

2023 DNA HIT OF THE YEAR

TOP 6 CASES

Case #1
Killing of US Coast Guard Officer

Florida Department of Law Enforcement
Jacksonville, Florida

"Caroline Schollaert was an active-duty U.S. Coast Guard member. She was assigned to the Helicopter Interdiction Tactical Squadron, which is dedicated to drug interdictions. On Tuesday, August 3, 2021, she was murdered in her driveway after interrupting a car burglar. She had the suspect at gunpoint, while on the phone with 911, ordering him to remain there until police arrived. The suspect didn't comply and pulled a gun firing multiple shots at Schollaert. She was struck and died at the scene. Several neighborhood cameras captured video of the suspect walking up to homes looking for unlocked cars. Other car burglaries from that evening, as well as car burglaries from days earlier were also caught on video. These videos showed several individuals involved along with a getaway vehicle. These cameras also captured the suspect fleeing the scene of the shooting and getting into a vehicle. Police had the suspect's image from the videos and clothing he had dropped along the flight path.

The clothing was submitted, the same day as the crime, to the Florida Department of Law Enforcement Jacksonville Regional Operations Center laboratory for the Biology section to examine. The clothing was processed and subjected to DNA analysis as soon as it arrived in the laboratory. The next morning, a male profile from the evidence was searched in Florida's CODIS. There were no matches. The profiles obtained from the clothing were mixtures. The analyst then resampled the shirt in a different area. The next round of DNA results was obtained three days after the murder. The resampling of the shirt produced a female DNA profile. Due to the shooting being linked to multiple car burglaries involving several suspects, the female profile was searched in Florida's CODIS. The profile hit to a Florida qualifying offender. Members of the Florida DNA Investigative Support Database, went into the lab on Saturday to review and confirm the search results, releasing the name to the Jacksonville lab. Detectives from Jacksonville Sheriff's Office went to the female's home the day of the DNA hit. They interviewed her, secured a warrant, and found the murder weapon and other information leading to the identification of the suspect, Tyree Parker. The murder weapon had been stolen from an unlocked vehicle 11 days prior to the shooting. Four days after the shooting, a warrant was issued for Tyree Parker.

On August 10, 2021, Tyree Parker turned himself into law enforcement. He was arrested and charged with second degree murder. His DNA profile was not the male profile previously searched in CODIS."

<https://www.legacy.com/us/obituaries/timesdispatch/name/caroline-schollaert-obituary?id=6281441>

[Caroline Schollaert Obituary \(1994 - 2021\) - Jacksonville, FL, VA - Richmond Times-Dispatch \(legacy.com\)](https://www.legacy.com/us/obituaries/timesdispatch/name/caroline-schollaert-obituary?id=6281441)

[Jacksonville Coast Guard member killed confronting thief outside home](#)

[Man who killed Jacksonville Coast Guardsman in car robbery pleads guilty \(msn.com\)](#)

Case #2
IDENTIFICATION OF THE DEAD BODY OF A BABY
FOUND IN A WASTE-TREATMENT PLANT

National Police of Spain
Madrid, Spain

On 22-05-2012 the dead body of an unidentified baby was found in the Valdemingómez waste-treatment plant (Madrid).

The baby's dead body still had the umbilical cord attached to it, for which reason DNA samples were taken from the dead body and the umbilical cord. The same genetic profile was obtained from all the samples.

The postmortem examination performed on the dead body established that the newborn girl had suffered a violent death, caused by mechanical asphyxia and severe head trauma.

After obtaining the conclusive STR genetic profile of the dead body, it was entered in the Spanish Police's DNA Data Base, which resulted in a new search tool that makes possible to obtain new possible candidates who are compatible with DNA samples that had until now remained anonymous.

On 18-08-2020 legal authorisation was requested for the creation of the Pedigree Tree with the genetic profile of the baby's dead body, and for its collation with the conclusive profiles which are of interest for purposes of fighting crime and which already exist in the DNA's database.

Once the authorisation was obtained the searches were triggered aimed at identifying the likely biological parents of the baby.

Compatibility with a male's conclusive genetic profile was obtained; the male had been arrested in 2011 for physical injury in Madrid, and had remained in the DNA's database since then.

Kinship analyses were conducted and, as a result, it was revealed that the said conclusive profile corresponded to that of the baby's biological father.

As a result of the biological father's identification, the judicial police units started an investigation which was aimed at the identification and location of the baby's biological mother. This investigation resulted in a woman being found, from whom a conclusive DNA sample was taken.

Once this conclusive sample of the presumed mother had been analysed, a STR genetic profile was obtained, after which the kinship statistical analyses were performed together with those conducted on the father and the baby.

The studies conclude that this woman is the biological mother of the baby who was found dead in 2012 at Madrid's waste-treatment plant. She was arrested in 2021 after confessing, and was charged with an offence of INTENTIONAL HOMICIDE based on the above-described facts."

https://www.huffingtonpost.es/entry/detenida-una-mujer-por-matar-hace-9-anos-a-su-bebe-encontrado-en-un-vertedero_es_60797571e4b0eac4813c5c2b

https://www.huffingtonpost.es/entry/detenida-una-mujer-por-matar-hace-9-anos-a-su-bebe-encontrado-en-un-vertedero_es_60797571e4b0eac4813c5c2b

<https://www.europapress.es/madrid/noticia-encuentran-cuerpo-bebe-meses-gestacion-planta-incineradora-valdemingomez-20120718105936.html>

<https://www.elmundo.es/madrid/2021/04/16/6079713efc6c83db4b8b45df.html>

https://www.lasexta.com/noticias/sociedad/detenida-nueve-anos-despues-matar-arrojar-cuerpo-bebe-vertedero-valdemingomez_2021041660797cde8beb39000150a889.html

<https://elcierredigital.com/sucesos/359442556/resuelven-caso-bebe-muerto-vertedero-valdemingomez-2012.html> <https://www.20minutos.es/noticia/4660498/0/detenida-una-mujer-por-asfixiar-a-su-bebe-recien-nacida-y-tirlarla-a-la-basura-hace-9-anos-en-madrid/>

Case #3

Using Consanguineous Marriages to Identify Terrorists Using Bahrain's DNA Database

DNA Section, Forensics Lab

Ministry of Interior

Kingdom of Bahrain

Abstract

The Kingdom of Bahrain is one of the few countries that has significant numbers of terrorist investigations, which has allowed our scientists to develop expertise in the forensic examination of post and pre-blast explosive exhibits as well as in developing different strategies in handling the terrorism evidences.

A total number of 34 Improvised explosive devices (IEDs) was deployed in different areas of Bahrain, mainly in Aali, Hamad Town and Bori in years 2015-2017. These IEDs consisted of pipes, adhesive tapes, cardboard boxes, and some electrical devices.

Terrorists do not respect geographical boundaries nor ethnicities of the victims, and the uses of DNA profiling technology are the most suitable way to identify the terrorists and keep an end to their violence. The results of touch DNA of these samples were stored in National DNA database and there was no hit at that time. The strategy in working on Terrorism cases have been published in the following papers and book chapters:

- Al-Snan, Noora R. "The recovery of touch DNA from RDX-C4 evidences." *International journal of legal medicine* 135.2 (2021): 393-397.
- Al Snan NR, Ghayyath MA. Potential Use of Touch DNA in Terrorism Cases: A Report of Four Cases. *Arab Journal of Forensic Sciences & Forensic Medicine (AJFSFM)*. 2019;1(9):1267.
- Al-Snan, Noora R. "Potential Use of DNA Profiling in Solving Terrorism Cases." *Handbook of DNA Profiling* (2022): 589.


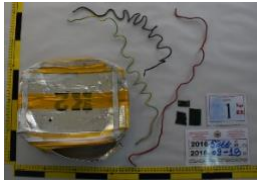




In 2019, we have come up with new DNA methodology which is going to be published soon under the title of *The effect of consanguineous marriages in solving DNA cases which was published in the following paper:*

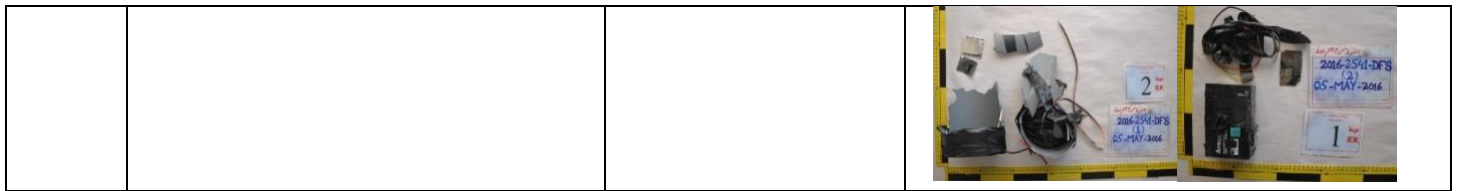
- Al-Snan, Noora R., Fatima J. AlBuarki, and Samreen S. Sayed. "The Effect of Consanguineous Marriages in Solving DNA Cases." *Handbook of DNA Profiling* (2020): 1-13.






Up to date, there are few papers discussing the inbreeding marriages and how they positively affect the process of human identification. We have found out the crucial need in focusing upon the characteristics of STR electropherograms with the excess of homozygous loci found and how can we utilize this kind of DNA profiles in obtaining astonishing findings. This strategy helped us to identify many unknown suspects by using familial DNA searching and kinship analysis by utilizing the number of homozygous loci found within each of the DNA STR profiles.


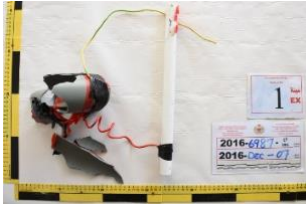
These homozygous counts assisted in identifying most of the known relatives stored in the DNA database, thus leading to the wanted unknown suspects. Mentioned below, the details of each terrorism case mentioned.

S.No	Case References	Incidence	Samples
1	DFS /6957/FSL/ 2/ 4376/ 2016	Five IEDs were found in Aali area on 05/12/2016	S1: Blue tape 
2	DFS /6983/FSL/ 2/ 4426/ 2016	One IED was found in Aali area on 06/12/2016	S1-2: Red Tape 
3	DFS/6982 /FSL/ 2/ 4425/ 2016	One IED was found on Sheikh Zayed Road, Block 740, in Aali on 06/12/2016	S1: Black and yellow tapes 
4	DFS/6942 /FSL/ 2/ 4367/ 2016	One IED was found on Salmabad Road, Block 708 on 04/12/2016	S1: Red tape 
5	DFS/6512 /FSL/ 2/ 4060/ 2016	One IED was found on Sh. Khalifa bin Salman Road, Manama side toward Aali area on 10/11/2016	S2: Yellow tape 
6	DFS/5508 /FSL/ 2/ 3394/ 2016	Two IEDs were found on Sh. Khalifa bin Salman Road, Hamad town side Block 760 on 25/09/2016	S1: Black tape 

S.No	Case References	Incidence	Samples
7	DFS/5508 /FSL/ 2/ 3394/ 2016	One IED was found near to resident house in block 738, Aali on 18/09/2016	S1: Green tape 
8	DFS/5266 /FSL/ 2/ 3256/ 2016	One IED was found on Sh. Salman Road near to Car Exhibition center on 15/09/2016	S1: White Tape 
9	DFS/3552 /FSL/ 2/ 2109/ 2016	Two IEDs were found on AlFakhar Roundabout on Sh. Zayed Road, Block 730 Aali on 21/06/2016	S2: Yellow and Black tapes 
10	DFS/3482 /FSL/ 2/ 2048/ 2016	Three IEDs were found on Sh. Zayed Road near to AlFakhar Roundabout on 16/06/2016	S2: Red tape on pipe 
11	DFS/3281 /FSL/ 2/ 1925/ 2016	Four IEDs on Sh. Zayed Road, block 742 Aali on 07/06/2016	S7: Yellow tape, S1: Green and black tape 
12	DFS/2541 /FSL/ 2/ 1466/ 2016	Two IEDs were found on Sh. Zayed Road, block 740 Aali on 04/05/2016	S1: black phone and black tapes, S2: Wires 



S.No	Case References	Incidence	Samples
13	DFS/919 /FSL/ 2/ 435/ 2016	Three IEDs were found on a yard opposite of abandoned warehouse, block 738 Aali on 14/02/2016	S2-2: Black Bag with black tape 
14	DFS/7078 /FSL/ 2/ 3038/ 2015	Two IEDs were found on road, block 742 Aali on 25/11/2015	S1: Red tape on gallon 
15	DFS/993 /FSL/ 2/ 515/ 2015	Riots and outlaw's terrorism acts were performed in block 738 Aali on 14/02/2015	S2: Face Mask 
16	DFS/3417 /FSL/ 2/ 2361/ 2017	One IED was found in Sh. Khalifa bin Salman Road, Hamad Town on 11/07/2017	S1: Metallic Can with Black tape 
17	DFS/4709 /FSL/ 2/ 2839/ 2016	Two IEDs were found on Road no. 71, Bori on 14/08/2016	S1: Blue tape on pipe and MP3 device 
18	DFS/4706 /FSL/ 2/ 2836/ 2016	One IED was found on Road, block 738 Aali on 14/08/2016	S1: pipe with tapes

			
19	DFS/6987 /FSL/ 2/ 4410/ 2016	One IED was found on Sh. Zayed Road near to Driving Training center, Block 734 Aali on 06/12/2016	<p>S1: Broke pipe with tapes</p> 

References obtained:

In July 2020, we have applied the homozygous count in the unknown DNA profile for the samples mentioned above. There were four homozygous loci and a microvariant (.2) (ratio of 50%) having homozygous which is relatively high and processed via AmpFLSTR™ Identifiler™ Plus PCR Amplification Kit).

Those five loci were checked in the National DNA database containing approximately ~ 100,000 DNA profiles (known and samples DNA profiles). The partial loci gave partial hit with 77 suspects. Along with our FSI team (Forensic Science Intelligence) and in cooperation with the Department of Criminal Investigation (CID) we have studied these 77 suspects that came hit with the 5 loci match and one of them was a 25 years old man (S.M) who was living near to this area where the IEDs were deployed (Aali).

On 26 July 2020, we have requested for the siblings of this person (S.M), who arrived at the CID to sign a collection consent and gave two reference samples. After analyzing his reference sample through GlobalFiler PCR amplification Kit and his fingerprint, it came a match to all of samples and fingerprint collected in the 19 cases of IEDs along with an outlaw case.

Significance of the HIT:

This is an important match achieved by using our strategy of counting the homozygous. It has been applied for many samples and so far, most of the cases gave a positive match. Consanguineous marriages are found among one-fifth of the world population mostly residing in the Middle East, West Asia, and North Africa, in addition to the emigrants from these communities now residing in North America, Europe and Australia. Although consanguinity is unadvised in medical practices as well as in some religious conviction such as Islam, due to the reoccurrence of recessive genetic disorders such as neuromuscular disorders, metabolic disorders, osteopetrosis syndromes and chondrodystrophia that might be lethal to the offspring. Nonetheless, there are still some cousin marriages at present day in most of the Arab countries, such as in tribes, conservative families, and Bedouins. There is considerably high level of inbreeding in the Arab countries, with intra-familial unions accounting for 20–50+% of all marriages compared to other countries.

This technique can be applied in various criminal cases such as terrorism, organized killings, robbery and human trafficking. As long as there is homozygous and microvariants characteristics in the electropherogram, DNA analyst can apply the partial search in the DNA database to look for possible matches from the relatives (any direct relative) of the wanted suspect.

This significant hit was obtained through the continuous progress in the forensics which is based upon worldwide research and the constant pursuit of the use of science in the achievement of crimin

Case #4
Serial Killer Identified by CODIS, Genetic Genealogy
Perhaps the first Interstate Familial Search

Denver Police Department Crime Laboratory

The solving of four cold case sexually motivated homicides from more than forty years ago in the Denver, CO metropolitan area happened through a combination of local CODIS matches, Investigative Genetic Genealogy (IGG), and an interstate familial search with the state of Texas. Local CODIS searches linked the cases together, IGG traced the individual's family line to Texas, and the familial search identified the exact family. After elimination of multiple brothers by investigators, an exhumation of a deceased individual and subsequent DNA testing on the remains identified the perpetrator as Joe Ervin and provided some measure of resolution to the families. Three of the cases occurred within the City and County of Denver and the fourth case occurred in neighboring Adams County. The individual responsible for these crimes subsequently killed a female Aurora, Colorado police officer during a traffic stop and then committed suicide while in jail awaiting court proceedings for that murder. The identification of Joe Ervin is nominated for "DNA Hit of the Year" due to the 'every tool in the toolbox' approach, the identification of a serial killer, and the innovative nature of the work performed. To date, another interstate familial search match is not known and one of this magnitude strengthens the reasoning to make this a regular option in cold casework. These cases were funded in part by federal grants and local Crime Stoppers backing.

<https://www.youtube.com/watch?v=zs4ByiCguao> <https://www.oxygen.com/crime-news/colorado-cop-killer-joe-michael-ervin-idd-as-serial-killer>

<https://www.washingtonpost.com/nation/2022/01/29/colorado-police-killings-denver-cold-case/>

Case #5
Sexual Assault Murder, Gauteng, South Africa

Forensic Pathology Service Bronkhorstspuit
Gauteng, South Africa

"On 2016/10/10 at 14:00 the SAPS Bronkhorstspuit requested FPS Bronkhorstspuit to collect a body of an unknown African Female on the R42 Delmas road. A case of murder was open Cas 121/10/2016. The body was starting to decompose and body number DR 224/2016 was assigned to the unknown deceased.

On 12 October 2016 at 09:00 a post-mortem was conducted at the medical legal laboratory Bronkhorstspuit Pathologist from Pretoria. The suspicion was there that the victim was murdered and sexually assaulted. The Pathologist conducting the examination then collected DNA evidence from the genital organs by using an evidence swabs provided in the sexual assault collection kit. The evidence was received by Forensic Pathology Service Bronkhorstspuit from the Pathologist sealed and handed over to the South African Police Service for DNA investigation. This samples were sent to the Biology Lab of the SAPS and reported as urgent as there was a suspicion that a serial killer and rapist was operating in the Bronkhorstspuit area. Forensic Pathology service by law has the right to bury an unknown deceased after 30 when all avenues were taken to see if the deceased can be identified. Thus on the 19 October 2016 The victim identification unit was requested to come and collect reference DNA and fingerprints for identification purposes. The same unit was requested again to come and collect samples and fingerprints for matching to the database on 26 April 2017. The fingerprint results was available on 2017/05/23 as unknown and couldn't be determent by LCRC or Home affairs. But still the Forensic Pathology service Bronkhorstspuit decided not to bury the victim. On the other side in Alandale a debriefed mother reported her daughter missing a week after she last saw her on 09 October 2016. In February 2017 the case was escalated to a kidnaping case at SAPS Lenasia case 97/02/2017 as the suspect was a high profile Cash and Transit suspect. The suspect DNA swab was collected and send for matching to the database as urgent. In the same year between July and August 2017 to the surprise of the investigation officer a hit on the suspects DNA was reported by the SAPS biological lab. The DNA from a sexual assault kit taken at FPS Bronkhostspuit case number linked to the suspect on the kidnaping case. The investigation officer then traced the case back to FPS Bronkhorstspuit DR 224/2016 in September 2017. On 2017/09/22 a human remains id kit was collected for comparison with the mother's DNA. On 2017/09/28 a report was received from the Pretoria SAPS Lab identifying the decease."

Supporting Document

https://74097c68-6e2e-43ed-820d-a88fd0a472d8.usrfiles.com/ugd/18050b_af9a4a3cb1dd41eba2f986a77cef4f5b.pdf

<https://www.iol.co.za/the-star/news/one-of-sas-most-wanted-heist-kingpins-convicted-for-rape-murder-of-sbv-employee-5dedb613-ed04-40ae-9b39-2e64c9b0aaba>

Case #6
Jewelry Heist Case

DNA Databank Division
Royal Malaysia Police
Kuala Lumpur, Malaysia

In early 2022, an owner of a jewelry shop stopped at a gas station to refuel his car and was ambushed by two cars with robbers. They attacked him and his vehicle and took three bags of jewelry from his car. The victim suffered minor injuries. Weapons used in the robbery were recovered from the scene and the incident was recorded on CCTV at the gas station. The case received substantial social media attention.

The Royal Malaysia Police was deployed to gather evidence and used DNA to obtain a DNA profile from the victim's car, which had been touched by the assailants. Seven DNA trace samples were collected leading to two male profiles. These profiles were uploaded into the Malaysian which led to a match with one of the two profile DNA profiles recovered from the victim's car. Within 48 hours, police were deployed and successfully captured the male whose profile matched to the database. This led to several additional arrests of other men police believed were involved in the case. Police collected additional DNA samples from these men and all resulting profiles were uploaded to the database. One of these arrested men matched to the DNA profile of the second male profile recovered from the crime scene. The suspects were charged with robbery. The DNA database therefore played a critical role in identifying the assailants.