

Forensic DNA Tools & Florida's Tracking Database

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Topics

- Forensic DNA Tools
 - STR
 - Y-STR
 - Mitochondrial DNA
 - Unknown perpetrator
 - CODIS
 - Familial Searching
 - Genetic Genealogy
- Florida's Tracking Database



FDLE Case Acceptance Policy

Sexual Assault

1st Submission:

- 1 sexual assault evidence kit (per FS 943.326 must be submitted **within 30 days of the victim reporting**)
- 1 pair of underwear worn by victim at time of incident or immediately after (Underwear should be separated from other items of clothing prior to submission)
- 1 condom, if applicable

2nd Submission: (if no probative results obtained from first submission)

- Limited to 5 items – Recommend victim's clothing worn at time of incident before additional clothing or bedding
- Contact a biology supervisor for a case consultation if additional evidence is needed

- All kits submitted & tested
 - Except assaults not reported
- Kit testing must be completed within 120 days

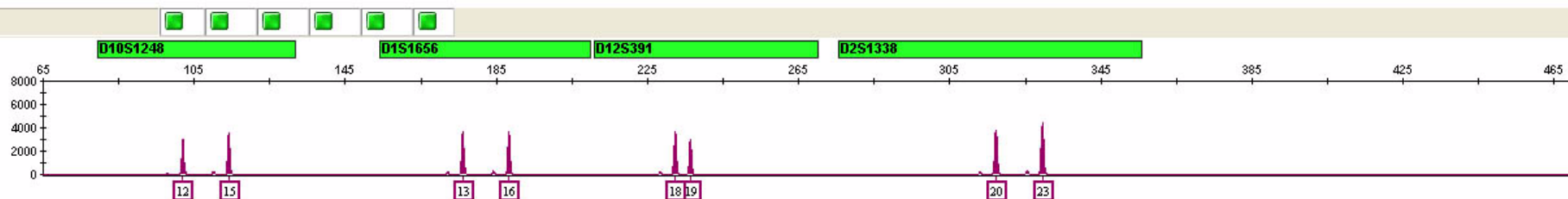
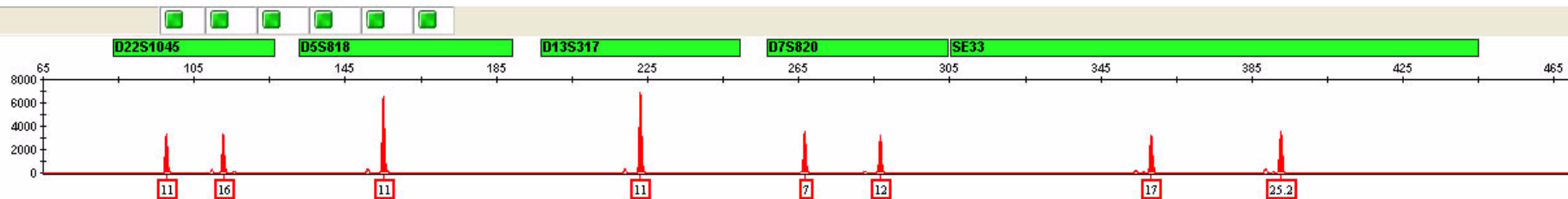
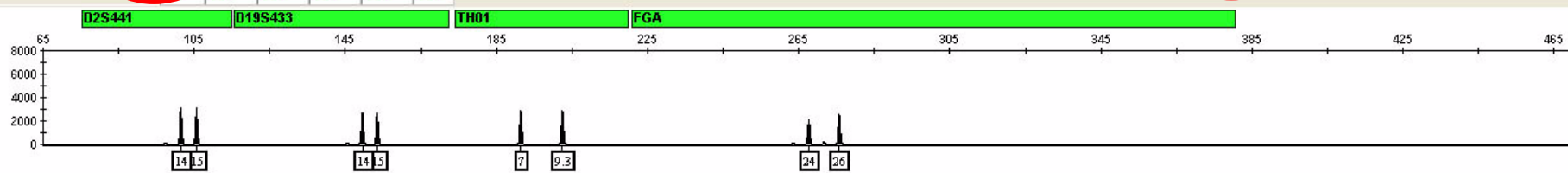
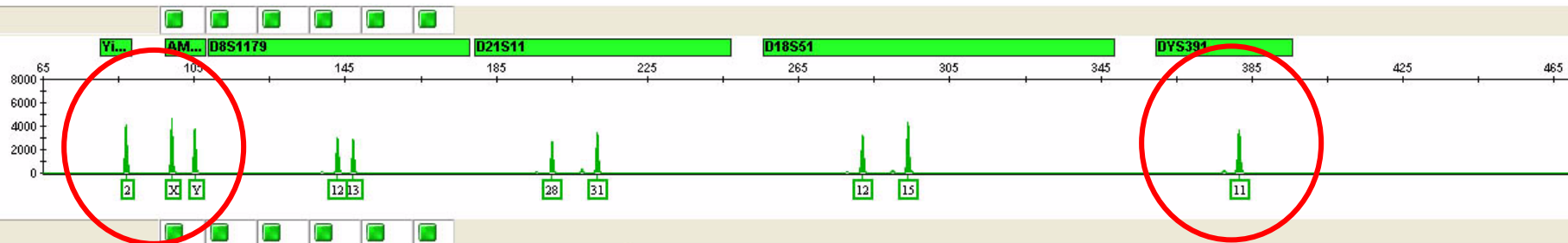
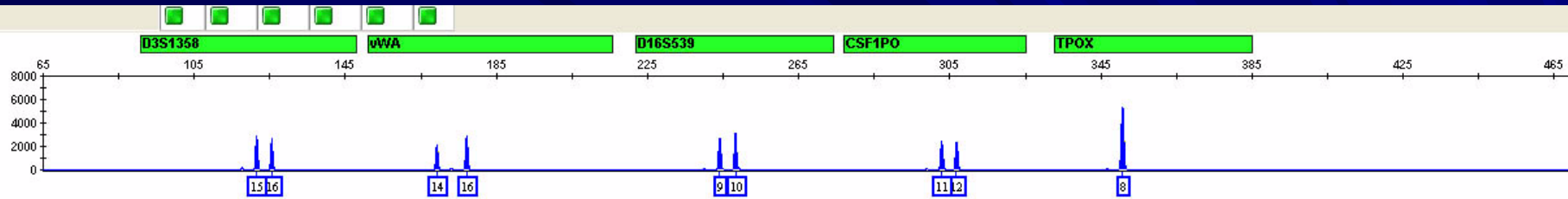


STR DNA Testing

- Short Tandem Repeats
- Forensic and CODIS standard (late 90s)
- Multi-step process
 - Automation
- Globalfiler – Feb 2017
 - 21 STR + 2 gender markers + 1 Y-STR
 - 10 mini-STRs (degraded)
 - Very discriminating
 - More results/ more mixture



STR DNA Profile – One male person



STRmix



- Commercially available forensic software
 - <https://www.strmix.com/>
- Online Sept. 2017
- Only Globalfiler DNA results

- 2 Uses
 - Interprets mixtures (probabilistic genotyping)
 - Calculates the weights of DNA matches or inclusions - likelihood ratios (LR)



Direct to DNA Approach

- 1 Swab per Orifice/ Sample from Underwear
 - Sperm Portion and Non-Sperm Portion
- 1 Swab per Body Area – possible body fluid
- All Swabs – touch

- Female/Male Assaults
 - Quantify the samples for Male DNA (10/2015)
 - Total Human vs. Total Male DNA

- Female/Female & Male/Male Assaults
 - All samples proceed



DNA Quantitation

Sample ID	Screen By Quant	[Auto] ng/ul Small Target	[Y] ng/ul	M:F	Deg. Index	Dropped at Quant
Ex2.2sperm	x	0.6208	0.0000		0.80	Yes
Ex2.3sperm	x	0.0012	0.0000		1.10	Yes
Ex2.4sperm	x	0.0004	0.0000		1.12	Yes
RBQsperm	x	0.0000	0.0000			Yes
Ex2.2epi	x	6.3578	0.0000		0.62	Yes
Ex2.3epi	x	0.0208	0.0002	1:97.222	1.27	Yes
Ex2.4epi	x	0.0508	0.0002	1:238.834	0.99	Yes
RBQepi	x	0.0000	0.0000			Yes
Ex2.1		0.6864	0.0001	1:5287.434	0.64	
RBK		0.0000	0.0000			
Ex1.2sperm	x	0.0141	0.0213		0.51	No
Ex1.3sperm	x	0.1576	0.1321		0.55	No
Ex1.4sperm	x	0.0246	0.0271		0.46	No
Ex1.5sperm	x	0.0073	0.0085		0.40	No
Ex1.6sperm	x	0.0354	0.0458		0.42	No
Ex1.7sperm	x	0.0259	0.0253		0.60	No
Ex1.8sperm	x	0.0004	0.0003			No
RBQsperm	x	0.0000	0.0000			No
Ex1.2epi	x	14.2727	0.0037	1:3807.977	0.57	No
Ex1.3epi	x	19.4619	0.0071	1:2726.231	0.70	No
Ex1.4epi	x	3.2629	0.0108	1:300.592	0.61	No
Ex1.5epi	x	5.1053	0.0044	1:1168.836	0.62	No
Ex1.6epi	x	0.0719	0.0166	1:3.342	1.15	No
Ex1.7epi	x	5.2895	0.0216	1:243.861	0.86	No
Ex1.8epi	x	0.0638	0.0000		1.03	No
RBQepi	x	0.0000	0.0000			No
Ex1.1		3.2768	0.0001	1:26665.373	0.47	
RBK		0.0000	0.0000			

No male DNA

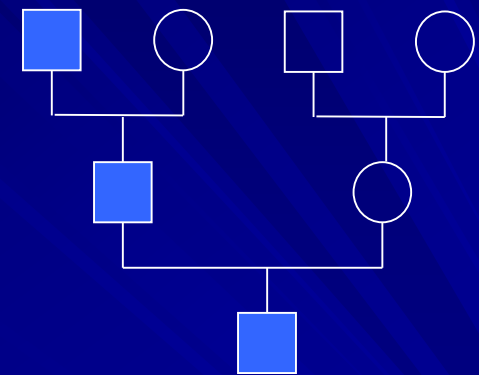
Plenty of male DNA

Ratio - Male to Female
Too much ♀ then Y-STR
may be option



Y-STR DNA Testing

- Males only
- All paternal relatives same
- Jacksonville & Tampa FDLE labs
- Specific case criteria
 - Sexual assault cases
- Limited CODIS capabilities
 - (Missing persons)
 - (Familial searching)

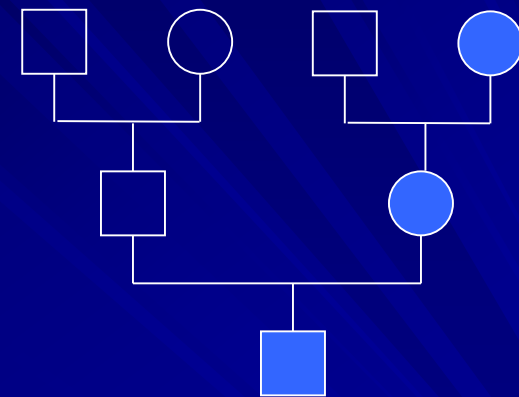


Y-Chromosome
(passed on only by sons)

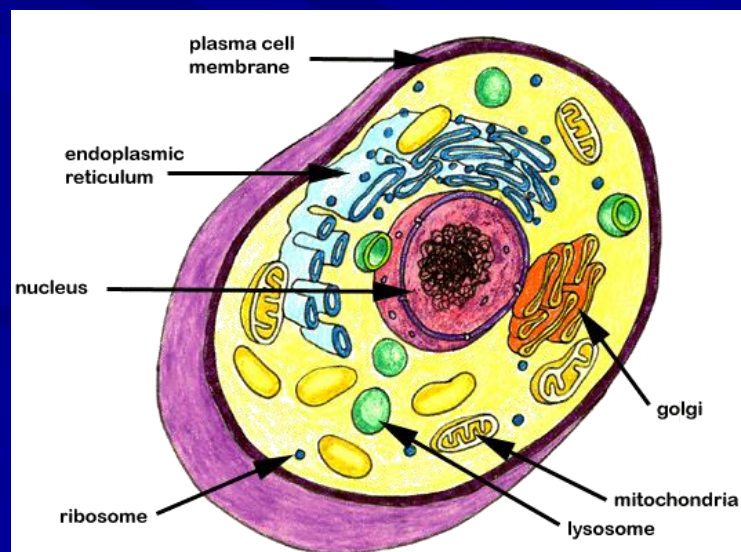


Mitochondrial DNA Testing

- Not available at FDLE
- Inherited from mother only
- All maternal relatives same
- Single cell sensitivity
- Hair shafts/shed hair
 - Hair in child's genitals
- Not suitable for mixtures
- Limited CODIS Capabilities
 - Missing persons



Passed only by daughters



Combined DNA Index System



- Created in 1990 by FBI
 - They make the rules for entry!
- Collection (Database) of DNA profiles
 - State mandated profiles (F.S. 943.325)
 - **DNA Profiles from crime scene evidence**
- Purpose: *to provide INVESTIGATIVE LEADS by linking unsolved cases to known individuals; unsolved cases to solved cases; and unsolved cases to unsolved cases*

<https://www.fbi.gov/services/laboratory/biometric-analysis/codis>



DISC

- DNA Index of Special Concern
 - Sexual assaults, homicides, kidnapping, terrorism
- Contact lab – additional info needed

Rapid DNA Searching

- As an NDIS participating lab, FDLE is able to upload DNA profile information from crimes of special concern into the DISC (DNA Index of Special Concern) within CODIS, so that once Rapid DNA Technology is in place, these profiles will be searched immediately.
- The **overall** goal of the FBI's Rapid DNA Initiative is to **immediately enroll qualifying arrestees in CODIS so every arrestee is searched against all unsolved crimes in CODIS within 24 hours.**
- For consideration to search using Rapid DNA within the CODIS database, cases submitted involving **sexual assault, homicide, kidnapping, or terrorism** should include the Rapid DNA/Crimes of Special Concern Certification Form (**available at <https://www.flejn.net/lmsinfo.aspx>**) to assist the laboratory in collecting **and documenting the** information needed to meet FBI requirements.

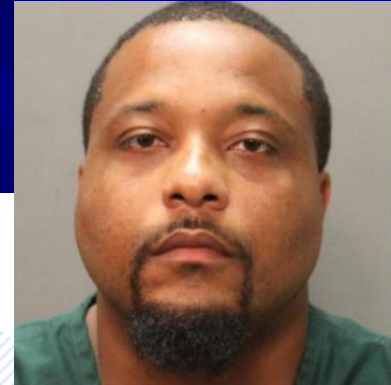


Familial Searching

- Unsolved violent crimes
- Not a CODIS search
- Software designed for this purpose
- Identify male parent, child or full-sibling
 - But it might not!
- Arkansas, California, Colorado, Florida, Michigan, Texas, Utah, Virginia, Wisconsin, and Wyoming



Local Success



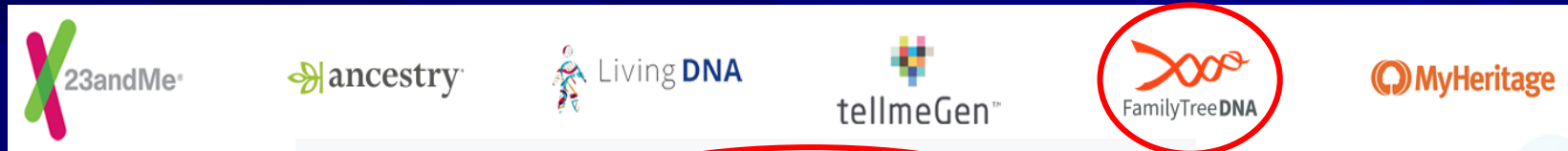
Man accused in 'serial' sexual offenses was a school football volunteer, certified nursing assistant

—
Young was arrested for sexual battery, false imprisonment and attempted sexual battery.



Genetic Genealogy

- Single-nucleotide polymorphisms (SNPs)
- Hundreds of thousands of locations tested



About GEDmatch

Genealogy research reimaged
and expanded

GEDmatch is a website for genetic genealogy research. Anyone can upload their DNA file, analyze results, and compare DNA shared with others.

- Measuring shared amounts of DNA
 - Passed down via common ancestors
- Search may produce a possible relative



Shared DNA (centimorgan)

New Click on any relationship to view a histogram

[Read more about cousin relationships](#)

100 cM

Great-Great-Great-Grandparent
GGGG Aunt / Uncle

Great-Great-Grandparent
GGG Aunt / Uncle

Half GG-Aunt / Uncle 208 103 – 284	Great-Grandparent 887 485 – 1486					Great-Great-Aunt / Uncle 420 186 – 713	1C3R 117 25 – 238	2C3R 51 0 – 154	Other Relationships		
Half 1C2R 125 16 – 269	Half Great-Aunt / Uncle 431 184 – 668	Grandparent 1754 984 – 2462			Great-Aunt / Uncle 850 330 – 1467	1C2R 221 33 – 471	2C2R 71 0 – 244	3C2R 36 0 – 166	6C 18 0 – 71		
Half 2C1R 66 0 – 190	Half 1C1R 224 62 – 469	Half Aunt / Uncle 871 492 – 1315	Parent 3485 2376 – 3720		Aunt / Uncle 1741 1201 – 2282	1C1R 433 102 – 980	2C1R 122 14 – 353	3C1R 48 0 – 192	4C1R 28 0 – 126	6C1R 15 0 – 56	
Half 3C 48 0 – 168	Half 2C 120 10 – 325	Half 1C 449 156 – 979	Half Sibling 1759 1160 – 2436	Sibling 2613 1613 – 3488	SELF	1C 866 396 – 1397	2C 229 41 – 592	3C 73 0 – 234	4C 35 0 – 139	5C 25 0 – 117	6C2R 13 0 – 45
Half 3C1R 37 0 – 139	Half 2C1R 66 0 – 190	Half 1C1R 224 62 – 469	Half Niece / Nephew 871 492 – 1315	Niece / Nephew 1740 1201 – 2282	Child 3487 2376 – 3720	1C1R 433 102 – 980	2C1R 122 14 – 353	3C1R 48 0 – 192	4C1R 28 0 – 126	5C1R 21 0 – 80	7C 14 0 – 57
Half 3C2R 27 0 – 78	Half 2C2R 48 0 – 144	Half 1C2R 125 16 – 269	Half Great-Niece / Nephew 431 184 – 668	Great-Niece / Nephew 850 330 – 1467	Grandchild 1754 984 – 2462	1C2R 221 33 – 471	2C2R 71 0 – 244	3C2R 36 0 – 166	4C2R 22 0 – 93	5C2R 18 0 – 65	7C1R 12 0 – 50
Half 3C3R	Half 2C3R	Half 1C3R 60 0 – 120	Half GG-Niece / Nephew 208 103 – 284	Great-Great-Niece / Nephew 420 186 – 713	Great-Grandchild 887 485 – 1486	1C3R 117 25 – 238	2C3R 51 0 – 154	3C3R 27 0 – 98	4C3R 19 0 – 60	5C3R 13 0 – 30	8C 11 0 – 42

Local Success

CRIME

Retired JSO homicide detective, ex-wife arrested in 1999 Jacksonville cold case murder

Former Jacksonville Sheriff's Office homicide detective William Baer was arrested Thursday in the brutal 1999 murder of Saad Kawaf.



Florida Statute 943.326

■ July 1, 2021

FDLE shall, no later than **July 1, 2023**, **create and maintain a statewide database to track the location, processing status, and storage of each sexual offense evidence kit** collected after the implementation of the database that is accessible to law enforcement agencies and alleged victims. The database shall track the status of the kits from the collection site throughout the criminal justice process, including the **initial collection at medical facilities, inventory and storage by law enforcement agencies or crime laboratories, analysis at crime laboratories, and storage or destruction after completion of analysis.**

FDLE ensures that **each alleged victim is notified of the existence of the database** and provided with instructions on how to access it, and entitled to access to **tracking information, testing status**, and **any DNA matches** to a person deemed by investigators to be a suspect or person of interest. Notification of a DNA match may be **delayed for up to 180 days** if such notification would, in the opinion of investigators, negatively affect the investigation.



Florida Track-Kit™

Track-Kit - Sign In - Track-Kit

https://fl.track-kit.us/Login

Great Seal of the State of Florida
IN GOD WE TRUST

Welcome to the Florida Sexual Assault Evidence Collection Kit Tracking System

TRACK-KIT

Track-Kit - Sign In

Please enter your Track-Kit login credentials below.

Username * ?

marcellascott@fdle.state.fl.us

Password * ?

.....

[Comments and Questions](#)

[Forgot your password?](#)

[How do I get an account?](#)

Sign In


For technical support, please contact support@stacsdna.com. This email is monitored Monday through Friday 8:00am - 5:00pm EST.

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TRACK-KIT 3.4.44.0

INTEGRITY
DEPARTMENT OF LAW ENFORCEMENT
FDLE
RESPECT
QUALITY

NEW Statewide Kits



FLORIDA SAE COLLECTION KIT

Victim Name: _____

Exam Date: _____

Agency Case No.: _____

Examiner Name: _____

CHAIN OF POSSESSION

FROM	TO	DATE/TIME

FDLE 100C:KENV-1.2 3/22

 Tracking
Barcode



Florida SAE Collection Kit

- Used by all counties
 - FDLE billed
- Barcoded for Tracking
- Survivor Access Card
 - in the kit



FL000000010

URL: fl.track-kit.us

Username: FL000000251
(el nombre de usuario)

Password: Fswm@(F6NPz
(la contraseña)

Florida Statute 943.326 addresses sexual assault evidence kits. · If you report to law enforcement and consent to testing, your kit must be submitted to the laboratory within 30 days, and tested within 120 days. · The back of this card provides a log-in to a secure kit tracking database. You are entitled access to tracking information, testing status, and notification of DNA matches to a person deemed by investigators to be a suspect or person of interest. · Notification of a DNA match may be delayed by investigators up to 180 days if it would negatively affect the investigation. · Additional resources are provided at the database website.



Survivor Portal Login Page

The screenshot shows a web browser window with the address bar displaying `https://fl-test.track-kit.us`. The page title is "Sign In - Track-Kit". In the top right corner, there is a red button that says "Leave this site quickly → EXIT". The main content area features a "SIGN IN" heading followed by the instruction "Please enter your login credentials below". There are two input fields: "Barcode (Username)" and "Password". Below the password field are three links: "Contact Support", "Forgot your password?", and "How do I get an account?". A red "Sign In" button is positioned below the form. Below the login section, there is a heading "CLEAR YOUR BROWSING HISTORY" with the subtext "Stay Anonymous". A paragraph explains that the browser stores information about browsing history, cache, and habits, and provides instructions on how to clear this data. Two links are provided: "CLEAR YOUR BROWSING HISTORY IN EDGE" and "CLEAR CACHE IN EDGE".

- No branding
- Barcode #
- Password
 - Password change 1st login
- Quick Exit
- English or Spanish

Disclaimer: FDLE doesn't recommend any private laboratory.

Thank you!

Track-Kit™ Policy Center

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