the extraction of polar analytes that require extreme pH conditions. Sol-gel hybrid sorbents offer a pH-stable alternative to conventional silica- or organic polymer-based extraction media. Also, the various intermolecular interactions provided by the presented sorbents avoid the need for derivatization of catecholamines often required for their extraction on polymeric sorbents. These sorbents can be advantageously employed in the extraction and enrichment of catecholamines and their metabolites which represent important biomarkers for neuroendocrine tumors.

**ADVANTAGES:**
- Extreme pH stability
- Excellent sensitivity enhancement factor
- High analyte desorption efficiency

**Stable in Extreme pH Conditions**

**Scanning electron microscopic image of hybrid sorbent coated capillary**

Tech ID #16A106