



Application of two new ambient ionization techniques

Diabetes protein biomarker licensing agreement

Intrinsic Bioprobes Inc. (AZ, USA) has licensed two Type 2 diabetes biomarkers to Ortho-Clinical Diagnostics Inc. (NJ, USA). The biomarkers were discovered using mass spectrometric immunoassays developed by Intrinsic Bioprobes in collaboration with Yale University (USA). They are modified forms of proteins in the blood and are significant and accurate in determining unaffected individuals and those with pre- and Type 2 diabetes.

Source: Intrinsic bioprobes announces the discovery and exclusive licensing of novel biomarkers for diabetes www.intrinsicbio.com/Press%20Release%20Biomarkers.pdf

Researchers at George Washington University (USA) have used two new ambient ionization sources to analyze lipids and metabolites from unprocessed animal tissue by mass spectrometry.

Atmospheric pressure-infrared-matrix-assisted laser desorption ionization (AP-IR-MALDI) and laser ablation electrospray ionization (LAESI) were successfully applied for mass spectrometric analysis of lipids (e.g. cholesterol and phospholipids) and metabolites (e.g. GABA, choline and creatine) from mouse brain samples.

Reactive LAESI was also applied, whereby lithium sulphate is used with in-plume reactions to enhance structural information without contaminating the sample with the reactant. Mass spectrometry under atmospheric pressure conditions offers high-throughput analysis and simplified sample preparation that may prove popular in bioanalytical laboratories.

Speaking to *Bioanalysis*, study lead Akos Vertes described the particular challenges encountered with the techniques "Collecting the ions from the mid-IR laser ablation plume was challenging because of its great sensitivity to fine changes in the source geometry and because of the low ionization efficiency of the ablation process. Combining laser ablation with electrospray ionization (LAESI) presented a breakthrough because it was a more robust way of producing the ions

and because it took advantage of the neutrals in the plume. The most significant remaining challenges are improving the trade-off between the analyzed spot size and the information content of the spectra and enhancing the coverage of detected biomolecules."

With regards to the wider applications of these techniques, Vertes commented "Direct tissue and cell analysis has a large variety of potential applications in biomedicine. For example, distinguishing healthy and diseased tissue *in vivo* can help with the accuracy of surgical procedures. Due to the short local analysis time (~1 s), high-throughput analysis is another important direction. Following the metabolism of drugs and drug candidates in tissues and bodily fluids is a logical extension of these applications."

Sources: Shrestha B, Nemes P, Nazarian J, Hathout Y, Hoffman EP, Vertes A. Direct analysis of lipids and small metabolites in mouse brain tissue by AP IR-MALDI and reactive LAESI mass spectrometry. *Analyst* DOI: 10.1039/b922854c (2010) (Epub ahead of print); Nemes P, Woods AS, Vertes A. Simultaneous imaging of small metabolites and lipids in rat brain tissues at atmospheric pressure by laser ablation electrospray ionization mass spectrometry. *Anal. Chem.* DOI: 10.1021/ac902245p (2010) (Epub ahead of print).

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