



The Connecting Point of DNA and BPA Expertise of Bloodstained Objects

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Editorial

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Abbreviations: BPA: Bloodstain Pattern Analysis; DNA: Deoxyribonucleic acid.

Editorial

During trials, eyewitness testimony is often deemed unreliable or biased, and then physical evidence becomes crucial for the conviction of the perpetrator. Crime-scene investigators identify items of interest at a crime scene, usually items such as bloodstained clothing and footwear which are transported to a forensic laboratory for further testing.

DNA analysts in forensic laboratories analyze and sample bloodstains from different bloodstained items. After a suspected stain is observed, analysts determine the nature of the stain using presumptive and confirmatory blood tests. Several protocols exist in the global forensic community regarding the laboratory processing of DNA evidence. According to protocols, reported descriptions of bloodstains should include the size, shape, location, and distribution of bloodstains, and most importantly a precise description of the type of the sampled bloodstain.

DNA analysts specializing only in molecular biology have insufficient knowledge about BPA. Molecular biologists focus on the identification and individualization of bloodstains. Making connections between specific bloodstains and patterns on items of interest to DNA profiles is of less importance for them. DNA analysts have little or no education about patterns of bloodstains, and issues arising from inaccurate descriptions of bloodstains and patterns. Detailed

and precise descriptions are very important for subsequent bloodstain pattern analysis (BPA) and reconstruction of a crime event.

If an item of interest has a single stain, there will be no issue for subsequent BPA. In those circumstances, a BPA analyst could analyze the item of interest after DNA investigations have been completed.

Characteristics of the bloodstain could be evaluated, and the mechanisms of origin also could be determined. Issues could occur for BPA expertise if the bloodstain of interest has been heavily damaged or destroyed by the DNA expert. In most forensic cases, heavily bloodied items are often examined featuring several types of contributing bloodstains. A major problem exists in cases where several people were injured in the same bloodshed event. Connecting specific types of bloodstains to obtained DNA profiles is essential for the reconstruction of crime events. The complete analysis should therefore include detailed descriptions of all types of observed and sampled bloodstains.

Knowledge of BPA should be incorporated into the process of sampling bloodstains for DNA analysis. Connecting specific types of bloodstains to obtained DNA profiles is essential for the reconstruction of crime events. The complete analysis should therefore include both a detailed description of all types of observed and sampled bloodstains and a linking of specific types of bloodstains to the obtained DNA profiles. Such a robust map of different types of bloodstains and corresponding DNA profiles empower analyses of a case and a crime-scene reconstruction.

Authorities in the forensic science community have different views on signing expert reports by experts

educated in diverse fields of forensic science. Also, some of those authorities have different opinions on the importance and proportion of generalist and specialist experts. Bigger laboratories have the privilege of having a wide range of different experts. In DNA laboratories that are part of a bigger institute, it would be more appropriate if BPA and DNA experts examine bloodstained items cooperatively. Moderately sized laboratories have a limited number of employees, so in those laboratories, it would be more appropriate to educate

DNA analysts in the basic principles of BPA. If there are no options for implementing BPA knowledge in DNA expertise of bloodstained items, it is advisable to do detailed forensic photography.

The organization scheme is very diverse across DNA and other forensic laboratories worldwide, so it means there is still no perfect one.

