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Standards for Training in Forensic Serological Methods

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Foreword

This standard defines the minimum requirements that shall be met in a forensic serology training program to evaluate body fluids, stains, or residues related to forensic investigations. The aim is to provide a framework for training that will result in quality and consistency in the forensic community.

In this document the industry standard definition for forensic serology as it relates to forensic science is used instead of the traditional scientific definition.

This document was revised, prepared, and finalized as a standard by the DNA Consensus Body of the AAFS Standards Board. The draft of this standard was developed by the Biological Methods Subcommittee of the Organization of Scientific Area Committees (OSAC) for Forensic Science.

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the term **'shall'** indicates that a provision is mandatory, and can be audited for compliance

the term **'should'** indicates that a provision is not mandatory, but recommended as good practice.

All hyperlinks and web addresses shown in this document are current as of the publication date of this standard.

Keywords: *training, forensic serology, forensic biology.*

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Standard for Training in Forensic Serological Methods

1 Scope

This standard provides the general requirements for a forensic serology training program to evaluate body fluids, stains, or residues related to forensic investigations.

This standard does not address training in forensic DNA analysis procedures.

2 Normative References

The document contains no normative references. See Annex A, Bibliography for other references.

3 Terms and Definitions

For purposes of this document, the following definitions apply.

3.1
confirmatory test
A test that is specific for the presence of a body fluid, stain, or residue of interest, and reduces or eliminates false positive results.

3.2
contamination
The unintentional introduction of exogenous materials or substances into a test sample.

3.3
forensic serology
The detection, characterization, identification, and/or typing of body tissues and fluids, either in native form or as stains or residues left at a crime scene using physical methods (e.g. normal and enhanced lighting), biochemical assays, reactions and/or microscopy.

3.4
presumptive test
A screening test that indicates the possible presence of a material of interest. A positive presumptive test result does not constitute the identification of that material. A negative presumptive test indicates that the material of interest was not detected; it is not confirmation of its absence. Presumptive tests are sensitive but not specific and can lead to false positive results.

3.5
technical designee
The designated individual in the laboratory who has technical responsibility.

4 Requirements

4.1 General

4.1.1 The laboratory shall have a documented training program for qualifying all personnel that will conduct and report forensic serological examinations.

4.1.2 All personnel processing potential biological evidence shall have documentation of successful completion of the training program before being authorized to perform forensic casework.

4.1.3 The training program shall be overseen by the technical designee. Qualified individual(s) designated by the technical designee shall perform training.

4.1.4 The training program for personnel conducting and reporting biological fluid examinations shall define the technical skills and knowledge required to perform forensic serological analysis. The training provided to each trainee shall be applicable to the individual's job responsibilities.

4.1.5 Each area of instruction shall have an objective(s) documented in the training program.

4.1.6 Examination(s) (e.g., written test, oral test, and/or laboratory practical exercise) shall be defined and administered in order to measure the trainee's knowledge. Each examination shall be graded according to laboratory policy. Final conformance and authorization of independence of a trainee shall be determined and documented by the technical designee.

4.1.7 Supporting documentation of an individual's previous training and experience in biological fluid examination shall be recorded and used to assess if modifications to the training program can be made. Any modifications shall be documented by the technical designee.

4.1.8 Expectations regarding satisfactory progression through the training program and performance on competency test(s) shall be provided to the trainee.

4.1.9 A competency test shall be successfully completed for the range of forensic serological examinations that will be performed regardless of previous experience.

4.1.10 For personnel who had an integral role in the validation sufficient to master the technical skills, concepts and knowledge pertaining to the validation, the technical designee may allow the validation to serve as the competency test in this method of serological analysis. The technical designee shall document the level of involvement of the individual in the validation to indicate how it applies to the individual's job responsibilities.

4.2 Knowledge-based Training

4.2.1 The laboratory's training program shall provide the trainee with an understanding of the fundamental principles of forensic serological methods, the function of the reagents and other components used in each method, the limitations of each method, and the laboratory's own forensic serological protocols.

4.2.2 At a minimum, the knowledge-based portion of the training program shall require review of the following:

a) the laboratory's protocols for forensic serological methods, including technical and administrative review process;

b) the laboratory's applicable validation studies;

c) literature used to support validation and the test methods in the laboratory;

d) applicable literature as assigned by the trainer;

e) general understanding of forensic serology testing and its impact on other forensic disciplines.

4.2.3 At a minimum, the knowledge-based portion of the training program shall cover the following topics:

NOTE Knowledge of historical methods is intended to provide an educated perspective on current methods.

a) the fundamentals of serological testing and the composition of body fluids;

b) mechanisms of biological fluid examinations to include visual and chemical analyses;

c) information regarding test specificity and limits of detection for presumptive and confirmatory testing;

d) the analytical information involved in establishing which assay to use (e.g. size of stain, age of stain);

e) the proper preservation of biological material to include safety, handling, packaging, storing, and chain of custody procedures to maintain the integrity of the evidence;

f) limitations of the methodology.

4.3 Practical Training

4.3.1 The laboratory's training program shall provide the trainee with sufficient practical instruction for the trainee to obtain the skills for successfully performing forensic serological methods used by the laboratory. This shall be done by a combination of direct observation, mock testing, and supplemented with case file review as necessary.

4.3.2 At a minimum, the practical portion of the training program shall include the observation of the process at least once or until clearly understood, representative of the range, type, and complexity of routine casework samples processed by the laboratory. These include:

a) DNA forensic serological methods to be utilized by the trainee;

b) sample selection methods necessary to permit downstream DNA analysis;

c) the preferred order in which serological tests should be applied to evidence as per laboratory policy;

d) the interpretation of the serological examination results, including the interpretation of appropriate controls;

e) reporting of serological examination results according to laboratory policy;

f) proper documentation of the process.

4.3.3 At a minimum, the practical portion of the training program shall include exercises representative of the range, type, limits of detection, and complexity of casework samples processed by the laboratory. These include:

a) forensic serological methods to be utilized by the trainee;

b) evaluation of controls and expected results;

c) proper documentation of the process;

d) the number and quality of samples processed by the trainee shall be appropriate to demonstrate the ability to follow the laboratory's forensic serological method protocol(s) and documentation protocol(s), and produce reliable and accurate results.

4.4 Competency Testing

4.4.1 General

Prior to performing work in any area of the knowledge-based or technical areas of the training program, the trainee shall successfully complete the competency test(s). The assigned competency testing shall be based on the individual's job responsibilities and the extent to which they will participate in forensic serological examination. The competency test(s) shall establish that the trainee has the knowledge, skill, and ability required to perform the assigned job responsibilities.

4.4.2 Knowledge-based Competency

The trainee shall successfully complete a knowledge-based competency test covering the critical information obtained during the training of forensic serological examinations. The test(s) shall cover, at a minimum:

a) the theoretical and scientific basis of forensic serology to include false positive and false negative results;

b) the function of the reagents and other components used in each method;

c) the proper application of each method and strategy for use;

d) the quality control steps pertaining to forensic serological examinations, including the evaluation of controls;

e) the laboratory's analytical procedures pertaining to forensic serological methods.

4.4.3 Practical Competency

The trainee shall successfully complete a practical test covering each of the forensic serological examination methods for which he or she will be independently authorized to perform. Samples of known type will be used. The trainee shall be able to satisfactorily perform the following, as applicable:

a) properly and accurately execute the analytical procedures related to forensic serological examinations without contaminating the samples;

b) apply the laboratory's analytical procedures to a variety of evidentiary casework type samples;

c) operate relevant equipment and instrumentation used in the laboratory;

d) correctly document work performed in accordance with laboratory procedures.

5 Conformance

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

a) A documented training program which includes the following.

   1) A written training manual covering all validated technologies and methodologies currently used by the laboratory as well as all of the forensic serological procedures to be performed by laboratory personnel.

   2) Documentation of the knowledge and technical skills required to perform forensic serological examinations.

   3) Documentation of the training activities and competency testing to be completed prior to performing forensic serological examinations.

b) Documented approval of the training program by the technical designee 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 forensic serological analysis. The records shall include any modifications made to the individual's training plan and documented approval of the modifications by the technical designee. All training activities for each trainee shall be documented and records retained. The technical designee shall review and approve the training records for completeness.

d) Documented acknowledgement from the technical designee that each individual has demonstrated the knowledge, skills, and ability to perform the assigned job responsibilities as they apply to forensic serological examinations.

Annex A
(informative)

Bibliography

The following information provides a list of the literature resources that may assist the technical designee in defining the breadth and scope of the materials to be reviewed by the trainee. This list is not meant to be all inclusive. The laboratory shall develop a list tailored to its specific needs. Updated references shall be added to the laboratory's list as new methods or technologies are incorporated into the laboratory's protocols.

1] National Institute of Justice (NIJ). *Sourcebook on forensic serology, immunology and biochemistry*. University of Michigan Library, 1983.

2] Scientific Working Group on the DNA Analysis Methods (SWGDAM), G*uidelines for the Collection and Serological Examination of Biological Evidence*[a].

[a] Available at https://docs.wixstatic.com/ugd/4344b0_b3deba7a272b4b268d7f522840607410.pdf

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