

NEW THERMAL PROCESS FOR AN ENHANCED MALDI MASS SPECTROMETRY IMAGING

A research group from URV and CIBER has developed a new method utilizing low-temperature thermal evaporation (LTE) for MALDI Mass Spectrometry Imaging (MSI) applications.

The Need

Analyses using MALDI-MSI require a uniform and high-quality matrix coating to achieve reliable and high-resolution imaging. Traditional methods, such as spray-coating, often result in uneven matrix crystallization, reduced ionization efficiency and increased analyte diffusion. There is a need for a deposition method that provides better control over the matrix layer, improves signal intensity, and enhances spatial resolution while maintaining reproducibility.

The Solution

LTE is a dry deposition method that enables precise and uniform application of organic matrices, overcoming key limitations of traditional MALDI-MSI systems. It enhances reproducibility, accuracy and efficiency while maintaining stable results even after storage. Compared to spray-coating, LTE detects more lipids and metabolites, provides higher signal intensities, and generates clearer images with minimal analyte diffusion, making it a superior solution for biomedical research.

Innovative Aspects

- Precise control over matrix thickness, allowing real-time adjustments for optimal imaging.
- Thin and clean matrix layers, minimizing interference with tissues and improving image quality.
- Low-temperature deposition, preventing tissue degradation and preserving sample integrity.
- Flexible deposition options, allowing simultaneous or separate application of multiple matrices.
- Intrinsic purification process, eliminating impurities and reducing material costs.
- Higher spatial resolution and ionization efficiency, improving molecular detection.
- Reduced analyte diffusion, ensuring more accurate molecular localization.
- Solvent-free method, preserving tissue structure.
- Compatible with various biomolecules, including small metabolites and lipids.

Stage of Development:

Validated through reproducible matrix layer deposition, demonstrating a uniform distribution of matrix crystals, enhanced purity and stable MALDI-MSI performance even after storage, outperforming traditional spray-coating methods by comparative analysis.

Intellectual Property:

- Priority European patent application filed

Aims

Looking for a partner interested in a license and/or a collaboration agreement to develop and exploit this asset.

Contact details