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Emerging Spectrometric Techniques for the Forensic Analysis of Body Fluids

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Opinion Article

Body fluids are evidence of great interest in forensics because they permit identification of people through the study of DNA. After reviewing the tests and therefore the methods that are currently getting used by forensic practitioners for the detection of body fluids (*e.g.,* blood, semen, saliva, vaginal fluid, urine and sweat), and after showing their main drawbacks and limitations, this work focuses on the review of emerging spectrometric techniques applied for the forensic analysis of body fluids. These techniques include the utilization of ultraviolet-visible, infrared, Raman, X-ray fluorescence and nuclear resonance spectroscopy and mass spectrometry for investigating blood, semen, saliva, urine, vaginal fluid or sweat. Although of these spectrometric techniques seem to possess a high potential to differentiate body fluids before DNA extraction, IR and Raman spectroscopy have shown the foremost promising results for discriminating stains from body fluids.

Forensic scientists collect, preserve, and analyze scientific evidence during the course of an investigation. While some forensic scientists visit the scene of the crime to gather the evidence themselves, others occupy a laboratory role, performing analysis on objects delivered to them by other individuals. Still others are involved in analysis of monetary , banking, or other numerical data to be used in financial crime investigation, and may be used as consultants from private firms, academia, or as government employees. additionally to their laboratory role, forensic scientists testify as expert witnesses in both criminal and civil cases and may work for either the prosecution or the defense. While any field could technically be forensic, certain sections have developed over time to encompass the bulk of forensically related cases. Forensic science may be a combination of two different Latin words: forensic and science. the previous , forensic, relates to a discussion or examination performed publicly . Because trials within the ancient world were typically held publicly, it carries a robust judicial connotation. The second is science, which springs from the Latin word for 'knowledge' and is today closely tied to the methodology, a scientific way of acquiring knowledge. Taken together forensic science means the utilization of the scientific methods and processes for crime solving.

The case of an individual murdered with a sickle was solved by an investigator who instructed each suspect to bring his sickle to at least one location. Flies, attracted by the smell of blood, eventually gathered on one sickle. In light of this, the owner of that sickle confessed to the murder. As other examples, the book also described the way to distinguish between a drowning and strangulation, and described evidence from examining corpses to work out if a death was caused by murder, suicide or accident.[citation needed] Methods from round the world involved saliva and examination of the mouth and tongue to work out innocence or guilt, as a precursor to the Polygraph test. In ancient India, some suspects were made to fill their mouths with dried rice and spit it back out. Similarly, in ancient China, those accused of a criminal offense would have rice powder placed in their mouths. In ancient middle-eastern cultures, the accused were made to lick hot metal rods briefly. it's thought that these tests had some validity since a guilty person would produce less saliva and thus have a drier mouth; the accused would be considered guilty if rice was sticking to their mouths in abundance or if their tongues were severely burned thanks to lack of protecting from saliva.

Body fluid traces recovered at crime scenes are among the foremost important sorts of evidence to forensic investigators. They contain valuable DNA evidence which may identify a suspect or victim also as exonerate an innocent individual. the primary step of identifying a specific liquid body substance is very important since the character of the fluid is itself very informative to the investigation, and therefore the destructive nature of a screening test must be considered when only a little amount of fabric is out there . The power to characterize an unknown stain at the scene of the crime without having to attend for results from a laboratory is another very critical step within the development of forensic liquid body substance analysis. Driven by the importance for forensic applications, liquid body substance identification methods are extensively developed in recent years. The systematic analysis of those new developments is significant for forensic investigators to be continuously educated on possible superior techniques. Significant advances in laser technology and therefore the development of novel light detectors have dramatically improved spectroscopic methods for molecular characterization over the last decade.

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