B158 Differentiation of Biological Fluids Using Direct Analysis in Real Time (DART) Technology

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After attending this presentation, attendees will understand new technologies for identifying common biological fluids (saliva, blood etc).

This presentation will impact the forensic community and/or humanity by providing alternatives to the presumptive tests for biological fluids presently utilized in forensic serology, speeding up the identification process.

The identification of biological fluids at crime scenes poses a number of challenges. Current methods of identification of body fluids apart from being extremely time consuming and labor-intensive also have the risk of false positives. In the field of mass spectrometry the introduction of a new innovative ionization source, Direct Analysis in Real Time (DART) represents a significant breakthrough in analysis (JEOL-USA, Inc). Combined with the AccuTOF™ mass spectrometer, solids, liquids, and gaseous samples can be analyzed by placing the sample between the ionization source (DART**)** and the mass spectrometer. The DART can analyze samples directly on surfaces such as currency, food, pills, and clothing. Additionally, the instrument has been shown to detect a variety of substances in biological fluids including urine, blood, and saliva. The substances detected include drugs, amino acids, lipids, and metabolites.

In this project the DART is being used to distinguish between biological fluids that are commonly encountered in forensic casework analysis, namely blood and saliva. Preliminary data comparing swabs containing human blood and saliva indicate signature peaks for small molecules unique to each of the two biological materials. These profiles represent chemical species in m/z range of 50-2000. The present study will involve detection and comparison with presumptive tests for biological fluids. The method will be adapted to identify trace amounts of biological fluids on a variety of substrates (swabs, cloth etc). The ability to distinguish biological stains using mass spectrometry could be a useful alternative to the biochemical tests currently being utilized in forensic serology.

Biological Fluids, Mass Spectrometry, DART

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