


<p>California Department of Justice DIVISION OF LAW ENFORCEMENT George B. Anderson, Director</p>		<h1>INFORMATION BULLETIN</h1>	
<p><i>Subject:</i> <b>DNA Partial Match (Crime Scene DNA Profile to Offender) Policy</b></p>	<p><i>No.:</i> 2008-BFS-01</p>	<p><i>Contact for information:</i> <b>Bureau of Forensic Services Gary Sims (510) 620-3300 Ext. 3305</b></p>	
	<p><i>Date:</i> April 24, 2008</p>		

**TO: All California Law Enforcement Agencies and District Attorneys Offices**

The Department of Justice (DOJ) has developed a DNA Partial Match Reporting and Modified CODIS (Combined DNA Index System) Search Policy that may result in investigative information provided to law enforcement officials in unsolved cases where all other investigative leads have been exhausted. Because the information that is ultimately provided will be the name or names of an offender or offenders in California's DNA database who may be related to the actual perpetrator, the process developed requires special DNA testing and review of the offender's non-DNA information. The process specified in the Policy was developed keeping privacy concerns in mind while at the same time providing information that may be useful in solving a violent offense.

**Background**

California's DNA Data Bank, formally established in 1990, consists of a database of DNA profiles from offenders and a database of crime scene (evidence) profiles. The two DNA databases form the California CODIS. When a crime scene profile is searched against the offender database, a match is declared if the crime scene profile is "exactly" the same as the offender's DNA profile. Logic suggests that if the profiles are not exact, but close, the source of the crime scene profile may be a relative of the offender. With the recent advances of DNA technology, DNA testing beyond the standard profiling for individual identification can now be conducted to provide additional information as to whether individuals may be related.

**DOJ Partial Match Reporting and Modified CODIS Search Policy**

The name of an offender who is not the source of the biological material from an unsolved case may be released in an investigation under the following two situations.

**I. Partial Match Obtained from CODIS Search**

When a crime scene DNA profile (forensic unknown) is routinely searched by the standard method against California's Offender DNA Data Bank and a "partial match" results in which the profile shares at least 15 STR (Short Tandem Repeat) alleles with a different but potentially related offender profile, the name of the offender may be released to the investigating agency if the protocol outlined below has been followed and all of the following conditions are met:

- 1) The crime scene DNA profile is a single-source profile.
- 2) The case is unsolved and all investigative leads have been exhausted.
- 3) A commitment is made by the agency and the prosecutor to further investigate the case if the name of the potentially related offender is eventually released.
- 4) Y-STR typing of the same crime scene evidence that yielded the submitted forensic unknown profile is completed by the submitting agency and is concordant with the offender's Y-STR type obtained by DOJ.
- 5) If the Y-STR profiles have been determined to be consistent, DOJ will review non-forensic information in order to identify additional evidence bearing on relatedness, if available.
- 6) A DOJ committee will discuss the case with the local law enforcement agency, the local laboratory, and the prosecutor's office. After reviewing all of the available information, the offender's name will be released unless there is a reason not to release it.
- 7) If the committee cannot reach consensus, the decision to release the name to the investigating agency will be made by the Attorney General or his designee.

## II. Special Request for a Modified CODIS Search

When a law enforcement agency is investigating an unsolved case that has critical public safety implications, the agency may request that DOJ conduct a modified CODIS search with the objective of identifying any offender(s) in the database who are likely to be related to the unknown perpetrator. In these situations, the name of an offender may be released to the investigating agency if the protocol outlined below has been followed and all of the following conditions are met:

- 1) A written request is sent to the Chief of the Bureau of Forensic Services that describes the case, and attests that all other investigative leads have been exhausted, and that the investigating agency and the prosecutor's office are committed to further investigate the case if the name of an offender is eventually released.
- 2) The crime scene profile is a single-source profile.
- 3) Y-STR typing of the same crime scene evidence that yielded the submitted forensic unknown profile has been completed by the submitting agency prior to the search.
- 4) The modified CODIS search conducted by DOJ must result in a manageable number of candidates.
- 5) The candidate matches resulting from the modified CODIS search will be prioritized by DOJ using appropriate statistical calculations for relatedness.
- 6) Based on this prioritization, DOJ will conduct Y-STR analysis of the offender sample(s).
- 7) If the Y-STR profiles of the evidence and offender sample(s) are consistent, DOJ will review non-forensic information in order to identify additional evidence bearing on relatedness, if available.
- 8) A DOJ committee will discuss the case with the local law enforcement agency, the local laboratory, and the prosecutor's office. After reviewing all of the available information, the offender's name will be released unless there is a reason not to release it.
- 9) If the committee cannot reach consensus, the decision to release the name to the investigating agency will be made by the Attorney General or his designee.

### **Initiating the Partial Match Investigation**

When a partial match occurs that has at least 15 shared STR alleles with an offender, DOJ will contact the local laboratory's CODIS administrator to confirm that the case is not yet solved. If the case is still active, the case investigator should be notified of the partial match by the local CODIS laboratory and the process defined in the policy will be followed upon request.

Partial matches that occurred prior to the date of this bulletin will be addressed on a case-by-case basis by DOJ.

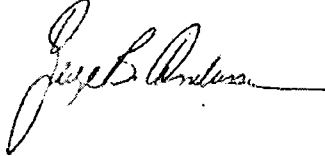
### **Initiating A Modified CODIS Search**

If an investigator has a case where no search of the crime scene DNA profile has produced an offender hit or a partial match as described above, and the case otherwise meets the criteria specified, a modified CODIS search request can be made to DOJ. These special requests should be on agency letterhead and sent to:

Chief  
Bureau of Forensic Services  
1102 Q Street, 6<sup>th</sup> Floor  
Sacramento, CA 95811

In either of the two instances described above, a memorandum of understanding will be formally established between the investigative agency and DOJ, as any costs associated with the special DNA testing of the crime scene evidence must be paid for by the investigative agency, unless the crime scene evidence testing was performed by DOJ.

Sincerely,

A handwritten signature in cursive script, appearing to read "George B. Anderson", with a horizontal line extending to the right.

GEORGE B. ANDERSON, Director  
Division of Law Enforcement

For EDMUND G. BROWN JR.  
Attorney General

## Bureau of Forensic Services

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### Familial Search Procedure

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**Familial Search: Introduction**

This document outlines the steps to be followed when conducting a search of CA SDIS (CAL-DNA) for the purpose of attempting to identify a putative perpetrator of a crime by comparing a forensic unknown profile with offender profile(s) that may be from a genetic relative. This process is known as "familial searching." Familial searching is the last resort in the use of the offender database when attempting to identify the perpetrator of an unsolved crime.

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**DOJ Familial Search Policy**

Based on the recommendations of the Bureau of Forensic Services (BFS) Partial Match and Familial Search Committee (PM&FSC), the Division of Law Enforcement (DLE) Bulletin 2008-BFS-01 was issued on April 24, 2008 (Appendix 5E) documenting the California Department of Justice (DOJ) policy on partial matches and familial searching.

The Bureau of Forensic Services subsequently renamed the PM&FSC as the Familial Search Committee (or FSC, per Memorandum dated 10-24-08, Appendix 5F), to execute and implement the DOJ policy in 2008-BFS-01. This section of the CODIS Unit Technical Procedure is a direct result of the FSC's work with the assistance of a Familial Search Technical Support Group (TSC) comprising members of Jan Bashinski DNA Laboratory staff, supervision and management.

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**Familial Search Process**

When invoked, after all other leads have failed, the objective of this procedure is to obtain a candidate offender or limited list of candidates, who may be related to the true perpetrator of a crime, through the use of the convicted offender database. As part of this process the initial candidate list of offenders' DNA samples will be profiled for Y-STR type. The samples to be tested are selected by priority based primarily on kinship indices, but may include an evaluation of the numbers of shared alleles. Any offenders not eliminated by the Y-STR type comparison could be patrilineally related to the true perpetrator and will be candidates for further investigation and consideration as potential genetic relatives of the true perpetrator. This process is designed to provide the most useful investigative lead(s) while limiting the number of potential contacts with individuals not related to the perpetrator.

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### Familial Search Procedure, Continued

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**Confidentiality** Beyond the rigorous restrictions already imposed on Data Bank Program employees concerning disclosure of information, the results of the familial search conducted by the CODIS Unit and subsequent Y-STR typing, if any, will be released only to the Familial Search Committee via the Chair or designee. Any wider distribution of results or data will occur only at the direction of the Chair. This precludes direct contact with the submitting laboratory by the CODIS Unit, in contrast to routine CODIS searching and operations. Because CODIS autosearch software is not utilized in the familial search process there is no automatic notification of the LDIS laboratory of the results of the familial search. Direct contact with law enforcement or the prosecution will always be made by the FSC as opposed to the usual involvement of the CODIS Unit. The FSC Chair generally retains the authority to release any familial search information to client groups in accordance with policy.

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**Practical Considerations** The chance of success in identifying a genetic relative of a perpetrator in the existing offender database is affected by these practical considerations:

1. There may be no such genetic relative in the database at the time of the search.
2. Estimates of the likelihood of familial relationships are made based on the sharing of STR alleles and the rarity of those alleles.
3. The search for genetic relatives is practical only for "first degree" relatives, i.e., full sibs (sharing both parents) and parent/child relationships.

In contrast to the identification of a putative perpetrator (or an identical twin) as a result of a confirmed offender hit, the output of a familial search can only indicate whether a statistically significant potential exists that an offender in the database may be a relative of the true putative perpetrator, based on the specific forensic unknown DNA profile submitted. Since multiple offenders' profiles may yield similar statistical results for kinship or allele sharing when compared to the forensic unknown STR profiles, further extensive investigation may be necessary to even confirm the existence of relatives to the offender identified via familial search, as well as to determine whether any of that offender's relatives could have committed the crime. In any case, the results represent another form of an investigative lead in the investigation, rather than a more direct association or identification of an offender.

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### Familial Search Procedure, Continued

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- Documentation of Familial Search Process, Results & Communications**
- Throughout the process of conducting any familial searches in CAL-DNA or in the resolution of partial matches, the following requirements for documentation will be met:
- Lists of the specimen identifiers (Spec Ids) of the candidate offenders' will be retained and included in the appropriate file (referred to as DFS or DPM files, respectively, as noted below) associated with the requested search.
  - Any communications with an outside agency concerning the requested search will be documented in the communications log of the appropriate file.

Note: DFS and DPM file contents are described in Appendices 5G and 5H.

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**Overview: Familial Search using the Ratiometer and the Ratiometer Output Analyzer**

BFS DNA Laboratory has adopted the approach of conducting a statistical comparison of the forensic unknown DNA profile with all of the offender profiles in CAL-DNA in an attempt to identify potential familial relationships. A software utility, the "Ratiometer" was developed and validated to accomplish this task.

The Ratiometer generates kinship indices (KIs) for sibship and paternity to quantify the statistical likelihood that the forensic unknown profile may be from a first-degree relative of an offender in the database. The output of the Ratiometer is a list of offender profiles with KIs above established thresholds.

Another software utility, the "Ratiometer Output Analyzer" (ROA), ranks the listed offender profiles from the Ratiometer by their KIs. The most statistically favorable candidates for relatedness to the true perpetrator are selected for Y-STR typing. Up to 168 candidates may be selected in this way with the collaboration of the TSG (through the FSC Chair) in the prioritization.

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**Initial handling of Request Completed Prior to Search**

Per the policies set forth in DLE Bulletin 2008-BFS-01, requests for a Familial Search received from a law enforcement agency will be routed through the office of the Chief of the Bureau of Forensic Services (BFS) to the DOJ Familial Search Committee (FSC) for review, approval and assignment of a DNA Familial Search (DFS) file number.

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### Familial Search Procedure, Continued

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**Familial Search MOU: Y-STRs and Identifier** Per policy, prior to initiating this procedure, a Memorandum of Understanding (MOU) (Appendix 5I) will be executed by a representative of the law enforcement agency requesting the familial search and by a representative of DOJ. Among the essential criteria these critical items require compliance prior to initiation of this procedure:

- The requesting agency will have successfully determined the Y-STR profile of the forensic unknown (using Yfiler® or PowerPlex® Y).
- The requesting agency will have considered, attempted or succeeded in obtaining a full, single source 15-locus profile of the forensic unknown with Identifier®.

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**Preliminary Standard Search** Upon receipt of direction and authorization from the DOJ Familial Search Committee (FSC) chairperson, the CODIS Unit of the BFS Jan Bashinski DNA Laboratory (CODIS Unit) will receive the forensic unknown DNA profile(s) of interest and the associated DFS file.

- To confirm that a direct match to a perpetrator is not present, a preliminary, moderate stringency, manual or “keyboard” search, with routine CAL-DNA Data Bank search settings, will be conducted of the forensic unknown against the usual offender and forensic indexes in the database immediately prior to initiating any modified search. The negative state match detail report will be retained in the DFS file.
- In the event of an offender hit, standard confirmatory processing will be initiated, the familial search will be terminated and the FSC Chair immediately notified.
- If a “partial match” is obtained, it will be noted and the state match detail report will be retained. The specimen involved will be considered for inclusion in the Y-STR processing list generated later at the discretion of the FSC Chair.

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**12 High + 1 Mismatch Search**

- As an additional quality assurance step in Standard Searching, a search of the forensic unknown will be conducted at high stringency at twelve loci with one mismatch allowed. Any resultant candidate matches under these search conditions will be documented and evaluated as potential offender hits in consultation with the FSC Chair.
- In the event of an offender hit, standard confirmatory processing will be initiated, the familial search will be terminated and the FSC Chair immediately notified.

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**Operation of the Ratiometer** The stepwise instructions for the operation of the Ratiometer are found in Appendix 5J. Only the Convicted Offender Index will be searched.

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### Familial Search Procedure, Continued

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<b>Operation of the Ratiometer Output Analyzer</b>	The stepwise instructions for the operation of the Ratiometer Output Analyzer (ROA) are found in Appendix 5K.
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<b>Selection of Y-STR Candidates</b>	In consultation with the FSC Chair and TSG members as needed, the CODIS Unit will identify the offender samples that require Y-STR typing. Guidelines for offender sample selection are in Appendix 5L.
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<b>Y-STR Typing and Upload</b>	Y-STR typing of the selected candidate offenders' samples will be performed by the validated Data Bank Y-STR analysis method (see Data Bank Procedures Manual, Appendices 3I and 4M). As documentation the resultant Y-STR profiles will be imported into the Y-STR Index in CAL-DNA using standard procedures for uploading profiles.
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<b>Y-STR Comparison of Target with Candidates</b>	The Y-STR profile of the target forensic unknown is compared against the set of Y-STR profiles obtained from the candidate offender samples identified by the ROA. The presence or absence of concordant offender Y-STR types is evaluated and documented according to the interpretation guidelines of the Y-STR analysis procedure utilized.
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<b>Memo: Results Reported to FSC Chair</b>	The CODIS State Administrator will notify the FSC Chair by memorandum of the existence or absence of offender Y-STR profiles concordant with the Y-STR profile of the target forensic unknown. (See sample memoranda in Appendices 5A.7 and 5A.8)
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<b>FSC Action: No Offender Candidates</b>	Where no appropriate investigative leads are identified, the FSC Chair will draft a letter for the BFS Chief's signatures communicating the negative result of the familial search to the requesting agency.
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### Familial Search Procedure, Continued

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**FSC Action: Offender Candidates Identified**      Where a potential investigative lead exists, the FSC Chair will provide the BII FSC member with the information developed by the Data Bank with regard to the requested familial search. BII will initiate a background investigation on each candidate to determine whether that candidate can be eliminated by historical facts, relationships or circumstances as being a potential relative of the true perpetrator.

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**Background Investigation Results Returned to FSC**      Upon return of the background investigation results to the Chair, the FSC will meet and confer. Unless there is a reason not to do so, the FSC will release to the requesting agency the name(s) of the relevant offender(s) that may be possible relative(s) of the perpetrator. Before rendering a final disclosure determination, the DOJ committee will discuss the case with the Investigating Agency, the local prosecutor, and the laboratory that analyzed the crime scene DNA evidence. These investigative leads will be communicated in a letter to the requesting agency drafted by the FSC Chair for the signatures of the BFS and BII Chiefs.

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**Partial Matches**      Because of the independent assortment of alleles inherited from biological parents by human offspring and siblings, it is expected that DNA profiles from genetically related persons will share some but not all alleles at the examined forensic STR loci. (In the case of identical twins, of course, sharing is complete.) The standard CODIS search employed at CAL-DNA uses the moderate stringency comparison to allow for the identification of an offender with a crime scene DNA profile that may be incomplete or a mixture. Candidate matches can occur using these search criteria that are not direct matches, but which may be to a potential relative of the true perpetrator. These candidate matches are classified as "partial matches."

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**Initial handling of Request Completed prior to Partial Match Processing**      Per the policies set forth in DLE Bulletin 2008-BFS-01, requests for a Partial Match examination received from a law enforcement agency will be routed through the office of the Chief of the Bureau of Forensic Services (BFS) to the DOJ Familial Search Committee (FSC) for review, approval and assignment of a DNA Partial Match (DPM) file number.

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**Partial Match MOU: Y-STRs and Identifiler** Per the above referenced policies, prior to initiating this procedure, a Memorandum of Understanding (MOU) (Appendix 5M) will be executed by a representative of the law enforcement agency requesting the partial match processing and by a representative of DOJ, typically the Chief of BFS, the Chair of the FSC, or the Designated State Official for CODIS. Among the essential criteria these critical items require compliance prior to initiation of this procedure:

- The requesting agency will have successfully determined the Y-STR profile of the forensic unknown (using Yfiler® or PowerPlex® Y).
- The requesting agency will have considered, attempted or succeeded in obtaining a full, single source 15-locus profile of the forensic unknown with Identifiler®.

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**Partial Match Evaluation** The CODIS Unit will verify that the candidate partial match meets the defining criteria in the FBI CODIS Bulletin BT072006 (Appendix 5N).

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**Preliminary Standard Search** Upon receipt of direction and authorization from the DOJ Familial Search Committee (FSC) chairperson, the CODIS Unit of the BFS Jan Bashinski DNA Laboratory (CODIS Unit) will receive the CODIS match identifier(s) of interest and the associated DNA Partial Match (DPM) file.

- To confirm that a direct match to a perpetrator is not present, a preliminary, manual, standard moderate stringency search will be conducted of the forensic unknown against the usual offender and forensic indexes in the database immediately prior to initiating any partial match processing. The resulting state match detail report(s) will be retained in the DPM file.
- In the event of an offender hit, standard confirmatory processing will be initiated, the partial match process will be terminated and the FSC Chair immediately notified.
- If a new, additional "partial match" is obtained, it will be noted and the state match detail report will be retained. The specimen involved will, at the discretion of the FSC Chair, be considered for inclusion in the Y-STR processing list that is generated later in the process.

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### Familial Search Procedure, Continued

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**12 High +  
1 Mismatch  
Search**

- As an additional quality assurance step in Standard Searching, a search of the forensic unknown will be conducted at high stringency at twelve loci with one mismatch allowed. Any resultant candidate matches under these search conditions may be evaluated as potential offender hits in consultation with the FSC Chair.
- In the event of an offender hit, standard confirmatory processing will be initiated, the familial search will be terminated and the FSC Chair immediately notified.

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**Y-STR Typing  
and Upload**

Y-STR typing of the partially matched offender sample will be performed by the validated Y-STR Data Bank method (see Data Bank Procedures Manual, Appendices 3I and 4M). As documentation, the resultant Y-STR profile will be imported into the Y-STR Index in CAL-DNA using standard procedures for uploading profiles. Alternatively, the Jan Bashinski DNA Laboratory Casework Section may do Y-STR typing according to existing Casework DNA protocols.

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**Y-STR  
Comparison**

The Y-STR profile of the partially matched forensic unknown is compared against the Y-STR profile obtained from the partially matched offender sample. The presence or absence of concordant Y-STR types is noted.

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**Memo: Results  
Reported to  
FSC Chair**

The CODIS State Administrator will provide the FSC Chair by memorandum the results of the comparison of the offender Y-STR profile with the Y-STR profile of the partially matched forensic unknown. (See sample memoranda in Appendices 5A.9 and 5A.10)

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**FSC Action: No  
Offender  
Candidates**

Where no appropriate investigative lead is identified, the FSC Chair will draft a letter for the BFS Chief's signature communicating the negative result of the familial search to the requesting agency.

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**FSC Action:  
Offender  
Candidates  
Identified**

Where a potential investigative lead exists, the FSC Chair will provide the BII FSC member with the information developed by the Data Bank with regard to the requested familial search. BII will initiate a background investigation on the candidate involved to determine whether that candidate can be eliminated by historical facts, relationships or circumstances as being a potential relative of the true perpetrator.

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### Familial Search Procedure, Continued

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#### Background Investigation Results Returned to FSC

Upon return of the background investigation results to the Chair, the FSC will meet and confer. Unless there is a reason not to do so, the FSC will release to the requesting agency the name of the relevant offender that may be a possible relative of the perpetrator. Before rendering a final disclosure determination, the DOJ committee will discuss the case with the Investigating Agency, the local prosecutor, and the laboratory that analyzed the crime scene DNA evidence. This investigative lead will be communicated to the requesting agency in a letter drafted by the FSC Chair for the signatures of the BFS and BII Chiefs.

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#### References

Listed below are references relating to these Familial Search procedures.

- J. Buckleton, C. Triggs "Relatedness," Ch. 4 in *Forensic DNA Evidence Interpretation*, ed., CRC Press, Boca Raton (2005);
  - J. Buckleton, C. Triggs, T. Clayton "Disaster Victim Identification, Identification of Missing Persons, and Immigration Cases," Ch. 11 in *Forensic DNA Evidence Interpretation*.
  - "SWGDM Recommendations to the FBI Director on the Interim Plan for the Release of Information in the Event of a Partial Match at NDIS," S. Myers (personal communication, 2008).
  - J.M. Butler "Kinship and Parentage Testing" (Chapter 23) and "Mass Disaster DNA Victim Identification" (Chapter 24) in *Forensic DNA Typing*, 2nd edition, Elsevier Academic Press, Burlington, MA (2005).
  - F.R. Beiber, C.H. Brenner, D. Lazer "Finding Criminals Through DNA of Their Relatives," *Science*, v. 312, pp. 1315-1316 (2006).
  - T.M. Reid, M.L. Baird, J.P. Reid, S.C. Lee, R.F. Lee "Use of Sibling Pairs to Determine the Familial Searching Efficiency of Forensic Databases," *Forensic Sci Int. Gene.* (2008), doi:10.1016/j.fsigen.2008.04.008 (electronic edition).
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