



A163 The Partial Match Process in New York City

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After attending this presentation, attendees will be introduced to a functioning, large-scale partial match operation. The presentation will illustrate how the SWGDAM recommendations for partial matches have been put into practice within the State and City of New York.

This program will impact the forensic science community by addressing the uses of DNA to generate investigative leads when there have been no direct matches to a profile.

In early 2008, the FBI hosted a conference for CODIS laboratories and other interested parties about partial matches, familial searching, and the various ramifications thereof. The SWGDAM Interim Plan for Partial Matches was introduced (and subsequently adopted), which makes recommendations to the community but leaves policy decisions to each state. Shortly thereafter, the New York State Commission on Forensic Sciences, DNA Subcommittee also took up the discussion. In anticipation of a statewide policy, the New York City Office of Chief Medical Examiner (OCME) Department of Forensic Biology began to review potential partial matches to be pursued when the policy took effect.

Partial matches are inadvertently discovered—for instance, moderate stringency matches in CODIS during a routine search, or an evaluation of profiles within a case. These exclude the person brought forward in CODIS as a candidate match as being the actual source of the forensic profile, but there is a chance that a close relative could be the source.

Partial matches are NOT familial searches. Familial searches are deliberate searches seeking similarities between a forensic sample in a database and an offender. Searches of this sort require specific non-CODIS software and are only conducted in a few jurisdictions at this time. In order for a profile to be considered for partial match evaluation in New York City, there are some basic criteria that must be met before even performing any calculations. First, it must be a previously unmatched forensic profile of ≥ 10 loci. Second, it must be a clean (or fully-deconvoluted) profile—there can be no partially-determined loci, even though such profiles are eligible to be entered into CODIS. At the local level there is a distinction between partial matches obtained through a database search or within a case. At the state and national search levels, only forensic-to-offender partial matches are considered.

The next screening step is to determine how many alleles are shared between the two profiles. For a parent-offspring relationship, the threshold is 50%, because there only needs to be one allele in common at every locus. At any given locus, siblings are not required to share any alleles at all; even when they are the offspring of the same two parents (most siblings have around half in common). Conversely, some siblings share a high percentage of alleles, and these are the siblings for which partial matches may be useful. Based on results from the literature, it was determined that having $\geq 70\%$ shared alleles maximizes the probability of a sibling relationship between two profiles, while minimizing the probability of more distant relatives, or of unrelated persons. Any pair of profiles fulfilling one or both of these scenarios is evaluated using the CODIS PopStats tool. Further testing (Y-STR or mitochondrial DNA testing) could be undertaken to confirm or refute the possible partial match between two local cases or samples if necessary.

For potential matches involving offender samples from SDIS or NDIS, the New York City Police Department (NYPD) and the appropriate District Attorney's Office (DAO) are queried regarding their interest in the case. Both entities must commit to pursue further investigation of the case if the name of the offender (potential relative) is released and to provide follow-up information to the New York State Division of Criminal Justice Services regarding the outcome. Only after affirmative responses are received from both NYPD and DAO will the OCME formally request the name of the partially-matched offender from the offender database. For non-New York requests, the process is also dependent on the CODIS unit (FBI) deeming it valid to pass along to the offender laboratory and whether that state will release offender names for partial matches.

For those requests from local labs within New York State, the SDIS staff at the New York State Police performs additional kinship calculations for the expected match ratio (EMR) and expected kinship ratio (EKR) as defined in the SWGDAM Interim Plan for Partial Matches. If the results meet their threshold, they advise the databank coordinators to release the name to the local lab. The name is then reported to the NYPD and DAO.

The partial match process began in the spring of 2011. Results regarding the outcomes for the partial match process are expected by early 2012.

Partial Match, DNA Database, Kinship Calculations