

Press Release

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Promising duo: Shimadzu's CHIP-1000 and AXIMA MALDI MS Combined strengths for MALDI tissue imaging experiments

**Large and small matrix arrays for imaging and profiling
experiments /**

For fast reproducible sample preparation /

Sensitive and flexible data acquisition

Shimadzu, one of the world's leading developers of analytical instrumentation, drives the development in the fast growing field of direct tissue analysis by MALDI-MS to identify potential biomarkers or to control compound distribution. In general, these applications have so far suffered from low reproducibility and a slightly inaccurate delivery of solvents for sample pretreatment. The combination of Shimadzu's CHIP-1000 for fast reproducible sample preparation and the AXIMA MALDI-MS systems for data acquisition will give this field a new momentum.

Fast reproducible sample preparation

The CHIP-1000 is a unique device employing state-of-the-art chemical printing technology for delivering reagents on a micro-scale using piezo-electric technology. Each droplet volume is less than 100 pL. MALDI matrix is precisely delivered to specific surface locations

via a non-contacting spotting method to minimize the possibility of contamination.

Matrix can be automatically and reproducibly deposited directly onto pre-selected regions of a tissue surface. Large matrix arrays can be generated to cover the entire surface of tissue sections (imaging) or smaller arrays can be used to study the differences between a number of different areas within the tissue (profiling). Due to its highly accurate delivery system, enzymatic digestions can also be carried out prior to matrix printing, enabling the identification of proteins by MS/MS sequence analysis. The easy and fast operation allows the user to screen different matrix, enzyme or solvent conditions in profiling mode to get the most out of one tissue section.

The CHIP-1000 incorporates a camera and an onboard scanner. The camera serves to optimize and monitor droplet formation, while the visible light scanner is used to identify target areas on the tissue surface for reagent delivery, improve visualization of the deposited arrays and create a target map for printing.

The CHIP-1000 also has an image import functionality. This enables tissue images to be imported from other scanning devices and superimposed to the tissue image on the MALDI plate. The CHIP-1000 facilitates the simple transfer of spotted sample locations to the AXIMA™ MALDI mass spectrometer for mass spectral data acquisition. In addition, it can also export the coordinates of print positions to other formats.

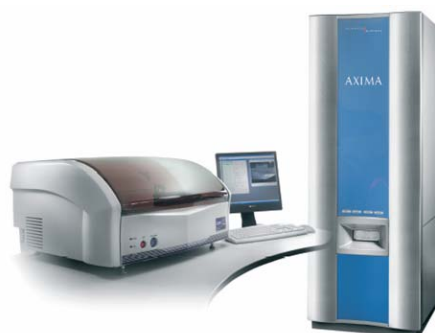
Sensitive and flexible data acquisition

The AXIMA series offers sensitive and flexible MALDI mass spectrometry ideal for imaging and profiling experiments. All AXIMA™ systems can be seamlessly integrated into a tissue imaging/biomarker discovery workflow. Using unique CHIP-1000 Imaging Experiment software, each print array can be seamlessly configured for data acquisition. A simple stage alignment procedure and highly accurate stage motors ensure that the laser fires precisely at

each of the matrix spots deposited – crucial, considering each matrix spot can be <200 μm in diameter.

The advanced laser technology ensures averaged intensities across each print position by roaming within a set print position. A variety of different sample targets and adaptors can be used, including microscope format MALDI targets suitable for clinical applications. Plate files and methods for data acquisition are automatically generated using the information provided by the CHIP-1000 and spectra can be generated over a mass range of interest.

Peptides, proteins or small molecules, for example drugs and their metabolites, can be analyzed directly from the tissue surface allowing the user to determine the distribution of the target compound within the sample. In addition to Shimadzu's software tools for direct visualization of the results, the data can be exported to the well known BioMAP software.



Caption: Promising duo: AXIMA MALDI-MS system with CHIP-1000 chemical inkjet printer for MALDI tissue imaging. The combined strengths drive the development in the fast growing field of direct tissue analysis by MALDI-MS to identify potential biomarker or to control compound distribution.

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