

### **OH3 NT<sup>3</sup> - New Techniques, New Tricks, New Toys for Analytical and Forensic Applications**

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MALDI-TOF-MS, LDI-TOFMS, LA-HR-MC-ICPMS, Forensic, Analysis

Innovative sampling/analysis produces innovative results from innovative mass spectrometers.

New techniques available for application to analytical and forensic investigations include High Resolution Multi Collector Inductively Coupled Plasma Mass Spectrometry (HR-MC-ICPMS), Matrix Assisted Laser Dissociation Ionisation Time of Flight Mass Spectrometry (MALDI-ToF-MS) and Secondary Ion Time of Flight Mass Spectrometry (ToF-SIMS). These techniques can be used for spatial imaging of surfaces, identification of chemical content on small spot size or identification of chemical gradients in small samples of evidence.

In this presentation it will be shown that analysis by these techniques can provide information at the small scale – for example the changing concentration of zinc in transects of semen stains (LA-ICPMS and LA-HR-MC-ICPMS), the presence of compounds associated with semen on single cloth fibres (LDI-ToFMS) and the change in chemical composition as we transect across a line of ink on paper (LDI-ToF-MS). In addition results from the application of these techniques will show how such microanalysis can easily and quickly discriminate between small samples of material (Pb isotopes in glass by LA-HR-MC-ICPMS). However, the difficulty in presenting such scientific results in court and the problems associated with sampling such small sizes leads us to question if we are looking too closely, and like the philosophers, trying to 'count the number of angels dancing on a pin head'.