## G82 Dead Hits: Matching Decedents' DNA to Unsolved Crime Scenes

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The goal of this presentation is to determine the value of comparing DNA samples from decedents to DNA evidence left at unsolved crime scenes.

This presentation will impact the forensic community and/or humanity by providing closure to cold cases, ultimately impacting the family and friends of those who were victims of unsolved crimes. The forensic and law enforcement community would benefit from determining DNA matches or hits from unsolved crime scenes and knowing that the perpetrators of these violent acts are now deceased.

**Hypothesis:** Submission of DNA samples from cases performed at Office of the Chief Medical Examiner (OCME) Central District, Richmond, Virginia, that meet the demographic profile of persons at risk for societal maladjustment for comparison with biological evidence left at scenes of unsolved crimes will result in the solving and closing of outstanding cases.

**Introduction:** A large percentage of medical examiner cases represent a high-risk group for societal maladjustment (crime) and for encounters with the legal system as felons. The felon data bank archives the DNA profiles of felons. The Division of Forensic Science (DFS) in Richmond, Virginia, also archives profiles of biologic evidence left at scenes of crimes by unknown perpetrators who are not in the data bank. Some perpetrators of crimes who have left biologic evidence profiled by DFS may die without ever being caught, convicted and entered into the felon data bank or compared with DNA evidence profiles.

A pilot study to establish identities among the three groups would assist law enforcement by: (1) solving and closing some outstanding cases upon identification of a decedent as the perpetrator of a crime where the decedent was not in the data bank but had left biological evidence, and (2) determining whether, in the future, continued comparison of the designated group of decedents would assist the law enforcement community by saving time, money, and record keeping in a futile search for presently unidentified, but now deceased, perpetrators of crime.

**Materials and Methods:** OCME Central pathologists collect and archive blood spots of all medicolegal cases. From these cases, a subset of 50 consecutive males aged 15 to 45 will be the focus of the pilot study. Prior to submitting samples to the data bank, a list of the individuals will be submitted to the data bank. Data bank staff will check the samples against the listed individuals that already exist in the data bank, and exclude from the study those who match by name. The remaining samples will then be submitted on a specially designed data bank Request for Examination (RFE) form, and will be assigned a unique sample number. The data bank profiles those samples utilizing standard DNA-STR profiling kits and enters the results in a specially created database (index), where they remain for an indefinite period of time for comparison purposes.

DNA profiles from these samples are compared against unidentified profiles obtained from crime scenes. If a match occurs, a certificate of analysis is issued to the submitting law enforcement agency, with a copy to the OCME Central. No certificate of analysis is issued for a search not resulting in a match. Matches or hits are presented to the police to correlate with the investigative information.

**Results:** The percentage of hits are calculated and assessed statistically for cost/benefit for law enforcement based on the number of cases actually closed/solved as the result of this information. Additionally, the predictive value positive will be calculated to further describe the efficacy of this study.

**Conclusion:** The major observation would be the establishment of identities or hits in cold cases.

**DNA, Decedents, Cold Cases**

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