Xie, Z., Lorkiewicz, P., Riggs, D. W., Bhatnagar, A., & Srivastava, S. (2018). Comprehensive, robust, and sensitive UPLC-MS/MS analysis of free biogenic monoamines and their metabolites in urine. *Journal of Chromatography B*, *1099*, 83-91. https://doi.org/10.1016/j.jchromb.2018.09.012

Definitions

- **Biogenic Monoamines**: Natural chemicals in the body that act as hormones and neurotransmitters, like dopamine and serotonin.
- **Metabolites**: Substances formed when the body breaks down drugs, chemicals, or food.
- **UPLC-MS/MS (Ultra Performance Liquid Chromatography-Tandem Mass Spectrometry)**: A method used to identify and measure very small amounts of chemicals in samples.
- **Catecholamines**: Hormones made by the adrenal glands, such as adrenaline and noradrenaline.
- **Serotonin**: A neurotransmitter that affects mood and other functions.

Key Findings

- The new method can measure 10 biogenic monoamines and their metabolites in urine.
- Smokers have higher levels of certain catecholamines and lower levels of their metabolites compared to non-smokers.
- This method is simple, fast, and does not need complicated sample preparation.

Introduction

The study presents a new method for measuring biogenic monoamines and their metabolites in urine. These chemicals are important for understanding various diseases, including those related to smoking, tumors, and neurological and cardiovascular conditions.

Main Content

Background

Biogenic monoamines like dopamine and serotonin play critical roles in regulating emotions, mood, and heart function. Abnormal levels of these chemicals are linked to several diseases. Measuring these chemicals in urine is challenging due to their low concentrations.

Methods

- **Participants**: The study involved 446 participants, including 255 non-smokers and 191 smokers.
- **Sample Collection**: Urine samples were collected and processed from all participants.
- **UPLC-MS/MS Analysis**: The new method uses UPLC-MS/MS to measure 10 biogenic monoamines and their metabolites in a single run without extensive sample preparation.

Results

- **Validation**: The method showed high accuracy and precision in measuring the chemicals.
- **Smokers vs. Non-Smokers**: Smokers had higher levels of free catecholamines and lower levels of their metabolites (like vanillylmandelic acid and homovanillic acid) compared to non-smokers.
- **Stability**: The method proved stable over long-term storage and was effective for large-scale studies.

Conclusion

This new UPLC-MS/MS method is effective for measuring biogenic monoamines and their metabolites in urine. It is simpler and faster than previous methods, making it suitable for large-scale studies and clinical diagnostics. The findings show significant differences in the urinary levels of these chemicals between smokers and non-smokers, highlighting its potential for assessing the impact of smoking and other health conditions.

Word Count: 352