

DNA: CODIS

Introduction

CODIS is the *COmbined DNA Index System* administered by the FBI. The purpose of CODIS is to create a national repository where law enforcement agencies can share DNA profiles and compare them to various indexes to generate investigative leads. CODIS links DNA evidence obtained from crime scenes, thereby identifying serial criminals. CODIS also compares crime scene evidence to DNA profiles from offenders, thereby providing investigators with the identity of the putative perpetrator. In addition, CODIS contains profiles from missing persons, unidentified human remains, and relatives of missing persons.

There are three levels of CODIS:

- the Local DNA Index System (LDIS) is used by individual laboratories
- the State DNA Index System (SDIS) is used at the state level to serve as a state's DNA database containing offender profiles and DNA profiles from LDIS laboratories
- the National DNA Index System (NDIS) is managed by the FBI as the nation's DNA database containing all DNA profiles uploaded by participating states

Profiles are entered into LDIS and then, if certain criteria are met, can be uploaded and searched against SDIS and NDIS.

All data that is submitted for upload is generated by this laboratory.

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SDIS and NDIS eligibility

It is the DNA analyst's responsibility to determine which evidence profiles will be uploaded to CODIS by following NDIS guidelines and evaluating sample type and case context.

A forensic unknown, forensic mixture, or forensic partial DNA record submitted to CODIS shall be derived from evidence items that originate from a crime scene or are associated with a crime scene and are attributable to a putative perpetrator.

For cases that involve a consenting sexual partner, the laboratory must contact the submitting agency to request a consenting partner reference prior to upload. This communication must be documented in the case file.

Analysts will submit all eligible evidence profiles for solved and unsolved cases. A case is considered solved if the evidence profile matches the reference profile of a suspect in the case.

NDIS upload

In order to be uploaded to NDIS, the profile must meet the NDIS thresholds for completeness and Moderate Match Estimation (MME). To satisfy NDIS completeness, a profile must contain DNA information at a minimum of 8 of the CODIS core loci. The MME is a statistical threshold for match rarity and is set at one in ten million for NDIS. If these two thresholds are met, the Specimen Category can be set to Forensic Unknown, Forensic Partial, or Forensic Mixture. Forensic Unknown records are searched at high stringency and are allowed one mismatch. Forensic Partial and Forensic Mixture records are searched at moderate stringency with no mismatches. Records uploaded to NDIS will also be searched at the state and local levels. Profiles that meet the completeness threshold but not the MME threshold for NDIS may be uploaded to SDIS if they meet the SDIS thresholds.

SDIS upload

To satisfy SDIS completeness, a profile must contain DNA information at a minimum of 7 of the CODIS core loci (which may also include D2S1338 and D19S433). The SDIS MME is set at one in one million. If these two thresholds are met, the Specimen Category can be set to CA Forensic Partial or CA Forensic Mixture. These CA records are searched at moderate stringency with no mismatches. Records uploaded to SDIS will be searched at the state and local levels only. Profiles that meet the completeness threshold but not the MME threshold for SDIS may be uploaded to LDIS if they meet the LDIS thresholds.

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LDIS upload To satisfy LDIS completeness, a profile must contain DNA information at a minimum of 7 of the CODIS core loci (which may also include D2S1338 and D19S433). The LDIS MME is set at one in ten thousand. If these two thresholds are met, the Specimen Category can be set to Local Forensic Unknown. Local records are searched at moderate stringency with no mismatches and only at the local level.

All newly entered profiles will be searched against the samples maintained in the local database. If a match is made against the Lab Staff, Vender Database, or Elimination indexes, indicating possible contamination, the analyst will inform the CODIS Administrator who will remove the newly entered profile.

Keyboard searches Profiles can be submitted to either SDIS or NDIS for a one-time keyboard search request. There is no minimum loci requirement; however, these profiles must still meet the appropriate MME threshold. Individual loci can be set to search at high or moderate stringency which can affect the MME of the profile. NDIS keyboard search requests require a brief case summary to be submitted to SDIS along with the profile.

Specimen categories When entering a profile into LDIS, the profile must be assigned to a specimen category. Examples of commonly used specimen categories are:

- **Forensic Unknown:** A single source DNA profile or a fully deconvoluted profile originating from a mixture. A forensic unknown shall not have more than three alleles at one locus while the remaining loci can have up to two alleles (this will allow for one true tri-allelic pattern).
 - **Forensic Partial:** A single source DNA profile or fully deconvoluted profile originating from a mixture with either locus or allelic dropout at any loci. A forensic partial shall not have more than three alleles at one locus while the remaining loci can have up to two alleles.
 - **Forensic Mixture:** A mixture profile containing DNA from more than one contributor. This mixture profile may be derived from a more complicated mixture. A forensic mixture shall not have more than four alleles at any locus.
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Specimen categories (continued)

- **CA Forensic Partial:** A single source DNA profile or fully deconvoluted profile originating from a mixture with either locus or allelic dropout at any loci. A CA forensic partial shall not have more than three alleles at one locus while the remaining loci can have up to two alleles.
 - **CA Forensic Mixture:** A mixture profile containing DNA from more than one contributor. This mixture profile may be derived from a more complicated mixture. A CA forensic mixture shall not have more than four alleles at any locus.
 - **Local Forensic Unknown:** A single source or mixture DNA profile with no more than four alleles at any locus.
 - **Legal:** A known suspect's reference sample which was legally obtained by a law enforcement agency. These profiles must be entered using the prefix "LOSK" which stands for Legally Obtained Suspect Known.
 - **Local Suspect:** A profile obtained from a suspect's reference sample. This specimen category cannot be marked for upload and is only searched at the LDIS level.
 - **Staff:** A profile obtained from a laboratory staff member. This specimen category cannot be marked for upload and is only searched at the LDIS level.
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Specimen detail reports

Specimen Detail Reports associated with an evidence sample in CODIS will be printed, reviewed, and included in the case file.

Second review for SDIS and NDIS

All profiles to be submitted for upload and search at SDIS and NDIS require a review by a second qualified analyst.

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In addition to the analytical data, the second analyst will review the eligibility for upload and that the profiles are assigned to the appropriate specimen category. Refer to *DNA: Data Review by Second Analyst* for additional information. The second analyst will document this review by signing the CODIS upload form.

The analyst must submit a copy of the signed CODIS upload form to the CODIS Administrator. The CODIS Administrator will file the copy in the CODIS upload form logbook.

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Suspect reference profiles

Suspect reference profiles may be entered and maintained at the LDIS level under the *Local Suspect* specimen category. A *Local Suspect* logbook will be maintained by the CODIS Administrator.

In order to upload a suspect reference profile to SDIS, an investigating officer must submit a signed *Legally Obtained Suspect Known* form which confirms that the individual is a suspect in an active criminal investigation and that the individual's reference sample was legally obtained. A *Legally Obtained Suspect Known* logbook will be maintained by the CODIS Administrator.

- Suspect reference profiles to be uploaded to SDIS will be entered under the *Legal* specimen category. The prefix "LOS" must be used for these specimens.
- If the laboratory receives an investigating officer's written notification stating that the person identified is no longer a suspect in a criminal investigation, the suspect profile will be removed from SDIS by the CODIS Administrator. Otherwise, the profile will be removed from SDIS two years after the profile was submitted.
- To maintain a suspect's profile in SDIS beyond the two-year mark, the laboratory will require written notification from an investigating officer stating that the person is still a suspect in a criminal investigation.

Suspect profiles that are removed from SDIS will still be maintained in LDIS in the *Local Suspect* index.

Unacceptable profiles for upload

The following profiles, derived from either evidence or reference samples, are not currently acceptable for submission to SDIS or NDIS:

- victim
- consenting partner
- elimination profiles

NOTE: If an above listed profile is inadvertently entered, it will be removed. See *Deletion of uploaded profiles in SDIS and NDIS*, below.

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Revising or correcting uploaded profiles

A profile uploaded to SDIS or NDIS may require revision or correction.

The amended profile must be reviewed by a second qualified analyst. The original and amended *Specimen Detail Reports* should be included in the case file.

Documentation of the reason for revision or correction must be included in the case file.

The CODIS Administrator will resubmit the amended profile after being notified that the revision or correction has been made.

Adding Y-STR data to uploaded profiles

Y-STR profiles may be added to existing DNA profiles in CODIS.

The Y-STR profile must be reviewed by a second qualified analyst. The new *Specimen Detail Report* with the Y-STR profile must be included in the case file.

The CODIS Administrator will resubmit the amended profile after being notified that additional data was added.

Deletion of uploaded profiles in SDIS and NDIS

A profile uploaded to SDIS or NDIS may require deletion (such as profiles later identified as being from a victim or a witness).

A profile is deleted from LDIS as follows:

Step	Action
1	Enter the reason for deletion in the <i>Comments</i> section.
2	Unmark the specimen.
3	Delete the specimen.
4	Print an LDIS Specimen Delete Report.
5	Note deletion in the log book.
6	Issue a CODIS Specimen Deletion report.

The CODIS Administrator will maintain a log of the deleted profiles, including the reason for removal.

Reports

Reports will state when a profile has been uploaded.
