Standard For Forensic DNA Analysis Training Programs
Draft

DRAFT Document

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1 Scope

This standard provides the general requirements for a forensic DNA laboratory's training program in DNA analysis and data interpretation.

2 Normative References

The following referenced documents are indispensable for the application of this standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document applies.

FBI, *Quality Assurance Standards for DNA Databasing Laboratories.* It is available at https://www.fbi.gov/file-repository/quality-assurance-standards-for-dna-databasing-laboratories.pdf/view.

FBI, *Quality Assurance Standards for Forensic DNA Testing Laboratories.* It is available at https://www.fbi.gov/file-repository/quality-assurance-standards-for-forensic-dna-testing-laboratories.pdf/view.

SWGDAM. *SWGDAM Training Guidelines.* It is available at *http://media.wix.com/ugd/4344b0_87b2b4a150aa433f9490b7113b1aa4a6.pdf.*

3 Terms and Definitions

The following terms and definitions apply to this standard.

3.1
Competency
The demonstration of technical skills and knowledge necessary to perform forensic DNA analysis successfully.

3.2
Competency test(s)
A test designed to establish that an individual has demonstrated achievement of technical skills and met minimum standards of knowledge necessary to perform forensic DNA analysis.

3.3
DNA technical leader (or equivalent role, position, or title as designated by the laboratory director)
An employee who is accountable for the technical operations of the laboratory and who is authorized to stop or suspend laboratory operations.

3.4
FBI
An acronym for the Federal Bureau of Investigation.

3.5
DNA analysis
The processes of DNA recovery (includes sampling and extraction), quantitation, amplification, separation, sequencing, designation, data analysis and profile interpretation.

3.6
Methods
The analytical processes and procedures used in DNA processing; for example, extraction methods (e.g. organic, Chelex), quantitation methods (e.g. slot blot, real time), typing test kits and platforms (e.g. capillary electrophoresis, real-time gel, and end-point gel systems).

3.7
Multi-laboratory system
An organization that has more than one laboratory performing forensic DNA analysis.

3.8
Protocol
An established practice to be followed in performing a specified task or under specific circumstances.

3.9
QAS
An acronym for the FBI's Quality Assurance Standards for DNA Databasing Laboratories and the Quality Assurance Standards for Forensic DNA Testing Laboratories.

3.10
SWGDAM
An acronym for Scientific Working Group on DNA Analysis Methods; formerly known as TWGDAM, Technical Working Group on DNA Analysis Methods; an FBI sponsored group that develops quality assurance standards and guidelines for forensic DNA laboratories in the United States.

3.11
Technology
1) The application of a particular type of methodology or process to generate results. 2) Used to describe the type of forensic DNA analysis performed in the laboratory, such as RFLP, STR, Y STR, or mitochondrial DNA.

3.12
Training Program
Activities and competency testing to be performed by a trainee for the purpose of enhancing their job-related knowledge, skills or abilities.

3.13
Validation
The process of performing a set of experiments that establish the efficacy, reliability, and limitations of a method, procedure or modification thereof; establishing recorded documentation that provides a high degree of assurance that a specific process will consistently produce an outcome meeting its predetermined specifications and quality attributes. May include developmental and/or internal validation.

4 Requirements

4.1 Personnel

4.1.1 General

All DNA laboratory personnel shall have training prior to participating in DNA analysis and data interpretation.

4.1.2 Training program administrator

The laboratory or multi- laboratory system shall have an individual designated as being accountable for the administration of the DNA training program.

NOTE – Throughout this standard, this individual will be referred to as the DNA technical leader.

4.1.3 Personnel with previous DNA experience

Individuals with documented previous experience or training in forensic DNA analysis may be exempted from portions of the training program. The DNA technical leader shall be responsible for assessing an individual's previous training and ensuring that it is adequate and documented.

4.1.4 Competency testing

Prior to participating in independent casework analysis, all personnel, regardless of previous experience, shall successfully complete a competency test(s) as applicable to the individual's job responsibilities related to DNA analysis and data interpretation.

4.1.5 New DNA processing, data interpretation, and statistical analysis methods

When a new DNA processing, data interpretation, or statistical analysis method is incorporated into the laboratory's protocols, all personnel responsible for performing the method shall successfully complete training and competency testing prior to performing DNA analysis or data interpretation.

NOTE – For DNA personnel intimately involved in a validation, the technical leader may allow the validation to serve as the demonstration of competency in this method of DNA analysis or data interpretation. The DNA technical leader shall document the level of involvement of the individual in the validation to indicate how it applies to the individual's job responsibilities.

4.1.6 Re-training

In the event that a previously qualified individual requires re-training, the DNA technical leader shall evaluate the knowledge-based or technical areas requiring improvement and determine the appropriate re-training and competency testing to be completed. The individual shall successfully complete the re-training and assigned competency test(s) in order to resume the applicable job responsibilities.

4.2 Training Program

4.2.1 General

The laboratory shall have a written training program that provides trainees with the appropriate knowledge, technical training, and practical experience to perform their job responsibilities as they apply to DNA processing, data interpretation, and statistical analysis methods performed by the laboratory. Prior to implementation, the DNA training program shall be approved by the DNA technical leader and any management staff as required by laboratory policy.

4.2.2 Content

At a minimum, the training program shall cover the following topics as they apply to the work currently conducted by the laboratory:

a) Expectations regarding satisfactory progression through the training program and performance on competency test(s)

b) General operation of the forensic laboratory

c) The laboratory's quality management program

d) Laboratory safety

e) Evidence handling and chain of custody

f) Lectures and literature review on the theoretical and scientific basis of forensic DNA analysis

g) Practical instruction and observation of the technologies, methodologies, and platforms used in the laboratory

h) Practical exercises in the technologies, methodologies, and platforms used in the laboratory on samples representative of the range, type and complexity analyzed by the laboratory

i) Lectures and practical exercises in data interpretation and statistical analysis

j) Lectures and practical exercises in report writing and technical review

k) Awareness of cognitive bias in decision-making processes associated with forensic DNA analysis

l) Lectures and practical exercises in testimony as an expert witness

4.2.3 Documentation of required portions of the training program

The training program shall be tailored, as applicable, to the trainee's specific job responsibilities and the extent to which the trainee will participate in DNA processing, data interpretation, and statistical analysis. The DNA technical leader shall document which portions of the training program are specific to the trainee's job responsibilities.

4.2.4 Administration of the training program

The training program shall be administered by the DNA technical leader. Internal training shall be performed by the DNA technical leader or a qualified analyst(s) or technician(s) designated by the DNA technical leader. External training shall be pre-approved by the DNA technical leader. External training activities shall be documented in the trainee's training records. The documentation shall include the DNA technical leader's review of the external training.

4.2.5 Revisions to the DNA training program

Any revision to the DNA training program shall be approved by the DNA technical leader and laboratory management, as applicable, prior to implementation by the laboratory.

4.2.6 New DNA analysis, data interpretation, and statistical analysis methods

Any new DNA processing, data interpretation, or statistical analysis method approved and implemented by the laboratory shall be incorporated into the laboratory's training manual.

4.2.7 Re-training of previously qualified laboratory personnel

In the event that a previously qualified individual requires re-training, the DNA technical leader shall document the re-training program and the required competency test(s) to be successfully completed by the individual in order to resume the applicable job responsibilities.

4.2.8 Training Records

All training activities for each trainee shall be documented and records retained as specified by laboratory policy. The DNA technical leader and laboratory management, as applicable, shall review and approve the training records for completeness.

4.3 Competency Testing

4.3.1 General

Prior to performing independent work in any area of the knowledge-based or technical areas of the training program, the trainee shall successfully complete the competency test(s) assigned by the DNA technical leader. The assigned competency testing shall be based on the individual's job responsibilities and the extent to which they will participate in

DNA analysis or data interpretation. The competency test(s) shall establish that the trainee has the knowledge, ability, and skill required to perform the assigned job responsibilities.

4.3.2 Required testing

Prior to performing independent DNA analysis or data interpretation, the trainee shall successfully complete the following knowledge-based and technical competency tests, as they apply to the assigned job responsibilities:

a) A written and a practical competency test(s) covering the following areas:

     i.   theoretical and scientific basis of forensic DNA analysis

     ii.   laboratory's analytical procedures performed on samples representative of the range, type, and complexity typically analyzed by laboratory

     iii.   data interpretation

     iv.   statistical analysis

     v.   report writing

     vi.   technical review

b) An oral competency test(s) to demonstrate an understanding of the scientific basis of forensic DNA analysis. The oral competency test shall be designed to demonstrate that the trainee can explain the DNA analysis and data interpretation procedures used by the laboratory to both a layman and a scientific expert. The oral assessment shall include a mock trial exercise in addition to any other laboratory-specified requirements.

4.3.3 Administration of competency tests

Competency tests may be administered as individual tests for each assigned area of the training program or combined into more comprehensive tests. When practicable, competency tests shall be assembled, issued, and assessed internally. The DNA technical leader shall approve all competency tests prior to administration to the trainee.

4.3.4 Assessment of competency

All competency tests shall be graded as either Satisfactory or Unsatisfactory according to laboratory policy. The DNA technical leader shall evaluate and document the results of all competency tests. Competency test results shall be reviewed with the trainee, the trainer(s), and the trainee's supervisor.

4.3.5 Re-testing

In the event that an individual needs to be re-tested to demonstrate competency, the DNA technical leader shall evaluate the knowledge-based or technical areas requiring

improvement and determine the appropriate additional training necessary for the individual to demonstrate competency. Following completion of that training, the individual shall demonstrate competency in order to initiate or resume the applicable job responsibilities.

4.3.6 Acknowledgement of competency

Prior to the trainee performing independent casework, the DNA technical leader shall document that the trainee has demonstrated the knowledge, skills, and ability to perform the assigned job responsibilities as they apply to forensic DNA analysis or data interpretation.

5   Conformance

In order to demonstrate conformance with this standard, the laboratory shall have the following:

a) A documented training program which includes:

   i.   A written training manual covering every validated technology and methodology currently used by laboratory as well as all of the DNA analytical procedures to be performed by laboratory personnel.

   ii.   Documentation of the knowledge and technical skills required to perform DNA analysis and interpretation.

   iii.   Documentation of the training activities and competency testing to be completed prior to performing DNA analysis.

b) Documented approval of the training program by the DNA technical leader and any other laboratory management staff as required by laboratory policy prior to implementation by the laboratory.

c) Records of successful completion of training activities and competency test(s) for each trainee prior to performing independent DNA analysis and data interpretation. The records shall be specific as to the individual's job function and the extent to which they will participate in DNA analysis and data interpretation. The records shall include any modifications made to the individual's training plan and documented approval of the modifications by the DNA technical leader.

d) Documented acknowledgement from the DNA technical leader that each individual has demonstrated the knowledge, skills, and ability to perform the assigned job responsibilities as they apply to independent DNA analysis or data interpretation.