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# **General Standards for Training in Forensic Serological Methods**

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## **Foreword**

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

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

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

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

## Table of Contents

1	Scope .....	3
2	Normative References .....	3
3	Terms and Definitions .....	3
4	Requirements of the Standards .....	3
5	Annex A: Bibliography.....	6

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## **Standards 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.

### **3 Terms and Definitions**

For purposes of this document, the following definitions apply:

#### **3.1 Confirmatory Test**

A test that is specific for a biological material or substance of interest and is necessary for the conclusive identification of a biological fluid; this usually refers to a serological or microscopic test for the detection of a particular biological fluid (e.g., blood or semen).

#### **3.2 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 (normal and enhanced lighting), biochemical assays and/or microscopy.

#### **3.3 Presumptive Test**

A screening test that indicates that a biological fluid of interest may be present on an item of evidence but the result does not constitute the identification of that biological fluid. A negative presumptive test indicates that a biological fluid of interest was not detected; it is not confirmation that the biological fluid is absent.

#### **3.4 Technical Leader**

An employee who is accountable for the technical operations of the laboratory and who is authorized to stop or suspend laboratory operations.

### **4 Requirements of the Standard**

#### **4.1 General**

- 4.1.1 The laboratory shall have a documented training program for qualifying all personnel that will conduct and report serological examinations.
- 4.1.2 All personnel processing potential biological evidence shall have documentation of successful completion of the training program before being released to perform forensic casework.
- 4.1.3 The training program shall be overseen by the technical leader. Training shall be performed by a qualified individual designated by the technical leader.

- 4.1.4 The training program for personnel conducting and reporting biological fluid examinations shall define the technical skills and knowledge required to perform 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 leader.
- 4.1.7 If applicable, based on a trainee's prior experience a training plan, which can include re-training, will be assessed by the technical leader. 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 leader.
- 4.1.8 Expectations regarding satisfactory progression through the training program and performance on competency test(s).
- 4.1.9 A competency test, as determined by established laboratory procedure, shall be successfully completed for the range of serological examinations that will be performed regardless of previous experience.
- 4.1.10 Before the introduction of a new serological procedure into the laboratory, the training program shall be updated to incorporate any new methodologies that will be conducted by the laboratory, and personnel should successfully complete a competency/qualifying test prior to performing casework utilizing that new methodology.
- 4.1.11 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 leader may allow the validation to serve as the competency test in this method of serological analysis. The 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.

## **4.2 Content**

The laboratory's training program shall provide the trainee with an understanding of the fundamental principles of forensic serological methods and the laboratory's own forensic serological methods procedures, as applicable.

- 4.2.1. At a minimum, the training program shall require the following:
  - a) General understanding of serology testing and its impact on other forensic disciplines
  - b) The laboratory's protocols for forensic serological methods, quality assurance, ethics, and safety
  - c) The laboratory's applicable validation studies
  - d) Literature used to support validation
  - e) Applicable literature, lectures, and practical exercises as assigned by the technical leader

- 4.2.2 At a minimum, the knowledge-based portion of the training program shall cover the following topics:
- a) The fundamentals of serological testing and the composition of body fluids
  - b) Mechanisms of biological fluid examinations to include: visual, chemical, histological, immunological, and PCR (i.e. RNA, epigenetics)
  - c) Information regarding test specificity, limitations and limit of detection for presumptive and confirmatory testing
  - d) Foundation, court room testimony, and impact of forensic serology testimony in the judicial system
  - e) The analytical information involved in establishing which assay to use (e.g. size of stain, age of stain)
  - f) The proper preservation of biological material to include safety, handling, packaging, storing, and chain of custody procedures to maintain the integrity of the evidence. (e.g., for additional characterization, DNA testing, or in accordance with applicable law)
- 4.2.3 At a minimum, the technical portion of the training program shall include:
- a) Practical instruction in the forensic serological methods to be utilized by the trainee. This shall be done by a combination of direct observation, mock testing, and supplemented with case file review as necessary.
  - b) Practical exercises representative of the range, type, and complexity of routine casework or samples processed by the laboratory. The number and quality of samples processed by the trainee shall be appropriate to demonstrate the ability to follow the laboratory's forensic serological methods protocol(s) and to produce reliable and accurate results.
  - c) Sample selection methods and appropriate sample size necessary to permit downstream DNA analysis.
  - d) The preferred order in which serological tests should be applied to evidence as per laboratory policy.
  - e) The interpretation of the serological examination results, including interpretation of appropriate controls.
  - f) The technical and administrative review and reporting of serological examination results according to laboratory policy.

#### **4.3 Conformance**

4.3.1 The trainee shall successfully complete a knowledge-based test covering , at a minimum, the topics outlined under 4.2. The format of the test(s) shall be at the discretion of the technical leader.

4.3.2 The trainee shall successfully complete a laboratory- based competency test covering each of the forensic serological method protocols for which they will be independently authorized to perform.

4.3.3 The trainee shall successfully complete a mock-trial to demonstrate their ability to explain serological methods and results in both a simplistic and scientific capacity.

ANNEX A  
(informative)  
**Bibliography**

- 1) National Institute of Justice, *Sourcebook on forensic serology, immunology and biochemistry*, 1983.
- 2) James, Stuart H., Nordby, Jon J., Bell, Suzanne. *Forensic Science: An Introduction to Scientific and Investigative Techniques*. CRC Press; 4 edition (January 13, 2014).
- 3) Scientific Working Group on the DNA Analysis Methods, *Guidelines for the Collection and Serological Examination of Biological Evidence*, 2015.

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