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An investigation of biomarkers of mixed berry intake

Abstract:

There is increasing interest in food biomarkers to address the shortcomings of self-reported dietary intake. Berries (strawberry and blueberry) are regarded as an important fruit worldwide, however there are no well validated biomarkers of berry intake. Thus, the objective of this study is to identify biomarkers of berry intake in urine using a LC-MS based metabolomic approach.

For the discovery study, participants consumed 192 g strawberries with 150 g blueberries and urine samples were collected at 2, 4, 6 and 24-hours post consumption. A dose-response study was carried where participants consumed 3 portions (78 g, 278 g, and 428 g) of mixed berries. The urine samples were profiled by an untargeted LC-MS metabolomics approach in positive and negative modes. Statistical analysis of the data revealed that 37 features in negative mode and 15 in positive mode significantly increased between fasting and 4-h postprandial samples following mixed berries intake. Following analysis of the dose-response data 21 biomarkers were selected to form a biomarker panel for mixed berry intake. Identification of the biomarkers was performed using the fragmentation matches in databases of METLIN, HMDB and MoNA and in papers. Following this the features with high match scores or sharing the primary MS/MS fragments were verified by authentic standards. The validated biomarkers are furaneol sulfate, syringic acid glucuronide, urolithin A, pelargonidin glucuronide. Most of the biomarkers in the panel were related to the metabolic pathways of phenolic acids, furanones and flavonoids.

Future work will assess the ability of the panel to determine intake.

lems are frequent and result in significant health care use. Further studies are needed to address their optimal prevention modalities and management.

Biography

Ya Gao is a postdoctoral researcher from University College Dublin. Her interest is to use metabolomics techniques to identify biomarkers of commonly consumed foods.