

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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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 obtained from an evidence sample and attributed to the putative perpetrator. This profile may be derived 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 (or fully deduced profile originating from a mixture) DNA profile attributable to the putative perpetrator with either locus or allelic dropout at any loci. A forensic partial shall not have more than 3 alleles at one locus while the remaining loci can have up to 2 alleles. A forensic partial must meet the NDIS completeness (a minimum of 8 CODIS core loci) and Moderate Match Estimation (MME) thresholds. The MME threshold is defined by NDIS as a statistical threshold for match rarity of one in ten million at moderate stringency.
- **Forensic Mixture:** A mixture of DNA obtained from an evidence sample and attributed to the putative perpetrators. This mixture profile may be derived from a more complicated mixture. A forensic mixture shall not have more than four alleles at any locus. A forensic mixture must meet the NDIS completeness and MME thresholds.
- **CA Forensic Partial:** A single source (or fully deduced profile originating from a mixture) DNA profile attributable to the putative perpetrator with either locus or allelic dropout at any loci. A CA forensic partial shall not have more than 3 alleles at one locus while the remaining loci can have up to 2 alleles. This category is for partial profiles that do not meet the NDIS completeness or MME thresholds. A CA forensic partial must meet the SDIS completeness (a minimum of 7 loci) and Moderate Match Estimation (MME) thresholds. The MME threshold is defined by SDIS as a statistical threshold for match rarity of one in approximately one million at moderate stringency. Search will be limited to LDIS and SDIS levels.
- **CA Forensic Mixture:** A mixture of DNA obtained from an evidence sample and attributed to the putative perpetrators. This mixture profile may be derived from a more complicated mixture. A forensic mixture shall not have more than four alleles at any locus. This category is for mixture profiles that do not meet the NDIS completeness or MME thresholds. A CA forensic mixture must meet the SDIS completeness and MME thresholds. Search will be limited to LDIS and SDIS levels.

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Specimen categories (continued)

- **Local Forensic Unknown:** A single source or mixture DNA profile attributable to the putative perpetrator. This category is for partial and mixture profiles that do not meet the match rarity requirements for SDIS or NDIS. A local forensic unknown must have a minimum of 7 loci. Search will be limited to the LDIS level.
- **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.

LDIS search configuration

The minimum number of loci required to report a match is seven and the stringency level is set to "moderate."

LDIS search

A newly entered profile will be searched against all samples in LDIS.

If a match is made against the *Lab Staff*, *Vendor Database*, or *Elimination* indexes, indicating possible contamination, the analyst will inform the CODIS Administrator who will remove the newly entered profile.

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Specimen detail reports	<i>Specimen Detail Reports</i> associated with an evidence sample in LDIS 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.
QAS 12.2.7	<p>In addition to the analytical data, the second analyst will review the eligibility for upload and that the profiles are designated in the appropriate specimen category. Refer to <i>DNA: Data Review by Second Analyst</i> for additional information. The second analyst will document this review by signing the CODIS upload form.</p> <p>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.</p>
SDIS and NDIS eligibility	<p>It is the DNA analyst's responsibility to determine which evidence profiles will be uploaded to SDIS by following NDIS guidelines and evaluating sample type and case context.</p> <p>A forensic unknown, forensic mixture, or forensic partial DNA record submitted to SDIS shall originate from and/or be associated with a crime scene; the source of which is attributable to a putative perpetrator.</p> <p>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.</p> <p>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.</p>

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SDIS upload

In order to be uploaded to SDIS, the profile must be derived from evidence items and have a minimum of 7 loci. Once the profile is uploaded to SDIS, it will also be searched in NDIS if the profile meets the NDIS completeness (8 CODIS core loci) and MME thresholds.

A CA Forensic Mixture or CA Forensic Partial DNA record shall be reviewed by the analyst to ensure the DNA record satisfies a statistical threshold for match rarity of approximately one in one million.

Profiles that do not meet the minimum loci, but do meet match rarity requirements, can be submitted to either SDIS or NDIS for a one time 'keyboard search request.' Loci can be searched at High or Moderate stringency during a keyboard search, which may affect the match rarity of the profile. Keyboard searches at the NDIS level require a brief case summary submitted to SDIS with the profile.

Profiles that meet the minimum loci requirement for NDIS but not the MME threshold will be put into the CA Forensic Mixture or CA Forensic Partial specimen categories if they meet the match rarity threshold for SDIS. These profiles will be uploaded to SDIS but not NDIS.

Profiles that meet the minimum loci requirement for SDIS but not the match rarity requirement will be put in the Local Forensic Unknown specimen category. These profiles will remain at LDIS and will not be uploaded to SDIS or NDIS.

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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 "LOSK" 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 and
- 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. Both *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 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.
