

# CODIS Entry and Upload of Casework DNA Typing Results

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# CODIS Entry and Upload of Casework DNA Typing Results

## 1 INTRODUCTION

The **CO**mbined **DNA** Index System (CODIS) is a collection of DNA databases from forensic and databasing laboratories throughout the United States. CODIS consists of various indices including a forensic index, an offender index, and a missing persons index. CODIS enables federal, state, and local DNA laboratories to exchange and compare DNA profiles in order to link crimes to one another and to offenders. In addition, it allows DNA profiles from unidentified human remains to be linked to forensic samples, offender samples, and to samples involving missing persons.

CODIS functions as three separate tiers: local, state, and national. DNA profiles originate at the local level (LDIS – Local DNA Index System) and are then uploaded to state and national levels to be searched. The State DNA Index System (SDIS) laboratory typically serves as the central point of contact for access to the National DNA Index System (NDIS). NDIS is the national, FBI-administered, centralized database of all DNA profiles contributed by SDIS laboratories. The FBI Laboratory CODIS Unit manages the NDIS database and supports the SDIS and LDIS laboratories by providing computer software, training, and assistance with searches. This tiered approach enables local, state, and federal laboratories to manage the samples in their databases based upon their specific legislative requirements.

The FBI Laboratory DNA Casework Unit (DCU) located in Quantico, VA and Huntsville, AL perform the testing to generate DNA profiles (i.e., STR profiles or mitochondrial DNA sequences) from forensic and missing persons samples for entry into LDIS. Eligible profiles are then uploaded to SDIS where they are compared to profiles submitted by the Federal DNA Database Unit (FDDU) and by the Bureau of Alcohol, Tobacco, Firearms, and Explosives (BATFE). Eligible profiles are then uploaded to NDIS where they are compared nationally against all applicable indices. CODIS uploads and searches are conducted on a regular basis.

## 2 SCOPE

These procedures apply to DNA personnel who interpret or review DNA profiles from forensic and missing person cases, enter and upload DNA profiles from forensic and missing persons cases into CODIS, and disposition matches in CODIS.

## 3 EQUIPMENT

Combined DNA Index System (CODIS) Software (version 11.0 or higher)

## 4 PROCEDURE

### 4.1 CODIS Specimen Identification Number

- A. DNA profiles are entered into CODIS using a standardized format that is typically generated by the Sample Tracking and Control Software (STACS). The CODIS Specimen ID is a unique identifier that generally consists of the laboratory number, the item identifier, and stain identifier (e.g., 2017-00349\_1(1)A\_).

- B. For differentially extracted samples from a single item where profiles from both fractions are eligible for CODIS entry, a suffix/ID must be added in STACS, if applicable, to differentiate the samples. This suffix/ID addition will designate which fraction the profile came from (e.g., 2017-00349\_1(1)A\_F, 2017-00349\_1(1)A\_M).
- C. For forensic mixtures that result in major/minor designation, the portion of the profile being entered into CODIS may be indicated by adding information into the suffix/ID area in STACS, if applicable (e.g., 2017-00349\_1(1)A\_Cont1, 2017-00349\_1(1)A\_Cont2).

**4.2 Data Review Requirements Prior to CODIS Entry and Uploading**

- A. Each CODIS User will complete the Annual NDIS Eligibility Training which is required per the *National DNA Index System (NDIS) Operational Procedures Manual*.
- B. All DNA profiles must undergo primary analysis and technical review by appropriately qualified DNA Examiners prior to CODIS entry. Interpretation/review of the data must be performed in accordance with the appropriate DNA interpretation procedure (e.g., BIO-570, BIO-571).
- C. A qualified DNA Examiner is responsible for determining whether or not the DNA profile is eligible for entry into CODIS and assigning the specimen to the correct specimen category.

1. The original 13 CODIS core loci are: D3S1358, vWA, D16S539, CSF1PO, TPOX, D8S1179, D21S11, D18S51, TH01, FGA, D5S818, D13S317 and D7S820.

2. Specimen categories available:

- i. **Forensic Unknown:** This category is for samples from a single source (or a fully deduced profile originating from a mixture) from a putative perpetrator that contains results for all of the original 13 CODIS core loci. This profile shall not have more than 3 alleles at one locus while the remaining loci can have up to 2 alleles. There should be no indication of locus or allelic dropout at the original 13 CODIS core loci. This specimen category is used for uploading to NDIS.
- ii. **Forensic Partial:** This category is for samples originating from a single source (or a fully deduced profile originating from a mixture) from a putative perpetrator with either locus or allelic dropout at one or more of the original 13 CODIS core loci for entry into NDIS or any typed loci for entry into LDIS. This profile shall not have more than 3 alleles at one locus while the remaining loci can have up to 2 alleles. A single-source partial profile that will be entered into SDIS only must be entered using the SDIS Only specimen category. A moderate match

estimate (MME) must be calculated for this specimen category if the specimen is entered at either NDIS or SDIS.

- iii. **Forensic Mixture:** This category is for samples that contain DNA contributed from more than one source. These profiles can contain loci with 3 or more alleles at 1 or more loci (not to exceed 4 alleles at any locus) and/or loci with 2 alleles that need to be searched at moderate stringency. This specimen category will be used for entry into NDIS (using the original 13 CODIS core loci) and LDIS (using all typed loci). If an allele at a mixed locus can be definitively attributed to the putative perpetrator, it may be designated with a plus sign “+” as an obligate allele. A forensic mixture profile that will be entered into SDIS only must be entered using the SDIS only specimen category. An MME must be calculated for this specimen category if the specimen is entered at either NDIS or SDIS.
  
- iv. **Forensic Targeted:** These profiles originate from a forensic partial or a forensic mixture that do not meet the NDIS MME threshold but do meet the match rarity estimate (MRE) threshold if searched at a specified stringency by locus (high or moderate). These profiles must contain at least 8 of the original 13 CODIS core loci. These profiles will only be searched against full single source profiles (i.e., Forensic Unknown, Convicted Offender, Arrestee, Detainee, Legal). All unambiguous loci will be searched at high stringency. Any loci with more than 2 alleles will be searched at moderate stringency. Any loci marked as partial will be searched at moderate stringency. This is considered a ‘last resort’ specimen category to upload a specimen to NDIS.
  
- v. **SDIS Only:** This category is for samples that originate from a single source (or a fully deduced profile originating from a mixture) or samples that contain DNA from more than one source that do not meet the requirement for uploading to NDIS but do meet the requirements for uploading to SDIS. Note: If a sample is being entered into LDIS only or NDIS, do *not* select this category. An MME must be calculated for this specimen category
  
- vi. **SDIS Only Forensic Targeted:** These profiles originate from forensic partial or forensic mixture samples that do not meet the NDIS MME threshold nor the NDIS MRE threshold for uploading but do meet the SDIS threshold (SDIS MRE) for uploading. These profiles will be searched against full single source profiles (i.e., Convicted Offender, Arrestee, Detainee). All unambiguous loci will be searched at high stringency. Any loci with more than 2 alleles will be searched at moderate stringency. Any loci marked partial will be searched at

moderate stringency. This is considered a 'last resort' specimen category to upload a specimen to SDIS. As such, all specimens in this category must be source ID no.

**Table 1 - Specimen Requirements for Forensic Samples at each Index Tier**

Tier	NDIS	SDIS	LDIS
Forensic Unknown	All original 13 CODIS core loci Tri-allele allowed @ 1 core locus Spec Cat: Forensic Unknown	All original 13 CODIS core loci Tri-allele allowed @ 1 core locus Spec Cat: Forensic Unknown	All original 13 CODIS core loci Tri-allele allowed @ 1 core locus Spec Cat: Forensic Unknown
Forensic Mixture	≥ 8 original 13 CODIS core loci ≤ 4 alleles / locus MME ≥ 10 million Obligate alleles "+" Spec Cat: Forensic Mixture	≥ 7 loci ≤ 4 alleles / locus MME ≥ 1.2 million Obligate alleles "+" Spec Cat: SDIS Only	≥ 6 loci ≤ 4 alleles / locus MME 1 in size of LDIS Obligate alleles "+" Spec Cat: Forensic Mixture
Forensic Partial	≥ 8 original 13 CODIS core loci MME ≥ 10 million Mark partial loci Spec Cat: Forensic Partial	≥ 7 loci MME ≥ 1.2 million Mark partial loci Spec Cat: SDIS Only	≥ 6 loci MME 1 in size of LDIS Mark partial loci Spec Cat: Forensic Partial
Forensic Targeted	≥ 8 original 13 CODIS core loci ≤ 4 alleles / locus MRE ≥ 10 million Obligate alleles "+" Mark partial loci Spec Cat: Forensic Targeted	≥ 7 loci ≤ 4 alleles / locus MRE ≥ 1.2 million Obligate alleles "+" Mark partial loci Spec Cat: SDIS Only FT	NA
SDIS Only	NA	See above for Forensic Mixture, Forensic Partial	NA

vii. **Biological Child; Biological Father; Biological Mother; Sibling; Maternal Relative; Paternal Relative; Spouse:** These categories are for Relatives of Missing Persons samples that are voluntarily provided as reference samples where amelogenin is required. All of the 20 CODIS core loci with no drop out are required for uploading to NDIS. These samples require a signed consent form witnessed by law enforcement in order to be uploaded to CODIS.

viii. **Deduced Missing Person:** This category is for DNA profiles of a missing person that have been generated by examining intimate items purported to belong to the missing person (e.g., toothbrush). In order to enter these samples into CODIS, amelogenin is required and 7 of the original 13 CODIS core loci are required for upload to NDIS.

- ix. **Missing Person:** This category is for known reference samples from an individual that is missing. The source of the DNA has been verified as originating from the missing person (e.g., tissue from a medical sample). In order to enter these samples into CODIS, amelogenin is required and 7 of the original 13 CODIS core loci are required for upload to NDIS.
  - x. **Unidentified Human Remains (UHR):** This category is for DNA profiles from deceased individuals (e.g., bones) or an individual who is unidentified (e.g., children or others who cannot identify themselves or those who refuse to identify themselves). In order to enter these samples into CODIS, amelogenin is required and 7 of the original 13 CODIS core loci are required for identity searches at NDIS.
3. The DNA profile from a forensic sample (i.e., forensic unknown, forensic mixture, forensic partial, Forensic Targeted, SDIS Only Forensic Targeted) shall only offer those alleles that are attributed to the putative perpetrator(s). Alleles derived from forensic profiles that are unambiguously attributed to a victim or individuals other than the perpetrator(s), such as a consensual partner, will not be offered to CODIS. The qualified DNA Examiner may refer to "A Guide to Determining What is Allowable in the Forensic Index at NDIS", for clarification of what may be entered into CODIS.
  4. The DNA results from any locus in which an ambiguity exists in the assignment of one or more alleles to the putative perpetrator(s) may be offered to CODIS. The mere observation of alleles that may be attributed to individuals other than the putative perpetrator, does not in itself preclude offering DNA profiles to CODIS at that locus.
  5. When a forensic profile that has matched a known reference profile is being uploaded to CODIS, the forensic profile must be marked as source ID yes.
- D. Profiles entered into the Missing Persons, Relatives of Missing Persons, and Unidentified Human Remains Indices will not include homozygous alleles below the stochastic threshold listed in the applicable DNA interpretation procedure as these searches are conducted at low stringency. Profiles for entry into these indices may include heterozygous typing results below the stochastic threshold listed in the applicable DNA interpretation procedure.
- E. Samples for entry into the Missing Persons, Relatives of Missing Persons, and Unidentified Human Remains Indices will not include results for loci with tri-alleles. If a tri-allele is observed in an original 13 CODIS core locus, contact the casework LDIS Administrator or casework Missing Persons Program Manager for additional guidance.

- F. Missing Persons and Unidentified Human Remains samples should have DNA typing for autosomal as well as the appropriate lineage marker(s) attempted.
- G. All Relatives of Missing Persons samples must be typed for autosomal markers. In addition, at least one member of the pedigree should be typed using an appropriate lineage marker.
- H. Missing Persons, Unidentified Human Remains, and Relatives of Missing Persons samples that are typed for YSTRs should not have DYS570 and DYS576 entered into CODIS as these loci are rapidly mutating and are not suitable for entry and upload into NDIS.
  - 1. The DYS570 and DYS576 loci should not be entered into the CODIS entry form in Profile Management in STACS. Another final profile with these two loci should be created to allow for potential rank dispositioning by the casework LDIS Administrator or Missing Person Program Manager or qualified DNA examiner. These loci may be added as a comment in CODIS.
- I. A complete mitochondrial DNA (mtDNA) sequence includes positions 16024 to 16365 and 73 to 340 (HV1 and HV2). Profiles that meet or exceed this range are acceptable for uploading to NDIS. Profiles that are less than the NDIS definition for completeness can be stored in LDIS.
- J. Profiles that have complete mtDNA sequences, but have fewer than 7 of the original 13 CODIS core loci, may have the autosomal data stored in CODIS for evaluation purposes.
- K. Unidentified Human Remains profiles with less than 7 of the original 13 CODIS core loci may be eligible for searching at NDIS in a pedigree search on a case-by-case basis upon permission of the casework LDIS Administrator or casework Missing Persons Program Manager.
- L. Composite DNA profiles for all specimen categories, with the exception of Relatives of Missing Persons, may be entered into CODIS. Uploading the maximum amount of genetic information available for a given qualifying DNA profile decreases the likelihood of spurious matches within a database the size of NDIS. To reasonably ensure that a DNA profile compiled from genetic information derived from separate extractions, amplifications, and/or injections has arisen from the same individual, the resultant DNA profile must 1) be compiled from different items from a common source (e.g., replicate vaginal swabs, swabs from the same orifice such as vaginal and cervical swabs), multiple cuttings of the same evidentiary stain, or cuttings from different stains of the same grouping on a given evidence item and 2) demonstrate concordance as defined in the applicable DNA interpretation procedure.

M. Additional questions about the suitability/eligibility of a particular DNA profile for CODIS should be directed to the casework LDIS Administrator, casework LDIS Alternate Administrator, FBI State Administrator, or the FBI State Alternate Administrator.

#### **4.3 Entering and Uploading DNA Profiles into CODIS**

- A. Eligible profiles will be entered into the appropriate specimen category (e.g., Forensic Unknown) and marked for upload.
- B. When there are matching samples within a case (i.e., duplicate samples) only one will be marked for upload to NDIS.
- C. The appropriate DNA profiles (i.e., CODIS eligible profiles) are entered by the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software). Data entry and uploading of DNA profiles will be performed routinely following NDIS procedures and instructions for the current version of the CODIS software.
  - 1. Profiles and/or pedigrees that are manually entered into the CODIS software should be verified by the LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software).
- D. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will review the SDIS and NDIS Reconciliation Reports to confirm the receipt and processing of the upload to SDIS and NDIS.
- E. The DNA profiles at LDIS are uploaded to SDIS according to parameters set by the FBI State Administrator or the FBI State Alternate Administrator. Profiles not eligible for entry into SDIS (e.g., staff profiles) will not be marked for upload.
- F. Data linking may be performed by the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software), as appropriate, following instructions for the current version of the CODIS software. DNA profile information may also be exported and provided to another laboratory for data linking purposes.

#### **4.4 Routine Searches of the Database**

- A. The CODIS software will be routinely checked for candidate matches and ranks by the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software). A candidate match is a possible match between two or more DNA profiles discovered by the CODIS software. Ranks are potential associations between UHR samples and pedigree trees comprised of Relatives of Missing Persons samples.



- B. Candidate matches and ranks will be evaluated by the casework LDIS Administrator (or qualified DNA Examiner) for moderate or low stringency hits and evaluated by the casework LDIS Administrator (or qualified DNA Examiner or person with administrative rights who has been trained to use the CODIS software) for high stringency hits.

#### 4.5 DNA Index of Special Concern (DISC) (Rapid-Enabling of Samples)

- A. In order to be DISC eligible, samples must be entered into the Forensic Unknown specimen category as source ID no (i.e., unsolved). These cases must be from unsolved cases of significant public safety concern. These cases of significant public safety concern are defined as sexual assault cases, homicide cases, kidnapping cases, and terrorism cases. The determination will be made by a qualified DNA examiner.
- B. Casework Metadata must be entered prior to DISC enrollment. This metadata, if applicable, should be compiled by the qualified DNA Examiner. The metadata will be entered into the CODIS software by the casework LDIS administrator (or person with administrative rights who has been trained to use the CODIS software). The required metadata for DISC samples is:
  - o Investigative ID: ORI of investigative agency (up to 10 characters). This ORI is the agency's ORI that the investigative agency monitors 24 hours a day for National Crime Information Center (NCIC) Hit Confirmation.
  - o Investigative Case Tracking ID: (up to 32 characters) Investigative agency's reference/case ID
  - o Investigative phone number: (14 characters format (xxx) xxx-xxxx) Point of Contact of case
  - o Statute of Limitations: (MM-DD-YYYY or check box for unlimited): Information must be obtained from investigator or prosecutor's office
  - o Offense Description: (up to 64 characters): Description of type of crime that yielded type of evidence
  - o Extradition Information: (up to 255 characters): Investigating agency must be willing to extradite; minimum information is "yes" or "Pending Extradition"
  - o Investigating Agency Contact Information: (up to 255 characters): Any additional contact information or contacts such as contacts to investigative agency's 24 hour Wants and Warrants desk or other case specific information
- C. DISC samples will be periodically checked for hits to SDIS/NDIS samples by the casework LDIS administrator (or any person with administrative rights who has been trained to use the CODIS software). If the source ID has changed to 'Yes', these DISC samples will be un-enrolled as these samples are no longer eligible for DISC.

#### 4.6 Review of the Match/Rank Detail Report

- A. The casework LDIS Administrator (or qualified DNA Examiner or person with administrative rights who has been trained to use the CODIS software) will review the Match/Rank Detail Reports and supporting case file documentation, if necessary, to determine if confirmation of the match/rank is required if the match/rank is at

high stringency or, if the match/rank is at moderate/low stringency, this confirmation will be performed by the casework LDIS Administrator (or qualified DNA Examiner).

1. If the candidate match is determined to be a match and confirmation is required, the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will record the following information, as appropriate:
    - Match ID #
    - FBI Specimen ID #
    - State Specimen ID #
    - Match stringency
    - Indices of specimens (e.g., Forensic vs. Forensic, Forensic vs. Convicted Offender)
    - Point of contact information for other laboratory (or Federal DNA Database Unit)
    - Results of search for previous CODIS matches
  2. For CODIS Missing Persons candidate ranks, the casework LDIS Administrator (or qualified DNA Examiner) will review any calculated ranking information the software may have given to a match (i.e., Joint Pedigree Likelihood Ratio (JPLR) and/or combined Likelihood Ratio (LR)) and supporting case file documentation, if necessary, in an effort to evaluate the association. The following information will be recorded as appropriate:
    - Rank ID #
    - FBI Specimen ID #
    - Pedigree ID#
    - Indices of specimens (e.g., UHR vs. Pedigree, UHR vs. Convicted Offender)
    - Point of contact information for other laboratory (or Federal DNA Database Unit)
    - Results of search for previous CODIS ranks
- B. If the candidate match/rank is determined not to be an association, the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will disposition the match/rank accordingly and no further action is required.

#### 4.6.1 Forensic Sample to Forensic Sample Match

A forensic match occurs when two or more DNA profiles developed from crime scene evidence submitted from forensic laboratories match to one another.

- A. If a forensic sample hits to another sample with high stringency, the hit does not need evaluation by an examiner prior to the exchange of information with the other laboratory. If a forensic mixture sample hits to another sample at high stringency, an

appropriately qualified DNA examiner will need to perform an evaluation with STRMix™ prior to issuance of any written notifications.

B. To evaluate moderate stringency matches:

1. If DCU has a forensic unknown and the other laboratory has a forensic partial or forensic mixture:
  - i. The other laboratory should evaluate the hit to determine if the samples match.
2. If DCU has a forensic partial and the other laboratory has a forensic unknown:
  - i. An appropriately qualified DNA examiner should visually determine if the hit is a match/no match. The examiner will record their determination on the match details report along with their initials and date.
3. If DCU has a forensic partial and the other laboratory has a forensic mixture:
  - i. The other laboratory should evaluate the match to determine if this match is a hit.
4. If DCU has a forensic mixture and the other laboratory has a forensic unknown:
  - i. An appropriately qualified DNA examiner should use STRMix™ to determine if the hit is a match/no match.
  - ii. A match will be declared if the likelihood ratio (LR) is at least one in the size of the NDIS database for an NDIS match and at least one in the size of the SDIS database for an SDIS match.
  - iii. The examiner will record their determination on the match details report along with their initials and date.
5. If DCU has a forensic partial and the other laboratory has a forensic partial:
  - i. An appropriately qualified DNA examiner will determine which profile has the least amount of DNA data (DCU or the other laboratory).
  - ii. If the profiles from both laboratories share the same amount of DNA data, the examiner will determine if the hit is a match/no match and will electronically add their initials and date to the match detail report. The other laboratory will also evaluate the match.
  - iii. If the other laboratory has the more partial profile:
    - a. The other laboratory will determine if the hit is a match or no match.
  - iv. If DCU has the more partial profile:
    - a. The examiner will visually determine if the hit is a match/no match and will add their initials and date to the match detail report with their determination.

6. If DCU has a forensic mixture and the other laboratory has a forensic partial:
  - i. An appropriately qualified DNA examiner will determine if the hit is a match using STRMix™. The DCU examiner will select loci from the other laboratory's profile that have been determined to not have the possibility of drop-out. This may be determined by utilizing loci that are heterozygous or by contacting the other laboratory.
  - ii. A match will be declared if the likelihood ratio (LR) is at least one in the size of the NDIS database for an NDIS match and at least one in the size of the SDIS database for an SDIS match.
  - iii. The examiner will add their initials and date to the match detail report with their determination.
  
7. If DCU has a forensic mixture and the other laboratory has a forensic mixture:
  - i. The electropherogram from the other laboratory will be requested by the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software).
  - ii. If a clear major profile can be determined from the other laboratory's electropherogram, an appropriately qualified DNA examiner may use the major profile to evaluate the hit using STRMix™ utilizing the guidance provided above for forensic partial profiles or forensic unknowns. Loci which contain mixtures or are partial must be ignored for a mixture to mixture evaluation.
  - iii. If a clear major profile cannot be determined from the other laboratory's electropherogram, an appropriately qualified DNA examiner must determine that the hit is a no match.
  - iv. The examiner will add their initials and date and final determination of match/no match to the match detail report.
  - v. Questions regarding whether the other laboratory's forensic mixture is too complex to be treated as a forensic partial should be directed to the casework LDIS Administrator, casework LDIS Alternate Administrator, DNA Technical Leader, or designee.
  
8. Note: Forensic Targeted and SDIS Only Forensic Targeted specimens fit into one of the above categories. By definition, Forensic Targeted and SDIS Only Forensic Targeted specimens are either forensic mixtures *or* single source specimens (i.e., forensic partial). A qualified DNA examiner must determine whether these specimens are single source or mixtures.

C. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will contact the other forensic laboratory to verify the match and exchange case information, as detailed in the NDIS Operational Procedures Manual. This information exchange will be recorded in the case file. The contributing agency will be provided with information regarding the forensic match.

If appropriate, the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will change the source ID box in LDIS.

#### 4.6.2 Forensic Sample to Offender Sample Match

An offender match occurs when a DNA profile obtained from a forensic sample matches to a convicted offender, arrestee, detainee, and/or legal sample.

- A. If a forensic sample hits to another sample with high stringency, the hit does not need evaluation by an examiner prior to the start of offender confirmation by the offender laboratory. Additionally, if a forensic mixture sample hits to another sample at high stringency, an appropriately qualified DNA examiner will need to perform an evaluation with STRMix™ prior to issuance of any written notifications.
- B. To evaluate moderate stringency matches:
  - 1. If the DCU has a forensic partial:
    - i. An appropriately qualified DNA examiner should visually determine if the hit is a match/no match and electronically add their initials and date to the match detail report with their determination.
  - 2. If the DCU has a forensic mixture:
    - i. An appropriately qualified DNA examiner should use STRMix™ to determine if the hit is a match/no match.
    - ii. A match will be declared if the likelihood ratio (LR) is at least one in the size of the NDIS database for an NDIS match and at least one in the size of the SDIS database for an SDIS match
    - iii. The examiner will electronically add their initials and date to the match detail report with their determination
- C. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will determine if the contributor of the forensic sample is unknown or if the source of the forensic sample has been previously identified either by direct comparison or a previous CODIS match. Additional information may be collected from appropriate FBI databases to aid in the determination.
  - 1. If the candidate forensic sample is from a solved case, the casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will confirm the identity of the subject with the convicted offender laboratory and disposition as a conviction match upon name confirmation.
  - 2. If the candidate forensic sample is from an unsolved case, the casework LDIS Administrator (or person with administrative rights who has been trained to

use the CODIS software) will contact the convicted offender laboratory for confirmation of the hit, as detailed in the *NDIS Operational Procedures Manual*. This information will be recorded in the case file.

3. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will update the source ID box from 'No' to 'Yes', if appropriate.
  4. For Unsolicited DNA Notifications (UDN) for Rapid hits received by the CODIS message center, the casework LDIS administrator (or person with administrative rights who has been trained to use the CODIS software) will retrieve these UDN messages and contact the contributor to verify that the contributor has received their copy of the UDN and that the contributor is following up on this investigative lead in a timely fashion.
- D. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will determine if the match provided investigative information and provide this to the CODIS Unit monthly or as required.
- E. Appropriate forensic and offender matches will be verified and recorded by an appropriately qualified DNA Examiner. Written notification containing the match information will be provided to the contributing agency.
1. In the case of a non-qualifying offense, the contributor will be provided with written notification which should include the offender's name, if provided by the offender laboratory, and a point of contact for the offender laboratory.
  2. If upon evaluation of a hit, it is determined that a forensic sample is not eligible for database entry, the sample will be removed from the database. The contributor will be provided with written notification which should include the offender's name, if provided by the offender laboratory, and information regarding the CODIS ineligibility of the forensic sample.
  3. Forensic mixture and forensic targeted (as appropriate, such as when it is a mixture) matches (with the exception of conviction matches) will be verified using STRmix™. A match will be declared if the likelihood ratio (LR) is at least one in the size of the NDIS database for an NDIS match and at least one in the size of the SDIS database for an SDIS match.
    - i. If a new STRmix™ deconvolution was needed in order to evaluate the match, the deconvolution must be technically reviewed by an appropriately qualified DNA Examiner prior to issuing the written notification to the contributing agency.
    - ii. If a STRmix™ assessment was needed in order to evaluate the match, and the LR from Previous function was utilized, only an administrative

review by the Unit Chief (or any qualified DNA examiner) is required prior to issuing the written notification to the contributing agency.

4.6.3 Missing Persons Matches/Associations

- A. A Missing Persons association occurs when a rank is evaluated by the casework LDIS Administrator (or qualified DNA Examiner) and determined to potentially be an association between a UHR sample and relatives of the Missing Person. Ranks are evaluated on the following information, if applicable:
  - o Joint Probability Likelihood Ratio/Combined Likelihood Ratio
  - o Lineage Markers
  - o Metadata
- 1. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will verify that the corresponding metadata between the UHR and family reference sample(s) is consistent and contact the other laboratory to exchange case information, if necessary, as detailed in the *NDIS Operational Procedures*. This information will be recorded in the case file.
- 2. Written notification will be provided to the contributing agency to include supporting statistical information (e.g., kinship index), as appropriate. Any notification containing statistical information must be technically reviewed by an appropriately qualified DNA Examiner.
  - i. The laboratory responsible for the UHR will provide the supporting statistical information regarding any ranks. However, if DCU is responsible for the relatives and the other laboratory who is responsible for the UHR is unable to provide the supporting statistical information, DCU will provide the supporting statistics and written notification.
- B. Missing Persons/UHR matches to Offender Samples occur when a DNA profile obtained from a Missing Person or UHR sample matches to a convicted offender sample.
  - 1. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will contact the convicted offender laboratory for confirmation of the hit, as detailed in the *NDIS Operational Procedures*. This information will be recorded in the case file.
  - 2. Upon receiving confirmation from the convicted offender laboratory, written notification will be provided to the contributing agency to include supporting statistical information (e.g., likelihood ratio as appropriate), when appropriate. Any notification containing statistical information must be technically reviewed by an appropriately qualified DNA Examiner.

3. A UHR that has been potentially identified should be removed from CODIS unless the UHR is partial remains or the appropriate authority (i.e., medical examiner) decides against identification.
- C. A lineage marker only association occurs when an association is made between a UHR containing no, or very limited autosomal STR data, and a pedigree which includes mtDNA or Y-chromosome data.
1. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will verify that the corresponding metadata between the UHR and family reference sample(s) is consistent and contact the other laboratory to exchange case information, if necessary, as detailed in the *NDIS Operational Procedures*. This information will be recorded in the case file.
  2. Written notification will be provided to the contributing agency to include supporting statistical information, when appropriate. Any notification containing statistical information must be technically reviewed by an appropriately qualified DNA Examiner.

4.6.4 Written Notification of a Match or Positive Association

- A. Written notifications will be issued as a *Laboratory Report* in accordance with the appropriate FBI Laboratory level 1 documents (i.e., LAB-200) unless an investigative lead, intelligence, or other information (i3) product is appropriate.
- B. All written notifications will be administratively reviewed and technically reviewed, as appropriate, by the Unit Chief and/or any qualified DNA Examiner. This review will also verify the following information:
  - o Administrative information, if applicable (including specimen/sample, investigator, offender).
  - o Technical information related to missing persons associations, if applicable.
  - o Profile and specimen ID submitted for entry into CODIS are consistent with the profile and specimen ID on the CODIS Match Detail Reports, if applicable.
- C. The administrative and, if appropriate, technical reviewer will record the completion of their review.
- D. Records regarding the hit (e.g., Match Detail Report, *Laboratory Report*, review records) will be maintained in accordance with the FBI Laboratory level 1 and DNA level 2 documents.

**4.7 CODIS Search Requests**

- A. The casework LDIS Administrator (or person with administrative rights who has been trained to use the CODIS software) will update the NDIS batch target file and search



against the forensic and missing persons/UHR samples as needed. The date the batch target file is updated and searched as well as the initials of the individual performing the update and search will be recorded.

- B. One-time search requests of LDIS/SDIS for forensic DNA profiles from other NDIS participating laboratories will be individually evaluated by the casework LDIS Administrator, casework LDIS Alternate Administrator, FBI State Administrator or FBI State Alternate Administrator prior to initiating a manual keyboard search. One-time search requests of other laboratories must be approved and requested by the casework LDIS Administrator, casework LDIS Alternate Administrator, FBI State Administrator, or FBI State Alternate Administrator.
- C. A candidate match found with a target profile will be reviewed by the casework LDIS Administrator (or qualified DNA Examiner) for moderate or low stringency hits and by the casework LDIS Administrator (or qualified DNA Examiner or person with administrative rights who has been trained to use the CODIS software) for high stringency hits and written notification will be provided if necessary.
- D. No “victim” or “suspect” searches will be conducted of the FBI LDIS/SDIS data.

#### **4.8 Emergency Upload and Search Request (EUSR)**

- A. An EUSR may be requested if a forensic DNA profile from a serious violent crime must be searched before the routine upload and search of DNA data occurs due to exigent circumstances.
- B. The qualified DNA Examiner requesting the EUSR will ensure the request complies with current NDIS procedures.
  - 1. The DNA profile to be searched must be interpreted by a qualified DNA Examiner. The supporting data for the profile and the associated controls must be technically reviewed by a second qualified DNA Examiner and the profile must be eligible for retention in the database (i.e., LDIS, SDIS, or NDIS). A record of the profile, interpreting Examiner, and Technical Reviewer will be captured by STACS or maintained in the casefile.
- C. The casework LDIS Administrator, casework LDIS Alternate Administrator, or a DNA Examiner with CODIS software training will export the profile from STACS and import the profile into CODIS. The EUSR will be performed. The individual performing the EUSR (or a qualified DNA Examiner) will notify the FBI State Administrator and/or the FBI State Alternate Administrator that an EUSR is being performed.
- D. A candidate match from an EUSR will be reviewed by the casework LDIS Administrator (or qualified DNA Examiner) for a moderate stringency hit and by the casework LDIS Administrator (or qualified DNA Examiner or person with

administrative rights who has been trained to use the CODIS software) for a high stringency hit and written notification will be provided if necessary.

#### 4.9 Removal of a Sample from CODIS

- A. Deletion of a DNA profile in response to a court order that is specific to removing a forensic unknown DNA profile from CODIS is referred to as an expungement.
  - 1. The casework LDIS Administrator, casework LDIS Alternate Administrator or Missing Persons Program Manager will review the court order and consult with the Office of General Counsel to ensure it is complete.
- B. Deletion of a DNA sample from CODIS upon verification of the fact that the DNA record is not eligible or suitable for inclusion in CODIS is known as an administrative removal. Administrative removal may be warranted if:
  - o The contributing agency notifies the laboratory in writing that removal is warranted.
  - o Additional information indicates the sample is not appropriate for CODIS and/or does not meet the requirements set forth in the *NDIS Operational Procedures Manual*.
  - o An identification has been made for a Missing Person/UHR.
- C. The casework LDIS Administrator (or any person with administrative rights who has been trained to use the CODIS software) will delete the DNA profile using the CODIS software and record this action electronically (see *NDIS Operational Procedures Manual*). The LDIS specimen deletion report will also be maintained electronically.

#### 4.10 System Operations - Backup Procedures

- A. The LDIS backup will be conducted by an FBI employee or approved contractor.
- B. The backup will include all relevant drives and the registry from the LDIS server.
- C. The backup is stored at the FBI Laboratory and/or at an off-site location.
- D. In the event of an emergency and/or catastrophic loss, the backup may be used to restore the LDIS.

#### 4.11 Security

- A. Only authorized personnel will have physical access to CODIS servers and terminals.
- B. All CODIS users are responsible for protecting the security of the software as a user.
- C. When a user is finished with a CODIS work session, the user will log out of CODIS. If the user has not completed their CODIS work session but needs to move to an area

in which they can no longer visually observe the CODIS server/terminal, they must lock the screen or log out of CODIS.

## 5 LIMITATIONS

- A legal expungement cannot be performed without a court order signed by a judge.
- All profiles entered into the Forensic Index maintained by the DNA Casework Unit (DCU) will meet the criteria described in “*A Guide to Determining What is Allowable in the Forensic Index at NDIS.*”

## 6 REFERENCES

*National DNA Index System (NDIS) Operational Procedures Manual*, most recent version, available online.

*A Guide to Determining What is Allowable in the Forensic Index at NDIS*, most recent version, available on the CODIS CJIS/SEN

## 7 REVISION HISTORY

Revision	Issued	Changes
00	02/15/2022	Reformatted DNA 209-13 into new template and assigned new Doc ID. Added SDIS Only Forensic Targeted specimen category. Updated DISC requirements. Removed keyboard searches and added EUSR.
01	02/15/2023	Updated relatives of missing persons to require 20 CODIS loci and to notification of tri-alleles. Forensic profiles matched to a reference must be marked source ID yes. UHRs with less than 7 of the original 13 core may be eligible for searching. Added guidance for evaluating forensic to forensic and forensic to offender matches. Edits for clarity throughout.
02	09/04/2024	Removed SBAU throughout. Added guidance for rapidly mutating Y23 loci.