OBTAINING A DNA PROFILE FROM SHELL CASINGS – A REVIEW OF CASES

Carey Baucher M.S., Lisa Moore M.S., Jeffrey Oblock, Christine Scott M.S., Nasir Butt Ph.D., Harmeet Kaur, Ph.D., Cuyahoga County Regional Forensic Science Laboratory, Cuyahoga County Medical Examiner's Office

Approximately 70% of the homicide cases received at the Cuyahoga County Medical Examiner's Office involve the use of firearms. In some of these cases the only probative evidence available may be shell casings that remain at the scene of the crime. With the increasing frequency of items submitted for "touch DNA" testing, it is important to consider that epithelial cells left behind on shell casings, possibly by individuals handling the ammunition, can prove helpful in solving these crimes. The Cuyahoga County Regional Forensic Science Laboratory has found that success in developing DNA profiles from shell casings can be accomplished by giving careful attention to case history and method of sample collection and processing. The probative value of casings may be established by determining the location of the shooter in relation to the collected casings and the victim(s), whether there is one or more than one suspected shooter, and the caliber of weapon used in the crime. Casings of the same caliber and/or brand, depending on location, should be carefully swabbed, most often with one swab. The organic method of extraction is preferred, and the extract is eluted to a minimum volume. Other modifications such as: concentration of the extracted samples, longer injection time, increased sample input as well as post-amplification cleanup may sometimes be necessary in order to obtain a DNA profile. Using this careful approach this laboratory has had success generating partial and full DNA profiles from casing swabs, some of which have been uploaded to the CODIS database and returned probative hits. Because of the success that the processing of shell casings can provide, this delicate and important evidence should not be overlooked, especially when it is the only evidence available for processing in a case. In the current study, a review of five cases will be discussed in which shell casings were processed and provided probative DNA information.