

University of Louisville
Department of Chemistry

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Literature Seminar

When: January 21, 2021
Time: 2:30 PM
Location: Microsoft TEAMS

Analysis of Tryptophan Metabolites Using LC-MS

Abstract

Tryptophan is one of nine essential amino acids in the human body. In the digestive system, tryptophan is metabolized by three main tryptophan metabolic pathways, including the serotonin pathway, kynurenine pathway, and indole/AhR pathway¹. Some diseases (e.g., Parkinson's disease and colon cancer) are associated with altering the tryptophan metabolic pathways². Therefore, study tryptophan metabolites can help us further understand those diseases. Liquid chromatography-mass spectrometry (LC-MS) is a powerful separation and detection technique and has been recently applied to analyze the tryptophan metabolites. My presentation will introduce three literature reported analytical methods for tryptophan metabolite quantification³⁻⁵. Two applications quantified more than 15 metabolites in tryptophan metabolic pathways using different sample preprocessing and LC-MS systems^{3, 4}. In these two applications, the authors further applied their methods to biological samples and quantified tryptophan metabolites in different samples from mouse⁴ and human serum and plasma³. The third method was developed using a cheap chemical as an internal standard to improve the absolute quantification accuracy for two tryptophan metabolites⁵. Conclusions: Although several LC-MS-based methods have been developed to analyze tryptophan metabolites, none of these methods can quantify all metabolites in the tryptophan pathways. I will provide my critiques on the three methods introduced in my presentation.

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