**FORENSIC BIOLOGY TRAINING MANUAL**

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Revision History:

August 30, 2010 – Initial version of manual.

March 28, 2011 - Revised Section 2 (Training Program Guidelines) to include ethics, general forensic science, quality assurance/quality control, and the basics of the legal system in the theoretical background training, and specified requirement for all Forensic Biology employees to attend an annual review of the ASCLD/LAB *Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists;* Revised Section 3 and 4 by referencing a new "Required Training Lectures" list in the manual. This list is accessible through Section 4 (Modules).

July 16, 2012 – Entire manual revised for LIMS implementation. Names of approvers removed and replaced with general terminology. New training modules added: 12D, 22A, and 22B.

**FORENSIC BIOLOGY TRAINING MANUAL**

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Revision History:

August 30, 2010 – Initial version of manual.

March 28, 2011 - Revised Section 2 (Training Program Guidelines) to include ethics, general forensic science, quality assurance/quality control, and the basics of the legal system in the theoretical background training, and specified requirement for all Forensic Biology employees to attend an annual review of the ASCLD/LAB *Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists;* Revised Section 3 and 4 by referencing a new "Required Training Lectures" list in the manual. This list is accessible through Section 4 (Modules).

# 1. PROGRAM OVERVIEW



The purpose of the training program is to provide analysts with the theoretical and practical means necessary to perform reliable testing. For staff members who are DNA Interpreting Analysts, this includes training to learn how to present information competently in court. By having a multi-phase program of practical exercises, written assignments, and oral examinations, an analyst's weak points should become obvious, and the staff can work with the analyst to bolster this aspect of his/her knowledge and competency.

Newly hired staff is trained to perform a variety of different procedures, each relating to analyzing physical evidence for DNA typing. Each trainee progresses through a series of training modules; the modules correspond to duty rotations in the laboratory: evidence examination, sexual assault kit processing, exemplar processing, extraction, quantitation, and PCR amplification and typing. The modules selected depend on the job title and eventual work group of the trainee. Completion of the complete set of required modules is necessary for a trainee to become a reporting analyst.

Current staff is trained in new procedures as they are added. For each new technique implemented an analyst must successfully complete the new training module before using the procedure in casework. If a current analyst's job duties change or retraining is necessary, supplemental training is done using the current training module for that technique. Successful completion of the module is required before the analyst will be allowed to perform the technique in casework. Successful completion of each module is documented in the training folder either directly on the competency test results record or on one of the training checklists.

During training periods, staff should spend as much time as possible in training in order to expedite the process and help it to proceed more smoothly. This means that flexible or compressed time schedules, attendance at professional meetings and participation in special projects will not generally be allowed.

In total, the training will cover the theoretical and practical aspects of forensic biology. In particular it covers aspects of evidence examination, identification of physiological fluids, molecular biology, separation technology, interpretation of complex DNA results, statistical concepts as they relate to forensic DNA analysis, and court testimony.

## A. Training – evidence examination and serological methods

The goal of training and competency testing in the classical forensic biology methods is to establish consistency of performance between individual analysts and to maintain the highest possible level of performance over time. These analytical procedures for identifying physiological fluids are the foundation on which further individualization (DNA testing) is based, and their behavior and limitations must be understood.

The classical forensic biology training program is monitored by the Director, Deputy Directors, Assistant Directors, and/or Criminalist III/IV supervisors. The training may be provided by any Criminalist I or higher who is competent and has the appropriate level of experience (generally, at least six months completed past the training period for the specific procedure).

## B. Training - DNA analysis

The goal of training and competency testing in the DNA laboratory is to establish consistency of performance throughout the laboratory and to maintain the highest possible level of performance over time.

The DNA training program is monitored by the Director, Deputy Directors, Assistant Directors, and/or Criminalist III/IV supervisors. The training may be provided by any Criminalist I or higher who is competent and has the appropriate level of experience (generally, at least six months completed past the training period for the specific procedure).

The trainee may not interpret DNA results (STR CE processing and signing DNA reports) until they become a DNA Interpreting Analyst. This means that they(1) meet or exceed the degree and educational requirements as defined by the applicable "FBI Quality Assurance Standards for Forensic DNA Testing Laboratories (2) have a minimum of six months of documented forensic human-DNA lab experience, (3) successfully completed all training modules, and (4) successfully completed a written exam, oral exam, and moot courts. They will be expected to manage their DNA cases and write DNA reports for their supervisor's signature in the interim.

*If any new or additional federal and/or state requirements are imposed, they must be met by an analyst prior to interpreting and reporting DNA results.*

***Failure to satisfactorily complete competency tests, written or oral examinations, mock courts, required courses, or other required training activities, within a reasonable time frame after the beginning of training, may constitute grounds for demotion or termination.***

## C. Training record

The training is documented and maintained in a training record. The training record may contain notes, results, photographs, etc. generated during training. In addition, for each topic the date and initials of the trainer should be documented. The direct supervisor should regularly review the contents of the training record for accuracy and completeness.

The training record is the property of the Department of Forensic Biology and will be retained by the Department.



## D. Training schedule

A training schedule must be provided to each trainee and all scientific staff responsible for any aspect of the training. Because the training schedule affects many aspects of department operations, it should be adhered to as carefully as possible. Each module has adequate time allotted for the training. If necessary, for example if equipment is unavailable, a trainee may be asked to substitute a weekend day for a week day.

For Criminalist I's the training is limited. As competency is attained in each module, the trainee may be given a one or two week assignment in that technical rotation performing analysis on casework samples.

For Criminalist II's and above, the training is continuous and does not include intermediate assignments to technical rotations. Once all required training modules and moot courts are complete, the trainee joins the rotation schedule.

## E. Roles and responsibilities

Training Team

The training team is responsible for periodic review and/or revision of the Training Manual and reference articles.

The training team is responsible for preparation of training schedules, training assignments, and training records. This includes scheduling of training given by OCME staff other than those from the Department of Forensic Biology.

The training team is responsible for ensuring that practice samples and competency test samples are prepared.

The training team is responsible for ensuring that reference material is available.

The training team is responsible for maintaining the training records of current analysts.

Trainee

The trainee is expected to be ready by 9 am each day there is directly supervised training (observation or demonstration of a technique). A more flexible schedule may be possible on days where the trainee is working on practical exercises, practice samples, or competency tests.

The trainee is expected to do the required readings and be prepared to answer questions from the trainer or their supervisor on the topics as they are covered.

The trainee is expected to work on and complete the written questions during the time period of the training module and/or lecture. They should not be postponed until the end of hands-on training.

The trainee is responsible for retaining all training paperwork and documentation in the training record. At the completion of training the trainee is responsible for providing the complete training record to the Training Team for review.

Trainer

The trainer is expected to be ready to go by 9 am each day in which there is directly supervised training (observation or demonstration of a technique). The trainer must realize that training has the priority; meetings or other tasks may have to be postponed. *If the assigned trainer finds he/she is unavoidably unable to perform the training, they must make arrangements for the training to be re-assigned.*

The trainer is responsible for reinforcing the information from the required reading and lectures by discussing each technique in detail during the training, including theoretical and practical aspects.

The trainer must be available for questions on other days allocated for the module.

The trainer must review any paperwork/documentation/records generated during the demonstration of a technique by a trainee; the review should include checking for completeness and accuracy.

Supervisor

The direct supervisor of the trainee has the primary responsibility for monitoring the trainee's progress. The supervisor must plan on regularly spending time with the trainee, for example, by scheduling weekly or biweekly meetings in order to:

- Discuss the topics covered by the required reading and document completion of the reading.
- Review the answers to the written questions.
- Review the training record for completeness and accuracy.
- Review, determine and document the successful completion of competency tests.

The direct supervisor is responsible for helping the trainees choose cases for serology and DNA mock court, acting as prosecutor, and preparing them for testimony.

Technical Leader

The technical leader is responsible for final determination of the readiness of the trainee to enter the rotation. This includes:

- Final review of the training record, including review of competency tests as needed. The Technical Leader may designate a training supervisor and/or Assistant Directors to assist in this review.
- Final review of the answers to the written questions. The Technical Leader may designate a training supervisor and/or Assistant Director to assist in this review.
- Evaluation of the oral examination, including any needed remediation. The Technical Leader may designate a training supervisor and/or Assistant Director to assist in the evaluation and remediation of the oral exam.
- Determination of satisfaction of state and/or federal requirements, including review of college transcripts, course syllabi, and/or textbooks as needed.

The technical leader is responsible for issuing the notification of completion of training and the notification of achievement of DNA Interpreting Analyst status.

# 1. PROGRAM OVERVIEW

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|---|---|---|
| 08-30-2010 | ELI SHAPIRO & EUGENE LIEN | 1 OF 6 |

The purpose of the training program is to provide analysts with the theoretical and practical means necessary to perform reliable testing. For staff members who are DNA Interpreting Analysts, this includes training to learn how to present information competently in court. By having a multi-phase program of practical exercises, written assignments, and oral examinations, an analyst's weak points should become obvious, and the staff can work with the analyst to bolster this aspect of his/her knowledge and competency.

Newly hired staff is trained to perform a variety of different procedures, each relating to analyzing physical evidence for DNA typing. Each trainee progresses through a series of training modules; the modules correspond to duty rotations in the laboratory: evidence examination, sexual assault kit processing, exemplar processing, extraction, quantitation, and PCR amplification and typing. The modules selected depend on the job title and eventual work group of the trainee. Completion of the complete set of required modules is necessary for a trainee to become a reporting analyst.

Current staff is trained in new procedures as they are added. For each new technique implemented an analyst must successfully complete the new training module before using the procedure in casework. If a current analyst's job duties change or retraining is necessary, supplemental training is done using the current training module for that technique. Successful completion of the module is required before the analyst will be allowed to perform the technique in casework. Successful completion of each module is documented in the training folder either directly on the competency test results record or on one of the training checklists.

During training periods, staff should spend as much time as possible in training in order to expedite the process and help it to proceed more smoothly. This means that flexible or compressed time schedules, attendance at professional meetings and participation in special projects will not generally be allowed.

In total, the training will cover the theoretical and practical aspects of forensic biology. In particular it covers aspects of evidence examination, identification of physiological fluids, molecular biology, separation technology, interpretation of complex DNA results, statistical concepts as they relate to forensic DNA analysis, and court testimony.

## A. Training – evidence examination and serological methods

The goal of training and competency testing in the classical forensic biology methods is to establish consistency of performance between individual analysts and to maintain the highest possible level of performance over time. These analytical procedures for identifying physiological fluids are the foundation on which further individualization (DNA testing) is based, and their behavior and limitations must be understood.

The classical forensic biology training program is monitored by the Director, Deputy Directors, Assistant Directors, and/or Criminalist III/IV supervisors. The training may be provided by any Criminalist I or higher who is competent and has the appropriate level of experience (generally, at least six months completed past the training period for the specific procedure).

## B. Training - DNA analysis

The goal of training and competency testing in the DNA laboratory is to establish consistency of performance throughout the laboratory and to maintain the highest possible level of performance over time.

The DNA training program is monitored by the Director, Deputy Directors, Assistant Directors, and/or Criminalist III/IV supervisors. The training may be provided by any Criminalist I or higher who is competent and has the appropriate level of experience (generally, at least six months completed past the training period for the specific procedure).

The trainee may not interpret DNA results (STR CE processing and signing DNA reports) until they become a DNA Interpreting Analyst. This means that they(1) meet or exceed the degree and educational requirements as defined by the applicable "FBI Quality Assurance Standards for Forensic DNA Testing Laboratories (2) have a minimum of six months of documented forensic human-DNA lab experience, (3) successfully completed all training modules, and (4) successfully completed a written exam, oral exam, and moot courts. They will be expected to manage their DNA cases and write DNA reports for their supervisor's signature in the interim.

*If any new or additional federal and/or state requirements are imposed, they must be met by an analyst prior to interpreting and reporting DNA results.*

***Failure to satisfactorily complete competency tests, written or oral examinations, mock courts, required courses, or other required training activities, within a reasonable time frame after the beginning of training, may constitute grounds for demotion or termination.***

## C. Training folder

The training is documented in a training folder. This contains records (notes, worksheets, photographs, etc.) generated during training. In addition, for each topic the date and initials of the trainer should be noted. The direct supervisor should regularly review the contents of the training folder for accuracy and completeness.

The training folder is the property of the Department of Forensic Biology and will be retained by the Department.

## D. Training schedule

A training schedule must be provided to each trainee and all scientific staff responsible for any aspect of the training. Because the training schedule affects many aspects of department operations, it should be adhered to as carefully as possible. Each module has adequate time allotted for the training. If necessary, for example if equipment is unavailable, a trainee may be asked to substitute a weekend day for a week day.

For Criminalist I's the training is limited. As competency is attained in each module, the trainee may be given a one or two week assignment in that technical rotation performing analysis on casework samples.

For Criminalist II's and above, the training is continuous and does not include intermediate assignments to technical rotations. Once all required training modules are complete, the trainee joins the rotation schedule.

## E. Roles and responsibilities

Training Team

The training team is responsible for periodic review and/or revision of the Training Manual and reference binder.

The training team is responsible for preparation of training schedules, training assignments, and training folders. This includes scheduling of training given by OCME staff other than those from the Department of Forensic Biology.

The training team is responsible for ensuring that practice samples and competency test samples are prepared.

The training team is responsible for ensuring that reference material is available.

The training team is responsible for maintaining the training records of current analysts.

Trainee

The trainee is expected to be ready by 9 am each day there is directly supervised training (observation or demonstration of a technique). A more flexible schedule may be possible on days where the trainee is working on practical exercises, practice samples, or competency tests.

The trainee is expected to do the required readings and be prepared to answer questions from the trainer or their supervisor on the topics as they are covered.

The trainee is expected to work on and complete the written questions during the time period of the training module and/or lecture. They should not be postponed until the end of hands-on training.

The trainee is responsible for retaining all training paperwork in the training folder. At the completion of training the trainee is responsible for returning the complete training folder to the Training Team for review and retention.

Trainer

The trainer is expected to be ready to go by 9 am each day there is directly supervised training (observation or demonstration of a technique). The trainer must realize that training has the priority; meetings or other tasks may have to be postponed. *If the assigned trainer finds he/she is unavoidably unable to perform the training, they must make arrangements for the training to be re-assigned.*

The trainer is responsible for reinforcing the information from the required reading and lectures by discussing each technique in detail during the training, including theoretical and practical aspects.

The trainer must be available for questions on other days allocated for the module.

The trainer must review any paperwork generated during the demonstration of a technique by a trainee; the review should include checking for completeness and accuracy.

Supervisor

The direct supervisor of the trainee has the primary responsibility for monitoring the training process. The supervisor must plan on regularly spending time with the trainee, for example, by scheduling weekly or biweekly meetings in order to:

- Discuss the topics covered by the required reading and document completion of the reading.
- Review the answers to the written questions.
- Review the training folder for completeness and accuracy.
- Determine the successful completion of competency tests.

The direct supervisor is responsible for helping the trainees choose cases for serology and DNA mock court, acting as prosecutor, and preparing them for testimony.

Technical Leader

The technical leader is responsible for final determination of the readiness of the trainee to enter the rotation. This includes:

- Final review of the training folder, including review of competency tests as needed. The Technical Leader may designate a training supervisor and/or Assistant Directors to assist in this review.
- Final review of the answers to the written questions. The Technical Leader may designate a training supervisor and/or Assistant Director to assist in this review.
- Evaluation of the oral examination, including any needed remediation. The Technical Leader may designate a training supervisor and/or Assistant Director to assist in the evaluation and remediation of the oral exam.
- Determination of satisfaction of state and/or federal requirements, including review of college transcripts, course syllabi, and/or textbooks as needed.

The technical leader is responsible for issuing the written notification of completion of training and the written notification of achievement of DNA Interpreting Analyst status.

| 2. TRAINING PROGRAM GUIDELINES | | |
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| DATE EFFECTIVE<br>07-16-2012 | APPROVED BY<br>DNA TECHNICAL LEADERS | PAGE<br>1 OF 5 |

## A. Theoretical background

In addition to requiring a minimum educational background for the job title(s), the Department provides additional theoretical background necessary for trainees to understand the scientific basis behind each analytical test. The training program also includes instruction in general topic areas such as ethics, general forensic science, quality assurance/quality control, and basics of the legal system. This training takes place over a number of weeks through the required lectures and reading assignments. Most lectures are also available as computer presentations maintained in the departmental directory.

Each member of the scientific staff has access to literature references and reference books maintained by the department including methods manuals used in the laboratory which contain reference bibliographies for the scientific procedures. Publications pertaining to in-house methods are given to each trainee in the form of an online Reference Binder/Articles. Additionally, OCME professional staff has library and Internet privileges at the neighboring New York University Medical School library.



## B. Practical experience

Each analyst will be trained to perform the analytical procedures that are appropriate to the job title and specific work assignment. Practical training may include up to three phases: the trainee observes the procedure being performed; the trainee uses practice specimens to demonstrate the procedure to the trainer; and the trainee uses practice specimens to perform the procedure independently. It may be necessary for a trainee to demonstrate a procedure multiple times until a trainer determines that the trainee can perform the procedure independently. Practical training for procedures currently in use that have been updated or revised may or may not require all three training phases.

## C. Competency testing

At the conclusion of the practical training in any particular analytical procedure, the trainee is expected to successfully complete a competency test using that procedure. In general, a competency test is prepared in-house with the key to the results being supplied to the supervisor, Assistant Directors, Technical Leader, and/or Director. Successful completion of each competency test is documented in the training record.

## D. Written assignments and oral examination

New scientific staff must take and pass the written assignment for each module they are trained in. The written assignment is reviewed and graded by the direct supervisor and Technical Leader or designee.

New scientific staff, Criminalist II's and above must take and pass an oral examination covering several areas of DNA theory and analysis. The oral examination is attended by the trainee's direct supervisor and the test administrator, who is an Assistant Director or a DNA Technical Leader. Each Criminalist has a maximum of two attempts to pass the full examination. The determination of whether or not a Criminalist passes the examination is at the discretion of the examination committee. At the examination committee's discretion, the Criminalist shall have up to two attempts to remediate each full examination. The committee is not obligated to grant any remediation.

If a Criminalist has not passed the full oral examination after two attempts, the Criminalist may be subject to demotion or termination.

In addition to the basic DNA oral examination, mtDNA analysts are required to take and pass a mtDNA oral exam covering mtDNA theory and methods.

## E. Court preparation

An important part of training is learning to present scientific information in court. There are several ways for trainees to prepare for court and public speaking: observing the testimony of laboratory personnel at court, attending pre-trial conferences, and testimony training. Before testifying in court or grand jury, Criminalist II's and above must successfully complete an internal courtroom testimony training module. The purpose of the courtroom testimony training module is to give the analyst an introduction to the courtroom process as well as practical testimony experience prior to actual testimony in a trial or grand jury. It is also a mechanism for the supervisory staff to identify and correct any problems the analyst may have in his/her knowledge or ability to communicate effectively.

Moot/Mock court training consists of practice testimony covering all areas of testimony including qualifications, voir dire, and direct and cross examination using case examples. The Criminalist practices giving testimony in those areas prior to being tested in a mock court. Minimally, two moot/mock courts are required. The first, early in training, is a serology mock court on an actual or training small case; this covers the initial forensic biology training topics. Serology moot/mock court preparation is generally conducted by the direct supervisor or designee. The second, two months after the analyst has completed training, is a DNA moot/mock court on an actual DNA case; this covers all forensic biology training topics. The DNA moot/mock court preparation is conducted by the training group and/or the direct supervisor or designee.

The Criminalist's testimony is evaluated by their direct supervisor, Assistant Director or designee, and a jury comprised of court qualified scientific staff (DNA interpreting analysts with more than one year DNA case reporting experience and at least two trial testimonies). Checklists are used to structure the evaluation of the trainee's performance in each mock court. After the moot/mock court, constructive criticism of the trainee's testimony is given, and, if needed, specific suggestions for improvement are provided. A pass/fail determination for the serology moot/mock court is made by the scientific staff present at the moot/mock trial. For the DNA moot/mock court an average grade of 70% or greater must be achieved by the Criminalist in order to pass. Grades should be provided in writing to the analyst within two business days after the moot/mock court. An analyst, who does not achieve a passing grade, will be allowed to remediate the moot/mock court within two weeks, with the same case and jury panel. If the remediation is not successful the Criminalist, must complete and pass a second moot/mock court within two months. However, a new case and jury panel must be used.

If a Criminalist has not passed the DNA moot/mock court after two attempts, the Criminalist may be subject to demotion or termination. Successful completion of the moot/mock courts must be documented in the training record.

Analysts who train in specialized DNA techniques such as mitochondrial DNA testing and high-sensitivity DNA testing may be required to pass an additional moot/mock court covering the specific topic area.

## F. Continuing and Supplemental Training

Analysts are trained in new procedures as they are added, and as their job duties change. Supplemental training may include a lecture covering the theoretical and practical aspects of the new procedure; a reading list selected from the scientific literature and full (three-step) or modified (two-step) practical training. The modified (two-step method) does not require the independent demonstration of the analytical procedure.
The modified (two step method) training is used when current online procedures have been updated or revised.

Once the analysts are comfortable with the procedure, they are given competency test samples, which must be successfully completed for each new procedure before the analyst can use the procedure in casework. Successful completion of supplemental training is documented by the direct supervisor or designee in the training record.

The specific requirements of continuing and supplemental training for each procedure are determined by the appropriate Technical Leader or designee. When a new procedure or technique is established in the Laboratory, a training module is added or updated in the Training Manual appendix.

## G. Retraining

Retraining can be the result of requests from supervisors or analysts, or in response to a proficiency test or casework corrective action.

The retraining program initiated at the request of an analyst or supervisor will be determined by the Training coordinator and can involve additional observations, practices or competency tests depending on the needs of the analyst.

If it is determined by the Quality Assurance Manager and/or a Technical Leader that a deficiency in proficiency testing or casework is the result of analyst's lack of understanding of the methods, procedures, and/or protocols used by the laboratory, the analyst will be prohibited from performing the test in casework until he/she has been re-trained, and a new competency test has been successfully completed. In these cases, all re-training must be performed in accordance with the general and specific training guidelines specified in the Forensic Biology Training Manual.

## H. Continuing Education

Continuing education is an educational activity that is offered by a recognized individual or organization that brings participants up-to-date in their relevant area of knowledge. Analysts are provided the opportunity to obtain continuing education through attendance at scientific meetings and seminars both onsite at the Department of Forensic Biology and offsite.

Each analyst's earned Continuing Education hours are documented and maintained by the Training Group.

Every Forensic Biology employee is required to attend an annual review of the *ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists.*

Documentation of content and attendance at appropriate continuing education activities is provided by sign-in sheets, certificates of attendance, program agenda/lecture title, travel authorization, resume/publication/other documentation of the credentials of the presenter(s), and other means, depending on the type of event.

Records are maintained by the Training Group for at least one ASCLD/LAB cycle of accreditation or 5 years, whichever is greater.



## I. Review of Current Literature

The Forensic Biology Assistant Director assigned to Training or designee distributes relevant, scientific articles of interest to staff via e-mail on a regular basis, usually monthly. These articles are stored by the Training Group on the Forensic Biology server. Analysts are also encouraged to read other scientific articles of interest.

Analysts document their reading of the distributed articles and/or other scientific literature via a record distributed quarterly by the Training Group.

Records are maintained by the Training Group for at least one ASCLD/LAB cycle of accreditation or 5 years, whichever is greater.

## 2. TRAINING PROGRAM GUIDELINES

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| 03-28-2011 | ELI SHAPIRO & EUGENE LIEN | 1 OF 5 |

### A. Theoretical background

In addition to requiring a minimum educational background for the job title(s), the Department provides additional theoretical background necessary for trainees to understand the scientific basis behind each analytical test. The training program also includes instruction in general topic areas such as ethics, general forensic science, quality assurance/quality control, and basics of the legal system. This training takes place over a number of weeks through the required lectures and reading assignments. Most lectures are also available as computer presentations maintained in the departmental directory.

Each member of the scientific staff has access to literature references and reference books maintained by the department including methods manuals used in the laboratory which contain reference bibliographies for the scientific procedures. Publications pertaining to in-house methods are given to each trainee in the form of an online Reference Binder. Additionally, OCME professional staff has library and Internet privileges at the neighboring New York University Medical School library.



### B. Practical experience

Each analyst will be trained to perform the analytical procedures that are appropriate to the job title and specific work assignment. Practical training may include up to three phases: the trainee observes the procedure being performed; the trainee uses practice specimens to demonstrate the procedure to the trainer; and the trainee uses practice specimens to perform the procedure independently. It may be necessary for a trainee to demonstrate a procedure multiple times until a trainer determines that the trainee can perform the procedure independently. Practical training for procedures currently online that have been updated or revised may or may not require all three training phases.

### C. Competency testing

At the conclusion of the practical training in any particular analytical procedure, the trainee is expected to successfully complete a competency test using that procedure. In general, a competency test is prepared in-house with the key to the results being supplied to the supervisor, Assistant Directors, Technical Leader, and/or Director. Successful completion of each competency test is documented in the training folder.

## D. Written assignments and oral examination

New scientific staff must take and pass the written assignment for each module they are trained in. The written assignment is reviewed and graded by the direct supervisor and Technical Leader or designee.

New scientific staff who are Criminalist II and above must take and pass an oral examination covering several areas of DNA theory and analysis. The oral examination is attended by the trainee's direct supervisor and the test administrator who is an Assistant Director or a DNA Technical Leader. Each Criminalist has a maximum of two attempts to pass the full examination. The determination of whether or not a Criminalist passes the examination is at the discretion of the examination committee. At the examination committee's discretion, the Criminalist shall have up to two attempts to remediate each full examination. The committee is not obligated to grant any remediations.

If a Criminalist has not passed the full oral examination after two attempts, then the Criminalist may be subject to demotion or termination.

In addition to the basic DNA oral examination, mtDNA analysts are required to take and pass a mtDNA oral exam covering mtDNA theory and methods.

## E. Court preparation

An important part of training is learning to present scientific information in court. There are several ways for trainees to prepare for court and public speaking: observing the testimony of laboratory personnel at court, attending pre-trial conferences, and testimony training. Before testifying in court or grand jury, Criminalist II and above must successfully complete an internal courtroom testimony training module. The purpose of the courtroom testimony training module is to give the analyst an introduction to the courtroom process as well as practical testimony experience prior to actual testimony in a trial or grand jury. It is also a mechanism for the supervisory staff to identify and correct any problems the analyst may have in his/her knowledge or ability to communicate effectively.

Moot/mock court training is conducted by the training group and/or direct supervisor. Training consists of practice testimony covering all areas of testimony including qualifications, voir dire, and direct and cross examination using case examples. The Criminalist practices giving testimony in those areas prior to being tested in a mock court. Minimally, two moot/mock courts are required. The first, early in training, is a serology mock court on an actual or training small case; this covers the initial forensic biology training topics. The second, two months after the analyst has completed training, is a DNA mock court on an actual DNA case; this covers all forensic biology training topics.

The Criminalist's testimony is evaluated by their direct supervisor, Assistant Director or designee, and a jury comprised of court qualified scientific staff (DNA interpreting analysts with more than one year DNA case reporting experience and at least two trial testimonies). Checklists are used to structure the evaluation of the trainee's performance in each mock court. After the mock court, constructive criticism of the trainee's mock testimony is given, and, if needed, specific suggestions for improvement are provided. A pass/fail determination for the serology mock court is made by the scientific staff present at the mock trial. For the DNA mock court an average grade of 70% or greater must be achieved by the Criminalist in order to pass. Grades should be provided in writing to the analyst within two business days after the mock court. An analyst, who does not achieve a passing grade, will be allowed to remediate their first mock court within two weeks, with the same case and jury panel. If the remediation is not successful the Criminalist, within two months, must complete and pass a second mock court; however a new case and jury panel must be used.

If a Criminalist has not passed the DNA moot court after two attempts, then the Criminalist may be subject to demotion or termination.

Analysts who train in specialized DNA techniques such as mitochondrial DNA testing and high-sensitivity DNA testing may be required to pass an additional moot court covering the specific topic area.

## F. Continuing and Supplemental Training

Analysts are trained in new procedures as they are added, and as their job duties change. Supplemental training usually includes a lecture covering the theoretical and practical aspects of the new procedure; a reading list selected from the scientific literature and full (three-step) or modified (two-step) practical training. The modified or two-step method does not require the independent demonstration of the analytical procedure.
The modified or two step phase training is used when current online procedures have been updated or revised.

Once the analysts are comfortable with the procedure, they are given competency test samples, which must be successfully completed for each new procedure before the analyst can use the procedure in casework. Successful completion of supplemental training is documented in the training folder by the signature of a supervisor on either a supplemental training form or directly on the competency paperwork.

The specific requirements of continuing and supplemental training for each procedure are determined by the appropriate Technical Leader or designee. When a new procedure or technique is established in the Laboratory, the training module is added to the Training Manual appendix.

## G. Retraining

Retraining can be the result of requests from supervisors or analysts, or in response to a proficiency test or casework corrective action.

The retraining program initiated at the request of an analyst or supervisor will be determined by the Training coordinator and can involve additional observations, practices or competency tests depending on the needs of the analyst.

If it is determined by the Quality Assurance Manager and/or a Technical Leader that a deficiency in proficiency testing or casework is the result of analyst's lack of understanding of the methods, procedures, and/or protocols used by the laboratory, the analyst will be prohibited from performing the test in casework until he/she has been re-trained, and a new competency test has been successfully completed. In these cases, all re-training must be performed in accordance with the general and specific training guidelines specified in the Forensic Biology Training Manual.

## H. Continuing Education

Continuing education is an educational activity that is offered by a recognized individual or organization that brings participants up-to-date in their relevant area of knowledge. Analysts are provided the opportunity to obtain continuing education through attendance at scientific meetings and seminars both onsite at the Department of Forensic Biology and offsite.

Each analyst's earned Continuing Education hours are documented and maintained by the Training Group in the online continuing education database.

Every Forensic Biology employee is required to attend an annual review of the *ASCLD/LAB Guiding Principles of Professional Responsibility for Crime Laboratories and Forensic Scientists.*

Documentation of content and attendance at appropriate continuing education activities is provided by sign-in sheets, certificates of attendance, program agenda/lecture title, travel authorization, resume/publication/other documentation of the credentials of the presenter(s), and other means, depending on the type of event.

Records are maintained by the Training Group for at least one ASCLD/LAB cycle of accreditation or 5 years, whichever is greater.



## I. Review of Current Literature

The Forensic Biology Assistant Director assigned to Training or designee distributes relevant, scientific articles of interest to staff via e-mail on a regular basis, usually monthly. These articles are stored by the Training Group on the Forensic Biology server. Analysts are also encouraged to read other scientific articles of interest.

Analysts document their reading of the distributed articles and/or other scientific literature via a form distributed quarterly by the Training Group.

Records are maintained by the Training Group for at least one ASCLD/LAB cycle of accreditation or 5 years, whichever is greater.

## A. Training Specific Guidelines

The training is divided into modules. The number of modules trained in depends on the job title of the trainee; fewer or additional modules may be given depending on the particular job assignment of the trainee.

| | **Criminalist I** | **Criminalist II and above** |
|---|---|---|
| Right to know (hygiene officer) | X | X |
| Microscopy | X | X |
| Digital photography | X | X |
| Evidence exam | Selected Staff | X |
| Serology - blood presumptive | X | X |
| Serology - AP and sperm | X | X |
| Serology - amylase | X | ✓ X |
| High Volume Exam | ✓ X | Selected Staff |
| Small cases | No | X |
| Serology mock court | No | X |
| Sexual assault kits | X | X |
| Small items | ✓ | n/a |
| Exemplar processing | Selected Staff | Selected staff |
| P30 ELISA | X | X |
| M48 Extraction | X | X |
| Chelex Extraction | X | X |
| Touched Item Extraction | X | X |
| Organic Extraction | Selected Staff | Selected Staff |
| Quantitation-rtPCR | X | X |
| PCR amp | X | X |

| | Criminalist I | Criminalist II and above |
|---|---|---|
| CE (ABI 3130 set up) | X | X |
| STR Analysis | No | X |
| Dilutions & mixtures | No | X |
| Data Interpretation Exercise | No | X |
| DNA written exam | Selected modules | X |
| DNA oral exam | No | X |
| DNA mock court | No | X |
| Technical Review | No | Selected Staff |
| PC Technical Negative Case Review | No | Selected Staff |
| Administrative Review | Selected Staff | Selected Staff |
| Blood spatter | Selected staff | X |



***Specialty Team Training***

*Members of specific teams may be trained in techniques used only by that specialty team. The training will follow the standard model of observation, practice, and competency. In these cases, training samples may be provided by the Training team or the specialty team.*

| | Criminalist I | Criminalist II and above |
|---|---|---|
| mtDNA hair extraction | X | X |
| mtDNA duplex amplification | X | X |
| Gel Analysis and/or Agilent | X | X |
| Linear Array Analysis | X | X |

| | Criminalist I | Criminalist II and above |
|---|---|---|
| mtDNA cycle sequencing | X | X |
| ABI 3130 set-up | X | X |
| mtDNA data processing & interpretation | No | X |
| mtDNA mock court | No | X |
| mtDNA oral examination | No | X |
| High Volume Exam | X | n/a |
| Bone Extraction | Selected Staff | Selected Staff |
| Sample Control | X | X |
| HPLC | X | X |
| Post Amplification PE-Testing | X | X |
| Post Amplification SC-Testing | X | X |
| PE Data Analysis | No | X |
| SC Data Analysis | No | X |



## B. Required lectures

Most of the training modules have required lectures (see Section 4 – Modules). Each individual training module specifies the required lecture(s) associated with the module. Some required lectures, e.g., Ethics, are not associated with specific training modules. See the list of **Required Training Lectures** in the Training Modules section of this manual.

Lectures are given by staff members, generally prior to beginning each training module. Many of the lectures are also available as computer presentations found in the departmental directories, and can be reviewed as necessary. The trainee's attendance at the required lectures is documented in the training record and signed off by the lecturer.

## C. Required reading

All of the training modules have required reading. Much of the information is found in the online reference binder/articles supplied to trainees. However, the analysts are also required to read the appropriate sections of manuals, chapters in books, etc. The required reading should be completed during the time allotted to the training module. Completion of the required reading is documented, by the direct supervisor, in the training record. .

## D. Practice samples

For serology training (blood presumptive tests, semen presumptive tests, semen confirmatory tests, and amylase) practice samples can come from a variety of sources: the trainee, stains from previous external proficiency tests or casework extracts previously tested for P30 and/or amylase.

The number of serology training samples is variable, depending on the training module. The number of tests performed is much greater, as specified in the practical exercises of each module.

Practice DNA training samples consist of coded swabs or specimens donated by laboratory personnel or from previous external proficiency samples. The DNA donor types and associated codes are maintained by the Training Team and are kept confidential. When a trainee generates a DNA result for a sample the trainee or supervisor provides the DNA type and code to the Training Team to check for correctness.

The number of DNA samples must include at least one of each of the following: blood stains, semen/non-semen mixed stains, saliva stains, and other samples. They should be supplied in sufficient quantity for the trainee to be able to do more than one analysis if necessary. The number of tests performed is much greater, as specified in the practical exercises of each module.

Practice DNA training samples will generally be provided by the Training Team; however, for specialized training (e.g., bone or hair extraction and typing), samples may be provided by specific specialty team. The trainee will generally use these same practice samples for all DNA procedures - extraction, quantitation, amplification and DNA typing. However, in some instances, e.g., when training commences on procedures beyond the extraction step, training samples can be provided as DNA extracts or amplified DNA.

During observation, the observer/trainer should evaluate the ability of the trainee for independent performance of the procedure. If the observer/trainer determines the trainee is not performing the technique independently and/or correctly, additional observation and training is required. Once the observer/trainer determines the trainee is capable of performing the technique correctly, the observation period of training is complete, and can be signed off. An independent practice is then performed and evaluated by the trainee's supervisor. If the supervisor determines the trainee is not independently performing the procedure correctly an additional practice and or training is required. Once the supervisor determines the trainee is able to independently perform the procedure correctly, the practice period of the training is complete. The supervisor documents the completion of the practice period in the training record.



## E. Competency samples

For the DNA modules, trainees are provided with competency DNA samples that are coded in the same manner as the practice samples. When a trainee generates a DNA result for a sample, the trainees' supervisor provides the DNA type and code to the Training Team to check for correctness.

The minimum number of competency samples is variable, depending on the training module. The minimum number for each module is listed below.

| Module | Sample type | Minimum number of Competency samples |
|---|---|---|
| Serology - blood presumptive | Blood/no blood | 4 |
| Serology - sperm identification | Sperm/no sperm | 4 |
| Serology - amylase identification | Amylase/no amylase | 4 |
| P30 ELISA | Semen/no semen | 4 |
| Chelex extraction | Contact swabs/cigarette butts/ saliva swabs<br>Mixed semen stains | 3<br>2 |
| Touched Item Extraction | Saliva stains or body swabs | 3 |
| M48 extraction | Blood and or saliva stains | 48 |

| Module | Sample type | Minimum number of Competency samples |
|---|---|---|
| Quantitation | The extracted samples from above or others supplied by trainer | 15 |
| PCR amp/CE (ABI 3130) | Blood and/or saliva stains, mixed semen stains, touched items - the extracts from above | 15 |
| mtDNA organic hair extraction | Hair shaft (no root) | 3 |
| Duplex Amplification/Linear Array | Extracts from the above mtDNA extractions, or other extracts | 3 + controls |
| Cycle Sequencing/3130/Data Analysis | Amplified products from the above or other amplified products | 3 + controls |



The trainee may use these same competency test samples for all DNA procedures - extraction, quantitation, amplification and DNA typing.

Trainees who start training after extraction steps (e.g., they have previously passed extraction competency) will be given at least three coded DNA extracts or three coded samples of PCR amp product as their competency test. The DNA extracts/PCR amp product can be of any type (blood/saliva/mixed semen stains).

Once the supervisor determines the trainee has performed and generated the correct results for the competency, the supervisor documents the completion in the training record.

## F. Review procedures

The results from the trainee's practice samples and competency tests will be evaluated by his/her direct supervisor in terms of sensitivity, consistency, and contamination at each of the steps in the training. In addition, the supervisor must ensure that the trainee is analyzing the proper control samples, is correctly and completely filling out all documentation used to record sample analyses, and is familiar with the operation of the equipment necessary to perform the tests. It may be helpful to include the trainer in this review process.

Problems will be addressed at each rotation and additional practice instituted, if necessary. For example, the supervisor must check the trainee's work for contamination. Low-level contamination (the presence of alleles that do not meet laboratory reporting criteria, such as small peaks in STR analysis) may not affect the typing results. Such contamination may often be eliminated by simply changing a reagent. However, if the analyst consistently demonstrates low-level contamination, he/she must be observed more closely during subsequent practice runs to identify the reason for the problem.

*The direct supervisor must document completion of all practical exercises and successful completion of the competency tests, if applicable, for all modules.*

## G. Completion of training

At the completion of each analytical training module, a notification must be made by the direct supervisor to the trainee and training team that the trainee has successfully passed the competency test. Once deemed competent, the analyst may perform that technique on casework samples. The notification will generally be done through/by initialing/signing the Forensic Biology Training Competency Record or by documenting directly on the competency test results/report.

Once an analyst has completed all the requirements to become a DNA Interpreting Analyst, the Technical Leader issues a written notification which acknowledges the successful completion of the requirements. This notification is filed in the training folder. As of that date, the analyst may interpret DNA results and sign DNA reports.

## H. Criminalist III Training

As a supervisor, a Criminalist III has additional duties in addition to routine casework. To prepare for those duties, additional training consists of rotation supervisor test results review and case file review training.

An experienced Criminalist III or higher demonstrates how to perform a review of the analytical test results on various rotations, and technical and administrative reviews of serology and negative DNA case files. A new Criminalist III must then demonstrate their ability to perform reviews on these test results and case files. This is accomplished by having the Criminalist III's supervisor or designee perform a second review and sign the test results or case files. Successful completion of a review is documented in the training record or on the Criminalist III Review Record.

The number of second reviews necessary is dependent on the type of review. If the supervisor determines the new Criminalist III is not performing the reviews correctly, additional second reviews may be required. Once the minimum number of second reviews has been successfully met for a particular technique the new Criminalist III may perform reviews on their own.

Criminalist III's in specialty teams may be trained in reviews used only by that team.

| | **Minimum Number of Second Reviews** |
|---|---|
| P30 | 20 |
| Amylase | 20 |
| Quantitation-rtPCR | 20 |
| Amplification Sheets | 20 |
| STR Analysis | 20 |
| Negative DNA Case File Review | 10 |
| Administrative Review | 10 |
| Linkage Entry | 5 |

A Criminalist III is required to have successfully completed all Criminalist II requirements for their team.

## I. Criminalist IV Training

As a supervisor, a Criminalist IV has duties in addition to routine case work. To prepare for those duties, additional training consists of Forensic Biology evidence case sign in, scheduling case analysis and technical review of positive DNA cases.

An experienced Criminalist IV, Assistant Director or designee demonstrates how to sign in evidence which includes review of all NYPD paperwork, creating and reviewing of Forensic Biology Database records and scheduling analysis of evidence for different case types. A new Criminalist IV must then demonstrate their ability to perform these techniques. This is accomplished by having an experienced Criminalist IV, Assistant Director or designee perform a second review of all paperwork and scheduled analysis prior to the case acceptance into the laboratory. Successful completion of signed in cases is documented in the training record or on the Criminalist IV Review Record.

A new Criminalist IV must also demonstrate their ability to technically review cases with positive DNA results. This is accomplished by having the Criminalist IV's Assistant Director perform a second review of the case file and co-sign the technical review. Successful completion of a technical review is documented on the Criminalist IV Review Record.

If the supervisor determines the new Criminalist IV is not performing sign in or technical case reviews correctly, additional second reviews may be required. Once the minimum number of signed in cases and second technical reviews has been successfully met the new Criminalist IV may now perform sign in and reviews on their own.



| | **Minimum Number of Second Reviews** |
|---|---|
| Evidence Sign In | 20 |
| Positive DNA Case File Review | 20 |

A Criminalist IV is required to have successfully completed all Criminalist III review training necessary for their team.

## J. Assistant Director Training

As manager, an Assistant Director has duties in addition to team supervision. To prepare for these duties, additional training consists of enhanced technical review.

A new Assistant Director must demonstrate their ability to perform enhanced technical review of cases containing complex deconvolution of DNA mixtures, kinship or paternity cases, and cases with comparisons of known profiles to mixtures of DNA. This is accomplished by having an experienced Assistant Director, Deputy Director, or Director perform a second review of the case file and co-sign the technical review. Successful completion of an enhanced technical review is documented in the training record or on the Assistant Director Review Record.

Once the minimum numbers of enhanced technical reviews have been successfully met, the new Assistant Director may perform enhanced technical reviews on their own.

| | **Minimum Number of Second Reviews** |
|---|---|
| Enhanced Technical Review | 20 |

An Assistant Director is required to have successfully completed all Criminalist IV technical review training necessary for their team.

## A. Training Specific Guidelines

The training is divided into modules. The number of modules trained in depends on the job title of the trainee; fewer or additional modules may be given depending on the particular job assignment of the trainee.

| | **Criminalist I** | **Criminalist II and above** |
|---|---|---|
| Right to know (hygiene officer) | X | X |
| Microscopy | X | X |
| Digital photography | X | X |
| Evidence exam | Selected Staff | X |
| Serology - blood presumptive | X | X |
| Serology - AP and sperm | X | X |
| Serology - amylase | Selected staff | X |
| High Volume Exam | X | Selected Staff |
| Small cases | No | X |
| Serology mock court | No | X |
| Sexual assault kits | Selected Staff | X |
| Small items | X | n/a |
| Exemplar processing | Selected Staff | Selected staff |
| P30 ELISA | Selected staff | X |
| M48 Extraction | X | X |
| Chelex Extraction | X | X |
| Touched Item Extraction | X | X |
| Organic Extraction | Selected Staff | Selected Staff |
| Quantitation-rtPCR | X | X |
| PCR amp | X | X |

| | Criminalist I | Criminalist II and above |
|---|---|---|
| CE (ABI 3130 set up) | Selected Staff | X |
| STR Analysis | No | X |
| Dilutions & mixtures | No | X |
| Data Interpretation Exercise | No | X |
| DNA written exam | Selected modules | X |
| DNA oral exam | No | X |
| DNA mock court | No | X |
| Serology Case Technical Review | No | Selected Staff |
| PC Technical Negative Case Review | No | Selected Staff |
| Administrative Review | Selected Staff | Selected Staff |
| Blood spatter | Selected staff | X |



***Specialty Team Training***

*Members of specific teams may be trained in techniques used only by that specialty team. The training will follow the standard model of observation, practice, and competency. In these cases, training samples may be provided by the Training team or the specialty team.*

| | Criminalist I | Criminalist II and above |
|---|---|---|
| mtDNA hair extraction | X | X |
| mtDNA duplex amplification | X | X |
| Gel Analysis and/or Agilent | X | X |
| Linear Array Analysis | X | X |

| | Criminalist I | Criminalist II and above |
|---|---|---|
| mtDNA cycle sequencing | X | X |
| ABI 3130 set-up | X | X |
| mtDNA data processing & interpretation | No | X |
| mtDNA mock court | No | X |
| mtDNA oral examination | No | X |
| High Volume Exam | X | n/a |
| Bone Extraction | Selected Staff | Selected Staff |
| Sample Control | X | X |
| HPLC | X | X |
| Post Amplification PE-Testing | X | X |
| Post Amplification SC-Testing | X | X |
| PE Data Analysis | No | X |
| SC Data Analysis | No | X |



**B. Required lectures**

Most of the training modules have required lectures (see Section 4 – Modules). Each individual training module specifies the required lecture(s) associated with the module. Some required lectures, e.g., Ethics, are not associated with specific training modules. See the list of **Required Training Lectures** in the Training Modules section of this manual.

Lectures are given by staff members, generally prior to beginning each training module. Many of the lectures are also available as computer presentations found in the departmental directories, and can be reviewed as necessary. The trainee's attendance at the required lectures is documented in the training folder and signed off by the lecturer on the lecture checklist.

## C. Required reading

All of the training modules have required reading. Much of the information is found in the online reference binder supplied to trainees. However, the analysts are also required to read the appropriate sections of manuals, chapters in books, etc. The required reading should be completed during the time allotted to the training module. Completion of the required reading is documented, by the direct supervisor, in the training folder either on the checklist or supplemental training form.

## D. Practice samples

For serology training (blood presumptive tests, semen presumptive tests, semen confirmatory tests, and amylase) practice samples can come from a variety of sources: the trainee, stains from previous external proficiency tests or casework extracts previously tested for P30 and/or amylase.

The number of serology training samples is variable, depending on the training module. The number of tests performed is much greater, as specified in the practical exercises of each module.

Practice DNA training samples consist of coded swabs or specimens donated by laboratory personnel or from previous external proficiency samples. The DNA donor types and associated codes are maintained by the Training Team and are kept confidential. When a trainee generates a DNA result for a sample the trainee or supervisor provides the DNA type and code to the Training Team to check for correctness.

The number of DNA samples must include at least one of each of the following: blood stains, semen/non-semen mixed stains, saliva stains, and other samples. They should be supplied in sufficient quantity for the trainee to be able to do more than one analysis if necessary. The number of tests performed is much greater, as specified in the practical exercises of each module.

Practice DNA training samples will generally be provided by the Training Team; however, for specialized training (e.g., bone or hair extraction and typing), samples may be provided by specific specialty team. The trainee will generally use these same practice samples for all DNA procedures - extraction, quantitation, amplification and DNA typing. However, in some instances, e.g., when training commences on procedures beyond the extraction step, training samples can be provided as DNA extracts or amplified DNA.

During observation, the observer/trainer should evaluate the ability of the trainee for independent performance of the procedure. If the observer/trainer determines the trainee is not performing independently, additional observation and training is required. Once the observer/trainer determines the trainee is capable of performing the technique correctly, the observation period of training is complete, and can be signed off. An independent practice is then performed and evaluated by the trainee's supervisor. If the supervisor determines the trainee is not independently performing the procedure correctly an additional practice and or training is required. Once the supervisor determines the trainee is able to independently perform the procedure correctly, the practice period of the training is complete. The supervisor documents the completion of the practice period in the training folder by initialing the Forensic Biology Training Checklist or by initialing the results of the practice samples.



## E. Competency samples

For the DNA modules, trainees are provided with competency DNA samples that are coded in the same manner as the practice samples. When a trainee generates a DNA result for a sample, the trainees' supervisor provides the DNA type and code to the Training Team to check for correctness.

The minimum number of competency samples is variable, depending on the training module. The minimum number for each module is listed below.

| Module | Sample type | Minimum number of Competency samples |
|---|---|---|
| Serology - blood presumptive | Blood/no blood | 4 |
| Serology - sperm identification | Sperm/no sperm | 4 |
| Serology - amylase identification | Amylase/no amylase | 4 |
| P30 ELISA | Semen/no semen | 4 |
| Chelex extraction | Contact swabs/cigarette butts/ saliva swabs<br>Mixed semen stains | 3<br>2 |
| Touched Item Extraction | Saliva stains or body swabs | 3 |
| M48 extraction | Blood and or saliva stains | 5 |

| Module | Sample type | Minimum number of Competency samples |
|---|---|---|
| Quantitation | The extracted samples from above or others supplied by trainer | 15 |
| PCR amp/CE (ABI 3130) | Blood and/or saliva stains, mixed semen stains, touched items - the extracts from above | 15 |
| mtDNA organic hair extraction | Hair shaft (no root) | 3 |
| Duplex Amplification/Linear Array | Extracts from the above mtDNA extractions, or other extracts | 3 + controls |
| Cycle Sequencing/3130/Data Analysis | Amplified products from the above or other amplified products | 3 + controls |



The trainee may use these same competency test samples for all DNA procedures - extraction, quantitation, amplification and DNA typing.

Trainees who start training after extraction steps (e.g., they have previously passed extraction competency) will be given at least three coded DNA extracts or three coded samples of PCR amp product as their competency test. The DNA extracts/PCR amp product can be of any type (blood/saliva/mixed semen stains).

Once the supervisor determines the trainee has performed and generated the correct results for the competency the supervisor documents the completion in the training folder by initialing the Forensic Biology Training Checklist or by initialing the results of the competency samples

## F. Review procedures

The results from the trainee's practice samples and competency tests will be evaluated by his/her direct supervisor in terms of sensitivity, consistency, and contamination at each of the steps in the training. In addition, the supervisor must ensure that the trainee is analyzing the proper control samples, is correctly and completely filling out worksheets and logbooks used to document sample analyses, and is familiar with the operation of the equipment necessary to perform the tests. It may be helpful to include the trainer in this review process.

Problems will be addressed at each rotation and additional practice instituted, if necessary. For example, the supervisor must check the trainee's work for contamination. Low-level contamination (the presence of alleles that do not meet laboratory reporting criteria, such as small peaks in STR analysis) may not affect the typing results. Such contamination may often be eliminated by simply changing a reagent. However, if the analyst consistently demonstrates low-level contamination, he/she must be observed more closely during subsequent practice runs to identify the reason for the problem.

*The direct supervisor must sign off on each module, indicating completion of all practical exercises and successful completion of the competency test, if applicable.*

## G. Completion of training

At the completion of each analytical training module, a notification must be made by the direct supervisor to the trainee and training team that the trainee has successfully passed the competency test. Once deemed competent, the analyst may perform that technique on casework samples. The notification will generally be done through/by initialing the Forensic Biology Training Checklist or by initialing the competency test results.

Once an analyst has completed all the requirements to become a DNA Interpreting Analyst, the Technical Leader issues a written notification which acknowledges the successful completion of the requirements. This notification is filed in the training folder. As of that date, the analyst may interpret DNA results and sign DNA reports.

## H. Criminalist III Training

As a supervisor, a Criminalist III has additional duties in addition to routine casework. To prepare for those duties, additional training consists of rotation supervisor test results review and case file review training.

An experienced Criminalist III or higher demonstrates how to perform a review of the analytical test results on various rotations, and technical and administrative reviews of serology and negative DNA case files. A new Criminalist III must then demonstrate their ability to perform reviews on these test results and case files. This is accomplished by having the Criminalist III's supervisor or designee perform a second review and co-sign the test results and case files. Successful completion of a review is documented in the training folder or on the Criminalist III Review Checklist.

The number of second reviews necessary is dependent on the type of review. If the supervisor determines the new Criminalist III is not performing the reviews correctly, additional second reviews may be required. Once the minimum number of second reviews has been successfully met for a particular technique the new Criminalist III may perform reviews on their own.

Criminalist III's in specialty teams may be trained in reviews used only by that team.



| | **Minimum Number of Second Reviews** |
|---|---|
| P30 | 20 |
| Amylase | 20 |
| Quantitation-rtPCR | 20 |
| Amplification Sheets | 20 |
| STR Analysis | 20 |
| Negative DNA Case File Review | 10 |
| Administrative Review | 10 |
| Linkage Entry | 5 |

A Criminalist III is required to have successfully completed all Criminalist II requirements for their team.

## I. Criminalist IV Training

As a supervisor, a Criminalist IV has duties in addition to routine case work. To prepare for those duties, additional training consists of Forensic Biology evidence case sign in, scheduling case analysis and technical review of positive DNA cases.

An experienced Criminalist IV, Assistant Director or designee demonstrates how to sign in evidence which includes review of all NYPD paperwork, creating and reviewing of Forensic Biology Database records and scheduling analysis of evidence for different case types. A new Criminalist IV must then demonstrate their ability to perform these techniques. This is accomplished by having an experienced Criminalist IV, Assistant Director or designee perform a second review of all paperwork and scheduled analysis prior to the case acceptance into the laboratory. Successful completion of signed in cases is documented in the training folder on the Criminalist IV Review Checklist.

A new Criminalist IV must also demonstrate their ability to technically review cases with positive DNA results. This is accomplished by having the Criminalist IV's Assistant Director perform a second review of the case file and co-sign the technical review. Successful completion of a technical review is documented on the Criminalist IV Review Checklist.

If the supervisor determines the new Criminalist IV is not performing sign in or technical case reviews correctly additional second reviews may be required. Once the minimum number of signed in cases and second technical reviews has been successfully met the new Criminalist IV may now perform sign in and reviews on their own.



| | **Minimum Number of Second Reviews** |
|---|---|
| Evidence Sign In | 20 |
| Positive DNA Case File Review | 20 |

A Criminalist IV is required to have successfully completed all Criminalist III review training necessary for their team.

## J. Assistant Director Training

As manager, an Assistant Director has duties in addition to team supervision. To prepare for these duties, additional training consists of enhanced technical review.

A new Assistant Director must demonstrate their ability to perform enhanced technical review of cases containing complex deconvoluted DNA mixtures, kinship or paternity cases, and cases with comparisons of known profiles to mixtures of DNA. This is accomplished by having an experienced Assistant Director, Deputy Director, or Director perform a second review of the case file and co-sign the technical review. Successful completion of an enhanced technical review is documented in the training folder or on the Assistant Director Review Checklist.

Once the minimum numbers of enhanced technical reviews have been successfully met, the new Assistant Director may perform enhanced technical reviews on their own.

| | **Minimum Number of Second Reviews** |
|---|---|
| Enhanced Technical Review | 20 |

An Assistant Director is required to have successfully completed all Criminalist IV technical review training necessary for their team.

**FORENSIC BIOLOGY TRAINING MANUAL**

| TRAINING MODULES | | |
|---|---|---|
| DATE EFFECTIVE<br>07-16-2012 | APPROVED BY<br>DNA TECHNICAL LEADERS | PAGE<br>1 OF 2 |

Required Training Lectures

| | |
|---|---|
| Module 1 | Basic Laboratory Techniques |
| Module 2A | Microscopy |
| Module 2B | Digital Photography |
| Module 3A | Serology – Blood Presumptive Tests |
| Module 3B | Serology – Acid Phosphatase and Sperm |
| Module 4A | Evidence Examination |
| Module 4B | Small Cases (Sexual Assault/Homicide) |
| Module 4C | Exemplar Processing |
| Module 4D | High Volume (PC) Exam |
| Module 4E | LCN Small Cases |
| Module 5A | Sexual Assault Kits |
| Module 5B | Small Items Exam (Kits) |
| Module 6 | P30 ELISA |
| Module 7 | Amylase |
| Module 8 | Serology Mock Court |
| Module 9A | Chelex Extraction |
| Module 9B | MagAttract Extraction |
| Module 9C | Organic Extraction |
| Module 9D | High Sensitivity (Touched Item) Extraction |
| Module 10 | DNA Quantitation |
| Module 11 | PCR Amplification |
| Module 12A | ABI 3130*xl* Capillary Electrophoresis Set Up |
| Module 12B | Identifiler 28 and Y-STR Analysis |
| Module 12C | Identifiler 31 STR Analysis |
| Module 12D | Minifiler Analysis |
| Module 13 | PCR Dilution and Mixture Studies |
| Module 14 | PCR Data Interpretation Exercise |
| Module 15 | Oral Examination |
| Module 16 | DNA Mock Court |
| Module 17 | Bloodstain Pattern Analysis |

Additional Modules

Module 20A P30 and Amylase – Review
Module 20B P30 and Amylase Interpretation – Practical
Module 21 Quantitative Real Time PCR – Review
Module 22A STR Analysis – Practical
Module 22B STR Technical Review
Module 23A Technical Review of Negative DNA Cases
Module 23B Technical Review of Positive DNA Cases
Module 24 Administrative Review of Cases
Criminalist III Training Module
Criminalist IV Training Module
Assistant Director Training Module

Mitochondrial DNA Modules

Module 25 Mitochondrial DNA Hair Extraction
Module 26 Mitochondrial DNA Duplex Amplification
Module 27 Mitochondrial Agilent Training
Module 28 Mitochondrial DNA Linear Array Analysis
Module 29 Mitochondrial DNA Sequencing
Module 30 Mitochondrial DNA Data Interpretation (computer exercise)
Module 31 Mitochondrial DNA Mock Court

**FORENSIC BIOLOGY TRAINING MANUAL**

| TRAINING MODULES | | |
|---|---|---|
| DATE EFFECTIVE<br>03-28-2011 | APPROVED BY<br>ELI SHAPIRO & EUGENE LIEN | PAGE<br>1 OF 2 |

Required Training Lectures

| | |
|---|---|
| Module 1 | Basic Laboratory Techniques |
| Module 2A | Microscopy |
| Module 2B | Digital Photography |
| Module 3A | Serology – Blood Presumptive Tests |
| Module 3B | Serology – Acid Phosphatase and Sperm |
| Module 4A | Evidence Examination |
| Module 4B | Small Cases (Sexual Assault/Homicide) |
| Module 4C | Exemplar Processing |
| Module 4D | High Volume (PC) Exam |
| Module 4E | LCN Small Cases |
| Module 5A | Sexual Assault Kits |
| Module 5B | Small Items Exam (Kits) |
| Module 6 | P30 ELISA |
| Module 7 | Amylase |
| Module 8 | Serology Mock Court |
| Module 9A | Chelex Extraction |
| Module 9B | MagAttract Extraction |
| Module 9C | Organic Extraction |
| Module 9D | High Sensitivity (Touched Item) Extraction |
| Module 10 | DNA Quantitation |
| Module 11 | PCR Amplification |
| Module 12A | ABI 3130*xl* Capillary Electrophoresis Set Up |
| Module 12B | Identifiler 28 and Y-STR Analysis |
| Module 12C | Identifiler 31 STR Analysis |
| Module 13 | PCR Dilution and Mixture Studies |
| Module 14 | PCR Data Interpretation Exercise |
| Module 15 | Oral Examination |
| Module 16 | DNA Mock Court |
| Module 17 | Bloodstain Pattern Analysis |

Additional Modules

Module 20A P30 and Amylase – Review
Module 20B P30 and Amylase Interpretation – Practical
Module 21 Quantitative Real Time PCR – Review
Module 22 STR Analysis – Practical
Module 23A Technical Review of Negative DNA Cases
Module 23B Technical Review of Positive DNA Cases
Module 24 Administrative Review of Cases
Criminalist III Training Module
Criminalist IV Training Module
Assistant Director Training Module

Mitochondrial DNA Modules

Module 25 Mitochondrial DNA Hair Extraction
Module 26 Mitochondrial DNA Duplex Amplification
Module 27 Mitochondrial DNA Gel Analysis
Module 27A Mitochondrial Agilent Training
Module 28 Mitochondrial DNA Linear Array Analysis
Module 29 Mitochondrial DNA Sequencing
Module 30 Mitochondrial DNA Data Interpretation (computer exercise)
Module 31 Mitochondrial DNA Mock Court

| APPENDIX | | |
|---|---|---|
| DATE EFFECTIVE<br>07-16-2012 | APPROVED BY<br>DNA TECHNICAL LEADERS | PAGE<br>1 OF 1 |

## Suggested Tracking Sheets

Forensic Biology Training Lecture Tracking Sheet

Forensic Biology Training Demonstration Tracking Sheet

Forensic Biology Training Observed Practice Tracking Sheet

Forensic Biology Training Independent Practice Tracking Sheet

Forensic Biology Competency Tracking Sheet

Forensic Biology Mitochondrial DNA Training Tracking Sheet

Forensic Biology Training Review Tracking Sheets

Serology Moot Court Evaluation Form – Judge

Serology Moot Court Evaluation Form – Juror

DNA Moot Court Evaluation Form – Judge

DNA Moot Court Evaluation Form – Juror

Written Examination

PCR Data Interpretation Exercises (Module 14)

| APPENDIX | | |
|---|---|---|
| DATE EFFECTIVE<br>08-30-2010 | APPROVED BY<br>ELI SHAPIRO & EUGENE LIEN | PAGE<br>1 OF 1 |

## Suggested Tracking Sheets

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PCR Data Interpretation Exercises (Module 14)