

Imaging mass spectrometry using a delay line detector

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Microscope mode mass spectrometric imaging is crucially dependent on the availability of a high-resolution, position-resolved time-of-flight detector. Here, a new detection method for microscope mode imaging mass spectrometry is presented. A delay-line detector has been used for the first time as a position-sensitive detector in imaging mass spectrometry. The method is implemented on a matrix-assisted laser desorption/ionization time-of-flight (MALDI-ToF), as well as a secondary ion mass spectrometry time-of-flight (SIMS-ToF) instrument. Trypsinogen and bovine serum albumin samples have been used with a metal mask to determine the spatial resolution of the new detector using the MALDI-ToF instrument. The new detector set-up was successfully employed to generate mass resolved SIMS images from biological structures on the surface of thin tissue sections. The biological samples studied were taken from tumor grown from xenografted breast cancer cell lines and chicken embryonal sections.

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