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	Verifying and Reporting DNA Matches	
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5.0 VERIFYING AND REPORTING DNA MATCHES

5.1 General principles

5.1.1 Discovering and confirming "exact matches" and "partial matches", and making timely notifications, are among the highest priority tasks done in the Department of Forensic Biology. Any delays can result in additional crimes being committed that may have been preventable. For local matches, it is not necessary to have all analyses completed or reports written, just that the required data is available for review of the match.

5.1.2 Local exact matches between cases may result in the creation (or extension) of a DNA pattern. To consolidate the handling of related pattern cases, and to streamline any subsequent court testimony, a single analyst (wherever possible) should be assigned all cases in a pattern. Therefore, depending on the nature of the cases involved, a "new" case may be transferred to the analyst of the previous case(s). See Section **5.4.1**- Local exact matches discovered by direct comparison or via LINKAGE or LDIS for additional information.

5.1.3 Partial matches are inadvertent "indirect matches" that suggest that the source of an evidentiary profile is potentially:

- A relative of a suspect (suspect file)
- A relative of another evidentiary profile (within a case or between two cases)
- A relative of some other comparison sample (victim or elimination sample)

5.1.4 This is evaluated by comparing the number of shared alleles and/or loci, then calculating the full sibling likelihood ratios and/or the parent-offspring likelihood ratios using the CODIS Popstats application; and the EKR (expected kinship ratio) and EMR (expected match ratio) (see specific procedures below). The use of partial matches at the national level has been approved by the NDIS Board; however, participation is left up to each individual state. The use of partial matches at the state level has been approved by the New York State Commission on Forensic Science; participation is left up to each individual CODIS laboratory. With the availability of Familial Searching in the state of New York as of October 2017, OCME will no longer perform Partial Match evaluations on SDIS and NDIS offender search results.

5.1.5 Matches at the local level may occur at any time. Matches at the state level follow a weekly cycle. Matches at the national level follow a twice-weekly cycle.

5.1.6 For Missing and Unidentified Persons cases, discovering and confirming "exact matches" and "associations" are also among the highest priority tasks done in the Department of Forensic Biology.

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5.1.7 Associations are "indirect matches" that suggest that the reference profiles (i.e. profiles from relatives of Missing Persons in a pedigree tree) are potentially related to profiles from a Missing Person or Unidentified Human Remains. These associations are ranked in CODIS according to a joint pedigree likelihood ratio.

5.1.8 Missing persons matches in CODIS may occur at any time at the local level. At the state and national level, matches follow a one month cycle set by NY State and/or the FBI. Additional searches such as those with mitochondrial DNA only are done as scheduled by NY State and the FBI (typically, quarterly).

5.2 DNA HITS application

5.2.1 The majority of DNA exact match and partial match notifications are made using the web-based DNA HITS application. This application allows for quick e-mail dissemination of matches to the NYPD and the District Attorney's offices. If DNA HITS is unavailable for > 24 hours, or a particular functionality is unavailable, notifications may be made using a Notification Letter; follow up with DNA HITS notification when it becomes available.

5.2.2 DNA HITS is not used for Missing and Unidentified Persons Cases. A notification letter is sent via email to notify all involved parties of the match. For matches with unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. Matches involving outside jurisdictions will be sent to that jurisdiction's designee(s).

5.2.3 Only the NYPD designee(s) and the appropriate DAO's designee(s) are notified via DNA HITS. If using DNA HITS, *do not also notify Detectives or ADA's directly* - they will be notified by their superiors and/or the NYPD's electronic case management system.

5.2.4 Members of lab management have privileges in DNA HITS to add or delete authorized users. Case analysts have varying levels of privileges within the program. All interpreting analysts plus certain clerical and CODIS staff members have login privileges and can enter match information. Supervisors, technical reviewers, management and certain CODIS staff members have approval privileges for matches. The program will not make a notification until it has been approved.

5.3 Method of notification

5.3.1 The existence of an exact match is disseminated via the Department of Forensic Biology report, via DNA HITS, or both. The method depends on the type of match ("cold" vs. "warm"), the level (local, state, national), or the type of comparison (exact vs. partial). "Cold hit" means no one thought the cases (or suspect) were linked previously. "Warm hits" are the opposite: the cases were previously thought to have been linked, and DNA is simply confirming this.

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5.3.2 In general, match notifications made via DNA HITS are applicable only to cases that have a clean, informative forensic autosomal DNA profile (single-source or deduced) attributable to a putative perpetrator. In addition, partial match notifications are limited to such profiles with ≥10 CODIS core loci with no Z's, INC's, or other indications of a mixture.

5.3.3 Associations solely to non-deconvoluted mixtures or solely to Y STR results are described in the reports, not via DNA HITS.

5.3.4 Notification via DNA HITS is necessary for the following types of matches:

5.3.4.1 Local matches:

- Cold hits between cases
- Warm hits between cases
- Partial matches between cases
- Cold hits between a case and a suspect (exemplar or pseudo-exemplar)
- Warm hits between a case and a suspect (exemplar or pseudo-exemplar)
- Partial matches between a case and a named suspect or arrestee (exemplar or pseudo-exemplar)

5.3.4.1.1 Suspect samples for which a protective order has been received prior to comparison to or entry into LDIS, that prohibits comparison to the local database or any other samples other than one specific case SHOULD have a DNA HIT issued in the instance of a confirmed match to that (and only that) evidence profile. The suspect shall not be searched against, or added to, LDIS, however.

5.3.4.2 State or national matches:

- Matches between a case and an offender
- Matches between an OCME case and a case in another laboratory

5.3.5 Notification via DNA HITS is not necessary for the following type of matches:

5.3.5.1 Partial matches within a case

5.3.5.2 Direct matches between state/national offenders or locally-tested suspect samples (true or abandonment) that match forensic profiles for cases in which they are revealed to be the named victim, homeowner, or witness in that case. Additionally, the evidence profile must then be removed from the database as it no longer eligible.

5.3.6 The report (evidence report or suspect report) will contain information on all local exact matches and/or partial matches.

5.3.7   DNA HITS is not used for Missing and Unidentified Persons cases. Match notifications are made via a Forensic Biology Report and Notification Letter.

5.4   Verifying and reporting exact matches

5.4.1   Local exact matches discovered by direct comparison or via LINKAGE or LDIS

5.4.1.1   The analyst of the "new" case has to request the "previous" case(s) if they do not exist in LIMS (pre-LIMS case file). Confirm the exact match by comparing the appropriate DNA profiles. Review the matching cases.

For a case-to-case match, compare the information available in the files: precinct, location of occurrence, description of assailant, details of the assault, etc. If any 61 forms are missing, have a supervisor arrange to get a copy. (This step is not required for NYPD project cases. If any of the information in the 61 forms seems inconsistent, discuss with your supervisor or technical reviewer.)

For case-to-case matches, determine whether the matching samples were processed together:

- Evidence exam on the same date and/or by the same analyst?
- DNA extraction and/or amplification worksheet with the same date and time?

If so, see your supervisor or technical reviewer and Assistant Director immediately.

For case-to-case matches between similar case types (e.g. Property Crime to Property Crime) or disparate case types (Homicide to Property Crime), it is a possibility that a member of law enforcement is the source of the DNA. Therefore, the following should also be determined based on paperwork in the file:

- Was the evidence in both cases collected by the same Crime Scene Unit or Evidence Collection Team member?
- Was the evidence in both cases processed by the same NYPD laboratory Criminalist?

If so, see your supervisor or technical reviewer and Assistant Director immediately. Conversations with NYPD and/or the relevant District Attorney's office(s) may need to be held in order to procure elimination samples from potentially-involved personnel. Although an elimination sample from potentially-involved personnel may have been requested, the case analyst should wait for procurement and typing of the requested sample before issuing the report and/or entering a DNA HIT for match notification. The case analyst and/or their supervisor should follow up on procurement of the elimination sample at least every 30 days.

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Any specimen found to match a profile in Lab Types shall not be entered into LDIS; if the link to a Lab Types specimen is found after the sample has been entered and/or uploaded, the specimen must be removed from the database system.

Once it has been ruled out that a member of law enforcement could be the source of the DNA, continue the process.

5.4.1.2   Determine if the match is a cold hit or a warm hit.

Use information in LIMS and/or the physical case file to determine if a previous connection between the cases and/or subjects existed. This can include, but is not limited to, having the same listed suspect, the same complaint number and/or a previous offender match to the named suspect. If a previous connection was not evident, then the match is a cold hit.

In the event an analyst suspects there is a cold hit between the "new" case and a previous case or pattern, between the "new" case and a suspect file, or between the "new" case and a Lab Types specimen, the analyst's direct supervisor will be notified immediately.

5.4.1.3   Expedite additional testing, if necessary, to determine if you have a true match or a fortuitous match. Additional testing includes any duplication needed to satisfy the concordance policy. Since the "new" case may be transferred per section 5.4.1.5, the analyst who discovered the match and their supervisor will determine who is in the best position to conduct this additional testing in a timely fashion. Once you have confirmed the exact match, continue the process.

5.4.1.4   Determine if the "new" case will be transferred.

Use common sense when deciding on the transfer of a "new" case. Consider the nature of the crimes; the nature of the evidence items within the cases; the time frame of the crimes; and whether any appear to be previously solved via arrest, typing of a suspect, or an offender database match. Transfers should only take place when a logical pattern is created or added to. Having the same analyst for the purposes of testimony is helpful in these situations. Examples of situations where transfer makes sense might include:

- A 2016 sexual assault case matching a 2010 sexual assault case.
- A 2017 burglary case matching a 2014 robbery case.
- A 2016 robbery matching a 2013 sexual assault (where case facts are similar)

If there is no logical pattern or relationship between the cases, no transfer of the "new" case is necessary. Examples might include:

- A 2016 burglary case matching a solved 2000 homicide case.
- A 2017 sexual assault case matching a 2011 auto theft case.
- A 2016 robbery matching a 2011 sexual assault (where case facts are different)

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A transfer is NOT necessary if a "new" case is solely matching a previous suspect file. The analyst of the "new" case retains that case and will have the previous suspect file transferred to him/her. The analyst of the "new" case is responsible for reporting the newly discovered match in an additional suspect report. As appropriate, have a supervisor update records to reflect the new case assignment.

5.4.1.5   Make the Match Notification(s)

If the match is determined to be a cold hit, the analyst who discovered the match(es) and their supervisor are the ones responsible for entering and approving the match(es) in DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS.

After entering the match(es), the analyst who discovered it will give the file to their supervisor to review and issue the match notification in a timely fashion.

If the "new" case will be transferred per section 5.4.1.4, contact the analyst receiving the case and their supervisor to inform them of a cold hit. After the match notification has been issued, transfer the file to the receiving analyst.

If the new case will not be transferred, the discovering analyst will write the associated report.

If the match is determined to be a warm hit, the analyst who will ultimately write the report detailing the match is the one responsible for entering the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS. If the "new" case will be transferred per section 5.4.1.5, contact the receiving analyst and their supervisor to inform them of a warm hit. The receiving analyst will write the associated report and submit the file for technical review via the current laboratory production system. If the new case will not be transferred, the discovering analyst will write the associated report and submit the file for technical review via the current laboratory production system.

The technical reviewer who is responsible for reviewing the report and match notification, whether the case has been transferred or not, will review the DNA HITS match(es) by using the procedure in section 5.6 Making notifications using DNA HITS.

5.4.2   Verifying and reporting SDIS exact matches

5.4.2.1   With DNA matches identified at SDIS, both laboratories involved in the match have confirmation responsibilities. All matches will be resolved by the CODIS staff, with the exception of Low Copy Number samples and certain identity searches performed and scheduled by NYS.

5.4.2.2   Responses to all candidate matches must be immediate. The final disposition of the candidate match to the SDIS custodian must be reported no later than 30 business days after receiving the match report.

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5.4.2.3   General Process

The CODIS staff will print out the Candidate Match Detail Reports from the CODIS system along with a Match Inventory list (a summary list of all the cases involved in the candidate matches) and obtain the corresponding files.

Each candidate match report and corresponding file or LIMS case record must be reviewed to confirm whether or not the two profiles indeed match. The analyst reviewing the file must fill out a Candidate Match Confirmation Checklist if the match is found to be true.

If any modifications to the DNA profile are needed, a Profile Modification Form must be filled out by the Interpreting Analyst or the analyst reviewing the data (see section 4.6), and submitted to the CODIS group. It is not necessary to wait for the profile to be modified to continue in the confirmation process.

5.4.3   Verifying and reporting SDIS offender exact matches

5.4.3.1   If the profiles are an exact match, complete a NYS DNA Databank Candidate Match Confirmation Form. This form communicates to DCJS and the Databank coordinator the case information, and that the candidate match is, in fact, a true match. Therefore, one NYS DNA Databank Candidate Match Confirmation Form for every confirmed candidate match listed on the Match Inventory must be completed. (For those cases matching an offender in SDIS but also matching a sample in LDIS that has previously hit the same offender at SDIS, the form can be omitted, as DCJS will not issue a new letter.) The NYS DNA Databank Candidate Match Confirmation Form is then transmitted to DCJS by fax or other electronic means.

5.4.3.2   Upon receipt of the NYS DNA Databank Candidate Match Confirmation Forms from our laboratory, and upon receipt of confirmation of the offender sample from the NYS DNA Databank coordinator, DCJS will release the offender's name, in the form of a DCJS Match Letter (see the current version of the *New York State COmbined DNA Index System Procedures)*. This letter will contain the name of the offender, any aliases, the NYSID number and offender's current location.

5.4.3.3   Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.4.3.4   If the confirmed match has linked an offender to an unsolved case, the investigating agency generally obtains an exemplar from the offender and submits to the laboratory for retesting prior to proceeding to trial. This requirement is located on the DCJS Match Letter that is available to the District Attorneys' offices upon request.

5.4.3.5   The DCJS Match Letter should be used by the DAO to obtain the court order authorizing the collection of the exemplar. The Department of Forensic Biology will perform testing

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on the exemplar to replicate the DNA match of the offender to the forensic sample(s) and to testify in court to the match. Questions from the DAO regarding offender information, offender blood draws, etc. should be directed to DCJS. Analysis of the exemplar by Forensic Biology is generally not necessary for grand jury proceedings. This analysis, however, is necessary before trial.

5.4.4　　Verifying and reporting SDIS forensic exact matches

5.4.4.1　　After the data is reviewed, the other laboratory involved in the match must then be notified via fax or email and the match verified. Both laboratory's case numbers and ORI numbers are on the Match Detail Report and on the Match Inventory list. The contact information for all CODIS laboratories can be found on the CJIS-WAN. Standard case contact protocol should be followed to document any correspondence or conversations.

5.4.4.2　　If it is determined the candidate match is a non-match, the process stops here. All case contacts should be documented on the checklist accordingly.

5.4.4.3　　If it is verified to be a true match, information regarding the cases must be exchanged. The CODIS DNA Match Data Request and Response Form is transmitted to the other laboratory by fax or other electronic means. This form facilitates the exchange of information. Information on this form, if available, should include:

- Contact information for the submitting police agency.
- Contact information for the laboratory.
- Laboratory and police identification numbers (Forensic Biology and complaint numbers).
- Whether the case is solved (i.e. by DNA).
- Suspect information (for example, name, NYSID number, has he/she been tested at our lab, etc.).
- General case information (for example, date of occurrence, type of crime, etc.)
- If the case with the match at SDIS is one of a local pattern, information regarding both/all should be provided to the other laboratory.

5.4.4.4　　Upon receipt of the response from the other laboratory, the match is confirmed. This form documents that the candidate match between the two laboratories was acknowledged, each laboratory has finished their review process, both laboratories are confirming the match and that case information has been exchanged.

5.4.4.5　　Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.4.5　　Verifying and reporting NDIS exact matches

5.4.5.1　　With DNA matches identified at NDIS, both laboratories involved in the match have confirmation responsibilities. All NDIS matches will be resolved by the CODIS staff.

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5.4.5.2   Responses to all candidate matches must be timely. The final disposition of the candidate match to the NDIS custodian must be reported no later than 30 business days after receiving the match report.

5.4.5.3   General Process

The CODIS staff will print out the Candidate Match Detail Reports from the CODIS system along with a Match Inventory list (a summary list of all the cases involved in the candidate matches) and obtain the corresponding files. The Match Inventory list is also used to create the magnets for the CODIS group's Lean Six Sigma tracking board.

Each candidate match report and corresponding file or LIMS case record must be reviewed to confirm whether or not the two profiles indeed match. The analyst reviewing the file must fill out a Candidate Match Confirmation Checklist.

If any modifications to the DNA profile are needed, a Profile Modification Form must be filled out by the Interpreting Analyst or the analyst reviewing the data (see section 4.6), and submitted to the CODIS group. It is not necessary to wait for the profile to be modified to continue in the confirmation process.

If a profile has a national offender candidate match and a state offender candidate match at or near the same time, allow the state confirmation process to proceed first. If a profile has two (or more) national offender candidate matches at or near the same time, select one of the candidate matches to proceed first (see the CODIS supervisor for guidance on selection). Once one of the candidate matches has been verified and the name of the offender obtained, process the remaining candidate matches as conviction matches.

5.4.6   Verifying and reporting NDIS offender exact matches

5.4.6.1   After the data is reviewed, the other laboratory involved in the match must then be notified via telephone, fax or email and the match verified. Both laboratories' case numbers and ORI numbers are on the Match Inventory list. The contact information for all CODIS laboratories can be found on the CJIS-WAN. Standard case contact protocol should be followed to document any correspondence or conversations.

5.4.6.2   If it is determined the candidate match is a non-match, the match is dispositoned in the CODIS software as "no match" and the process stops here. All case contacts should be documented on the checklist accordingly.

5.4.6.3   If it is verified to be a true match, information regarding the cases must be exchanged. The CODIS DNA Match Data Request and Response Form is transmitted to the offender laboratory by fax or other electronic means. This form facilitates the exchange of information. Information on this form, if available, should include:

- Contact information for the submitting police agency.

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- Contact information for the laboratory.
- Laboratory and police identification numbers (for example, case number, complaint number, etc.).
- Whether the case is solved (i.e. by DNA).
- Suspect information (for example, name, NYSID number, has he/she been tested at our lab, etc.).
- General case information (for example, date of occurrence, type of crime, etc.).
- If the case with the match at NDIS is one of a local pattern, information regarding both/all should be provided to the other laboratory.

5.4.6.4   When available, include any known aliases of the offender/suspect if the case is solved, because the offender/suspect may be in the other database under a different name.

5.4.6.5   Upon receipt of the CODIS DNA Match Data Request and Response Form from our laboratory, and upon the offender laboratory's confirmation of the offender sample, the match is confirmed. The offender laboratory will release the convicted offender's name, via fax, in the form of a match letter. This letter will contain the name of the offender, any aliases, the State ID #, current location, and sometimes an FBI number or social security number.

5.4.6.6   Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.4.6.7   If the confirmed match has linked an offender to an unsolved case, the investigating agency must obtain an exemplar from the offender and submit to the laboratory for retesting prior to proceeding to trial. This requirement is located on the match letter that is forwarded to the District Attorney's office upon request. The match letter should be used by the DAO to obtain the court order authorizing the collection of the exemplar.

5.4.6.8   The Department of Forensic Biology will perform testing on the exemplar to replicate the DNA match of the offender to the forensic sample(s) and to testify in court to the match. Questions from the DAO regarding offender information, offender blood draws, etc. should be directed to the agency contact information given on the CODIS DNA Match Data Request and Response form. Analysis of the exemplar by the Department of Forensic Biology is generally not necessary for grand jury proceedings. This analysis, however, is necessary before trial.

5.4.7   Verifying and reporting NDIS forensic exact matches

5.4.7.1   The CODIS staff will print out the Candidate Match Reports from the CODIS system along with a Match Inventory list (a summary list of all the cases involved in the candidate matches) and obtain the corresponding files.

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5.4.7.2   Each candidate match report and corresponding file or LIMS case record must be reviewed to confirm the profile data sent to NDIS is accurate. The analyst reviewing the file must fill out a Candidate Match Confirmation checklist.

5.4.7.3   If any modifications to the DNA profile are needed, a Profile Modification Form must be filled out either by the analyst reviewing the data (see section 4.6), or for LIMS-era cases, by the reporting analyst on that case, and submitted to the CODIS group. It is not necessary to wait for the profile to be modified to continue in the confirmation process.

5.4.7.4   After the data is reviewed, the other laboratory involved in the match must then be notified via telephone, fax or email and the match verified. Both laboratory's case numbers and ORI numbers are on the Match Inventory list. The contact information for all CODIS laboratories can be found on the CJIS-WAN. Standard case contact protocol should be followed to document any correspondence or conversations.

5.4.7.5   If it is determined the candidate match is a non-match, the process stops here. All case contacts should be documented on the checklist accordingly.

5.4.7.6   If it is verified to be a true match, information regarding the cases must be exchanged. The CODIS DNA Match Data Request and Response Form is transmitted to the other laboratory by fax or other electronic means. This form facilitates the exchange of information. Information on this form, if available, should include:

- Contact information for the submitting police agency.
- Contact information for the laboratory.
- Laboratory and police identification numbers (for example, FB number, complaint number, etc.).
- Whether the case is solved (i.e. by DNA).
- Suspect information (for example, name, NYSID number, has he/she been tested at our laboratory, etc.).
- General case information (for example, date of occurrence, type of crime, etc.).
- If the case with the match at SDIS is one of a local pattern, information regarding both/all should be provided to the other laboratory.

5.4.7.7   Upon receipt of the response from the other laboratory, the match is confirmed. This form documents that the candidate match between the two laboratories was acknowledged, each laboratory has finished their review process, both laboratories are confirming the match and that case information has been exchanged.

5.4.7.8   Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.5   Evaluating, verifying, and reporting partial matches

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5.5.1   General process

5.5.1.1   Partial match procedures are applicable only to cases that have a clean, informative forensic autosomal DNA profile (single-source or deduced) attributable to a putative perpetrator. Such profiles must have ≥10 CODIS core loci, with no Z's, INC's, or other indications of a mixture.

5.5.1.2   Partial matches will be evaluated by a combination of observing whether there is sharing at each locus (indicating a potential parent-offspring relationship) and/or counting of shared alleles across all loci (indicating a potential full-sibling relationship). Thresholds for allele sharing and the likelihood ratios have been established and are described on the Partial Match Evaluation Form.

5.5.1.3   At the local level, only partial matches between evidence samples (within a case or between cases) or partial matches between evidence samples and a named suspect or arrestee for that case will be evaluated. *Any partial matches revealed by comparing a suspect to LINKAGE or partial matches revealed by searching a suspect in LDIS will NOT be evaluated.*

5.5.1.4   At the state and national levels, no partial matches to offenders or other labs' forensic profiles will be evaluated.

5.5.1.5   Pull the previous case(s), if applicable.

5.5.2   Local partial matches

5.5.2.1   Partial matches may exist within a case, between two cases, or between a case and a suspect file.

5.5.2.2   Partial matches within a case

All eligible DNA profiles within a case should be reviewed for potential partial matches. For example, compare a victim or elimination sample to Male Donor A or compare Male Donor A, B, and C to each other.

In the event an analyst believes there is an eligible partial match, the first step is to evaluate the profiles. Using the Partial Match Evaluation Form and following the local flow chart below, determine if the two profiles meet laboratory requirements. If so, expedite any additional testing needed to satisfy the concordance and duplication policies.

If possible and appropriate (i.e. both profiles are male), further testing using Y STRs should be done. If a partial match is still a possibility, continue the process.

The existence of a partial match within a case is disseminated via the report, using wording that describes that a similarity was noted and requests additional exemplars. If

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the evaluation of the profiles reveals that the thresholds for both a parent/child relationship AND full sibling relationship have been met, then both potential relationships shall be included in the report.

5.5.2.3   Partial matches between two cases

In the event an analyst believes there is an eligible partial match between two cases (found in LINKAGE or an LDIS search), the first step is to evaluate the profiles. Using the Partial Match Evaluation Form and following the local flow chart below, determine if the two profiles meet laboratory requirements. If so, expedite any additional testing needed to satisfy the concordance and duplication policies.

If possible and appropriate (i.e. both profiles are male), further testing using Y STRs should be done. If a partial match is still a possibility, continue the process.

The analyst and supervisor must then meet with the local CODIS administrator and/or CODIS manager to discuss the potential partial match. If appropriate, efforts will be made to determine the status of each case (solved vs. unsolved, arrests, etc.) or gain additional case information.

The existence of a partial match between cases is disseminated via DNA HITS. Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.5.2.4   Partial matches between a case and a suspect (exemplar or pseudo-exemplar)

Partial matches involving the DNA profile of a suspect is limited to the case for which the person is a named suspect or arrestee.

In the event an analyst believes there is an eligible partial match, the first step is to evaluate the profiles. Using the Partial Match Evaluation Form and following the local flow chart below, determine if the two profiles meet laboratory requirements. If so, expedite any additional testing needed to satisfy the concordance and duplication policies.

If possible and appropriate (i.e. both profiles are male), further testing using Y STRs should be done. If a partial match is still a possibility, continue the process.

The existence of a partial match between a case and a suspect is disseminated via DNA HITS. Enter the match(es) into DNA HITS using the procedure in section 5.6 Making notifications using DNA HITS

5.6   Making notifications using DNA HITS

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NOTE: If a new match (case-to-case, case-to-suspect, case-to-known suspect or arrestee, or case-to-offender) is identified to a pattern that pre-dated DNA HITS, the *previous matches* must be entered into DNA HITS *prior* to the new match. In the Notes section, make reference to the previous match letters, including match letter number as well as the date of the original notification.

5.6.1   Using the internet, go to the DNA HITS program. The Domain should show "OCME"; login using your OCME user name and password.

5.6.2   Click on "Create New Local Hit", "Create New State Hit" or "Create New National Hit" button in the upper right hand corner.

5.6.3   Using the drop-down menu, select the appropriate match type.   It is very important to select the correct match type, since DNA HITS is being used for "cold hits", "warm hits", and for some local partial matches.

- Choices for local match types include Forensic to Forensic (abbreviated F-F), Forensic to Subject (F-S), Forensic to Named Suspect/Arrestee (F-NSA), Forensic to Forensic (Partial) (F-F (Partial)), and Forensic to Named Suspect/Arrestee (Partial) (F-NSA (Partial)).
- Choices for state match types include Forensic to Offender (F-O), Forensic to Forensic (F-F(S)), and Forensic to Offender (Partial) (F-O (Partial)).
- Choices for national match types include Forensic to Offender (F-O(N)), Forensic to Forensic (F-F(N)), and Forensic to Offender (Partial) (F-O (N)(Partial)).

5.6.4   Enter the case numbers for the new match and click on "Search".

NOTE: For notifications on a new case in an existing pattern, the two cases entered here should be the new case and the first case of the pattern. The first case is generally the one whose DNA profile is always represented in CODIS; see a supervisor or a member of the CODIS group if unsure which case is the first case.   For "first cases" entered prior to 2012, there may be profiles in the local pattern index that were not submitted to SDIS/NDIS due to policies at that time.

5.6.5   Using the drop-down menu, select the appropriate search type (LINKAGE or LDIS for local matches). If this is not done, all the information will be lost and will have to be reentered. "Direct match" can be used if a suspect came in for comparison to a given case but will not be entered into or searched via the databases.

"Warm hits" between a case and a suspect are reported using the "Case to Known Suspect or Arrestee" function within DNA HITS.

5.6.6   If one of the cases was involved in a previous DNA HITS notification, some information for that case will be populated automatically. If both cases are new to DNA HITS, all fields marked in yellow are required to be entered. In addition, when available, the date

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of occurrence, 61 number and the voucher number must be entered. The exceptions are PM samples (no voucher number); backlog project cases (no 61 number and sometimes no date of occurrence); and the occasional Biotracks or IAB case (no or partial 61 number).

NOTE: Be careful in using the drop-down menus; make sure what you select stays selected by moving the cursor off of the drop-down menu and clicking elsewhere to deactivate the drop-down.

Forensic Case - Fields that must be entered if present in case documentation:

- Search Type
- Match Type
- Forensic Lab # (twice)
- Specimen ID
- Gender
- Hospital (if applicable)
- Sample type
- Voucher
- Item #
- Storage number (applies to backlog rape cases only)
- Incident Date
- Case Type
- Full Complaint Number (add a leading zero to give 6 digits in the last segment)
- Borough
- Victim/Entity name
- Suspect info (if available)
- Assigned Criminalist (or tech reviewer, if criminalist is no longer at OCME)

Suspect/Offender Side - fields that must be entered if present in case documentation:

- Lab/Barcode/Offender ID (twice)
- Last Name
- First Name
- Complaint number
- NYSID or other state's ID number (add a leading zero to the NYSID if needed, to achieve the format 12345678L, so that the DNA HIT will be able to propagate into NYPD's ECMS system correctly)
- FBI #
- Voucher (for suspect samples)

Notes section:

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Statement regarding forensic sample being a mixed profile or partial profile.
This match is to a xx-locus, partial, profile.
This match is to a xx-locus, mixed, profile.

Do NOT put a comment in the notes section if the match is to a Forensic Unknown sample, even if it was deconvoluted from a mixture.

5.6.7　　For the 'Criminalist' section, if the analyst assigned (the IA for the cases) is not on the drop-down list, deselect 'Select' and manually type in the analyst's last and first names; use normal capitalization. If the analyst assigned to a case is no longer at the lab, list the Tech1 reviewer or Tech2 reviewer, in that order of preference. Should neither of them be available, consult CODIS staff or a supervisor regarding analyst assignment.

5.6.8　　Use the 'NOTES' section to indicate if the match is to a mixed profile or a partial profile. Use the following language:

- This match is to a xx-locus, mixed, profile.
- This match is to a xx-locus, partial, profile.

Other information, such as additional victims/suspects or contact information for state or national matches may also be indicated in NOTES. Do not include information about prior related DNA HITS notification in the 'NOTES' section; this information is already captured within the application and displayed when related matches are viewed.

5.6.9　　Click on "Get Approval". If any red error messages appear, fix the problem and click on "Get Approval" again. Once there are no errors, the screen will return to the "Create New Entry" mode and inform you that you have successfully entered a match.

5.6.10　　Have the cases reviewed by a technical reviewer (or two, if enhanced technical review is required). For local matches, it is not necessary to have all analyses completed or reports written, just that the required data is available for review of the match.

The technical reviewer must check all fields with information in both sides of the entered DNA HIT. Note: If a case had more than one CODIS profile, pay special attention to the Specimen ID field, as DNA HITS will select one which may not be the one involved in the current match.

Forensic Case - Fields that must be entered if present in case documentation:

- Search Type
- Match Type
- Forensic Lab # (twice)
- Specimen ID
- Gender
- Hospital (if applicable)

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- Sample type
- Voucher
- Item #
- Storage number (applies to backlog rape cases only)
- Incident Date
- Case Type
- Full Complaint Number (add a leading zero to give 6 digits in the last segment)
- Borough
- Victim/Entity name
- Suspect info (if available)
- Assigned Criminalist (or tech reviewer, if criminalist is no longer at OCME)

Suspect/Offender Side - fields that must be entered if present in case documentation:

- Lab/Barcode/Offender ID (twice)
- Last Name
- First Name
- Complaint number
- NYSID or other state's ID number (add a leading zero to the NYSID if needed, to achieve the format 12345678L, so that the DNA HIT will be able to propagate into NYPD's ECMS system correctly)
- FBI #
- Voucher (for suspect samples)

Notes section:
Statement regarding forensic sample being a mixed profile or partial profile.
    This match is to a xx-locus, partial, profile.
    This match is to a xx-locus, mixed, profile.

5.6.11   Have the technical reviewer approve the match in DNA HITS. Once approved, the assigned analyst and technical reviewer will receive a DNA HITS confirmatory email from DNAHITS@cityhall.org.

5.6.12   Print out the DNA HITS email confirmation and add to the case record.

5.7   Verifying and Reporting Missing and Unidentified Person Matches

5.7.1   General Search Guidelines:

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There are varied searches done in CODIS to accommodate Missing and Unidentified Person cases. "Exact matches" are the result of an identity search. An identity search is done amongst the following indices:

- Unidentified Human Remains to Unidentified Human Remains
- Unidentified Human Remains to Missing Persons

5.7.1.1   Profiles of Unidentified Human Remains and Missing Persons are also searched against Convicted Offenders and Forensic Unknowns. Searches are performed against the following indices:

- Unidentified Human Remains to Convicted Offenders
- Unidentified Human Remains to Forensic Unknowns
- Missing Persons to Convicted Offenders
- Missing Persons to Forensic Unknowns

5.7.1.2   Ranks or associations to relatives of Missing Persons in a pedigree tree are the result of a pedigree search. A pedigree search is done amongst the following:

- Pedigree Tree to Unidentified Human Remains
- Single Typed Node pedigree trees to Unidentified Human Remains
- Biological Mother, Father, and Child to Unidentified Human Remains

5.7.1.3   Refer to the NYS CODIS Procedures-Search Parameters and NDIS Missing Person DNA Searches (Operational Procedures) from the FBI for search parameters.

5.7.2   Exact Matches in CODIS

5.7.2.1   Exact matches in CODIS occur between profiles from Unidentified Human Remains searched against profiles of Unidentified Human Remains and Missing Persons/Deduced Missing Persons.

5.7.2.2   Local Level Exact Matches (LDIS):

Unidentified Human Remains to Unidentified Human Remains and/ or Unidentified Human Remains to Missing Persons

Request and pull the case files.

Confirm that the profiles match by reviewing the data.

Compare the information available in the files. Some questions to consider are:

- When was the body recovered in relation to when the person was reported missing?

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- Are physical descriptions such as age, race, stature, hair color, eye color, tattoos, scars, etc. indistinguishable?
- Are fingerprints, dental records, or other medical records available for comparison? If these are available, the information should be shared with the appropriate departments for comparison such as the Forensic Anthropology Unit, Forensic Odontology, Forensic Pathology, or NYPD.
- Determine if the samples were tested in concordance with the duplication guidelines.
- Determine whether the matching samples were processed together:
- Evidence exam on the same date and/or by the same analyst?
- DNA extraction and/or amplification worksheet with the same date and time?
- If so, see your supervisor or technical reviewer and Assistant Director immediately.
- Determine if additional technologies such as Y-STRs or mtDNA are needed to confirm or refute the match.

Transfer the newly linked case/or cases to the interpreting analyst from the previous case or to the analyst that has the lowest FB case number. Have your supervisor update records to reflect the new case assignment. (This step can be done after notifications, if desired.)

Once all is confirmed, notifications can be made via telephone and/or email.

An additional report is written linking the two cases together. Random match probability statistics are performed on the unidentified human remains and included in the report in accordance with Forensic Biology protocol.

A notification letter and a copy of the additional report are sent via email to notify all involved parties of the match. For matches with unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. Matches involving outside jurisdictions will be sent to that jurisdiction's designee(s). The notification letter may be sent by emailing a scanned .pdf copy of the original signed letter and/or facsimile.

5.7.2.3   State Level Exact Matches (SDIS)

Missing persons samples at SDIS are included in the weekly searches for direct matches within the offender or forensic indices. Pedigree and low-stringency searches at SDIS are done less often (monthly or quarterly).

5.7.2.4   National Level Exact Matches (NDIS):

Unidentified Human Remains to Unidentified Human Remains and/or Unidentified Human Remains to Missing Persons

With DNA matches identified at NDIS, both laboratories involved in the match have confirmation responsibilities.

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Responses to all candidate matches must be immediate. The final disposition of the candidate match to the NDIS custodian must be reported no later than 30 business days after receiving the match report.

The CODIS staff will print out the Candidate Match Detail Reports from the CODIS system along with a Match Inventory list (a summary list of all the cases involved in the candidate matches) and retrieve the corresponding files.

Each candidate match report and corresponding file or LIMS case record must be reviewed to confirm whether or not the two profiles indeed match. The analyst reviewing the file must fill out a Candidate Match Confirmation Checklist.

If any modifications to the DNA profile are needed, a Profile Modification Form must be filled out by the Interpreting Analyst or the analyst reviewing the data (see section 4.6), and submitted to the CODIS group. It is not necessary to wait for the profile to be modified to continue the confirmation process.

Compare the information available in the files. Some questions to consider are:

- When was the body recovered in relation to when the person was reported missing?
- Are physical descriptions such as age, race, stature, hair color, eye color, tattoos, scars, etc. indistinguishable?
- Are fingerprints, dental records, or other medical records available for comparison? If these are available, the information should be shared with the appropriate departments for comparison such as the Forensic Anthropology Unit, Forensic Odontology, Forensic Pathology, or NYPD.
- Determine if the sample(s) were tested in concordance with the duplication policy.
- Determine whether the matching samples were processed together:
- Evidence exam on the same date and/or by the same analyst?
- DNA extraction and/or amplification worksheet with the same date and time?

If so, see your supervisor or technical reviewer and Assistant Director immediately.

Determine if additional technologies such as Y-STRs or mtDNA are needed to confirm or refute the match.

Once all is confirmed, notifications can be made via fax or email.

An additional report is written. Statistics are performed on the unidentified human remains or the missing person profile and included in the report in accordance with Forensic Biology protocol. If the remains are intact or living person is found, then the profile should be removed from CODIS and noted in the additional report. Refer to Section 4.6.

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A notification letter and a copy of the report are sent via email to notify all involved parties of the match. For matches with unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. Matches involving outside jurisdictions will be sent to that jurisdiction's designee(s). The notification letter may be sent by emailing a scanned .pdf copy of the original signed letter and/or facsimile.

5.7.3   Exact Matches in CODIS

5.7.3.1   Unidentified Human Remains to SDIS offender exact matches

If the profiles are an exact match, complete a NYS DNA Databank Candidate Match Confirmation Form. This form communicates to DCJS and the Databank coordinator the case information, and that the candidate match is, in fact, a true match. Therefore, one NYS DNA Databank Candidate Match Confirmation Form for every confirmed candidate match listed on the Match Inventory must be completed. The NYS DNA Databank Candidate Match Confirmation Form is then transmitted to DCJS by fax or other electronic means.

Upon receipt of the NYS DNA Databank Candidate Match Confirmation Forms from our laboratory, and upon receipt of confirmation of the offender sample from the NYS DNA Databank coordinator, DCJS will release the offender's name, via fax followed by USPS, in the form of a DCJS Match Letter (see the current version of the *New York State COmbined DNA Index System Procedures)*. This letter will contain the name of the offender, any aliases, and the NYSID number.

Request and pull the case file.

Confirm that the profiles match by reviewing the data.

Determine if the sample was tested in concordance with the duplication guidelines.

Once all is confirmed, notifications can be made via telephone and/or email to the OCME Identification Unit and to the Medical Examiner.

An additional report is written. Random match probability statistics are performed on the unidentified human remains and included in the report in accordance with Forensic Biology protocol.

A notification letter and a copy of the additional report are sent via email to notify all involved parties of the match. For matches with unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. The notification letter may be sent by emailing a scanned .pdf copy of the original signed letter and/or facsimile.

5.7.3.2   Unidentified Human Remains to NDIS offender exact matches

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After the data is reviewed, the other laboratory involved in the match must then be notified via telephone, fax or email and the match verified. Both laboratory's case numbers and ORI numbers are on the Match Inventory list. The contact information for all CODIS laboratories can be found on the CJIS-WAN. Standard case contact protocol should be followed to document any correspondence or conversations.

If it is determined the candidate match is a non-match, the process stops here. All case contacts should be documented on the checklist accordingly.

If it is verified to be a true match, information regarding the cases must be exchanged. The CODIS DNA Match Data Request and Response Form is transmitted to the offender laboratory by fax or other electronic means. This form facilitates the exchange of information. Information on this form, if available, should include:

- Contact information for the submitting police agency.
- Contact information for the laboratory.
- Laboratory and police identification numbers (for example, case number, complaint number, etc.).
- Whether the case is solved (i.e. by DNA).
- Suspect information (for example, name, NYSID number, has he/she been tested at our lab, etc.).
- General case information (for example, date of occurrence, type of crime, etc.).
- If the case with the match at NDIS is one of a local pattern, information regarding both/all should be provided to the other laboratory.
- When available, include any known aliases of the offender/suspect if the case is solved, because the offender/suspect may be in the other database under a different name.

Upon receipt of the CODIS DNA Match Data Request and Response Form from our laboratory, and upon the offender laboratory's confirmation of the offender sample, the match is confirmed. The offender laboratory will release the convicted offender's name, via fax, in the form of a match letter. This letter will contain the name of the offender, any aliases, the State ID #, and often an FBI number or social security number.

- Request and pull the case file.
- Confirm that the profiles match by reviewing the data.
- Determine if the sample was tested in concordance with the duplication guidelines.

Once all is confirmed, notifications can be made via telephone and/or email to the OCME Identification Unit and to the Medical Examiner.

An additional report is written. Random match probability statistics are performed on the unidentified human remains and included in the report in accordance with Forensic Biology protocol.

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A notification letter and a copy of the additional report are sent via email to notify all involved parties of the match. For matches with unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. The notification letter may be sent by emailing a scanned .pdf copy of the original signed letter and/or facsimile.

5.7.4   Ranks in CODIS

- Pedigree Tree to Unidentified Human Remains (UHR)
- Single Typed Node pedigree trees to Unidentified Human Remains (UHR)
- Pedigree Tree to Missing Person (MP)
- Biological Father, Mother, Sibling (with additional technology) to UHR or MP

5.7.4.1   Profile(s) from a pedigree tree associated to unidentified human remains or a missing person are ranked according to a joint pedigree likelihood ratio (JPLR) in Rank Manager. Any JPLR above 500 will constitute a rank.

5.7.4.2   The CODIS staff will print out the Specimen Detail Reports for the associated ranks to the pedigree tree or single relative.

Fill out the Rank Manager Sample Inquiries Form.

Locate the files and determine if the JPLR constitutes a true association.

Some questions to help in the disposition:

- Does the gender of the Missing Person correlate to the UHR?
- When was the body recovered in relation to when the person was reported missing?
- If further investigation is still needed, then review the STR data and perform kinship analysis.
- If an additional technology such as mtDNA has been performed, utilize that in the assistance of the disposition of the case.
- Determine if additional technologies such as YSTRs or mtDNA need to be performed.
- Determine if additional reference samples from relatives of missing persons or samples from the missing person are available and needed to assist in the identification (i.e. strengthening the likelihood ratio or assisting in confirming an association via a direct match with a reference sample from the missing person).

If the association does not pan out, note it as "No Match" and initial and date the Specimen Detail Report and make comments on the Rank Manager Sample Inquiries Form.

For true associations, notifications can be made via telephone and/or email.

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An additional report is written. Kinship analysis is performed between the relatives of the Missing Person and the unidentified human remains or the missing person profile and included in the report in accordance with Forensic Biology protocol. The profiles of the relatives of the Missing Person must be removed from CODIS and noted in the additional report. Refer to Section 4.6.

A notification letter and a copy of the report are sent via email to notify all involved parties of the match. For associations to unidentified remains from NYC OCME, the assigned Medical Examiner, Identification Unit, and NYPD Missing Persons are always notified. Associations involving outside jurisdictions will be sent to that jurisdiction's designee(s). The notification letter may be sent by emailing a scanned .pdf copy of the original signed letter and/or facsimile.

5.7.5   Low stringency searches in CODIS

5.7.5.1   NY State performs a low stringency search every quarter against the remaining Relatives of Missing Person samples in the state database against the Unidentified Human Remains index in CODIS.

5.7.5.2   For verifying and reporting these possible matches, follow the same steps above in 5.7.4 Ranks in CODIS.

5.8   Organization of CODIS Paperwork in Case Records

5.8.1   For LIMS era case records, CODIS documentation is added to the case record electronically.

5.8.1.1   Events that should be noted on the DNA Profile Evaluation page in LIMS include:

- Initial LINKAGE search (date, analyst, and any true matches found)
- Initial LDIS search (date, analyst, and any true matches found)
- Initial LabTypes search (date, analyst, and any true matches found)
- No-matches discovered in LDIS, SDIS or NDIS searches, one event line per search type; approximately 10 specimen IDs. Use "Profile does not match in" as the event type.
- Profile entry into LDIS (date, analyst)
- Date profile upload/search confirmed in SDIS/NDIS when applicable (date, analyst)
- Date profile confirmed to be in LDIS (for non-uploaded categories)

5.8.2   In pre-LIMS era files, the documentation is arranged as follows:

- Left side of file: if all paperwork was properly completed and photocopied, the left side of the file with a confirmed match should contain:
- DNA Profile Evaluation Form - copy
- Specimen Detail Report - printout from CODIS

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- Candidate Match Detail Report - printout from CODIS.

NOTE: It is not necessary to write "match", with date and initials on this printout, because the next items in the case record will be what was done to complete the confirmation and report the match.

- Candidate Match Confirmation Checklist - original
- Candidate Match Confirmation Form - copy
- DCJS Match Letter – copy sent by DCJS (or comparable form from another state)
- DNA HITS confirmation email – printout from email (CODIS staff does not need a copy)

5.8.2.1 If a candidate match is reviewed and found to NOT be true match, include:

- DB Profile evaluation form
- CODIS Non-Matching Comparison Record – list each no-match on the original form if pre-LIMS era case. There may be more than one no-match listed for any given profile, and more may be added as future searches are conducted. Use a separate worksheet for each profile in the case, adding additional pages as necessary.

5.8.2.2 For Partial Match cases, the left side of file depending on the type of match and level may have some or all of the following:

- DB Profile documentation report
- Specimen Detail Report - printout from CODIS
- Candidate Match Detail Report - printout from CODIS
- Partial Match Evaluation Form
- Likelihood ratios – printout from CODIS Popstats application
- Hit Notification Letter-original or copy, PDF of original saved in CODIS folder under "HITNOT" in "MISP" for Missing Persons identification cases only

5.8.2.3 For Missing Persons cases, left side of file depending on the type of match may have some or all of the following:

- Forensic Biology report(s)
- DNA Profile Evaluation Form-copy
- Specimen Detail Report - printout from CODIS
- Candidate Match Detail Report - printout from CODIS
- Candidate Match Confirmation Checklist – original
- Hit Notification Letter-original or copy, PDF of original saved in CODIS folder under "HITNOT" in "MISP"

5.8.2.4 Depending on the type of match and at what level it may have occurred, the following may also be on the left side of the file:
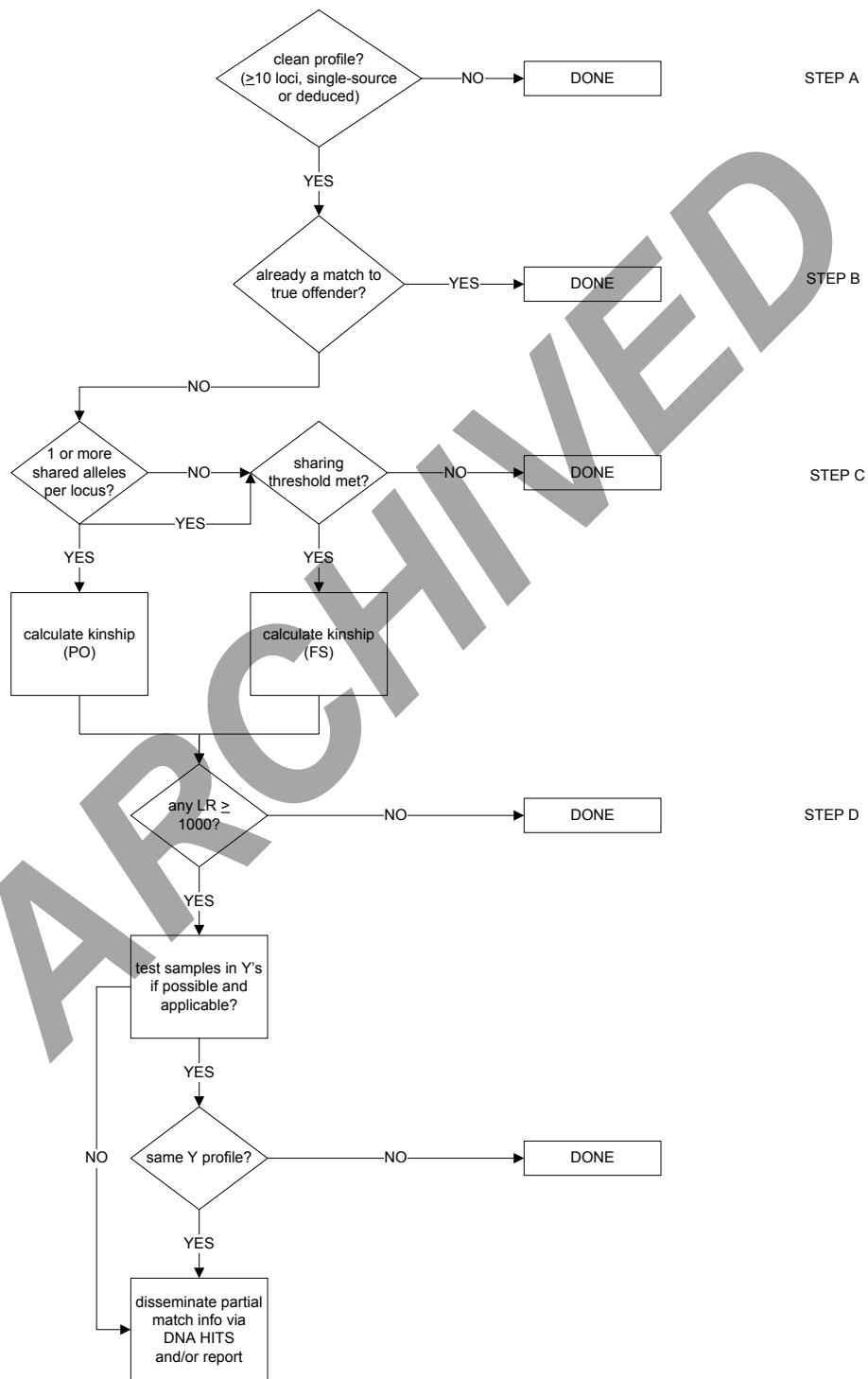
- Candidate Match Confirmation Form-copy
- DCJS Match Letter-faxed copy
- Supporting paperwork such as copies of dental records, anthropology reports and scene reports from within OCME or from the outside jurisdiction.

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Local partial match flowchart