

A COMPACT MALDI TOF INSTRUMENT WITH DESORPTION VELOCITY CORRECTION AND ORTHOGONAL ACCELERATION GEOMETRY – TOWARDS A BENCH-TOP DEVICE WITH IMPROVED MASS ACCURACY AND MINIMAL MASS CALIBRATION REQUIREMENTS

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The development of a new MALDI-orthogonal acceleration time-of-flight mass spectrometry (oa-TOFMS) instrument will be described and the potential advantages of this instrument over conventional delayed extraction MALDI instruments will be discussed.

Orthogonal acceleration TOFMS [1] is a proven technology with many benefits for continuous ion sources. It has been particularly successful in combination with the electrospray ion source and in tandem with a quadrupole precursor mass filter [1,2]. There is growing interest in coupling oa-TOFMS to pulsed sources such as matrix assisted laser desorption/ionisation (MALDI) because of the inherent mass resolution and mass accuracy that is afforded by oa-TOFMS due to the decoupling of the source and mass analyser. However the broad energy spread originating in the desorption process is a problem that can severely limit the sensitivity and mass range of this approach [3]. An excellent solution is to employ collisional focusing and cooling with RF multipole collision cells [4]. This technique requires significant additions to the hardware and vacuum system.

We are investigating an alternative approach that corrects for the desorption energy spread and provides direction focusing by application of a pulsed electrostatic lens. This does not require any RF optics, collisional devices or additional pumping. Initial experiments point to a significant (at least 20-fold) sensitivity advantage of the approach.

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 3. Mlynski V, Guilhaus M, "Matrix-assisted Laser/Desorption Ionisation Time-of-Flight Mass Spectrometer with Orthogonal Acceleration Geometry: Preliminary Results", *Rapid Commun Mass Spectrom*, 1996, **10**, 1524-1530.
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