



Scientific & Technical Review Panel Final Report for OSAC 2021-S-0029 Standard for Familial DNA Searching

Organization of Scientific Area Committees (OSAC) for Forensic Science





STRP Final Report OSAC 2021-S-0029 Standard for Familial DNA Searching

Organization of Scientific Area Committees (OSAC) for Forensics Science
August 30, 2022

Disclaimer:

This report was produced by an independent Scientific and Technical Review Panel (STRP). The views expressed in the report do not necessarily reflect the views or policies of the U.S. Government. Visit the OSAC website for more information on [OSAC's STRP process](#).

Scientific & Technical Review Panel Members

- Frederick R. Bieber, Harvard Medical School
- Dorothy Catella, Oakland County Sheriff's Office
- George Duncan, Nova Southeastern University
- Jessica Goldwaithe, The Legal Aid Society
- Stacy Hafner, Denver Police Department
- Brad Jenkins, Virginia Department of Forensic Science
- Swathi A. Kumar, Verogen
- Richard Lempert, University of Michigan (emeritus)
- Casandra Setser, Florida International University



Report Summary:

The Scientific and Technical Review Panel (STRP) for “Standard for Familial DNA Searching” is an independent panel appointed by the National Institute of Standards and Technology (NIST). A STRP is established with a range of experts to consider how well a standard meets the needs of the forensic science, law enforcement, and legal communities, and to recommend improvements to the standards under review. The STRP appreciates the efforts of Ann Marie Gross, Human Forensic Biology Subcommittee affiliate, while serving as the subcommittee liaison to this STRP during the review process.

The STRP began its review process with a kickoff meeting on August 13, 2021, and concluded with this STRP final report. The panel reviewed the draft standard and prepared comments for the [Human Forensic Biology Subcommittee](#).

Report Components:

The STRP reviewed this draft standard against OSAC’s *STRP Instructions for Review* which include the following content areas: scientific and technical merit, human factors, quality assurance, scope and purpose, terminology, method description and reporting results. The details below contain a brief description of each reviewed content area and the STRP’s assessment of how that content was addressed in the Draft OSAC Proposed Standard.

- 1. Scientific and Technical Merit:** OSAC-approved standards must have strong scientific foundations so that the methods practitioners employ are scientifically valid, and the resulting claims are trustworthy. In addition, standards for methods or interpretation of results must include the expression and communication of the uncertainties in measurements or other results.

1.1.1 Consensus View - The STRP believes that the draft standard is thorough in its approach and well-written. It contains suitable references and guidance on the scientific and technical merits of familial searching. Given the likelihood of changes in the capacity for, technology of, and views of the legal and ethical issues surrounding familial DNA searches, we note that this standard may require regular revisiting.

We suggest adding the following references to the draft standard:

- Probabilistic strategies for familial DNA searching
Klaas Slooten, Ronald Meester
First published: 20 September 2013
<https://doi.org/10.1111/rssc.12035>
- Choosing Relatives for DNA Identification of Missing Persons
Jianye Ge Ph.D., Bruce Budowle Ph.D., Ranajit Chakraborty Ph.D.

3



First published: 13 December 2010
<https://doi.org/10.1111/j.1556-4029.2010.01631.x>

- Klaas-Jan Slooten, Thore Egeland, Exclusion probabilities and likelihood ratios with applications to kinship problems, *International Journal of Legal Medicine*, 10.1007/s00414-013-0938-0, 128, 3, (415-425), (2013).
- Daniel Kling, Sándor Füredi, The successful use of familial searching in six Hungarian high profile cases by applying a new module in Familias 3, *Forensic Science International: Genetics*, 10.1016/j.fsigen.2016.05.012, 24, (24-32), (2016).

1.1.2 Minority View - A minority is undecided and disagrees with portions of the consensus view.

1.2.1 Consensus View - Section 4.2.2 sets the requirements for the validation study of familial DNA searches, however, it makes no mention of when an existing validation may no longer be applicable to the process. For example, the size of the database used for comparison has been steadily growing. Therefore, we propose that validations for familial DNA search be revisited on a regular basis to evaluate continued suitability. As a general rule, the familial search process should be updated when a specified profile's random match probabilities are statistically significantly different before and after the adjustment.

1.2.2 Minority View - A minority disagrees with the need to specify any further requirements other than what is already present in the draft standard.

2. Human Factors: All forensic science methods rely on human performance in acquiring,

examining, reporting, and testifying to the results. In the examination phase, some standards rely heavily on human judgment, whereas others rely more on properly maintained and calibrated instruments and statistical analysis of data.

2.1 No Consensus View Achieved (5 yea and 4 nay): The STRP believes that this draft adequately addresses issues related to human factors and performance.

2.2 Consensus View - The document lists what individuals/roles “may” be involved in the search process and oversight in section 4.1.2. This is a critical step in the process and the STRP believes that certain individuals must be involved such as an individual or committee who has the ultimate control for the search and directs the release of investigative lead(s) and any follow-up; a representative from the requesting law enforcement agency; and a legal representative; for consideration the list of individuals should be broken into categories of “shall” and “may”.

2.3 No Consensus View Achieved (4 yea and 5 nay) - Add language to require a defense attorney representative or defense-oriented attorney in section 4 in defining the individuals involved in the search process and oversight.

4



2.4 Consensus View - Add information about cognitive biases and ways of limiting the degree to which they might affect analytic decision making and reporting to the laboratory training section in section 4.

2.5 Minority View - Add a new category under case acceptance section 4 that considers the opportunity costs of the search.

2.6 Consensus View - Suggest changing “who could not be the perpetrator” to something like, “who has been eliminated as a possible perpetrator” under the protecting privacy of family members in section 4.

3 Quality Assurance: Quality assurance covers a broad range of topics. For example, a method must include quality assurance procedures to ensure that sufficiently similar results will be obtained when the methodology is properly followed by different users in different facilities.

3.1 Consensus View - The STRP believes that if this document is a general guidance document for use by a forensic laboratory that is already accredited following the FBI Quality Assurance Standards (QAS), then the quality assurance topics are properly covered in this draft standard. If this document is meant to be used by a non-accredited forensic laboratory, then the proposed standard does not provide sufficient quality assurance requirements. If that is the case, then additional information should be provide in the areas of validation, verification, proficiency, competency testing, technical and administrate review.

3.2 Minority View - Require laboratories to use familial search software which complies with IEEE 1012, *Standard for System and Software Verification and Validation* (current version is 1012-2016).

3.3 Consensus View - The proposed standard should require laboratories to the extent possible to track data for things in their control, including at a minimum, the number of searches conducted, number of searches requested, number of potential relatives returned on each search and under what search parameters, number of potential relatives who were determined not to be related to the evidence sample donor, and how many samples were received by the lab for testing and comparison to the evidence sample. Certain data may be outside the control of the lab, such as number of DNA samples taken from presumptive perpetrators, arrests made, final case outcome, etc. However, it would be surprising if the lab was not already keeping track of that information to determine the utility of these types of searches.

4 Scope and Purpose: Standards should have a short statement of their scope and purpose. They should list the topics that they address and the related topics that they do not address. Requirements, recommendations, or statements of what is permitted or prohibited do not belong in this section.



4.1 Consensus View - Upon review, the STRP sees no reason to modify the proposed language defining "Scope and Purpose" as currently set forth in the document. The document also complies with the proposed language in that the terminology is appropriate and the draft standard's scope and purpose are appropriate.

4.2 Minority View - This standard should include a requirement that labs shall only implement familial searching if expressly approved by the legislature. Familial searching is a controversial forensic method which raises serious questions of how to balance law enforcement interests with privacy, racial disparity, and equality concerns. A forensic laboratory is not well-suited to do this balancing. The role of the state legislature or Congress is to balance these concerns in enacting, or refusing to enact legislation.

4.3 Minority View - During our review of the proposed standard and discussion of its scope, STRP members asked "Who should use this standard? For whom was it intended? Should police departments or labs which are not accredited under the FBI QAS be able to claim compliance with this standard? Could they even possibly claim compliance if they weren't already in compliance with the FBI QAS?" Born from concerns over privacy and quality assurance when familial searching is performed by non-accredited labs or law enforcement actors, these questions deserve careful scrutiny. In answering those questions, the troubling practice of police departments and laboratories maintaining and exploiting DNA indexes unauthorized by law are instructive. These indexes may contain the DNA of persons simply questioned by the police but never arrested, charged, or convicted; those who have provided DNA voluntarily for the purposes of excluding them from crime

evidence; victims of crimes; or surreptitiously collected DNA where the person has no idea their DNA will live and be compared against crime scene samples in perpetuity. See e.g., Graham Rayman, Developer of NYC's DNA database 20 years ago troubled by what it has become, NY Daily News, Feb. 24, 2020, available at <https://www.nydailynews.com/new-york/nyc-crime/ny-dna-pioneer-criticizes-nypd-20200224-brwloofnrfapzhn332kvyzl23y-story.html>; Forensic Science Oversight Board, Report on the Bristol County District Attorney's Office DNA Database, available at <https://www.mass.gov/doc/forensic-science-oversight-boards-investigation-of-the-bristol-county-district-attorneys-office-dna-database-subsection-d-report-october-2021/download>; Bryan Pietsch, San Francisco police use rape kit DNA to identify survivors as suspects in other crimes, district attorney says, Wash.Post Feb. 14, 2022, available at <https://www.washingtonpost.com/nation/2022/02/14/san-francisco-police-rape-kit-dna/>.

4.4 Minority View - Certainly, if unaccredited labs and police departments are going to perform familial searches in non-CODIS DNA indexes, it would be better to have a standard that provides some minimal guarantee of quality and privacy protection. However, these bodies simply should not be performing familial searches at all, particularly if those searches will be performed within an unregulated DNA index, which would exacerbate the harms that those databases cause to the people in them and to their relatives.

4.5 Minority View - If there is to be familial searching at all, in addition to adding a requirement for statutory authorization, an STRP member recommends that the OSAC

6



working group delete all references in the standard to suspect DNA indexes and issue a clear condemnation of familial searching within any database other than SDIS and NDIS.

4.6 No Consensus View Achieved (5 yea, 3 nay, and 1 abstention) - OSAC Proposed Standards require a Scope to be defined by listing what topics are addressed and what related topics are not addressed. Here, Standard 029 includes “c) the search process” but does not provide an exact method for that search process. Some STRP members find it reasonable not to describe the search process in depth due to the preponderance of variables presented by software, amplification kits, state laws, etc. used in familial DNA searches. Due to differing state laws in particular, it would be onerous for this standard to describe the familial DNA search process step-by-step as not all states may require the same steps and/or safeguards. Therefore, we advise the addition of a statement to the Scope describing this as a policy document subject to local laws and not a procedure to address what related topics are outside of the Scope of this standard.

4.7 Minority View - The scope doesn't contain a concise summary of the purpose/reach of the standard.

4.8 No Consensus View Achieved (5 yea and 4 nay) - The scope appears to contain requirements (“This standard requires laboratories that perform familial DNA

searches...”). Some STRP members suggest changing the wording to “This standard sets forth requirements for...”

4.9 Minority View – A minority view suggests using the language “[t]his standard also sets forth the requirements for the design and evaluation of internal validation studies for familial searching and the development of appropriate protocols based on the validation studies performed,” but the standard does not actually do this sufficiently. While the change in the scope language is recommended, it must be accompanied by changes in the standard itself.

4.10 No Consensus View Achieved (4 yea, 4 nay, and 1 abstention) - The scope should contain a retroactivity requirement or at least recommend ensuring that labs already conducting familial searching adhere to the standard: “Laboratories conducting familial search should review their familial search policies and protocols (or program) for compliance with these requirements.” It is critical that labs to go back and ensure that their program adheres to these minimal requirements.

4.11 No Consensus View Achieved (4 yea, 4 nay, and 1 abstention) – an STRP member used language from previously published standards on the Registry in drafting a revised scope and the retroactivity-type language (see Standard 18: Standard for Validation of Probabilistic Genotyping Systems and Standard 20: Standard for Validation Studies of DNA Mixtures, and Development and Verification of a Laboratory’s Mixture Interpretation Protocol).

Proposed revision of Scope:

7



1. Scope

1.1 This standard sets forth requirements for a laboratory’s familial search policies and procedures, including the requirement that the laboratory have a written policy and procedures specifying criteria for:

- a) accepting a familial DNA search request;
 - b) administrative structure and responsibilities;
 - c) the search process;
 - d) reporting results; and
- Note: The lettered points could be removed from the scope and inserted as a requirement in the standard itself

e) safeguarding individual privacy and confidentiality of the results.

f) Training of lab personnel conducting familial searches

This standard also sets forth the requirements for the design and evaluation of internal validation studies for familial searching and the development of appropriate protocols based on the validation studies performed.

1.2 This standard does not apply to Investigative Genetic Genealogy or to the investigation of partial matches that may occur during the normal course of forensic database searches.

1.3 Laboratories are advised to review their familial search policies, protocols, and validation for compliance with this standard, supplement policies and validation where necessary, and modify existing protocols accordingly.

4.12 Minority View – Familial DNA searching should not be employed because it exacerbates racial disparities in the criminal justice system, violates the privacy of those who are subjected to law enforcement intrusion simply by virtue of being related to an offender in the database, and expands databases beyond their original intended use and justification. See, eg, Erin Murphy, *Relative Doubt: Familial Searches of Databases*, 109 Mich.L.Rev. 291 (2010) (discussion of concerns over familial searching).

5 Terminology: Standards should define terms that have specialized meanings. Only rarely should they give a highly restricted or specialized meaning to a term in common use among the general public.

5.1 Consensus View - The STRP finds that the draft standard defines appropriate terms with specialized meaning within the area of familial DNA searching. The document balances the need for definitions while avoiding defining commonly used terminology. The STRP recommends using OSAC preferred terms, when available.



6 Method Description: There is no rule as to the necessary level of detail in the description of the method. Some parts of the method may be performed in alternative ways without affecting the quality and consistency of the results. Standards should focus on standardizing steps that must be performed consistently across organizations to ensure equivalent results. Alternatively, standards can define specific performance criteria that are required to be demonstrated and met rather than specifying the exact way a task must be done. For example, it may be enough to specify the lower limit for detecting a substance without specifying the equipment or method for achieving this limit of detection.

6.1 Consensus View - With the variety of software, amplification kits, state laws, etc. used in familial DNA searches, there are too many variables to describe a procedure in detail that laboratories should follow. Due to differing state laws, it would be onerous for this standard to describe the familial DNA search process in sufficient detail to create consistency across organizations that would ensure equivalent results. The STRP therefore

interprets this document as a policy document rather than a method intensive standard.

7 Reporting Results: Methods must not only be well described, scientifically sound, and comprehensive but also lead to reported results that are within the scope of the standard, appropriately caveated, and not overreaching.

7.1 Consensus View - The standard does not contain clearly defined reporting requirements. The only place the word “report” appears in the document is in the scope. To the extent that 4.1.3 concerns reporting, it does not require that the report be written, specify the minimum contents of the report, to whom it will be issued, where it will be stored, or contain any limiting statements. There must be a clear requirement for the issuance of a written report containing the results of the search.

7.2 Consensus View - There should also be a requirement that the suitability of a profile for familial searching be documented in writing. To the extent that 4.1.4 addresses this, “in writing” should end the first sentence: “*The document shall ensure that all the individuals with roles established in 4.1.2 are informed of the process, likely outcomes, limitations, and the need for additional investigation in writing*”.

7.3 No Consensus View Achieved (4 yea and 5 nay) - The standard should comply with the recommendations of the National Forensic Commission in its *Recommendation to the Attorney General Documentation, Case Record, and Report Contents*, available at <https://www.justice.gov/archives/ncfs/page/file/905536/download> (last visited 12/27/2021) (footnotes omitted):

1. Records should be created contemporaneous with the examination of evidence and the technical review that, along with the FSSPs’ quality management system documents relating to the forensic work performed, would allow another analyst or scientist, with proper training and experience, to understand and evaluate all the work performed and independently analyze and interpret the data and draw conclusions.



2. Providing all of the documentation encompassed by recommendation #1 in a single report in every case is impractical. Instead, if not in the report, the documentation described herein must be maintained in a case record. Generic documentation such as standard operating procedures and definitions must either be a part of the case record or be easily accessible (e.g., posted on a Web site, available on request).
3. Reports should clearly state: the purpose of the examination or testing; the method and materials used; a description or summary of the data or results; any conclusions derived from those data or

results; any discordant results or conclusions; the estimated uncertainty and variability; and possible sources of error and limitations in the method, data, and conclusions.

4. Every report should state that the report does not contain all of the documentation associated with the work performed. In order to understand and evaluate all the work performed, and independently analyze and interpret the data and draw conclusions, a review of the case record is required.

5. The case record should be organized and made available in a manner consistent with the National Commission on Forensic Science discovery recommendations.

7.4 No Consensus View Achieved (5 yea and 4 nay) Suggestion for additional requirements:

Laboratories shall generate a written report containing the results of the familial search.

At a minimum, the report must contain the following information:

1. The database searched, including number of known and unknown profiles searched
2. Name and developer of software used to conduct the familial search
3. Threshold used (e.g., LR of X)
4. Results of the familial search
5. Criteria used to release a name or where to find such criteria
6. Statement that validation and protocols are available for inspection
7. Confidence bounds
8. Confidentiality provisions/warnings
9. Statement that additional information, calculations, etc. is contained in the casefile



The report shall clearly state that the results may not contain a true relative of the perpetrator and additional investigation is needed.

8 Miscellaneous:

8.1 Consensus View - Add language to section 4 that all searches shall comply with applicable state and federal law.

8.2 Consensus View - The updated *Standard for Familial DNA Searching* had a standard removed which changed the numbering scheme. As such, updates need to be made.

8.3 Consensus View - In section 4.2.2. The wording “*It is impractical...*” seems more like a response one might make to objections than a provision intended to set a standard. Less glaring would be to add after “reasonable ... test” in each of the following two paragraphs, a phrase like, “taking practicalities into account”.