



Laboratory Information Management Systems – DoD DNA Operations



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**Director DoD DNA Operations
Armed Forces Medical Examiner System**

**Military Libraries Training Workshop 2019
Dec 11, 2019**





Outline



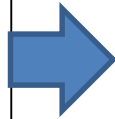
- **Armed Forces Medical Examiner System (AFMES)**
- **DoD DNA Operations**
- **DNA Databases**
- **Laboratory Information Management Systems**

Mission & Vision



Mission

*Investigate deaths
Identify the fallen
Improve readiness*



Vision

*Be the global leader in
comprehensive and
innovative medicolegal
services enhancing the
readiness, sustainability,
and survivability of those
we serve*



Deploy Solutions for
21st Century Battlefield



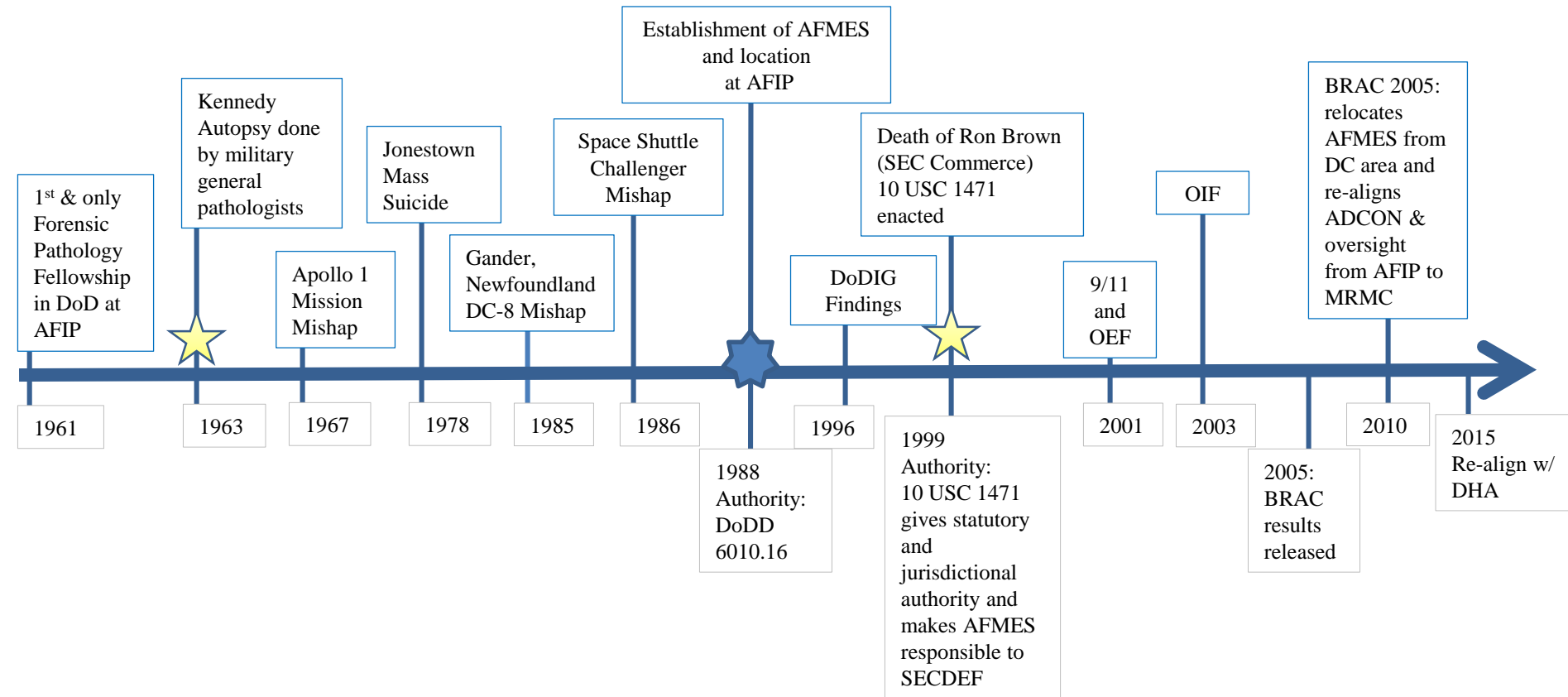
Improve Readiness,
Health and Experience



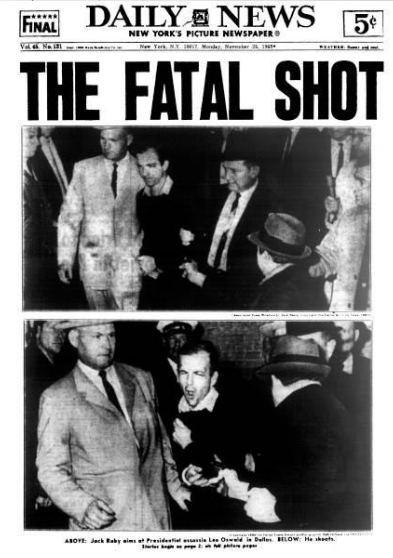
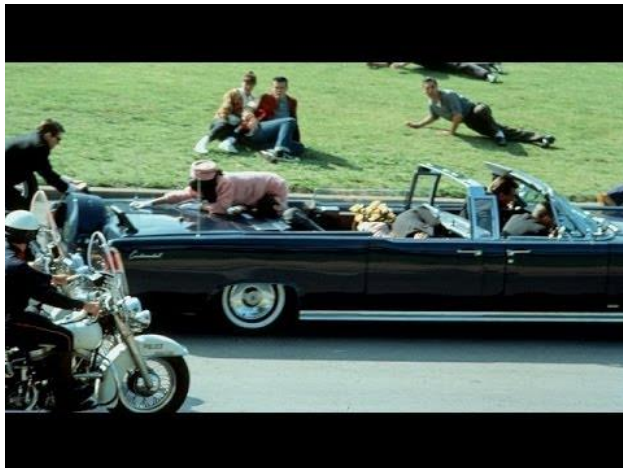
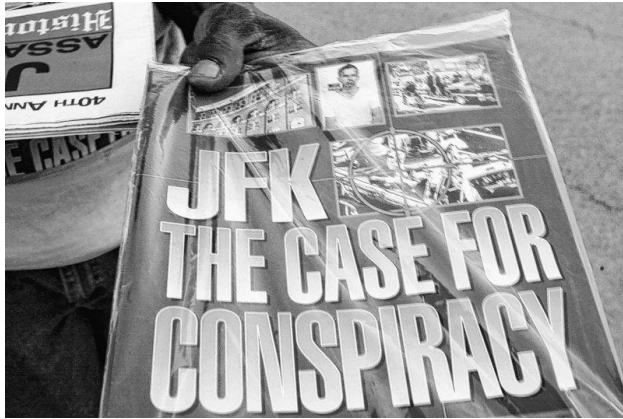
Deliver Solutions to
Combatant Commands

Impartial; Objective; Authoritative and Scientific determination
of cause/manner of death and identification of decedents (10 USC § 1471)

History



Kennedy Assassination 1963



Apollo 1 Mission Mishap



Jonestown Mass Suicide



Space Shuttle Challenger Mishap




Gander, Newfoundland DC-8 Mishap




Establishment of AFMES and location at AFIP 1988





**OPTIC
ELECTE
NOV 12 1993
A**

Department of Defense
DIRECTIVE
AD-A272 374



March 8, 1988
NUMBER 6010.16
ASD (HA)

2

SUBJECT: Armed Forces Medical Examiner System

References: (a) Title 10, United States Code, Sections 133, 176, 3012, 4711, 5031, 8012, and 9711
(b) Title 37, United States Code, Section 555
(c) DoD Directive 5210.42, "Nuclear Weapon Personnel Reliability Program," December 6, 1985
(d) DoD Directive 5210.65, "Chemical Agent Security Program," October 15, 1986

A. PURPOSE

This Directive establishes an Armed Forces medical examiner system with an Office of the Armed Forces Medical Examiner (OAFME) and an Armed Forces Medical Examiner (AFME), under reference (a), to conduct scientific forensic investigations for determining cause and manner of death under specific circumstances for:

1. Members of the Armed Forces on active duty or on active duty for training.
2. Civilians, including dependents of military members.

B. APPLICABILITY

This Directive applies to the Office of the Secretary of Defense (OSD) and to the Military Departments.

C. DEFINITIONS

The terms used in this Directive are defined in enclosure 1.


D. POLICY

1. The AFME and the OAFME shall be located at the Armed Forces Institute of Pathology (AFIP).
2. The AFME shall be notified expeditiously of the death of any Service member on active duty or active duty for training and of any individual, regardless of status, who dies on a military installation, vessel, or aircraft or who was enrolled in the Personnel Reliability Program, references (c) and (d).
3. The AFME shall have the authority to order a medicolegal investigation to include an autopsy, of the death of any Service member on active duty or member of the Reserve components on active duty for training where the Federal Government has exclusive jurisdictional authority, and where the circumstances surrounding the death are suspicious, unexpected, or unexplained. Such circumstances include, but are not limited to the following:

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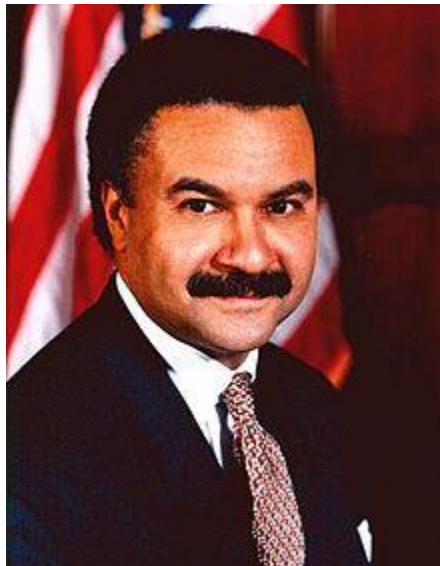
93-27354



Death of Ron Brown

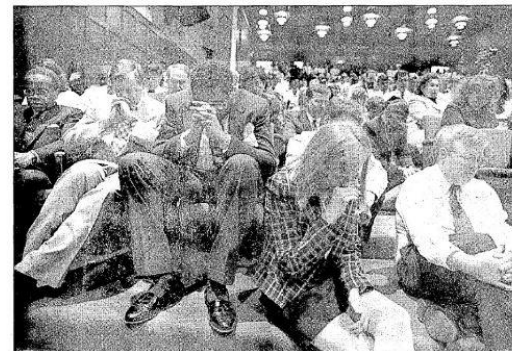
United States Secretary of Commerce (SecCom)

April 3, 1996



Jet Crash Kills Commerce Secretary Brown

Business Leaders, U.S. Officials Among 33 Who Perish as Air Force Plane Goes Down in Croatia



Commerce Department employees pray during President Clinton's address to them on the crash of Secretary Ronald H. Brown's plane. Detail, Page A20.

By Elaine Marcus
Washington Post Staff Writer

A U.S. military plane carrying Commerce Secretary Ronald H. Brown and 32 other people crashed into a hillside yesterday while trying to land in extremely bad weather near the Croatian port city of Dubrovnik, killing everyone on board.

"Unfortunately all the people who were in the aircraft are dead. We found all the bodies," Miroslav Zandi, Croatian ambassador to the United States, told reporters this morning after rescue teams worked through the night in fog and rain. He said 23 bodies were recovered in and around the plane.

The Air Force T-43A aircraft, whose passengers included other Commerce Department officials and a group of American business leaders looking into postwar reconstruction projects in the former Yugoslavia, smashed into a rocky 2,300-foot hillside about 1.8 miles from the Dubrovnik airport.

The plane disappeared from airport radar screens at 2:52 p.m. (7:32 a.m. EDT). Air Force Lt. Gen. Howell Estes, operations director for the Joint Chiefs of Staff, told reporters at his Pentagon that there was no evidence of an explosion aboard the plane or of hostile fire around the airport, once the scene of heavy Serb-Croat fighting.

Besides Brown, there were 12 U.S. government officials, 13 business executives, New York Times reporter Nathaniel Rahn and six crew members aboard the plane.



Heavy Rains Hamper Searchers

10 Bodies Taken From Plane's Site

By John Fund
Washington Post Staff Writer

DUBROVNIK, Croatia, April 3—Braving fierce winds and driving rain, Croatian security services scoured a hillside near this medieval town tonight

10 U.S.C. § 1471

Forensic Pathology Investigations



Enacted October 5, 1999



September 11, 2001 Operation Enduring Freedom Operation Iraqi Freedom



OEF: Oct 7, 2001



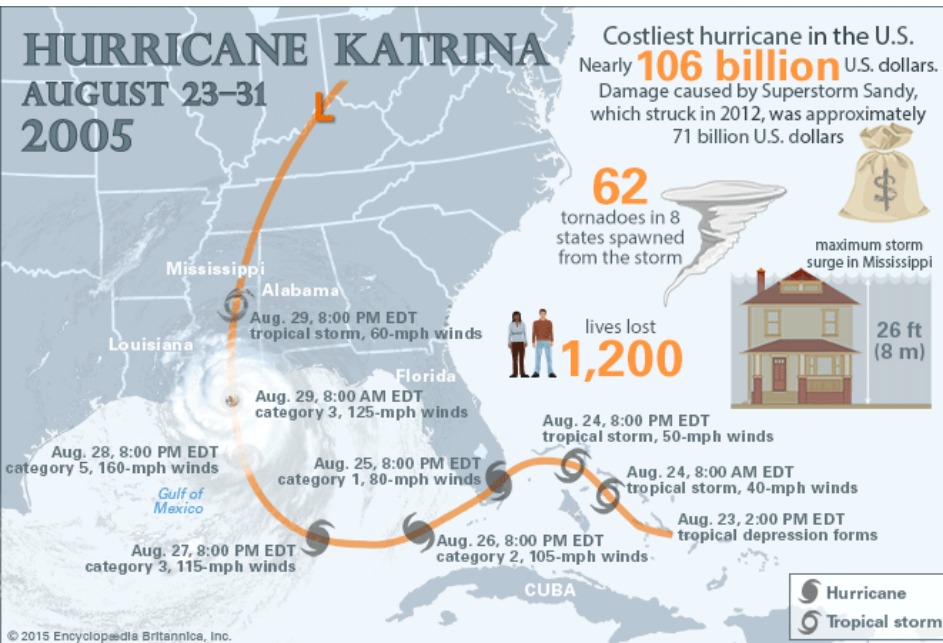
OIF: Mar 20, 2003



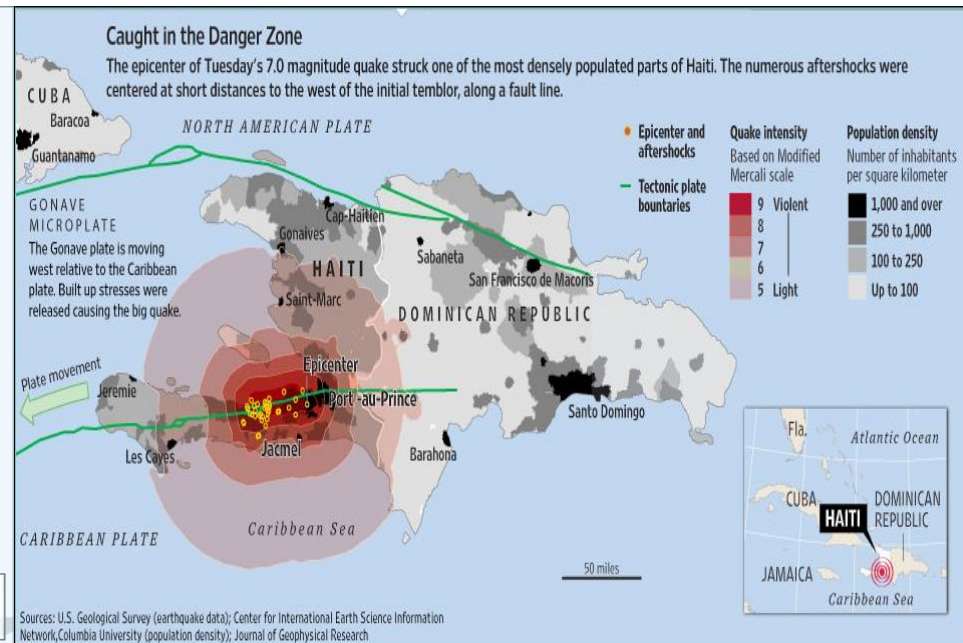
Humanitarian Efforts 2005 and 2010



Hurricane Katrina



Haiti Earthquake

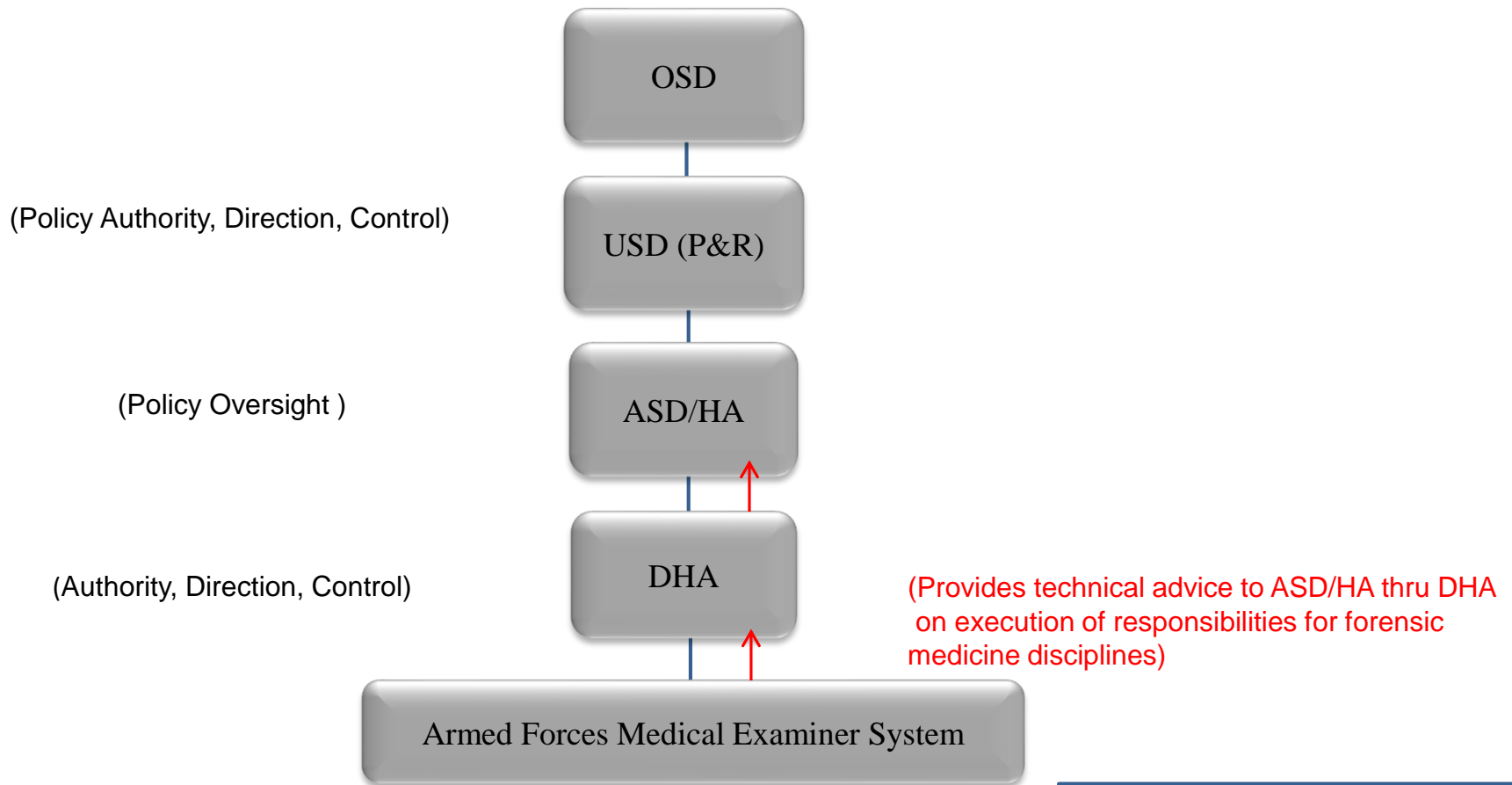




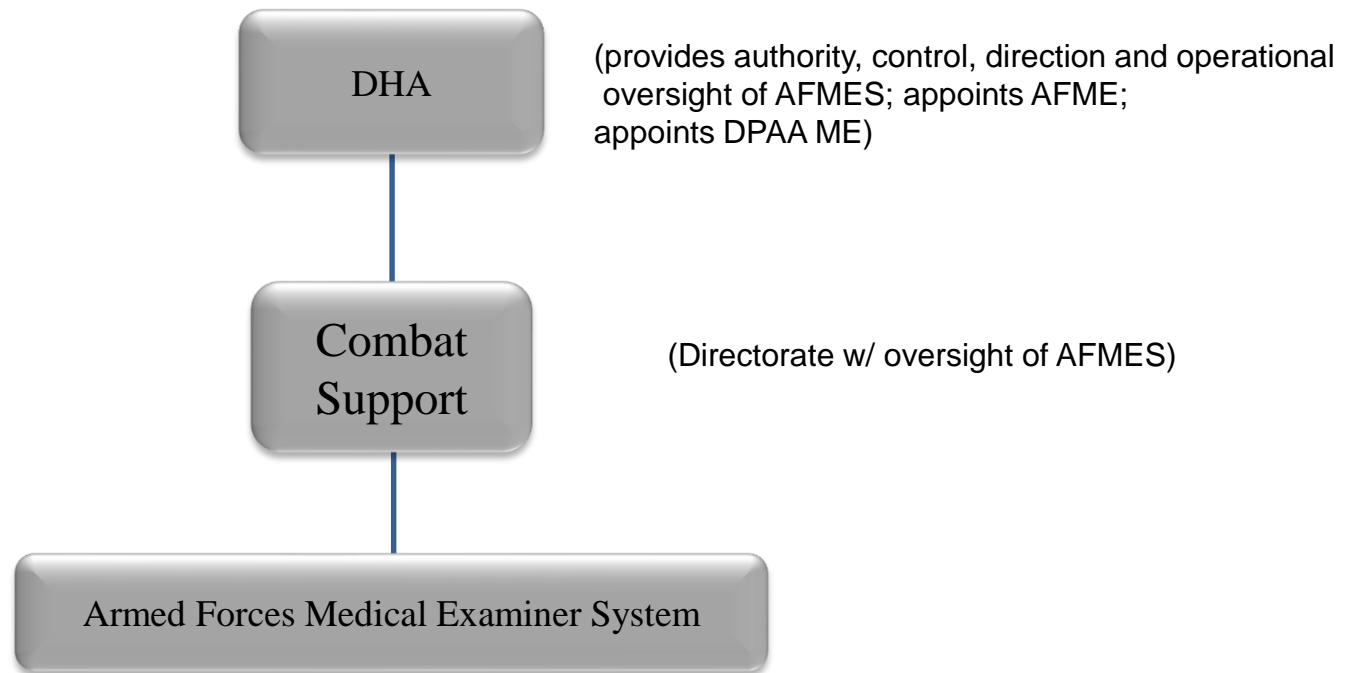
BRAC Relocates AFMES from DC area to DAFB Building Fully Occupied 2012



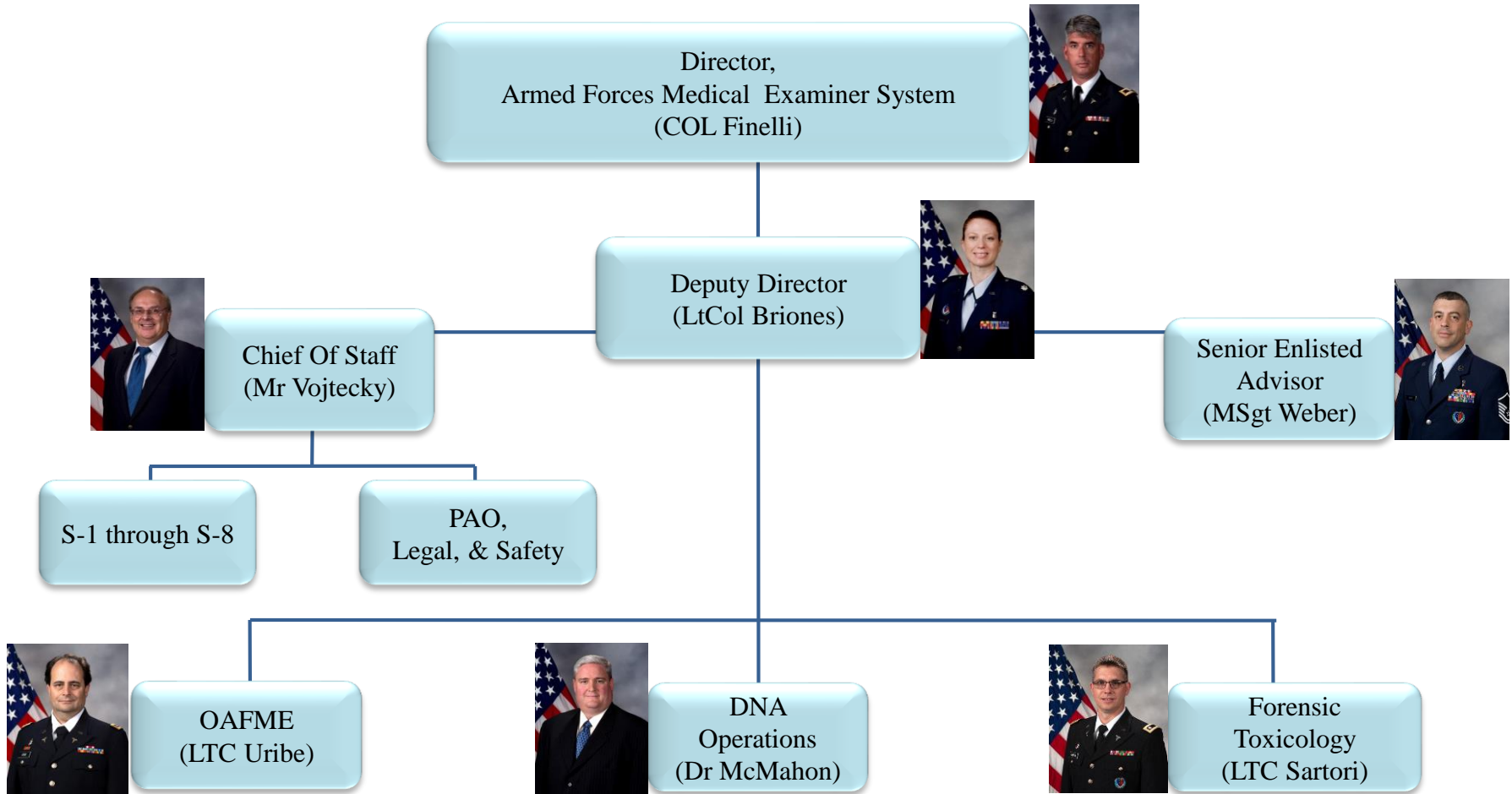
Command & Control



Command & Control



Organization Chart



The ONLY Federal Medical Examiner System

Office of the AFME



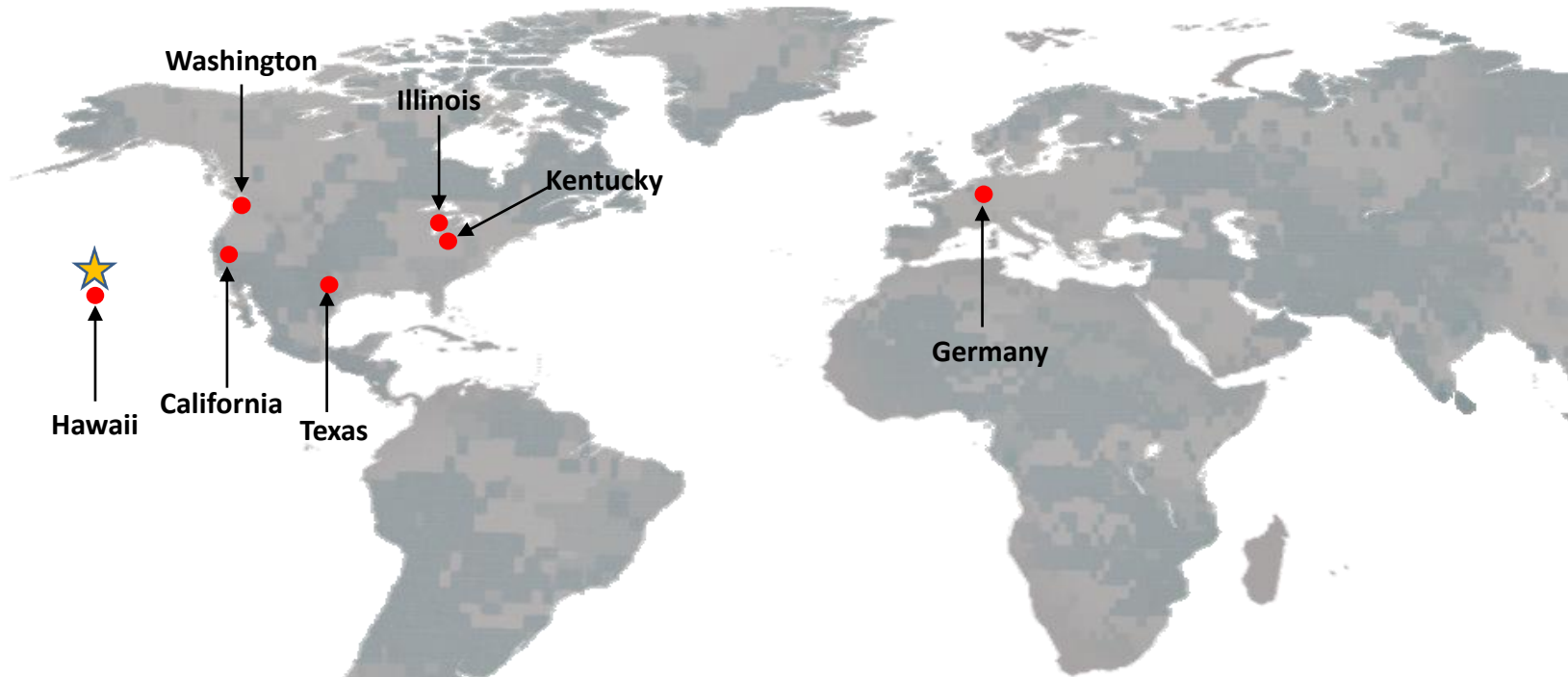
Functions:

- Provide comprehensive forensic pathology investigations worldwide IAW 10 USC 1471
- Responsive to no-notice missions worldwide
- Identify decedent; determine cause & manner of death
- Train fellows, residents, medical students and mortuary affairs specialists
- Conduct mortality surveillance on all Active Duty U.S. Service Members
- Provide information to improve Warfighter survivability
- Provide death certificates and autopsy reports to authorized entities
- Provide weekly, quarterly, and annual suicide reports
- Present and publish relevant findings related to service member mortality

Stakeholders:

- Families of the decedents
- DoD Leadership, Combatant Commanders, Local Commanders, Surgeon Generals
- Investigative agencies, safety boards, 15-6 investigators
- FBI, NTSB, DoJ, other federal agencies
- Combat casualty care providers, Joint Trauma Analysis and Prevention of Injury in Combat, Defense Suicide Prevention Office

Regional Medical Examiners



★ AFME leads the AFMES; serves as scientific authority for the identification of remains; ensures the Medical Examiner at Defense POW/MIA Accounting Agency (DPAA) is fully informed in order to establish identification and laboratory Policy consistent with AFMES

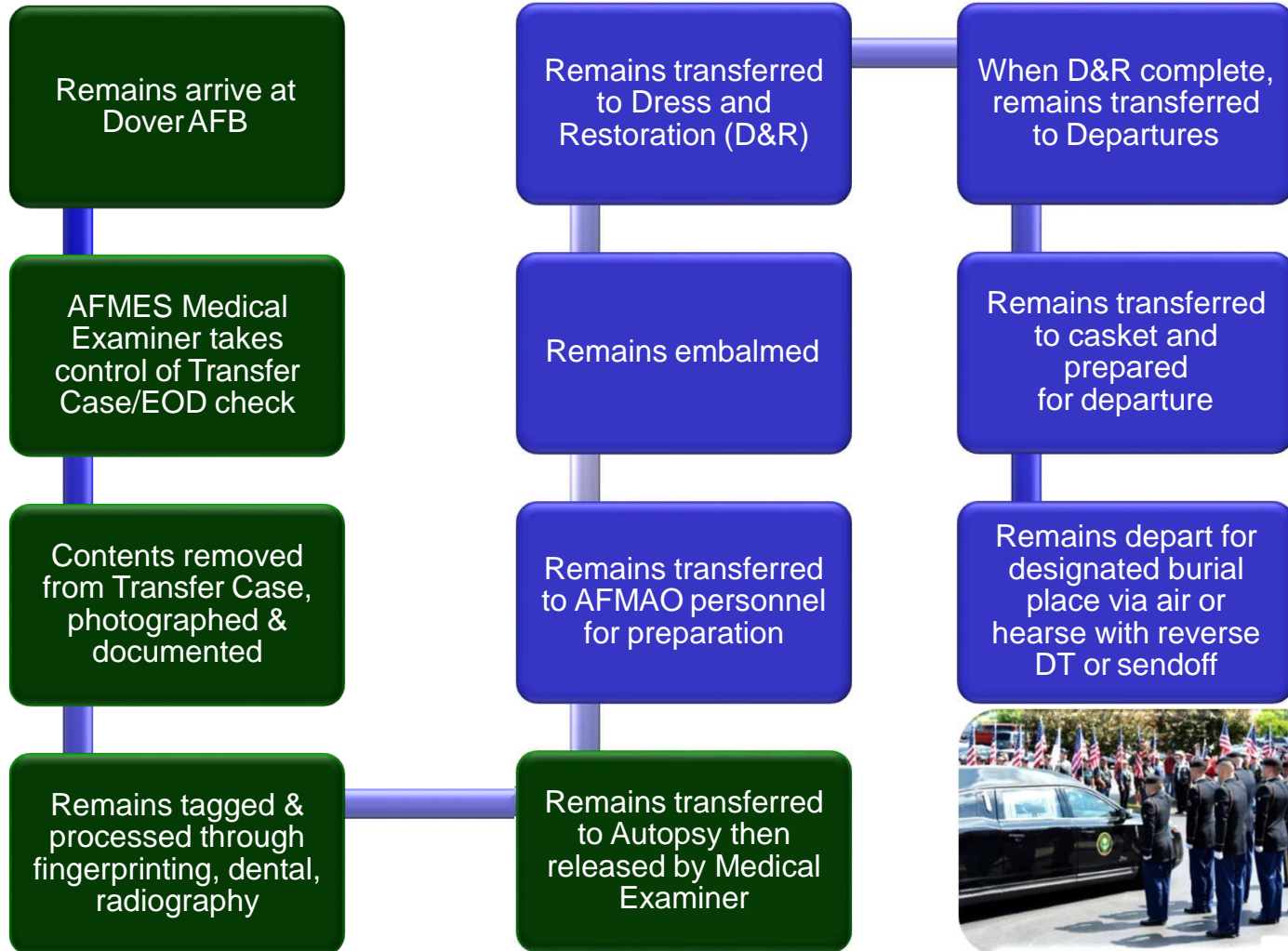
Office of the AFME cont...



Color legend for designated areas of responsibility:

AFMAO

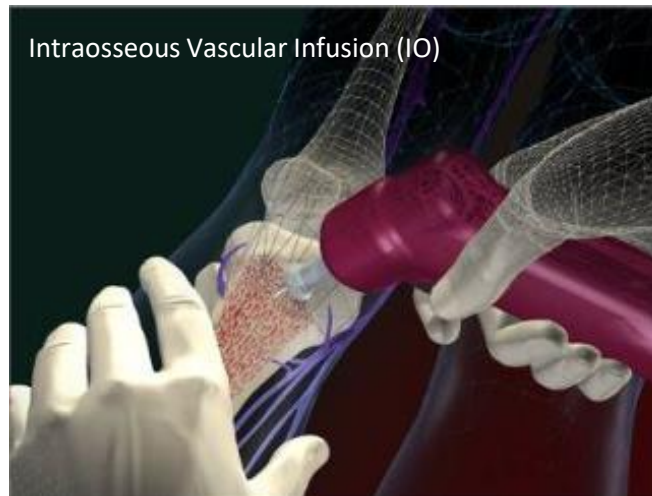
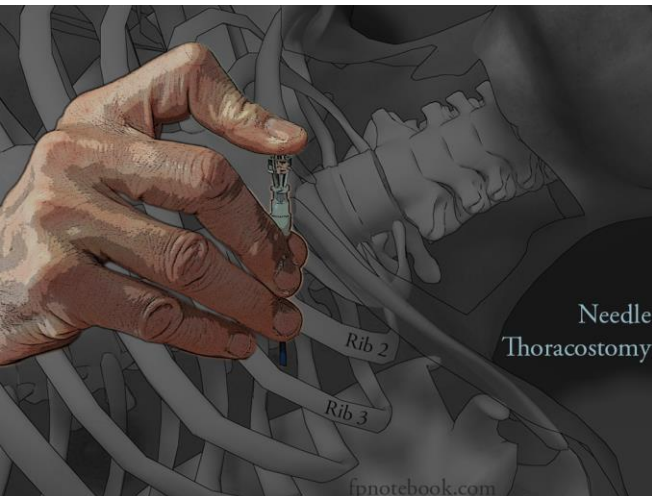
AFMES



Force Multiplier



Feedback to the Field



Mortality Statistics help us understand health and how it can be improved

Forensic Toxicology



Functions:

- DoD centralized laboratory which performs routine and specialized toxicological analysis on military aircraft, ground and ship incidents, with and without fatalities.
- Forensic toxicology support for criminal investigations conducted by AFOSI, CID and NCIS.
- Alcohol and drug tests for medicolegal (sexual assault, DUI, suicide) determinations.
- Quality assurance, certification and inspection services for the DoD Drug Demand Reduction Program.
- Selected cases of national and international interest.

Stakeholders:

- Armed Forces Medical Examiners
 - Full service post mortem toxicology
- Drug Demand Reduction Program/Labs
 - Provide QA/QC support through proficiency specimens, inspections, prevalence testing and surveillance (DoDI 1010.16/ DoDD 1010.01))
 - Provide a technical evaluation and method development capability
- Military Working Dog Kennels World Wide
 - Provide K-9 training aides for the 200 services kennels
- Services JAG Corps
 - Deliver expert witness support at legal proceedings
 - Provide DFSA toxicology training

DoD DNA Operations



Functions:

- Collection and storage of DNA reference specimens of current military, and other designated individuals (AFRSSIR) IAW DEPSECDEF memo 16 Dec 1991: Establishment of a Repository of Specimen Samples to Aid in Remains Identification Using Genetic Deoxyribonucleic Acid (DNA) Analysis
- Provide laboratory operations for processing of specimens and references for human remains identification (AFDIL)
- Produce comparison reports for use by DPAA and Medical Examiners for authoritative identification of decedents
- Provide laboratory operations for current and past conflict personnel accounting
- Research

Stakeholders:

- Families of decedents
- OAFME
- Defense POW/MIA Accounting Agency
- National Security Intelligence and Law Enforcement
- Other Federal Agencies as requested

AFMES Missions Supported By DoD DNA Operations



Present Day Accounting



Past Accounting

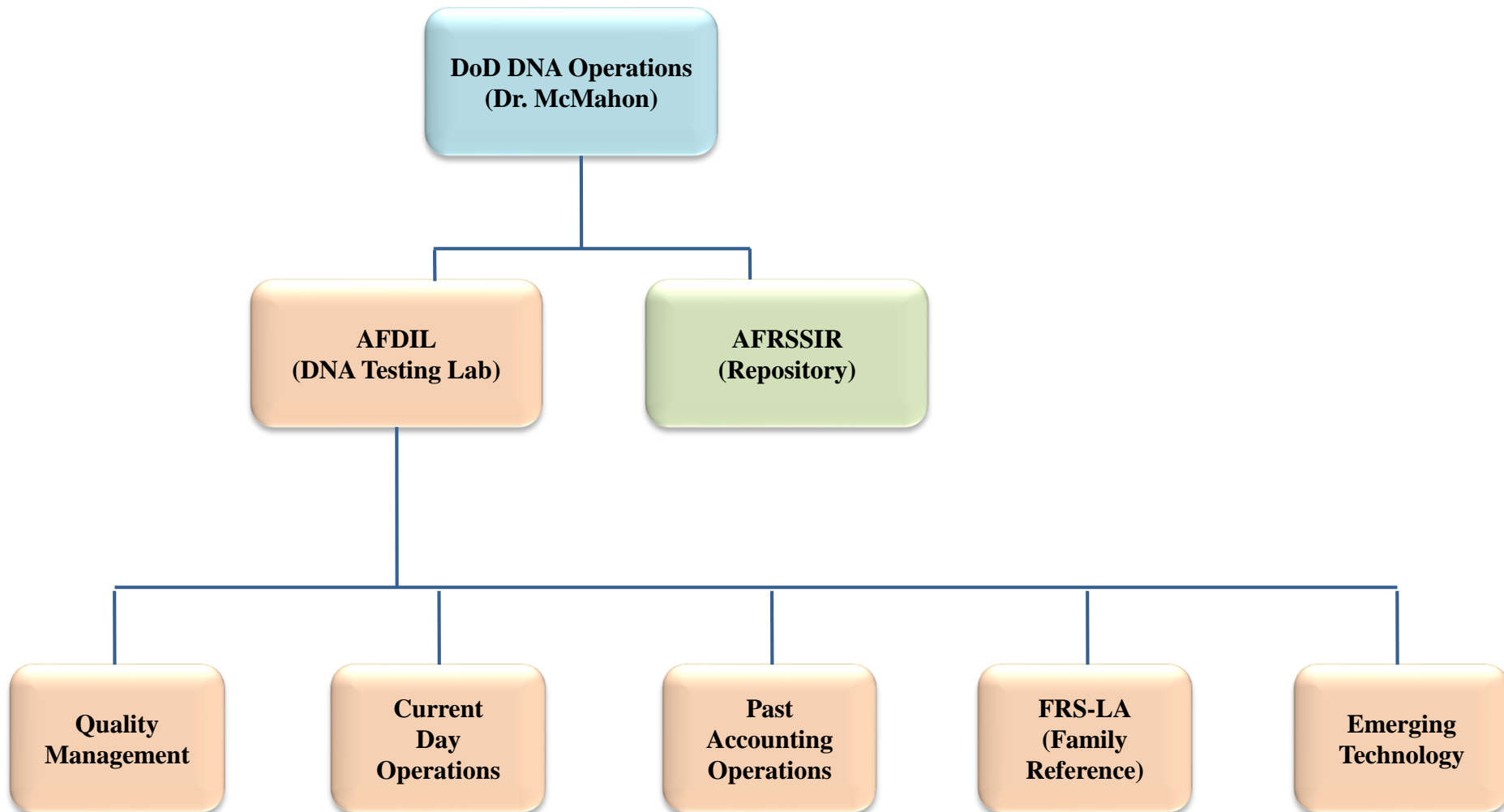


FRS Databasing



World Wide Support

DoD DNA Operations



- **Criminal Forensics**

- Question: Who in the general world's population committed the crime?
- Open population as you initially do not know who committed crime
- Nuclear DNA testing with either Direct Comparison to Reference or search of appropriate database

- **Human Remains Identification**

- Question: Who is the missing individual?
- Typically a closed population
- Nuclear and mtDNA testing with Direct comparison to reference with either Direct Comparison to Reference or search of appropriate database

AFRSSIR (Repository)

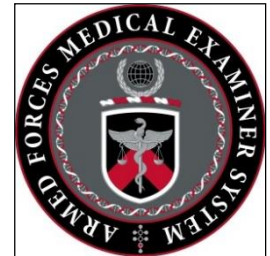




AFDIL (Armed Forces DNA Identification Laboratory)



- Division of the Armed Forces Medical Examiner System (AFMES)
 - Defense Health Agency (DHA)
- Established in 1990
 - Utilize DNA methods to identify the remains of US service members
- Mission Partner with the Defense POW/MIA Accounting Agency (DPAA) since 1990



Laboratory Accreditations & Standards



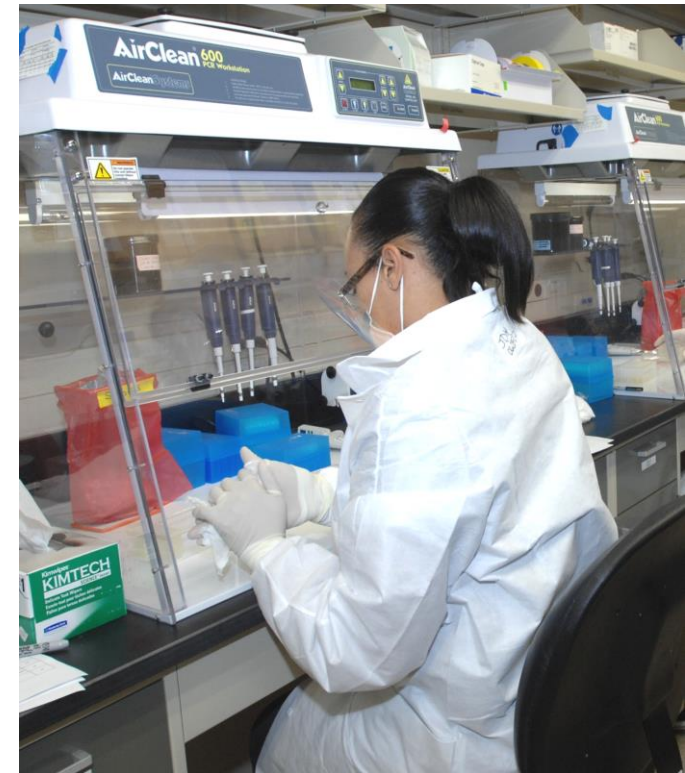
**American Society of Crime
Laboratory Directors-Laboratory
Accreditation Board
(ASCLD – ISO 17025
International Certification)**



**Federal Bureau Of Investigation
(FBI) Quality Assurance
Standards**



**DoD DA Oversight Committee
(Defense Science Board 1995)**



Defense POW/MIA Accounting Agency



The Defense POW/MIA Accounting Agency's mission is to provide the fullest possible accounting for our missing personnel from past conflicts to their families and the nation.



Currently there are more than 81,000 Americans remain missing from WWII, the Korean War, the Vietnam War, the Cold War, and the Gulf Wars/other conflicts. Out of the 81,000 missing, 75% of the losses are located in the Indo-Pacific, and over 41,000 of the missing are presumed lost at sea (i.e. ship losses, known aircraft water losses, etc.).

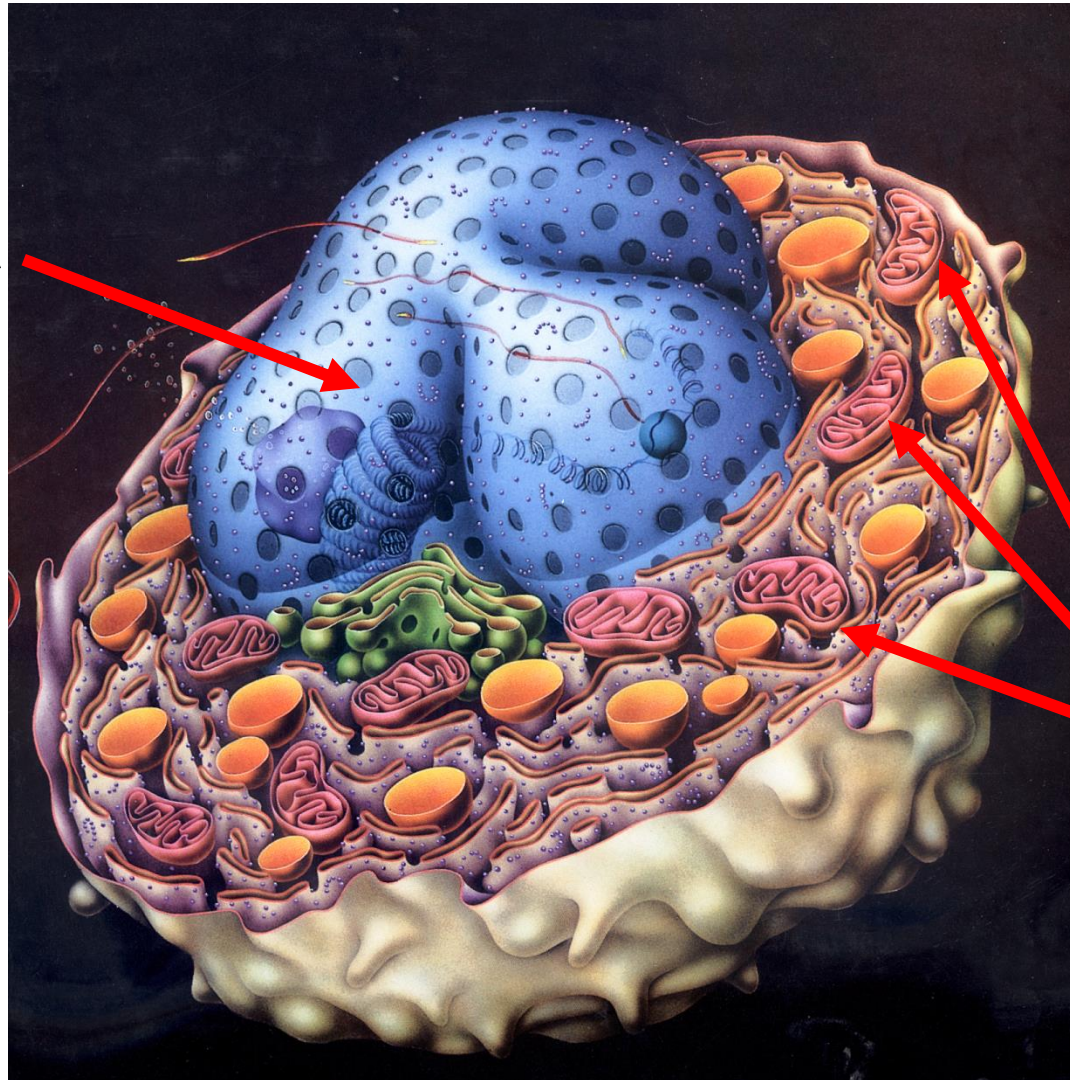
Points to Consider



- Every DNA result will not necessarily lead to or support a new ID
 - **Too degraded**
 - **Commingling**
 - Subsequent recoveries
 - Local national/non-US
 - **No family reference**
 - Non human



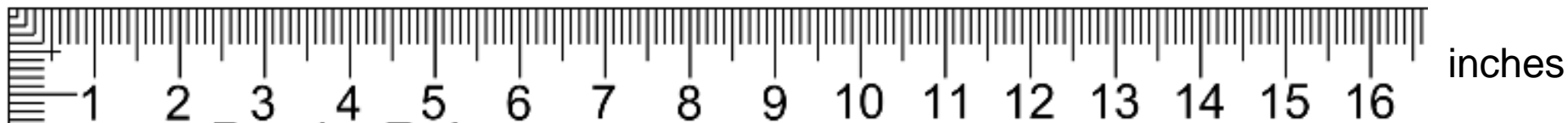
The Human DNA Genome



Nuclear DNA
~3.2 billion
base pairs
(bp)

**Mitochondrial
DNA**
16,549 bp

DNA Degradation: Example



inches

1 yr

2 yr

3 yr

4 yr

5 yr

6 yr

1 in = 100 base-pairs

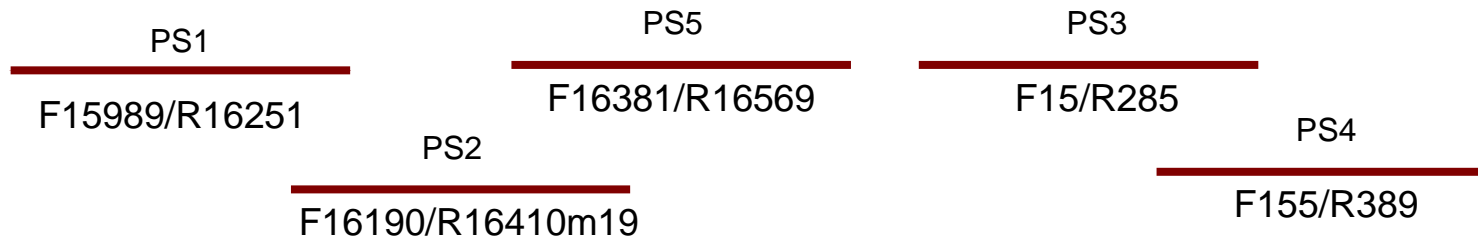
mtDNA Forensic Testing Strategies



Control Region

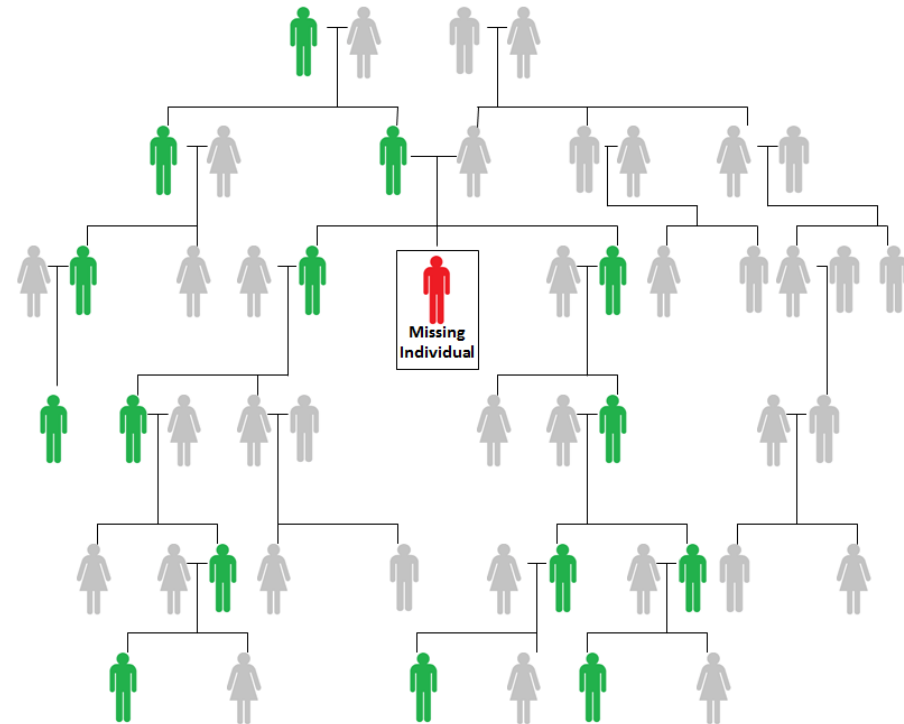


Primer sets (~200bp i.e. 2 in)



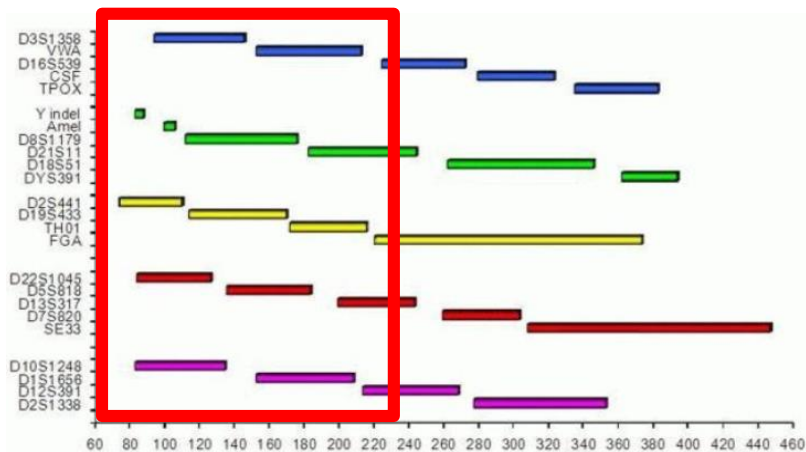
Mini-primer sets (~120bp i.e. 1 in)





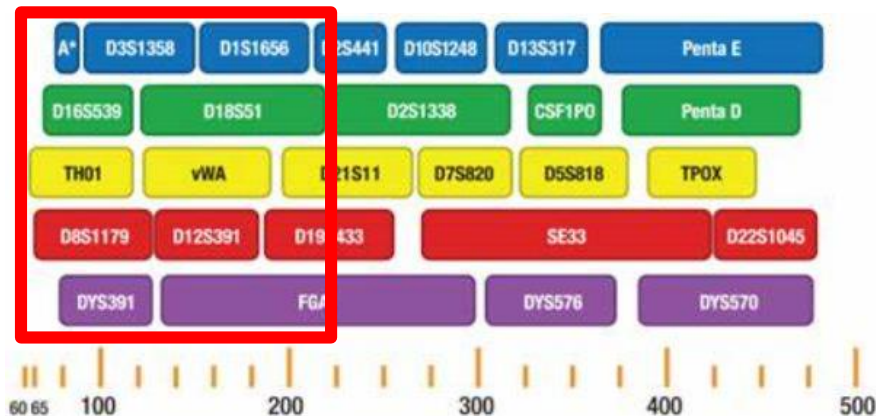
Paternal Donors

Nuclear DNA Capabilities (auSTR and YSTR)



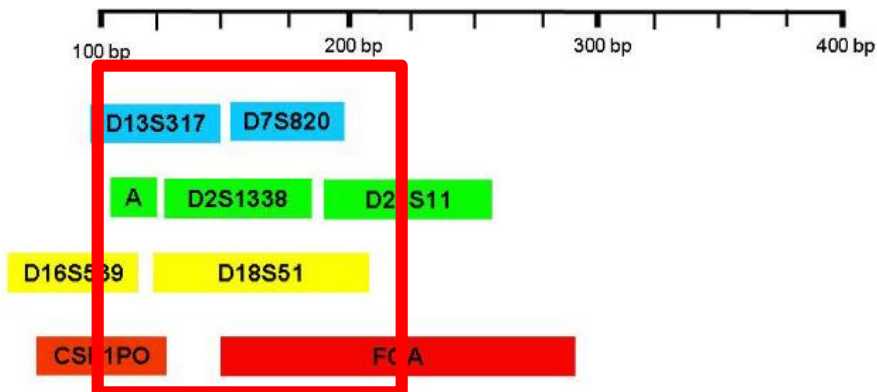
AmpFISTR GlobalFiler

<https://www.thermofisher.com/order/catalog/product/4476135>



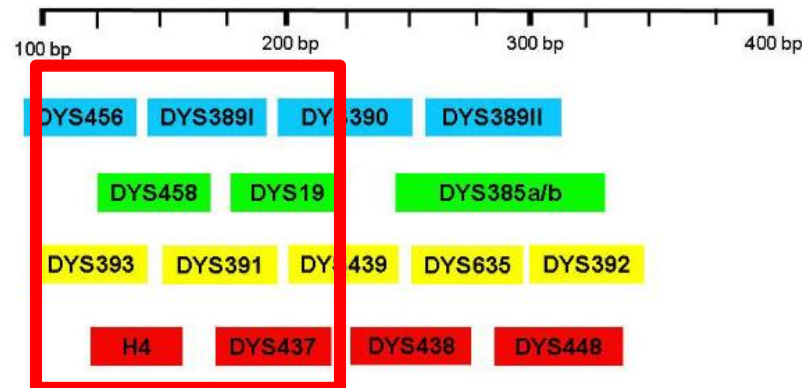
PowerPlex Fusion

<https://promega.com>



AmpFISTR MiniFiler

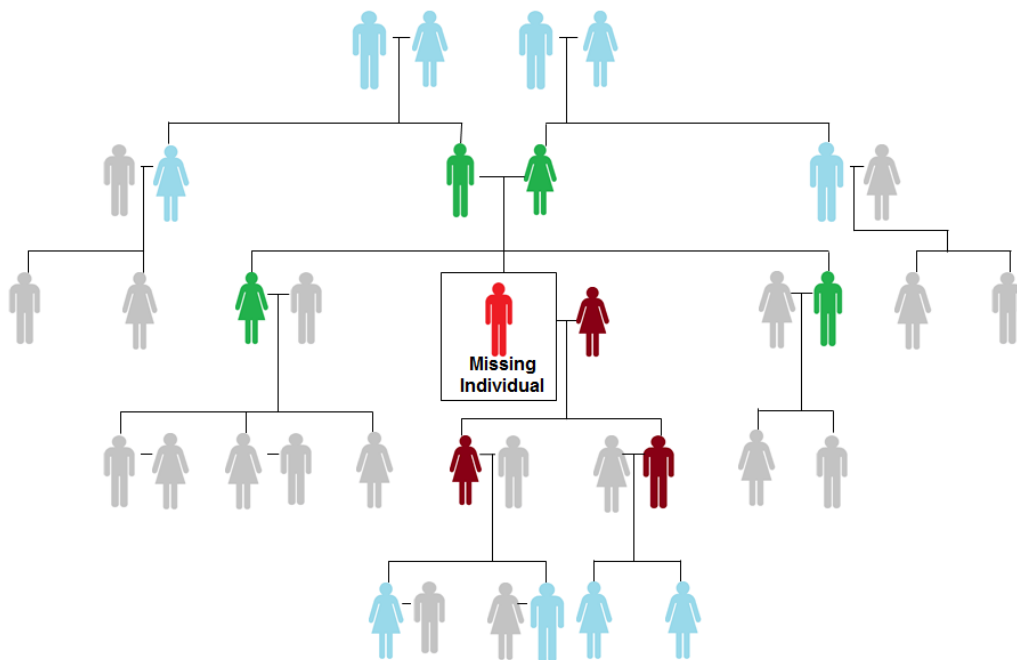
<https://strbase.nist.gov/kits/MiniFiler.htm>



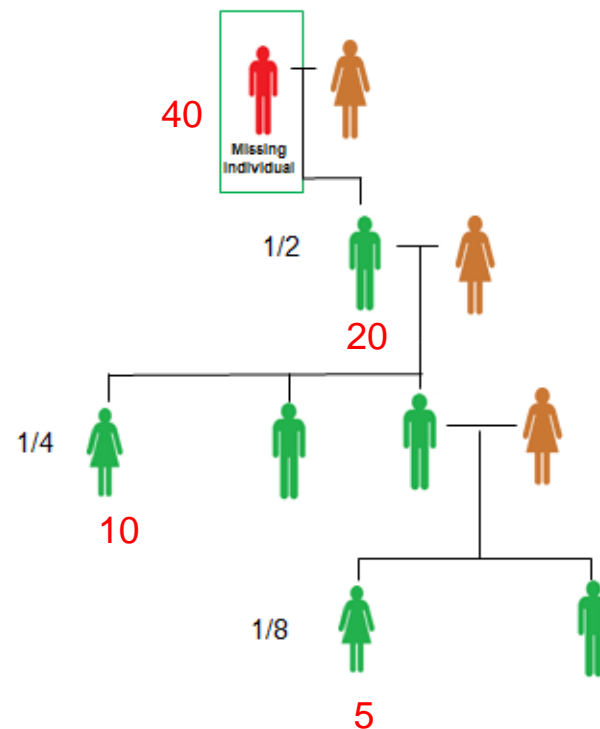
AmpFISTR YFiler

<https://strbase.nist.gov/kits/YFiler.htm>

Autosomal Inheritance

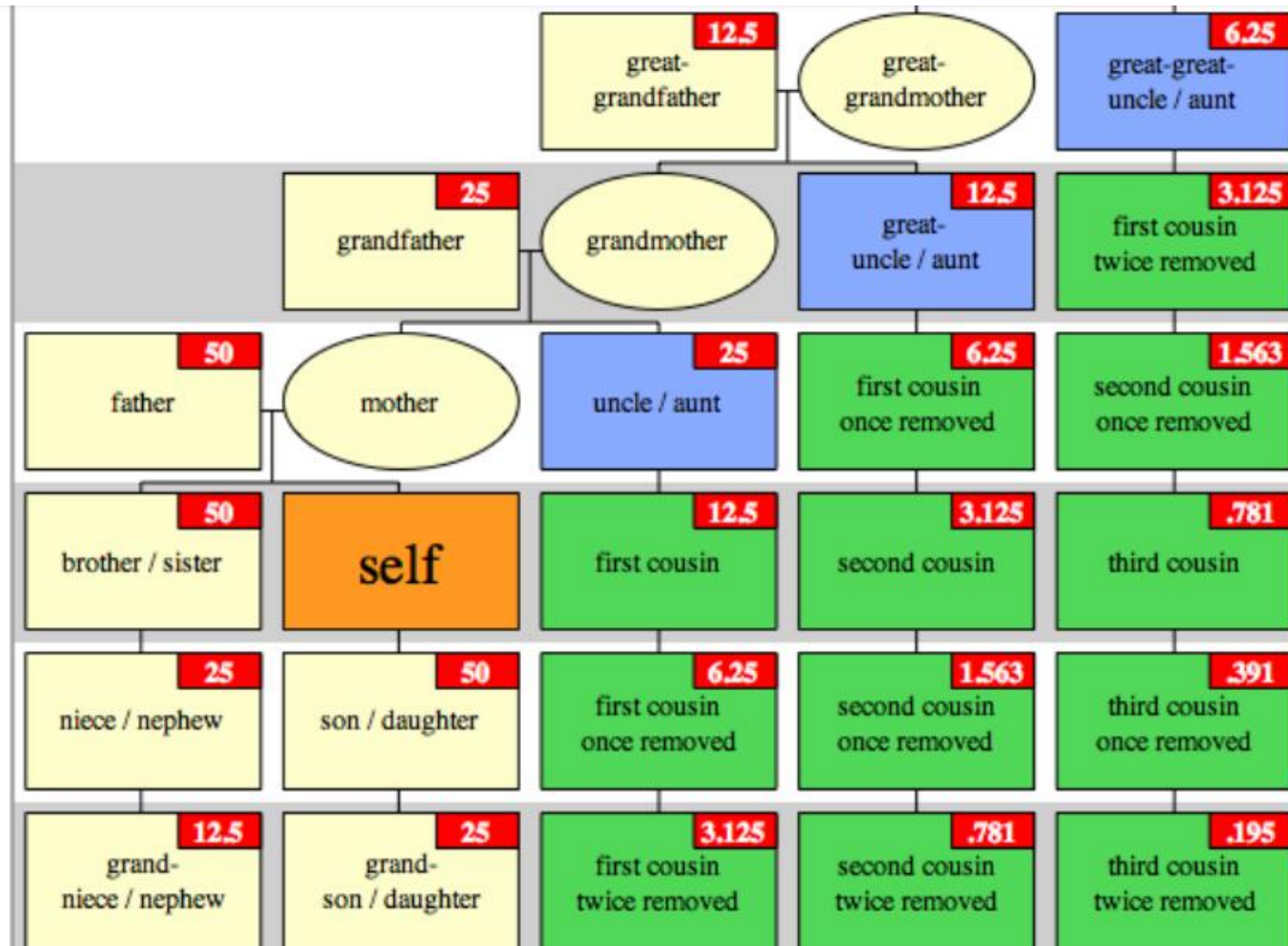


Nuclear Donors



Allele share between
Generations

Nuclear DNA Shared Between Relatives



Amount of total nuclear DNA in common with ones relatives

2016: NGS Korea Punchbowl



- **Kokura Mortuary**
- **Chemically Modified**
 - 40-50% formaldehyde: Bad for DNA
- **16 year project by AFMES-AFDIL**

NGS Success



- **Overall: 1363 samples in 3.5 yrs**
 - ~707 reportable sequence (52%)
 - World War II, Korea, Vietnam
- **DNA Reports**
 - 309 DNA Comparison Reports
 - 136 First Time Named Reports
 - 173 Addendum Reports
- **Processing Capacity**
 - Increased to ~43 samples/month



Common mtDNA sequence and no auSTR or YSTR results generated:

- Sequence whole mtDNA genome
- Individuals with common mtDNA distinguishable
- Grant to expand whole mtDNA database: better statistics



DNA Tests Reported By AFDIL

As Of September 30th, 2019

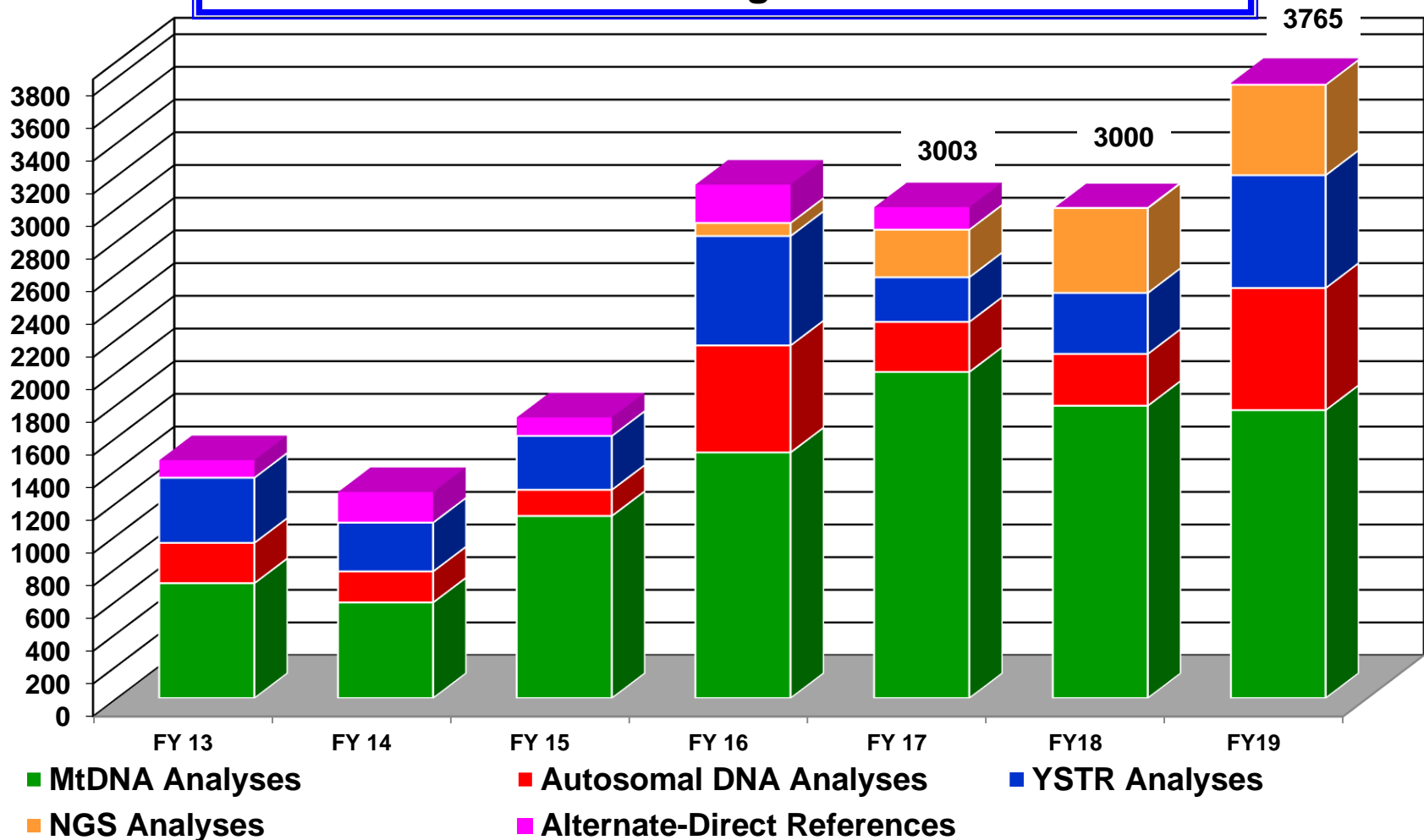


94% Success Rate Obtaining MtDNA Sequence Data

63% Success Rate Obtaining Au-STR DNA Data

66% Success Rate Obtaining Y-STR DNA Data

60% Success Rate Obtaining NGS Data



DNA Reports

September 30th, 2019



FY	Believe to Be Reports	Addendum Reports	Foreign National	Total Reports
2012	60	103	57	220
2013	55	120	39	214
2014	75	57	51	183
2015	71	77	32	180
2016	133	65	6	204
2017	154	165	26	345
2018	189	496	34	719
2019	207	448	3	658

DNA Forensic Databases



- **A database is organized files of data that are organized to allow for search and retrieval of information.**
- **DNA databases compare profiles derived from evidentiary samples to a database of DNA profiles obtained from known or unknown individuals to provide investigative leads or statistical weight for inclusion or exclusions.**
- **Typical DNA Databases**
 - Criminal or Missing Person Database
 - Collection of DNA Profiles that can be searched to look for matches
 - Statistical Population Databases
 - Includes population data to determine allele frequencies to allow calculation of statistical relevance
 - DNA Databank
 - Is the repository of the actual blood or buccal swab samples

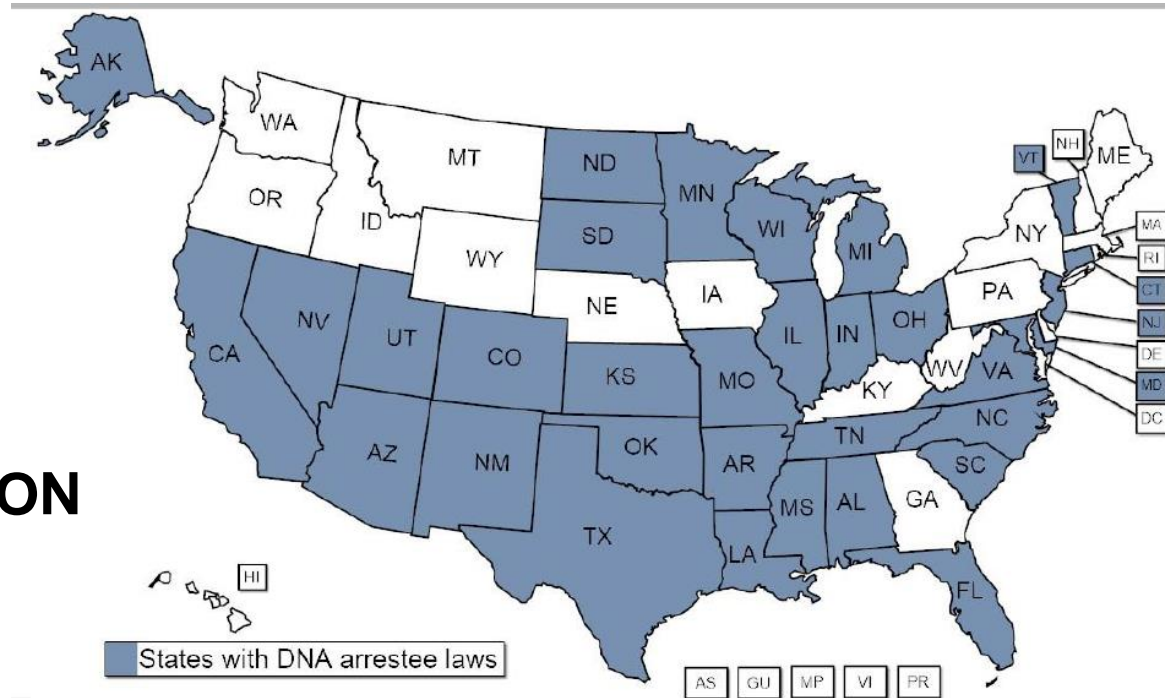
CODIS Database



- **The FBI created and mandated to main the Combined DNA Index System (CODIS).**
- **CODIS initiated in 1991, STR Markers finalized by congress in 1998.**
- **Blends DNA forensic science and computer technology to offer effective tool for solving crimes and missing person cases**
- **Enables federal, state and local crime labs to exchanged and compare electronic data allowing for crimes and convicted offenders to be linked.**

- **ALL CONVICTED OFFENDER LEGISLATION**

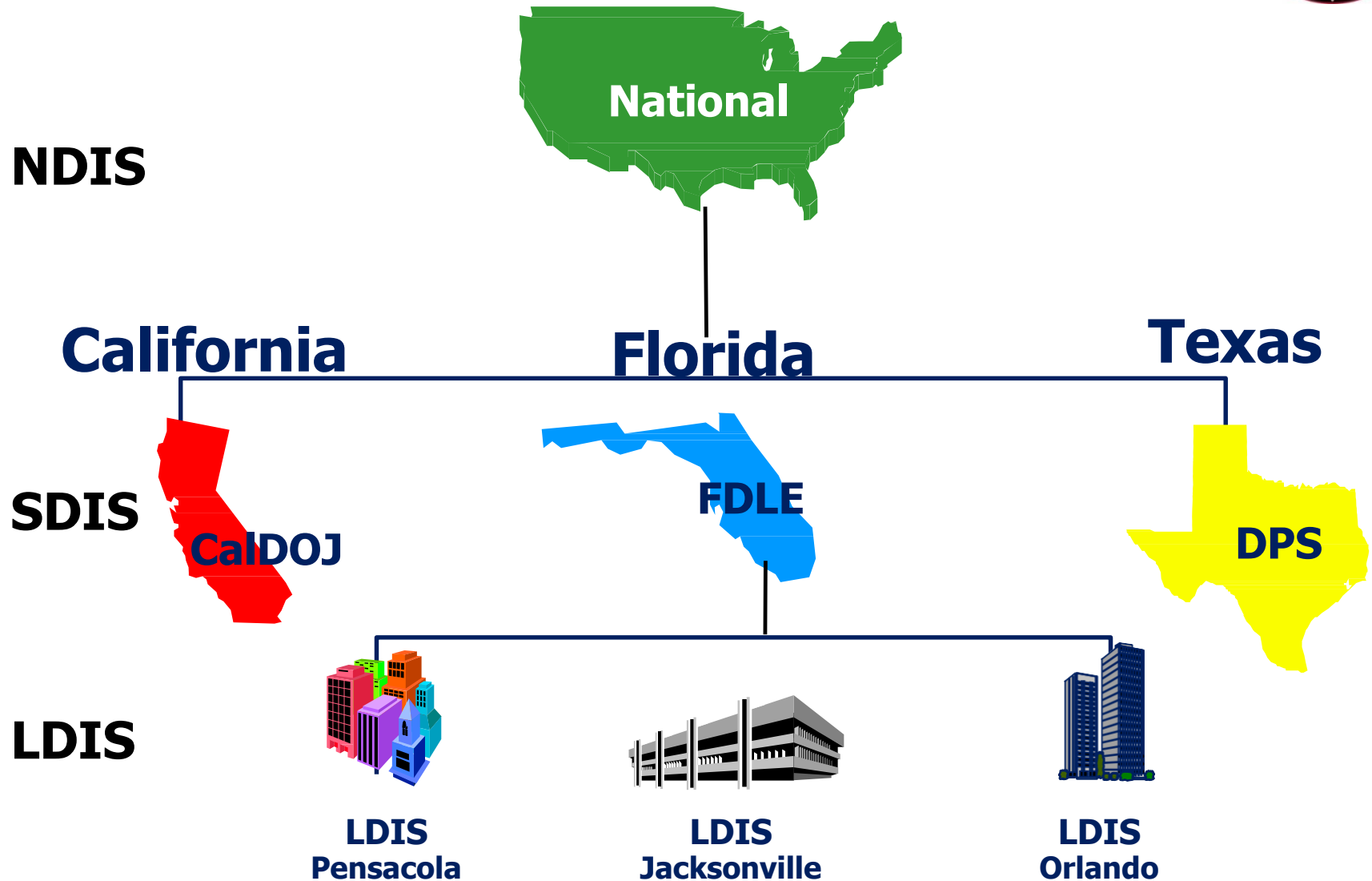
1999 – 5 states
2003 – 27 states
2008 – 42 states
2011 – 50 states



- **ARRESTEE LEGISLATION**

1999 – 1 state
2006 – 7 states
2012 – 26 states
2018 – 32 states

CODIS Architecture



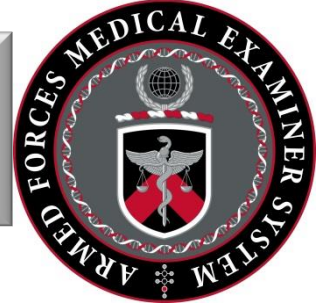
Primary Functions of CODIS Software



- **DNA profile entry and management:** the function dealing with the database DNA profiles
- **Searching:** the function allowing a search of database DNA profiles
- **Match management:** the function managing search results
- **Statistical calculations:** Popstats function enabling laboratory personnel to calculate profile statistics based upon population frequency data

- DNA profiles generated at participating crime laboratories are organized into Indexes in CODIS.
 - Convicted Offender Index
 - DNA Profiles from individuals convicted of a crime and eligible based on their states collection laws.
 - Arrestee Index
 - DNA Profiles from individuals arrested for eligible crimes based on their states collection laws.
 - Forensic Index
 - DNA profiles developed from crime scene evidence that may have originated from the perpetrator/s

CODIS Missing Person Index System



- National Missing Person DNA Database (NMPDD): Assist with Missing Persons or Unidentified Remains
 - Missing Person Index
 - DNA Profiles of missing persons; Direct profiles
 - Unidentified Human Remains Index
 - DNA Profiles from found remains with no ability to identify
 - Biological Relatives of Missing Person Index
 - Contains DNA Profiles from eligible family members

RDIS: Rapid DNA Index System



- 2010 FBI establish RAPID DNA program to look at developing capability for DNA testing to occur in a booking station.
- Building on DoD funded project to get DNA profiles in 90 minutes.
- RDIS will allow trained police officers to collect a swab at the booking station, run it on a RAPID instrument, search CODIS to see if the individual is wanted for other crimes.

How does it work



- 2010 CJIS WAN (Criminal Justice Information Systems Wide Area Network), a stand-alone law enforcement computer network that operates like the Internet. The software is the same at all sites and configured based on LDIS, SDIS, or NDIS rights.
- Participating labs connected via T1 line on CJIS WAN that allow 1.5 MB per second, no security risk like internet.
- LDIS labs will enter profiles meeting requirements to SDIS and SDS administrator will promote to NDIS based on meeting set requirements.
- NDIS automatically searched once a week
 - Can search partial profiles and set stringency levels.

- **ORI = DCFBIWAD7**
 - **FBI Laboratory Wash. DC Div.7**
- **Specimen ID #**
 - **MD060215039Q4M**
 - **MD, 2006, February 15 Case# 39**
Question Specimen 4 Male Fraction
- **STR Profile**
 - **11,11; 12,12; 12,13; 10,20; 29,30; 16,18; 12,13; 09,11; 11,15; 23,24; 06,9.3; 08,08; 17,19; X, Y**
- **Analyst Identifier = JCL**

Database Search – Perfect Match



<u>Locus</u>	<u>Crime Scene</u>	<u>Offender</u>
D3S1358	15,16	15,16
vWA	18,18	18,18
FGA	21,22	21,22
D8S1179	13,14	13,14
D21S11	29,30	29,30
D18S51	14,17	14,17
D5S818	11,12	11,12
D13S317	11,12	11,12
D7S820	10,11	10,11
CSF1PO	11,12	11,12
TPOX	8,11	8,11
TH01	6,9.3	6,9.3
D16S539	11,12	11,12



AFMES-DoD DNA Operations



- **DNA Databank**
- **Family Reference Database**
- **Population Database**

AFRSSIR (Repository)





- All active duty, reserve, and National Guard service members.
- 250,000 new cards a year
- Developed Specimen Management System to track and in-process the samples.
- Must be able to talk to service specific databases
- Card on file tied to readiness, promotion status, and retention.

DNA Reference Cards



SMS [v19.6.13.0] [Timeout: 00:00:09:50]

Processing	▼
Manage Boxes	
Accession Cards	
Manage Cards	
Quality Control	▼
Manage Boxes	
Manage Cards	
Batch Edit Cards	
Administration	▼
Manage Boxes	
Manage Cards	
Batch Edit Cards	
Manage Users	
Manage Sites	
DNA Query	
Export by SSN	
Batch Update DoDEDI	
Card Requests	▼
Create Request	
Manage Requests	
Manage Requestors	
Reporting	▼
Accession	
Accession Summary	
Site Accession Summary	
Site Rejects	
Collection	
Collection Age	
Reject Counts	
QC	
Custom	

Current Box

N/A

Available Slots: N/A

Change

Clear

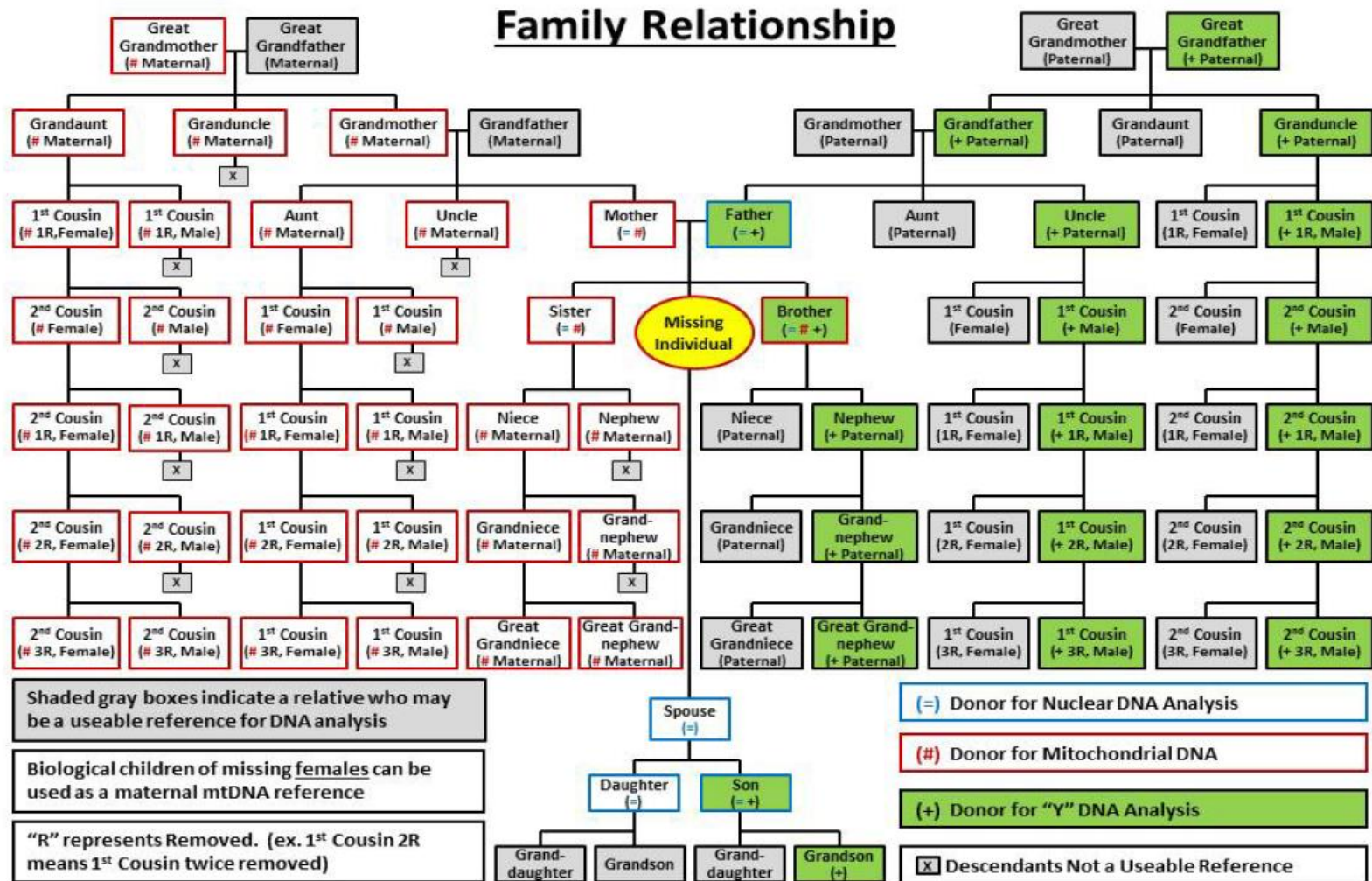
DNA Reports

September 30th, 2019



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2019	207	448	3	658

Family Reference Collection Efforts: Types of References Collected



If your relationship is not represented in the chart above, please describe, in detail, your relationship to the missing individual: _____

- **Receive ~2000 family references a year**
- **World War II, Korea, Vietnam, Cold War**
 - World War II: 12% of the 74K missing: 36-38 recoverable
 - Korea: 92% of the original 8100 missing
 - Vietnam: 85% of the original ~1600 missing
 - Cold War 85% of the ~125 missing

- **Unique Identifiers assigned**
 - **Year; case type identifier; Sequential case number; sample number; subsample**
 - **2020F3098-01A**
 - Year 2020
 - F:Family Reference; H: Past accounting; M-Military (CDO)
 - 3098, is the 3098th case accessioned into system for the year.
 - 01; multiple samples 01, 02, 03....
 - A is first sample, if multiple samples A, B, C,...
- **Entered into searchable database**

Laboratory Information Management System: LISA



Laboratory Information Systems Application Version 7.04.23



Armed Forces DNA Identification Laboratory
Laboratory Information Systems Applications

System Administration

Case Management

DNA 2000 System

Quality Control System

DNA Registry Inventory Management System

Research Section

Armed Forces DNA Identification Laboratory



DNA 2000 System

Accessioning

Process/Review

SOP/Form Management

Lookup Tables Maintenance

High Throughput Processing

JFAIDD

Reports

Designed and Developed by Future Technologies, Inc.

 LisaSharp
  Problem Log
  Help
  Close

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Case Accessioning

File Package Evidence Case Report Help

Pac Ad Modify View

Transfer Package Custody

Transfer Multiple Packages

Transfer Batch Packages

Admin Transfer Package Custody

Assign Case Folder

Find

1998-1 Show Packages: [AT] Search C&E

	Sender Organization	Carrier	Tracking Nbr	Dat
		FedEx	8017-0539-0635-9	12/
		FedEx	8017-0539-0635-10	12/
		FedEx	8017-0539-0635-11	12/
		FedEx	8017-0539-0635-12	12/
	30MDG/SGOMH(DRP)	Regular Priority	R519690807	12/
	LICE R	Regular Express	EE148711974US	12/
	INSTRUMENTS	FedEx	414622038491	12/
1998-8		FedEx	4224-7261-0908	12/
1998-9	1998F1371	Bessie B. Young	Regular Express: ee826148575us	12/
1998-10		CAP	FedEx 413879645796	12/
1998-11	1998F1340	CARIBOU MEDICAL CLINIC	FedEx 800423758454	12/
1998-12	1999F0007	CARL WADMAN	Regular Express: EE366600238US	12/

Evidence Nbr	Evidence Type	Status	Description	Storage Location	Current Custodian	Datetime Logged	Contributor Nbr
0001A	Bone	Check-in	Radius	Consumed	Meyers, Kerriann K	12/9/2004 11:55:43 AM	

Evidence Accession



Defense Health Agency

Completed Chain of Custody



Chain Of Custody

03/12/15 2:52:43 PM

PACKAGE: 201542

Sender Name: McManus, Amber

Date: 3/11/2015 12:00:00 AM

Sender Organization: AFDIL

Address: Dover AFB

Telephone:

115 Purple Heart Dr

Dover, DELAWARE 19902 United States

Sender

Tracking Number: N/A

Comments One HS ziploc bag, labeled "GSM COC Exercise Training Use Only 030915BET", containing one brown GS envelope, labeled "...Test No 13-571...", containing one medium sized TS manila envelope, labeled same, containing four smaller TS manila envelopes.

Description

PACKAGE CUSTODY

Custody Date	Action	Performed By	Location	Condition
	Send	AFDIL		
	Transit	N/A		
3/11/2015 1:39:04 PM	Receive	McIlmoyle, Grace S.	Lab 249 RfG 011621301110822 - Shelf 3	Acceptable

Location/Storage

DESCRIPTION OF ARTICLES

Evidence Nbr	Description	Type	SubType	Identifying Numbers
Case Nbr: 2015T0661				
0001A	One small TS manila envelope, labeled "Test No. 13-571 Item 1", containing one piece of white fabric with a reddish brown stain, labeled "1".	Biological Stain		Other #: Item 1
0002A	One small TS manila envelope, labeled "Test No. 13-571 Item 2", containing one piece of white fabric with a reddish brown stain, labeled "2".	Biological Stain		Other #: Item 2
0003A	One small TS manila envelope, labeled "Test No. 13-571 Item 3", containing one piece of white fabric with a green polka dot pattern, with a reddish brown stain, not labeled.	Biological Stain		Other #: Item 3
0004A	One small TS manila envelope, labeled "Test No. 13-571 Item 4", containing one piece of off white fabric with a reddish brown stain, not labeled.	Biological Stain		Other #: Item 4

Description

CHAIN OF CUSTODY

Evidence Nbr	Date/Time	Action	Released By	Received By	Reason	Witness
Case Nbr: 2015T0661						
0001A	3/11/2015 2:09:16 PM	Check-In		Lab 249 RfG 011621301110822 - Shelf 2	Initial Check-in of Evidence	
0002A	3/11/2015 2:11:10 PM	Check-In		Lab 249 RfG 011621301110822 - Shelf 2	Initial Check-in of Evidence	

Custody/Tracking

Chain Of Custody

03/12/15 2:52:43 PM

CHAIN OF CUSTODY

Custody/Tracking

Evidence Nbr	Date/Time	Action	Released By	Received By	Reason	Witness
Case Nbr: 2015T0661						
0003A	3/11/2015 2:12:41 PM	Check-In		Lab 249 RfG 011621301110822 - Shelf 2	Initial Check-in of Evidence	
0004A	3/11/2015 2:14:00 PM	Check-In		Lab 249 RfG 011621301110822 - Shelf 2	Initial Check-in of Evidence	
0002A	3/11/2015 2:31:38 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Photodoc	
0003A	3/11/2015 2:31:38 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Photodoc	
0004A	3/11/2015 2:31:38 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Photodoc	
0001A	3/11/2015 2:31:38 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Photodoc	
0004A	3/11/2015 3:27:43 PM	Check-In	McIlmoyle, Grace S	Lab 249 RfG 011621301110822 - Shelf 2	Storage	
0001A	3/11/2015 3:27:43 PM	Check-In	McIlmoyle, Grace S	Lab 249 RfG 011621301110822 - Shelf 2	Storage	
0002A	3/11/2015 3:27:43 PM	Check-In	McIlmoyle, Grace S	Lab 249 RfG 011621301110822 - Shelf 2	Storage	
0003A	3/11/2015 3:27:43 PM	Check-In	McIlmoyle, Grace S	Lab 249 RfG 011621301110822 - Shelf 2	Storage	
0004A	3/12/2015 2:35:27 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Return to Evidence Custodian	
0001A	3/12/2015 2:35:28 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Return to Evidence Custodian	
0002A	3/12/2015 2:35:28 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Return to Evidence Custodian	
0003A	3/12/2015 2:35:28 PM	Check-Out	Lab 249 RfG 011621301110822 - Shelf 2	McIlmoyle, Grace S	Return to Evidence Custodian	
0004A	3/12/2015 2:42:05 PM	Transfer	McIlmoyle, Grace S	McManus, Amber L	Return to Evidence Custodian	
0003A	3/12/2015 2:42:05 PM	Transfer	McIlmoyle, Grace S	McManus, Amber L	Return to Evidence Custodian	
0002A	3/12/2015 2:42:05 PM	Transfer	McIlmoyle, Grace S	McManus, Amber L	Return to Evidence Custodian	

Laboratory Information Management System: LISA



Laboratory Information Systems Application Version 19.8.1

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AFDIL
Armed Forces DNA Identification Laboratory
Laboratory Information Systems Applications

System Administration	<p>Armed Forces DNA Identification Laboratory</p> <p> Case Tracking and Management</p> <table border="1"><tr><td>ERS Reference</td></tr><tr><td>H Screen Format Profile Review</td></tr><tr><td>nDNA Statistical and Kinship Analysis</td></tr><tr><td>mtDNA g:cat Search/Stats</td></tr><tr><td>Reports</td></tr><tr><td> Exit</td></tr></table>	ERS Reference	H Screen Format Profile Review	nDNA Statistical and Kinship Analysis	mtDNA g:cat Search/Stats	Reports	 Exit
ERS Reference							
H Screen Format Profile Review							
nDNA Statistical and Kinship Analysis							
mtDNA g:cat Search/Stats							
Reports							
 Exit							
Case Management							
DNA 2000 System							
Quality Control System							
DNA Registry Inventory Management System							
Research Section							

Help Close

Designed and Developed by FTI AFMES\WK5PV3BZ2\1272351 amedAFMESa401.amed.ds.army.mil\PROD\Lisa2000

Reference Database



Laboratory Information Management System: LISA



Service Member for [AFDIL Casework: CILHI F and H Cases]

File Sort Search [All Past Accounting Incidents] Help

AFDIL Casework: CILHI F and H Cases

Service Member

Filter

☒ Identified ☐ Suitable Reference (Gen.)

Suitable Ref.: ☐ Autosomal? ☒ Maternal? ☒ Paternal?

Last Name: [REDACTED] Suffix: [REDACTED]

Middle: [REDACTED]

First Name: [REDACTED]

Address: [REDACTED]

City: [REDACTED]

State: [REDACTED] Zip: [REDACTED]

Country: [REDACTED] Race/Ethnicity: Caucasian

Citizenship: American Pursuit Status: [REDACTED]

SSN: [REDACTED] Service#: [REDACTED]

REF#: [REDACTED] Service Name: US Air Force

FSC#: [REDACTED] MACR#: [REDACTED]

BUND#: [REDACTED] JPAC-I#: [REDACTED]

Conflict: Korean War Conf. Region: [REDACTED]

DOB: [REDACTED] Gender: Male

Loss Incident: 1993-266-I-04 Accession#: 2506607

ISN: 0 DCIPS#: 282569

Comments: JRO Recovery & K208 portions JJC 8 May 12

Associated Family Reference(s)

Filter

Family Full Name	Relationship	Case #	Status
[REDACTED]	DIRECT	2011F1287	C

Service Member Samples/Evidences

Case #	Evidence Number	Evidence Type
[REDACTED]	[REDACTED]	[REDACTED]

Assigned Cases

Case #	Result	Worklist Nbr(s)
1994H0007	YES	
1995H0016	YES	
1995H0292	YES	
1998H1243	YES	
2000H1417	YES	

Reference Database

Laboratory Information Management System: LISA



FRS mtDNA Results

File Final Report Other Reports/mtDNA Help

Case Information

Relationship: DIRECT
Ethnic Origin: Caucasian
Date Entered:

Reference Name: Aaron, George

Service Member Name	Conflict	Reference Nbr	Relationship
[REDACTED]	Korean War		DIRECT

Other Reference(s) For Service Mbr	Relationship	AFDIL Case #	Status

AFDIL Case#: 2011F1287
Service Member Identified?: ☒
Old AFDIL Case#:
Date Received: 11/7/2011
Status: Complete
Date Last Modified:
Completed: 4/20/2011
Date Reported: 1/3/2019
Added:
Accession Number: 2506607
mtDNA Consistent With Relative?:
Number Bases: 533
Case Type:
Nbr Matches / Database Size: 20 / 10428
Prof ID:

Specimens:	Case Number	Specimen Nbr	Specimen Type	Worklist Number
	2011F1287	0001A	Bone	
	2011F1287	0002A	Tooth	

Comment: [REDACTED]

Final
mtDNA

mtDNA Consistent With Relative?:

Profile (FINAL REVIEW COMPLETE)

Enable Profile
Default Regions
-> Revise Profile
Final Report Hist.
View -> Edit
GCAT

☒ Sort By CR1-2/HV1-2?
Mitochondrial Data
Regions: ☐ No Results?

Region Start	Region Finish	Ins.
16024	16365	
73	265	

Polymorphisms: ☐ Anderson?

Position	Base
16040	
16189	
16192	
16214	
16223	
16278	
16294	
16309	
73	
146	
152	
195	
263	

Reference Database



Laboratory Information Management System: LISA



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mtDNA g:cat Search/Stats

Reports

X Exit

Population Database



Help



Close

Sibling, Cousins Inheritance



Locus	Sample A	Sibling 1 (9 shared alleles)	Sibling 2 (7 shared alleles)
D13S317	8,15	8,15	12
D7S820	8,10	8,9	8
AMEL	X,Y	X	X
D2S1338	23,25	23,25	19,25
D21S11	29	29,32.2	29
D16S539	11	11	11
D18S51	15,17	16,18	15,16
CSF1PO	10	10,11	10
FGA	22,24	23,24	22,23
D8S1179		13	11,13
D3S1358		14,16	16,18
TH01		6,8	8,9
D19S433		14,14.2	14,14.2
vWA		17,20	17,20
TPOX		10,11	8,10
D5S818		12	11,12

Locus	Sample A	Sibling 1	Sibling 2
D18S51	15,17	16,18	15,16

Locus	Mom	Dad
D18S51	15,16	17,18
child	15	17
child	15	18
child	16	17
child	16	18

Likelihood Ratio		
Population Group	Sample 1 and Sib 1 Sister of Service Member	Sample 1 and Sib 2 Sister of Service Member
Caucasian	5.84 million	212 thousand



Laboratory Information Management System: LISA



Laboratory Information Systems Application Version 19.8.1

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DNA 2000 System

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Lookup Tables Maintenance

High Throughput Processing

Red Force

Reports

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Casework Management



Help



Close



Casework Database



Review of Case 2019P0025

Case View Report Help

Case Forms:

Type	Form Nbr	Title
PH	20191 - 2317	Photo I
EX	20191 - 2318	Chelex
QF	20191 - 2443	Amplif
EX	20191 - 2527	Chelex
QF	20191 - 2769	Amplif
QF	20191 - 2913	Amplif
AM	20191 - 3082	Power
AM	20191 - 3083	AmpFI
AM	20191 - 3084	Power
AM	20191 - 3085	AmpFI
TY	20191 - 3138	3500xl
TY	20191 - 3139	Sample
TY	20191 - 3144	3500xl
TY	20191 - 3146	Sample
EX	20191 - 3214	Chelex
QF	20191 - 3451	Amplif
QF	20191 - 3581	Amplif
AM	20191 - 3654	Power
TY	20191 - 3690	3500xl
NO	20192 - 222	Case N
NO	20196 - 684	Case N

DNA Form 4 [READ-ONLY]

Chelex Extraction of DNA from Whole Blood, Blood Serum and Bloodstains

Lane #	Case Nbr	Specimen	Type	Amount	Storage Box #	Evid. Disp.
1	2019P0025	0001A1	Bloodstain	3mm square	Prof. Box 15	S
2	2019P0025	0002A1	Bloodstain	3mm square	Prof. Box 15	S
3	2019P0025	RB20191-2527	-	-	Prof. Box 15	-

Tube Labels

Start NGS Nextera

Item	Source	Lot Nbr	Tube Nbr
Sterile Water	AFDIL CLRW	072418SAS	012219ACB
Chelex-100	BIO-RAD	19M	5

Review of Case 2019P0025

Case View Report Help

Case Forms:

Title
Photo Documentation
Chelex Extraction of DNA from W
Amplification for Plexor HY
Chelex Extraction of DNA from W
Amplification for Plexor HY
Amplification for Plexor HY
PowerPlex Fusion Amplification W
AmpFISTR-Yfiler Amplification W
PowerPlex Fusion Amplification W
AmpFISTR-Yfiler Amplification W
3500xl Fragment Analysis for Pow
Sample Placement Yfiler on 3500
3500xl Fragment Analysis for Pow
Sample Placement Yfiler on 3500
Chelex Extraction of DNA from W
Amplification for Plexor HY
Amplification for Plexor HY
PowerPlex Fusion Amplification W
3500xl Fragment Analysis for Pow
Case Note
Case Note

DNA Form 281 [READ-ONLY]

AmpFISTR-Yfiler Amplification Worksheet

Analyst				Case(s) On Form			
Bunbury, Allyson C				2019P0025			
Reagent		Source	Lot #	Tube Nbr	Final Vol. (µl)	Volume/ Sample (µl)	# of Reac. (n+3)
POS DNA 2800M (0.75ng/µL)		Promega	0000111071	76			
Sterile Water		AFDIL	032918SAS	040918AC			
AmpFISTR Y-Reaction Mix		AB	37	192	73.6	9.2	8
AmpFISTR Y-Primer Set		AB	37	244	40	5	8
AmplITAQ Gold		AB	37	20	6.4	0.8	8

of Samples: 5

Cor. Fact.
3

TC Nbr
106

Program Nbr
abi-y-30

Tube	Case Nbr	Sample Name	MM (µl)	dH2O (µl)	DNA (µl)	Total (µl)	Comments
1	2019P0025	RB20191-2527	15	9.2	0.8	25	Well B1
2	2019P0025	0001A1.1	15	9.2	0.8	25	Well C1
3	2019P0025	0002A1.1	15	9.2	0.8	25	Well D1
4	2019P0025	P20191-3083	15	8	2	25	Well E1
5	2019P0025	N20191-3083	15	10	0	25	Well F1



Research and Innovation

Armed Forces Medical Examiner System

- Office of the Armed Forces Medical Examiner
- DoD DNA Operations Forensic Toxicology

MHSRS 2018

Health IT Research and Innovation Strategy

Innovation

Medical Research and Development

Military Health System Studies Inventory Tool

Privacy, Information

Armed Forces Medical Examiner System

The Armed Forces Medical Examiner System (AFMES) is committed to being the Department of Defense's (DoD's) leader in providing medical-legal services and emerging technologies essential for the readiness, sustainability and survivability of our service members. AFMES provides the DoD and other federal agencies comprehensive forensic investigative services, to include forensic pathology, DNA Forensics, forensic toxicology, and medical mortality surveillance. AFMES is not only the single worldwide medical examiner system, but it also supports the entire U.S. federal government.

Mission

Investigate deaths, Identify the fallen, Improve readiness

Vision

Be the global leader in comprehensive and innovative medicolegal services enhancing the readiness, sustainability, and survivability of those we serve.

- [Office of the Armed Forces Medical Examiner](#)
- [DoD DNA Operations](#) ←
- [Division of Forensic Toxicology](#)



Contact Us

The Armed Forces Medical Examiner System
115 Purple Heart Drive
Dover Air Force Base, DE 19902

[Email Us](#)

DSN: 366-8648

Phone (During Duty Hours): 1-302-346-8648

To Report a Death After Hours: 1-202-409-6811

Fax: 1-302-346-8819

Related Links

[Autopsy Diagrams/Paperwork](#)

[Frequently Asked Questions about Medical-Legal Examinations](#)

[iSalute](#)

<https://health.mil/afmes>



Director DoD DNA Operations: Timothy.P.McMahon10.civ@mail.mil