



Traditional detective work will always be integral to law enforcement, but investigators increasingly rely on science and technology to solve crimes. DNA is one of the most important crime-fighting tools of modern times because it can pinpoint suspects, convict the guilty, exonerate the innocent, and bring closure to victims and their families.

DNA, or deoxyribonucleic acid, is a unique genetic fingerprint found in cells of the human body. Just a tiny trace of the criminal's saliva or blood left behind can yield a DNA profile, which then can be compared to DNA samples from known criminals, arrestees or evidence from other crimes for a match.

DNA technology is perhaps most promising when used to solve crimes without an apparent suspect, such as a rape case where the victim cannot identify the attacker. Evidence collected can include a DNA sample left behind by the attacker, which can then be compared to millions of DNA profiles included in the state and national DNA database, called the CODIS system. If the comparison yields a match to an offender, the rapist can be identified and brought to justice.

The North Carolina State Crime Laboratory (NCSCL) uses DNA technology to help law enforcement solve crimes and bring justice to victims. The Laboratory's DNA Database unit screens, processes, and analyzes DNA samples from arrestees and convicted offenders and adds those DNA profiles to the database. In cases without a known suspect, a Laboratory analyst can compare a DNA profile developed from crime scene evidence to more than 375,000 DNA profiles in the Laboratory's database to look for a match or hit to identify the suspect.

Once a hit is made, the NCSCL confirms it by re-analyzing the original DNA sample taken from the convicted offender or arrestee. The Laboratory also compares the thumbprint taken at the time the DNA sample was collected to the convicted offender's or arrestee's fingerprints on file to confirm that the identity of the person who provided the DNA sample. After this confirmation is complete, a search warrant is written and served on the convicted offender or arrestee to obtain another sample of DNA. This sample is analyzed to definitively confirm that the DNA matches.

Expanding North Carolina's DNA database—to include all convicted felons in 2003, certain arrestees in 2011, and additional arrestees in 2015—is succeeding with more hits to help solve crimes and aid investigations. To date, the NCSCL has achieved more than 8,600 hits to the DNA database, including a record number of hits in Fiscal Year 2021-2022.

During FY 2021-2022, the North Carolina State Crime Laboratory:

- **Achieved 1,211 hits to the DNA database**, the highest number ever recorded in a single year. A hit is a match between a DNA profile in the database and DNA recovered from a crime scene. Since criminals, and especially rapists, often repeat their crimes, a database hit can crack a cold case.
- **Grew the state's DNA database to contain more than 400,000 DNA profiles** thanks to diligent work by the NCSCL and local and state law enforcement agencies. The more profiles the database contains, the more hits it is likely to yield to identify suspects, eliminate suspects and solve crimes. Data included in North Carolina's DNA database is included in the Federal Bureau of Investigations' national CODIS (Combined DNA Index System) database.
- **Partnered with the State of North Carolina's Government Data Analytics Center (GDAC)** to integrate the DNA Database Section's specimen management software with the Criminal Justice Law Enforcement Automated Data Services (CJLEADS) database. This sharing of data will enable law enforcement personnel to search CJLEADS to determine if an individual already has a DNA Database sample on file in CODIS, or if a sample is needed. The goal of this project is to reduce the number of duplicate samples submitted to the NCSCL, thus saving money and time for the laboratory and law enforcement personnel. Partnering with GDAC will also help ensure more samples are collected from individuals that are to be included in the DNA Database. In September 2020, a new report launched in CJLEADS for all Sheriffs to see which individuals in their county owe a DNA sample for inclusion in the DNA Database. The goal is to increase samples submitted to the DNA Database and increase hits in CODIS. To date, over 3,400 samples from the report have been submitted leading to 65 CODIS hits.

Summary of the Operations of the DNA Database Section for FY 2021-2022

CODIS Hits for FY 2021-2022: 1211

- 802 hits to Convicted Offender DNA profiles
- 291 hits to Arrestees DNA profiles
- 118 hits to Forensic Samples, DNA profiles uploaded as a result of crime scene evidence analyzed by the NCSCL.

Forensic Samples Uploaded: 2,828

Convicted Offenders Uploaded: 6,137

Arrestee Samples Uploaded: 7,382

**Since February 1, 2011, more than 114,000 arrestee samples received*

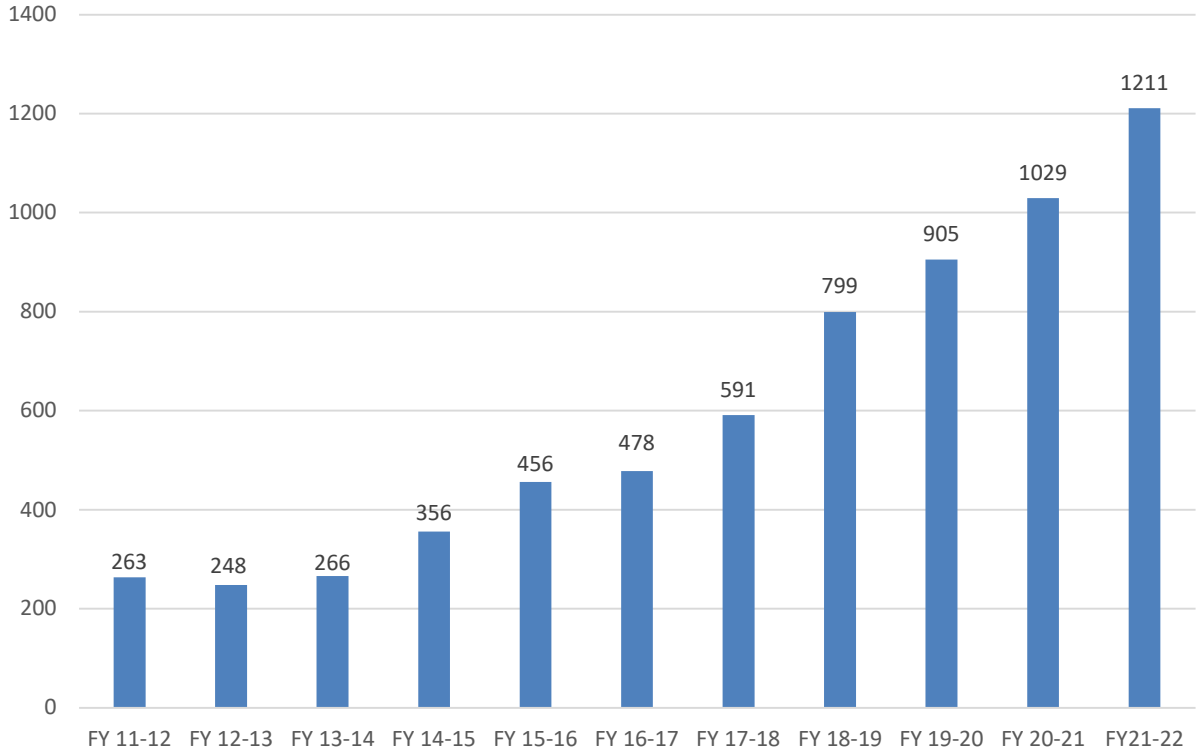
Trends from FY 11-12 through FY 20-21

	FY11-12	FY12-13	FY13-14	FY14-15	FY15-16	FY16-17	FY17-18	FY18-19	FY19-20	FY20-21	FY21-22
Total CODIS hits:	263	248	266	356	456	478	591	799	905	1,029	1,211
Hits to arrestee DNA	34	19	41	40	96	102	125	176	199	296	291
Hits to Convicted Offender DNA	229	220	218	285	345	355	446	578	633	632	802
Hits to crime scene DNA	0	9	7	31	15	21	20	45	73	101	118
Forensic Samples Uploaded	683	532	523	878	1,245	1,350	1,177	1,394	2,015	2,343	2,828
Arrestee Samples Uploaded	5170	3325	9419	7,210	8,047	9,212	7,906	7,348	6,474	7,567	7,382
Convicted Offender Samples Uploaded	7,202	*19,183	14,471	10,366	13,103	10,165	9,933	8,731	7,634	5,248	6,137

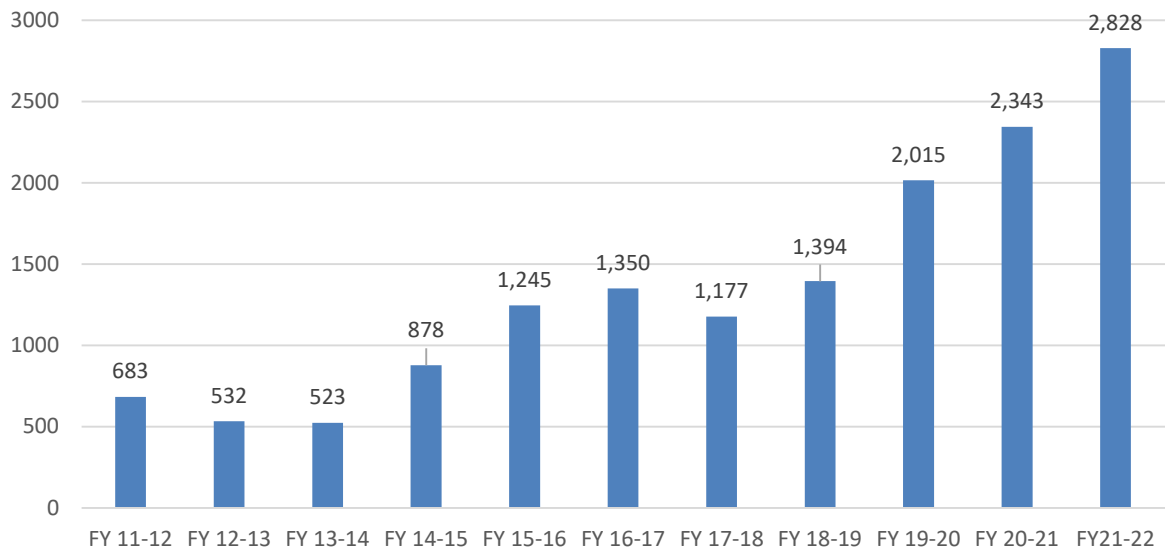
CODIS=Combined DNA Index System, a nationwide DNA database;

**Numbers uploaded for FY2012-2013 were significantly higher due to the elimination of samples pending in that calendar year. In subsequent years, samples have been worked in the year in which they were submitted.*

Total CODIS hits by Fiscal Year



Forensic Samples Uploaded into CODIS

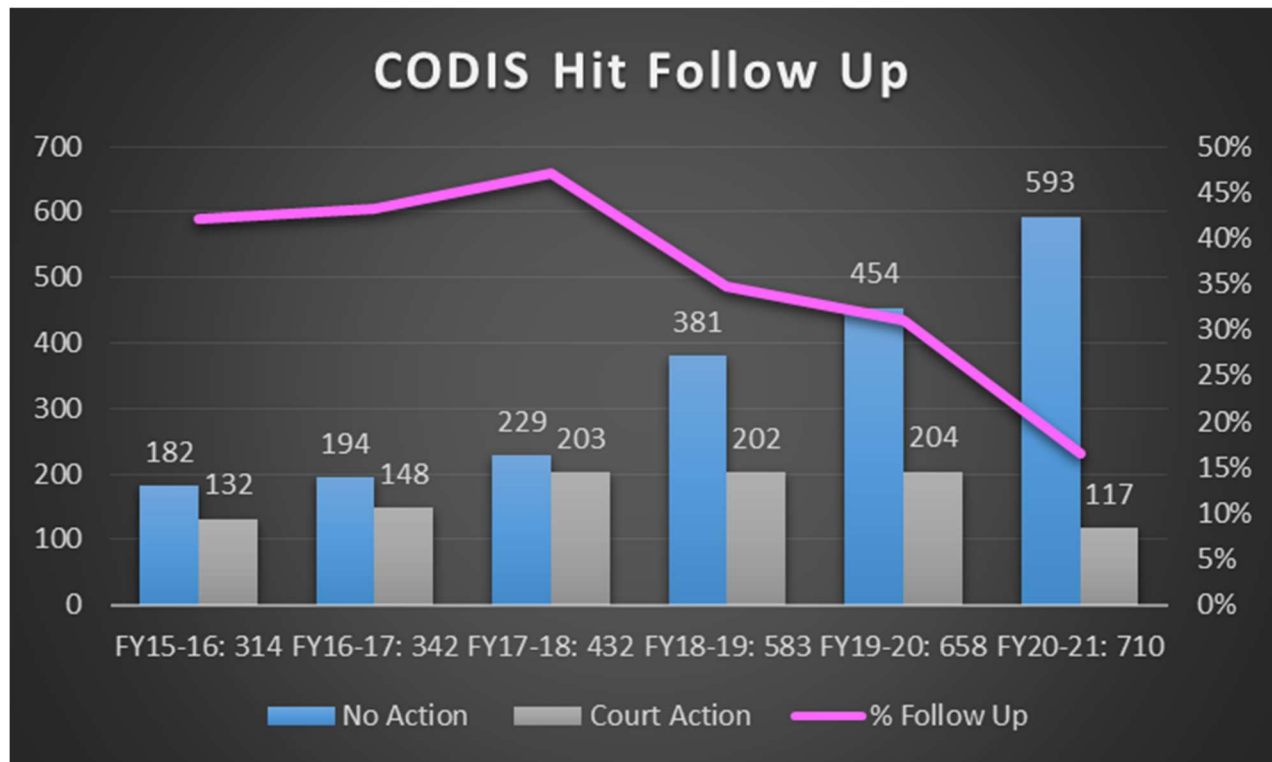


Outcome of Arrestee Hits

The State Crime Lab partnered with NCDOJ's Information Technology Division, NC Government Data Analytics Center (GDAC), NC Administrative Office of the Courts (AOC), and the Statistical Analysis Institute (SAS) to identify instances of an arrest or conviction associated with an arrestee CODIS hit. The data below is an estimate based on arrest and/or conviction data in CJLEADS. Therefore, the data can only be obtained for North Carolina Arrestees or Convicted Offenders hitting to cases within North Carolina. The chart below is for FY21-22

<u>FY21-22</u>	
<u>Hits In-state to NC Arrestee/Convicted Offender</u>	<u>778</u>
<u>Court action/arrest</u>	<u>188</u>
Robbery	6
Assault	6
Homicide	8
Property	69
Sex Offense	97
Other	2
<u>NC Arrestee CODIS Hits</u>	<u>196</u>
Court action/arrest	61
Convictions	20
Voluntary dismissal	13
<u>NC Convicted Offender CODIS Hits</u>	<u>582</u>
Court action/arrest	127
Convictions	53
Voluntary dismissal	25
Not guilty	2

Data from CODIS hits occurring in FY17-18 show that approximately 203 out of 432 hits in North Carolina cases yielded an arrest and/or conviction. This demonstrates that follow up on CODIS hits by law enforcement and the court system can take a few years to yield results in a case. The graph below illustrates the increase in CODIS hit follow up after two to three years.



FY 2021-2022 DNA Database Expenses (Convicted Offender and Arrestee Samples)

Staff Costs to Process DNA CODIS Samples	\$ 1,363,393
Outsourced Laboratory expenses to process DNA CODIS Samples	\$ 0
Other operating expenses (e.g. supplies)	\$ 1,302,144
Total FY2021-2022 DNA Database Expenses	\$ 2,699,578

Expunction of Arrestee DNA records

DNA records from arrestees expunged in FY 2020-2021:	2,036
DNA expungements requested in FY 2020-2021:	2,974
Letters provided to Defendants notifying of expunctions	2,974

An important workload and associated programmatic cost of the DNA Database Section is the expungement or removal of arrestee samples upon request. Of the 2,974 expungements processed through completion in FY 2021-2022, 2,036 requests were approved and 938 were denied. As in prior years, the Database Section placed a number of requests on hold for final processing because no sample had been received for the specific arrest from the appropriate law enforcement unit.

Expungement Procedure

The State Crime Laboratory continues to follow its FBI-approved expungement procedure to remove qualifying arrestee DNA profiles from the database upon receipt of the Administrative Office of the Court (AOC) verification form as directed by G.S. 15A-266.3A. If the arrestee qualifies for expungement, the DNA samples are removed from the DNA database and destroyed. Also, the DNA record is removed from the DNA database and CODIS. Each person who submits a request for expungement is notified by letter whether or not his/her sample qualified for expungement. The expungement process is completed within 90 days. The DNA Database has also begun working with GDAC to streamline the expungement process, and to explore ways to automate the process.

Arrestee/Convicted Offender Collection Kits

The Laboratory continues to provide the standardized Arrestee/Offender DNA collection kit; however, the kits are now ordered by law enforcement agencies directly through the State's vendor. Kits continue to be provided to law enforcement at no cost to the agencies. The kits will continue to be used specifically to collect DNA from certain convicted offenders and arrestees.

The Laboratory additionally purchases 8,000 kits biennially for the Department of Public Safety to facilitate standardized DNA collection in all state correction facilities.

Numerous DNA samples were rejected in FY 2021-2022 because they did not meet the statutory standards for collection pursuant to N.C.G.S. 15A-266.3A, or there were issues with the sample itself. In FY 2021-2022 there were approximately 813 samples rejected. The DNA Database Section continues to receive many duplicate samples for convicted offenders and arrestees whose samples are already present in the CODIS database.

In FY 2021-2022 approximately 3,457 samples received were duplicates. While the over-submission of kits continues to impact the DNA Database Section, 3,457 duplicate kits is half of the number of duplicate submissions from five years ago. This represents a savings to the DNA Database Section of over \$20,000. The Laboratory pays for the collection kits, which are provided to law enforcement agencies at no cost. To maximize taxpayer resources, the

Laboratory has provided ongoing training in efficient collection procedures for submitting law enforcement agencies. All personnel involved in DNA sample collection are encouraged to verify the need of a new sample prior to collection and submission to the NCSCL. To facilitate this, the DNA Database has integrated the sample database with CJLEADS to provide law enforcement with another method to verify the need of a new sample. Since this integration of systems and education to collecting agencies, duplicate sample submission has been reduced each year.

Cutting Edge Technology and Equipment

New technology recently implemented at the NCSCL means arrestee and convicted offender DNA profiles are analyzed and uploaded to the database more rapidly and with more data. In 2019 the NCSCL completed a validation of a new chemistry kit using Y-STRs, or the male portion of DNA. This additional testing method can aid in the identification of suspects in unsolved cases. This new technology was used to identify suspects in cold cases in this fiscal year.

ISO 17025

The Database Section received full accreditation under ISO 17025 in 2018. The ISO/IEC 17025 procedures are the highest international standards and protocols applicable to forensic science laboratories.

ATTACHMENT I



DNA Collection Upon Arrest: How it works

DNA collection upon arrest saves lives, prevents violent crime by repeat offenders, saves investigative resources, improves ID procedures, reduces misidentification, reduces convictions based on false confessions, and clears cold cases.

How it works in North Carolina:

- During certain felony arrests, law enforcement takes a DNA sample by cheek swab using a kit provided by the NC State Crime Laboratory (NCSCL)
- The cheek swab goes to the NCSCL, which logs the sample, verifies the eligibility of the sample, and then analyzes it to provide a DNA profile for upload to the database.
- That analysis is 100% quality assurance reviewed by a qualified NCSCL forensic analyst prior to entry into the DNA database as per federal requirements.
- The DNA profile is uploaded to state and national databases to search for matches to solve cold cases.

NC State Crime Laboratory responsibilities:

Laboratory scientists analyze crime scene evidence that may contain DNA. DNA profiles obtained from crime scene evidence are then run against the database of convicted offenders and arrestees to try to identify the perpetrator.

NCSCL staff receive each arrestee DNA sample, enter the sample data, verify the sample was taken from a suspect accused of a qualifying offense, analyze the sample, and upload it to the database of convicted offender and arrestee DNA.

When a search of the database yields a hit or matches between crime scene DNA and the DNA database, the NCSCL works with local law enforcement agencies to identify the suspect. Fingerprint collection is required in the DNA collection kit to help confirm identity.

If a person is permitted by court officials to expunge their DNA profile from the database (due to dismissal or acquittal or other qualifying event), the NCSCL removes it.

Confirming a hit to the database: How it works:

The CODIS State Administrator at NCSCL notifies the NCSCL Database Manager of a hit. The NCSCL Database Manager then starts the offender/arrestee confirmation process:

- Subject Information Assessment-- NCSCL verifies that the DNA profile is in the database due to a qualifying offense and that the offender/arrestee was not incarcerated at the time the offense under investigation was committed.
- Fingerprint verification — NCSCL analysts verify that the fingerprints submitted with the offender/arrestee DNA sample match those on file for the individual.
- Confirmation of offender/arrestee sample — DNA Database Analyst pulls the original offender/arrestee DNA sample and re-analyzes the sample to ensure that the profile matches what was uploaded to the database.

Once the confirmation process is completed, the Database Analyst notifies the NCSCL CODIS State Administrator. The CODIS Administrator then notifies the investigating law enforcement agency of the offender/arrestee's identity. This gives investigators probable cause to obtain a DNA standard from the individual to confirm the hit.

The investigating agency obtains a search warrant, often with SBI/NCSCL assistance, and obtains a DNA standard from the suspect which is then submitted to the NCSCL case analyst.

The NCSCL case analyst generates the profile for the DNA standard and compares this to the original crime scene evidence that was uploaded to CODIS. A case report is generated to confirm the match.

ATTACHMENT II

DNA FLOW CHART



North Carolina State Crime Laboratory Forensic Biology and DNA Database Flow Chart

