Enhanced Detection of Eicosanoids and Carboxylic Acids by Mass Spectrometry

Innovative reagent and method for improving the sensitivity and accuracy of detecting eicosanoids and carboxylic acids using mass spectrometry.

What is the Problem?

Eicosanoids are bioactive lipids that play crucial roles in inflammation and other physiological processes. However, their low abundance in biological samples makes them challenging to detect and quantify accurately. Traditional mass spectrometry methods often suffer from poor ionization efficiency and high background noise, making it difficult to obtain reliable results. These limitations hinder the sensitivity required to measure eicosanoids effectively, leading to potential gaps in understanding their biological functions and implications in health and disease.

What is the Solution?

This technology introduces a novel derivatization reagent, N-(4-aminomethylphenyl)pyridinium (AMPP), designed to enhance the detection of eicosanoids and carboxylic acids using electrospray ionization mass spectrometry. The AMPP reagent converts carboxylic acids into positively charged amides through an amide linkage. These cationic derivatives are then detected using positive ion mode electrospray mass spectrometry. This charge reversal derivatization process improves detection sensitivity by 10- to 20-fold compared to conventional negative ion mass spectrometry with non-derivatized carboxylic acids, resulting in more accurate and sensitive measurements.

What is the Competitive Advantage?

Increased Sensitivity: Improved sensitivity allows for the detection of lower concentrations of eicosanoids.

Improved Accuracy: Reduced background noise results in clearer, more reliable data.

Versatility: Applicable to a wide range of biological samples and compatible with existing mass spectrometry equipment.

Efficiency: Faster and more straightforward sample preparation compared to traditional methods.

Technology ID

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Category

Selection of Available Technologies

Therapeutics/Other

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