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**Department of Forensic Science**

**VIRGINIA**

**DEPARTMENT**

**OF  
FORENSIC BIOLOGY SECTION  
PROCEDURES MANUAL**

**FORENSIC SCIENCE**

**SECTION 1**

**GENERAL DOCUMENTATION  
AND**

**EVIDENCE HANDLING REQUIREMENTS**

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**1 SECTION POLICIES**

- 1.1** As a general rule a substrate control (an unstained area adjacent to the stain) will not be tested nor will the control swabs that may be submitted with the evidence.
- 1.2** In general, screening followed by DNA analysis of items in a case is limited to the number of items which will yield the most probative information.
- 1.2.1** Large evidence submissions will be reviewed by the examiner/supervisor via telephone communication or in-person meetings in order to identify the most probative evidence for the respective case and evidence submission will be limited to those items.
- 1.2.2** Determination of probative evidence will be decided based on a number of factors including the type of case, the evidence collected, the number of victims and perpetrators, etc.
- 1.2.3** In the event that additional evidence submission is necessary, communication between the assigned examiner and the investigator will occur to facilitate this process and the examination of the subsequent submission in a timely manner.
- 1.3** DNA analysis of evidence associated with simple possession of controlled substances (i.e., cocaine, heroin) and misdemeanor offenses, except any sex-related offenses (such as peeping tom cases), will not be analyzed without a written request from the Commonwealth's Attorney specifying the reason for such testing.
- 1.4** Requests for DNA analysis of "touch" evidence will not be accepted without a written request specifying the reason for such testing from the Commonwealth's Attorney. A letter request from the Commonwealth's Attorney will not be required for the analysis of "touch" evidence in major crimes cases where screening by a DNA examiner as described in paragraph 1.2.1 above has occurred.
- 1.4.1** "Touch" evidence is evidence resulting from limited contact by an individual with a surface or material. This would include primarily objects touched by an individual's hand, such as cigarette lighters, keys, door handles, gun grips, triggers, light switches, drawer handles, countertops, gear shift knobs, steering wheels, etc. This does not refer to items of evidence on which blood is observed or other biological fluids would expect to be found. For example, items of clothing, gloves, etc. are not considered "touch" evidence and may be analyzed in an attempt to identify the wearer of these items. Additionally, evidence that has allegedly come in contact with a person's mouth such as a bottle, can, or cigarette butt is also not deemed "touch" evidence.
- 1.5** It is recommended that all appropriate known samples be available in order to proceed with DNA PCR-based typing. The submission of these samples should routinely be requested prior to an examiner taking possession of a case. However, analysis will proceed without them.
- 1.5.1** Cases involving the crimes of drug possession and/or firearm/ammunition possession will not be worked without the appropriate known DNA samples from the listed suspect(s). Profiles developed in these cases are typically not eligible for entry into CODIS.
- 1.6** All homicide cases that require STR and YSTR DNA analysis (and probative DNA results are obtained) or any STR DNA case involving a complex mixture, will undergo a peer technical review as well as an additional review performed by a Supervisor, his/her designee, or the Program Manager prior to the release of the report. This additional review will consist of a review of the Certificate of Analysis (including conclusions) and the calculated statistic (if applicable). This review will be documented in the case file as "2<sup>nd</sup> review" initials of the analyst conducting the review, followed by the date of the review. When appropriate, this review may also serve as supervisory review conducted with the additional review elements and documented in accordance with the Department Quality Manual. This additional review is not required in supplemental statistical report cases.

- 1.6.1 A complex mixture is one that contains DNA profiles from more than two individuals, no major contributor can be determined and generally contains allelic dropout, which can makes the interpretation difficult.

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## 2 REQUIREMENTS FOR DOCUMENTATION

- 2.1** Refer to the Department of Forensic Science Quality Manual Section 15.9 for the requirements for “Examination Documentation.”
- 2.2** Specific requirements for examination documentation in the Forensic Biology Section will include the following:
- 2.2.1** While the use of “shorthand” during note taking is acceptable, it will not be so individualized that it is incomprehensible to all but the examiner using the “shorthand” or the examiners within the same laboratory. The “shorthand” must be easily interpretable by all examiners in the section. A list of acceptable section specific abbreviations for use by examiners in the Forensic Biology Section can be found in Appendix A.
- 2.2.2** The approximate location of stains and when appropriate, a description of the grouping of stains for testing and the surface of stain deposition will be documented in the case file.
- 2.2.3** The approximate size of stains AND the amount (%) or size of stains consumed for testing OR the amount (%) or size of stains that remain for possible future testing, OR that stains or extracts were consumed in analysis will be documented in the case file.
- 2.2.4** If a stain or stained area is to be sampled for serology or DNA analysis (i.e., a large area of stains in one general location being considered one stained area) then a portion(s) of the stain shall be taken from a representative sample of stains in that area and treated as one sample.
- 2.2.4.1** The representative sampling of an item, stain(s), or stained area shall be based upon the examiners training and experience.
- 2.2.4.2** This sampling procedure also pertains to touch samples taken from firearms and other objects where swabbings may be taken from different locations (handle, trigger, etc.). The specific parts of the item sampled for DNA analysis should be listed in the body of the report with wording that accurately describes the locations sampled (see the examples below):
- “No DNA amplification results were obtained from a sample collectively recovered from the grips, trigger, slide release and magazine release of the pistol.”
  - A DNA profile was developed from a stained area (or stains) found on the cuff of the right sleeve of a white shirt
- 2.2.5** Documentation of quality control will be included in the case record when appropriate or otherwise available for review within the section. Refer to other sections in this manual for specific requirements.
- 2.2.6** Lot numbers of reagents used for testing will be recorded in the case file and, as appropriate, in the laboratory’s quality control records to establish an audit trail to the quality control documentation.
- 2.3** It is strongly recommended that notes also include the following documentation:
- 2.3.1** Observations regarding the color, size, brand, and designs on clothing, bedding, towels, etc.
- 2.3.2** Diagrams and/or photographs showing where stains were observed and where specific cuttings of samples were taken. Photographs and diagrams must be appropriately labeled to include the surface (inside or outside), or location (left or right side, top or bottom) of the item if not readily

discernible. Refer to the Department of Forensic Science Quality Manual for additional labeling requirements for photographs.

2.3.3 Fabric separations and/or fastener function on articles of clothing, in addition to pocket contents.

2.4 Work sheets used by all examiners and/or support personnel in the Forensic Biology Section, can be found in the Master List.

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### 3 CONTAMINATION PREVENTION AND DETECTION PROCEDURES

It is each member of the Forensic Biology Section's responsibility to consider the impact of his/her actions at each step of the evidence handling and analysis process to reduce the potential of introducing a foreign DNA source into the evidence or Data Bank samples. Therefore, everyone is encouraged to consider the impact of their actions beyond the practices addressed below.

#### 3.1 Contamination Prevention Procedures

##### 3.1.1 Cleaning/Decontamination Supplies

###### 3.1.1.1 10% solution of bleach (7 mM sodium hypochlorite)

**NOTE:** In order for a 10% solution of bleach to be effective, the solution must be prepared daily.

###### 3.1.1.2 Isopropyl Alcohol

##### 3.1.2 General Contamination Prevention Practices

3.1.2.1 Remove disposable gloves after handling or analyzing evidence or Data Bank samples and before using the telephone, any computer key board, etc.

3.1.2.2 Disposable gloves, a laboratory coat, a face mask and head cover **WILL BE WORN** by any member of the Forensic Biology Section while inventorying and preserving the evidence or processing the evidence during the screening process. A laboratory coat, gloves and face mask will be worn during the DNA extraction steps. A laboratory coat and gloves will be worn during all other stages of the sample processing, including handling and labeling tubes. All visitors (individuals who do not have a DNA profile in CODIS) **WILL BE REQUIRED** to wear disposable gloves, a laboratory coat, a face mask, and head cover at all times while in the laboratory.

3.1.2.3 If it is necessary for someone to be in close proximity to a member of the Forensic Biology Section while he/she is inventorying and preserving evidence or processing evidence during the screening and DNA extraction steps, the individual **MUST WEAR** disposable gloves, a laboratory coat, a face mask, and head cover.

3.1.2.4 **DO NOT TOUCH** any surface which may contain a contaminant, such as the surface of the skin, eyes, safety glasses, clothing, or an unclean bench-top, while wearing disposable gloves or working with evidence or Data Bank samples. Change gloves if such contact occurs.

3.1.2.5 Store all clean swabs, tubes, disposable pipettes, slides, etc. located in an area where evidence is examined/processed in closed containers.

3.1.2.6 Prior to, during, and/or after evidence preservation, screening, extraction, PCR setup, and post-amplification processes, wipe off examination/work areas (i.e., counter tops, drawer handles, biological safety cabinets, etc.), tools (i.e., tweezers, scissors, pipettes etc.), and tube racks with a 10% solution of bleach or a solution that will remove/degrade the DNA. Subsequently use Isopropyl Alcohol to remove the residue left by the chemicals, using special care to remove all residue left on surfaces.

3.1.2.7 Decontamination of the Pre- and Post-Amplification Rooms (May Be Conducted By Custodial Staff)

3.1.2.7.1 Decontamination practices for the pre- and post-amplification rooms may be modified based upon the laboratory setup and the availability of the custodial staff. To ensure all areas are decontaminated on a routine basis, it is recommended that a list of duties to be performed is shared with the custodial staff.

3.1.2.7.2 Refer to paragraph 3.1.2.6 for decontamination procedure and specific areas to be decontaminated. Also include the handles on the inside and outside of the doors leading into these areas. Use a disposable cleaning rag for decontaminating the post-amplification room and discard it in that room immediately following the decontamination.

3.1.2.7.3 Sweep and mop floors in the post-amplification room with a designated broom and mop and bucket that remain in the room. Each post-amplification room should have its own broom, mop, and bucket.

#### 3.1.2.8 Decontamination of the Biomek<sup>®</sup> Automation Workstation

Prior to and after extraction, quantitation, and PCR setup on the Biomek<sup>®</sup> Automation Workstation wipe off all surface areas, pipette tools, and tube racks with a 10% solution of bleach or a solution that will remove/degrade the DNA. Subsequently use Isopropyl Alcohol to remove the residue left by the chemicals, using special care to remove all residues left on surfaces.

#### 3.1.2.9 Contamination Prevention Practices for Preservation, Screening, and Analysis of Each Case or Group of Cases

3.1.2.9.1 Work with only one item at a time to avoid sample mix-up and/or contamination.

3.1.2.9.2 Place each item of evidence on a new sheet of paper (i.e., Kimwipe, Kaydry, butcher, blotter, etc.). Change disposable gloves between each item of evidence.

3.1.2.9.3 ALWAYS handle all crime scene samples at a different TIME or in a different SPACE from standards/known samples.

3.1.2.9.4 Handle crime scene samples known to contain low levels of biological material before crime scene samples known to contain a higher concentration of biological material.

3.1.2.9.5 When preserving evidence, use different hoods or place barriers in one hood to separate crime scene samples known to contain low levels of biological material from those known to contain high levels of biological material and standards/known samples. Alternatively, crime scene samples can be preserved first, followed by decontamination of the drying area and subsequent preservation of the known samples.

3.1.2.9.6 Handle crime scene samples from a case or multiple cases first to prevent the potential of transferring DNA from the known samples into the crime scene samples. Handle standards/known samples ONLY after the crime scene samples have been put away and the work area and tools (e.g., scissors, tweezers, pipettes, etc.) have been cleaned. Alternatively, if two independent work areas are available the crime scene samples may be processed in one area and the standards/known samples in another area (i.e., at a different TIME and in a different SPACE).

- 3.1.2.9.7 Pulse spin all microcentrifuge sample tubes before they are opened to minimize aerosol and splashing. Amplification sample tubes may be pulse spun or “wrist flicked” before they are opened.
- 3.1.2.9.8 During the extraction, PCR setup/amplification, and post-amplification processes, use a clean Kimwipe to open each microcentrifuge/amplification tube to minimize transferring DNA to the disposable gloves. If the evidence (i.e., stained area or the liquid from the cap of the tube) comes in contact with the disposable glove, change gloves before proceeding to the next stained area, item of evidence, or sample tube.
- 3.1.2.9.9 Only the paperwork associated with amplification and electrophoresis (or CE analysis) will be carried into and out of the post-amplification room. This paperwork is not to be returned to an evidence examination or DNA extraction area of the laboratory after it has been in the post-amplification room.
- 3.1.2.9.10 Prior to exiting the post-amplification area remove gloves and laboratory coat, and wash hands in the designated sink.
- 3.1.2.10 The DNA Data Bank sample extraction, pre- and post-amplification, and scanning areas will be physically separated from the casework analysis areas. In addition, separate refrigerators/freezers from those used by the casework examiners will be used for storage of reagents and samples used by the Data Bank.

### 3.2 General Practices to Prevent Sample Switches

- 3.2.1 When a procedure requires the sample tube to be opened and the sample to be transferred from one tube to another (such as when preparing extracted DNA for amplification) and/or to perform a procedure (such as when loading samples into a sample plate), place the sample in a new sample tube rack or a new location in the tube rack after completing the process to prevent the sample from accidentally being used a second time.
- 3.2.2 Any time a sample is transferred from one tube to another, verify the identifying information on the sample tube from which the sample is to be removed and the new pre-labeled tube into which the sample will be transferred **IMMEDIATELY PRIOR TO MAKING THE TRANSFER.**

### 3.3 General Practice to Detect Sample Switches and Cross Contamination

- 3.3.1 For samples that are processed in a batch review all electropherograms, including evidence and reference electropherograms, to identify possible sample switches or cross-contamination between samples or cases.
- 3.3.2 When possible, keep samples that are extracted at the same time together throughout the entire process.

**4 GENERAL ROUTING**

- 4.1** Receive evidence by completing the chain of custody and ensuring that the evidence is sealed properly.
- 4.2** Inventory and identify evidence and compare the evidential items to the RFLE.
  - 4.2.1 Identification involves marking the evidence in accordance with established policies of the Virginia Department of Forensic Science. (Refer to the Department of Forensic Science Quality Manual.)
- 4.3** If appropriate, transfer items to other sections in the appropriate sequence as soon as possible. This may require consultation with other sections prior to transfer.
- 4.4** Preserve samples appropriately (dependent on the type of evidential sample submitted).
  - 4.4.1 Typically this involves short-term refrigeration followed by air drying.
  - 4.4.2 Check to ensure that evidence packaged in plastic is dry and document appropriately.
- 4.5** Store all evidence in appropriate evidence storage areas in accordance with established policies of the Virginia Department of Forensic Science. Refer to the Department of Forensic Science Quality Manual for specific evidence storage requirements.
  - 4.5.1 Short term storage is used when the evidence is in the process of examination. The length of time evidence may remain in short term storage, generally will not exceed sixty days. After this time period, evidence must be placed into long term storage according to the QM Section 14.9.1.1.
- 4.6** Screen evidence for biological substances and, as appropriate, conduct DNA analysis.
- 4.7** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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## 5 BLOOD ANALYSIS

### 5.1 Whole Blood Specimens

- 5.1.1 All whole blood specimens will be preserved on stain cards as soon as possible after receipt. DNA typing will be conducted when appropriate.
- 5.1.2 The following method describes the procedure to preserve whole blood specimens on stain cards.
- 5.1.2.1 Safety and Other Considerations:
- 5.1.2.1.1 Perform the procedure in a well-ventilated area, such as in a bio-safety cabinet (preferable) or fume hood.
- 5.1.2.1.2 Avoid areas subject to temperature and/or humidity extremes.
- 5.1.2.1.3 Wear safety glasses. If the procedure is not performed in a hood where a sash separates you from the blood, wear a face shield.
- 5.1.2.1.4 The use of double gloves is preferable.
- 5.1.2.2 Supplies
- 5.1.2.2.1 Bloodstain cards – Whatman Catalog # WB 10 00 14  
**DO NOT USE FTA CARDS.**
- 5.1.2.2.2 Disposable transfer pipets
- 5.1.2.2.3 Tissues (Kimwipes, etc.)
- 5.1.2.2.4 Permanent ink pen or other permanent marker
- 5.1.2.2.5 Biohazard disposal receptacle
- 5.1.2.3 Procedure
- 5.1.2.3.1 Describe the blood sample in notes, including any identifying information on the blood tube, as appropriate.
- 5.1.2.3.2 At a minimum, label the bloodstain card with the following data:
- 5.1.2.3.2.1 subject's name
- 5.1.2.3.2.2 case number
- 5.1.2.3.2.3 item number
- 5.1.2.3.2.4 date card is made
- 5.1.2.3.2.5 your initials
- 5.1.2.3.3 Mix the blood in the tube by gently inverting the tube several times.

**CAUTION!** When mixing post-mortem samples, take care that the stopper does not become dislodged from the top of the tube.

- 5.1.2.3.4 Uncap the tube so as to prevent any contaminating spatter or aerosol that may occur as the suction is broken in the tube. A Kimwipe may be useful for covering the cap while it is being twisted off of the tube.
- 5.1.2.3.5 Using a fresh disposable pipet for each blood sample, transfer blood from the tube to the appropriately labeled bloodstain card.  
Alternatively, slowly decant the liquid blood from the tube to the bloodstain card. If clotting of the sample has occurred or a red top tube was submitted, gently break up the clot (using the pipet tip, applicator sticks, etc.) before transferring the blood onto the bloodstain card. Discard any excess blood from the tube in an appropriate biohazard container.  
**CAUTION!** Do not over-saturate the card, as drips and spill-over can occur.
- 5.1.2.3.6 Allow the bloodstain card to **COMPLETELY AIR DRY** before packaging it in an appropriately sealed and identified container. Allow the residual blood in the corresponding tube and the cap to air dry thoroughly before packaging in a separate container. The cards and tubes may be stored at room temperature or otherwise refrigerated or frozen.
- 5.1.2.3.7 If no analysis will be conducted on the sample, the case notes will indicate that sample has been preserved; the results will be reported as “this sample was not analyzed/examined”.

## 5.2 Bloodstain Analysis

- 5.2.1 Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for visible red-brown staining. Describe the item and the appearance, size, and location of stains in notes, diagrams, and/or photographs, as appropriate. In instances where no stains are visible, the use of an alternate light source (ALS), ultra-violet (UV) light, and/or luminal/BluStar may be helpful in locating stains. In some instances, in the absence of any visible stains, random swabbing of the item may be appropriate, depending on the item, substrate, color, other examinations requested, etc.
- 5.2.2 Test stain/stained area for blood, record and report results.
- 5.2.2.1 If “stained” swabs are submitted with corresponding “control” swabs, the “control” swabs will not be examined.
- 5.2.2.2 If tests on an item of evidence indicate the presence of blood, as a general rule a substrate control (an unstained area adjacent to the stain) will not be tested.
- 5.2.3 If appropriate, examine the stain for a possible mixture of physiological fluids (semen, urine and/or feces) and record and report results.
- 5.2.4 Assess and document the suitability of stains/stained areas for DNA PCR-based typing.
- 5.2.5 Stains that test inconclusive for blood may be taken forward for DNA analysis.
- 5.2.6 As appropriate, conduct DNA PCR-based typing.
- 5.2.6.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect or victim is eliminated, but a potentially probative foreign profile is

identified, conduct a DNA Data Bank search for a “match” to the foreign profile, and report the results of the search.

5.2.6.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator, and report the results of the search.

5.2.6.3 In the absence of all appropriate known samples, conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a “match” to any suitable DNA profiles that are believed to be probative to the case. Report results and request the submission of the appropriate known samples.

5.3 If appropriate, forward evidence to another section for analysis. Consult with other section examiners during analysis, as necessary.

5.4 Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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## 6 SEMEN ANALYSIS

### 6.1 Liquid Samples (Including Oral Rinses and Condoms Containing a Liquid Sample)

- 6.1.1 Centrifuge and/or allow cellular debris to settle to the bottom of the container.
- 6.1.2 Transfer a portion of the sediment to an appropriately labeled microscope slide and preserve the remainder of the sediment on multiple swabs as appropriate. Discard the supernatant.

**NOTE:** When a condom is submitted, and if appropriate to the case scenario, in addition to removing apparent liquid or dried semen from the inner surface, remove possible secretions present on the outer surface with a swab(s) moistened with distilled water and label appropriately. This sample may contain vaginal fluid and may be suitable for DNA PCR-based typing. Air dry and package samples obtained from the inner and outer surfaces separately.

### 6.2 Dried Stains/Swabs/Smears

- 6.2.1 Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for stains. In addition to locating stains visually, an alternate light source (ALS) such as an ultra-violet (UV) light may be useful. Describe the item and the appearance, size, and location of the stains. Diagrams and/or photographs may be helpful.
- 6.2.2 Test stains and/or swabs, as appropriate, for the possible presence of seminal fluid using the acid phosphatase test, and record and report results.

**NOTE:** Alternatively, smears correspondingly labeled to PERK swabs may be microscopically examined first. If no spermatozoa are observed on the smears, test the correspondingly labeled swabs for acid phosphatase activity. If spermatozoa are observed on the smears, acid phosphatase testing of the correspondingly labeled swabs is optional unless no DNA typing results are obtained from the swabs. Refer to 6.2.8.4.

- 6.2.2.1 If the “stained” swabs are submitted with corresponding “control” swabs, the “control” swabs will not be examined.
- 6.2.2.2 If tests on an item of evidence indicate the presence of seminal fluid, as a general rule a substrate control (an unstained area adjacent to the stain) will not be tested.
- 6.2.3 Examine smears correspondingly labeled to PERK swabs. If appropriate, based on the acid phosphatase test results, extract stains/swabs for the presence of spermatozoa. Transfer a portion of the extract to an appropriately labeled microscope slide and examine the slide microscopically. The presence of spermatozoa is microscopically confirmed by the presence of identifiable heads and/or by the presence of intact spermatozoa.
  - 6.2.3.1 If no spermatozoa are identified, record and report results. If the acid phosphatase test exhibits a result indicative of the presence of seminal fluid, proceed to paragraph 6.2.4.
  - 6.2.3.2 If no spermatozoa are identified and results obtained for the acid phosphatase test are not indicative of the presence of seminal fluid, no further testing will be conducted. Record and report results.
  - 6.2.3.3 If no spermatozoa are identified in an extract of a stain and a portion of the stain remains, the microscope slide of the negative extract does not need to be retained.
  - 6.2.3.4 If spermatozoa are identified, record and report results. Return the microscope slide with the evidence.

- 6.2.4 Test stains/swabs for the presence of human prostate-specific antigen (p30) as appropriate and record and report results.
- 6.2.5 If appropriate, examine stain(s)/swabs for possible mixtures of physiological fluids (blood, urine and/or feces) and record and report results.
- 6.2.6 Assess and document the suitability of stains/stained areas/swabs for DNA PCR-based typing.
- 6.2.7 Stains that test inconclusive for seminal fluid may be taken forward for DNA analysis.
- 6.2.8 As appropriate, conduct DNA PCR-based typing.
- 6.2.8.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a probative foreign profile is identified, conduct a DNA Data Bank search for a “match” to the foreign profile, and report the results of the search.
- 6.2.8.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator, and report the results of the search.
- 6.2.8.3 When a case has a listed suspect but no known has been submitted, conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search on any suitable DNA profiles that are believed to be from the putative perpetrator. Report results in the absence of all appropriate known samples and request the submission of appropriate known samples.
- 6.2.8.4 If no DNA typing results are obtained on swabs with correspondingly labeled smears when the smears were positive for spermatozoa and a DNA typing result was expected, but no acid phosphatase testing was previously conducted on the swabs, conduct acid phosphatase testing on the corresponding swabs and record and report results. It may be necessary to analyze other samples submitted in the case to determine if the swabs were mislabeled.
- 6.3** If appropriate, forward evidence to another section for analysis. Consult with other section examiners during analysis, as necessary.
- 6.4** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**7 VAGINAL FLUID ANALYSIS**

- 7.1** There are no tests available to conclusively identify the presence of vaginal fluid. However, its presence may be inferred on those items for which a reasonable person would infer that vaginal fluid would be present, e.g., on vaginal swabs, female victim's underpants, etc.
- 7.2** Although it is not possible to conclusively identify the presence of vaginal fluid, it may be probative to a case to conduct DNA PCR-based typing on items believed to contain vaginal fluid.
- 7.3** Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for stains. An alternate light source (ALS) and/or ultra-violet (UV) light may aid in the location of stains believed to contain vaginal fluid. Describe the item and the appearance, size, and location of the stains. Diagrams and/or photographs may be helpful.

**EXAMPLE 1:** A condom is left in a wooded area where an alleged sexual assault occurred. Identifying the DNA profile of biological material on the outer surface of the condom consistent with the victim's profile may help to substantiate the victim's story and/or help define the location of the event.

**EXAMPLE 2:** An alleged sexual assault has occurred, but no semen is identified on evidence from the victim. A Physical Evidence Recovery Kit from the suspect (collected within 24 hours of the alleged incident) contains pubic area swabs and underpants from the suspect. Identifying a DNA profile foreign to the suspect's profile and consistent with the victim's profile on either of these items may be probative if the suspect denies any sexual contact with the victim.

- 7.4** If appropriate, examine stain(s) for possible mixtures of physiological fluids (blood, urine, semen and/or feces), and record and report results.
- 7.5** As appropriate, conduct DNA PCR-based typing.
- 7.5.1** Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles.
- 7.5.2** Conduct DNA PCR-based typing, record results, report results in the absence of the alleged perpetrator's known or other appropriate known samples, and request the submission of appropriate known samples.
- 7.6** If appropriate, forward evidence to another section for analysis.
- 7.7** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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## 8 SALIVA ANALYSIS

**8.1** There are no tests available to conclusively identify saliva. However, its presence may be inferred on those items for which a reasonable person would infer that saliva may be present, e.g., on postage stamps, envelope flaps, chewing gum, cigarette butts, mouth openings in masks, etc.

**8.2** Although it is not possible to conclusively identify the presence of saliva, it may be probative to a case to conduct DNA PCR-based typing on items believed to contain saliva.

**8.3** Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for stains. An alternate light source (ALS) and/or ultra-violet light (UV) may aid in the location of stains believed to contain saliva. Describe the item and the appearance, size, and location of the stains. Diagrams and/or photographs may be helpful.

EXAMPLE 1: A child victim alleges that a suspect performed cunnilingus on her. No semen is identified. Identifying a DNA profile foreign to the victim's profile on the victim's thighs/external genitalia swabs may not only help to substantiate the victim's story, but may also help to identify the perpetrator.

EXAMPLE 2: A ski mask is dropped by the perpetrator at the scene of a robbery. Identifying a DNA profile around the mouth area may help to identify the perpetrator.

**8.4** If appropriate, examine stain(s) for possible mixtures of physiological fluids (blood, urine, semen and/or feces), and record and report results.

**8.5** As appropriate, conduct DNA PCR-based typing.

8.5.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a profile believed to be that of the putative perpetrator is identified, conduct a DNA Data Bank search for a "match" to the profile and report the results of the search.

8.5.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a "match" to a profile believed to be that of the putative perpetrator, and report the results of the search.

8.5.3 In the absence of all appropriate known samples, conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a "match" to a profile believed to be that of the putative perpetrator. Report results and request the submission of appropriate known samples.

**8.6** If appropriate, forward evidence to another section for analysis.

**8.7** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

**9 ANALYSIS OF PERSPIRATION / SKIN CELLS**

- 9.1** There are no tests to conclusively identify the presence of perspiration / skin cells. However, the presence of these may be inferred on those items for which a reasonable person could infer that they would be present, e.g., on hat bands, inside gloves, on cuffs and/or collars of shirts and jackets, etc.
- 9.2** Although it is not possible to conclusively identify the presence of perspiration / skin cells, it may be probative to a case to conduct DNA PCR-based typing on items believed to contain one or both of these. These types of samples are referred to as “touch” and “wearer” DNA.
- 9.3** Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for stains. An alternate light source (ALS) may aid in the location of stains believed to contain perspiration. Describe the item and the appearance, size, and location of the stains. Diagrams and/or photographs may be helpful.
- EXAMPLE: A baseball cap is found at the scene of a robbery. Identifying the DNA profile of biological material on the inner band of the cap may help identify the perpetrator through a DNA Data Bank search and subsequent “hit”.
- 9.4** If appropriate, examine stain(s) for possible mixtures of physiological fluids (blood, urine, semen and/or feces), record and report results.
- 9.5** As appropriate, conduct DNA PCR-based typing.
- 9.5.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a profile believed to be that of the putative perpetrator is identified, conduct a DNA Data Bank search for a “match” to the profile, and report the results of the search.
- 9.5.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator, and report the results of the search.
- 9.5.3 In the absence of all appropriate known samples, conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator. Report results and request the submission of appropriate known samples.
- 9.6** If appropriate, forward evidence to another section for analysis.
- 9.7** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**10 URINE ANALYSIS**

- 10.1** When a liquid sample believed to be urine is submitted, centrifuge the sample and/or allow cellular debris to settle to the bottom of the container. Preserve a portion of the sediment on swabs. Return liquid to an appropriate leak proof container.
- 10.2** Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for visible stains and describe the item and appearance, size, and location of stains. Diagrams and/or photographs may be helpful. In instances where no stains are visible, the use of an alternate light source (ALS) may be helpful in locating stains. The detection of a characteristic urine odor may also be helpful.
- 10.3** If the stain size allows perform the Urease Test on appropriate stains/stained areas, record and report results. Do not consume the sample performing the Urease Test if DNA analysis will be performed.
- 10.4** Samples that test inconclusive for urine may be taken forward for DNA analysis.
- 10.5** If appropriate, examine stain(s) for possible mixtures of physiological fluids (blood, semen or feces), and record and report results.
- 10.6** As appropriate, conduct DNA PCR-based typing.
- 10.6.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a profile believed to be that of the putative perpetrator is identified, conduct a DNA Data Bank search for a “match” to the profile, and report the results of the search.
- 10.6.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator, and report the results of the search.
- 10.6.3 In the absence of all appropriate known samples, conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator. Report results and request the submission of appropriate known samples.
- 10.7** If appropriate, forward evidence to another section for analysis.
- 10.8** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**11 FECES ANALYSIS**

- 11.1** Preserve a portion of the fecal stain as appropriate.
- 11.2** Working with only one item at a time to avoid sample mix-up and/or contamination, examine the item for visible stains and describe the item and the appearance, size, and location of stains. Diagrams and/or photographs may be helpful. The detection of a characteristic fecal odor may also be helpful.
- 11.3** If stain size allows, perform Edelman's Test on stains/stained areas, record and report results. Do not consume the sample performing the Edelman's Test if DNA analysis will be performed.
- 11.4** Stains that test inconclusive for fecal material may be taken forward for DNA analysis.
- 11.5** If appropriate, examine stain(s) for possible mixtures of physiological fluids (blood, semen or urine), and record and report results.
- 11.6** As appropriate, conduct DNA PCR-based typing on stains (i.e., smears, swipes, etc.). DNA PCR-based typing will not be conducted on "whole" fecal samples or other samples heavily contaminated with fecal material.
- 11.6.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a profile believed to be that of the perpetrator is identified, conduct a DNA Data Bank search for a "match" to the profile, and report the results of the search.
- 11.6.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a "match" to a profile believed to be that of the putative perpetrator, and report the results of the search.
- 11.6.3 When a case has a listed suspect but no known has been submitted conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a "match" to a profile believed to be that of the putative perpetrator. Report results and request the submission of appropriate known samples.
- 11.7** If appropriate, forward evidence to another section for analysis.
- 11.8** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**12 TISSUE ANALYSIS**

**12.1** If appropriate, freeze the tissue until you are ready to proceed with the examination. Alternatively, a portion of the tissue sample may be collected on a swab and then preserved for possible future test.

**NOTE:** Examination by a pathologist of the submitted tissue to determine the tissue type based on cellular structure may be helpful to the investigator. The item of evidence may be submitted to the Office of the Chief Medical Examiner by the examiner or submitted directly by the investigator.

**12.2** Working with only one item at a time to avoid sample mix-up and/or contamination, examine and describe the item. Diagrams and/or photographs may be helpful.

**12.3** If appropriate, test for blood, and record and report results.

**12.4** As appropriate, conduct DNA PCR-based typing.

12.4.1 Conduct DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles. If a suspect is eliminated, but a profile believed to be that of the putative perpetrator is identified, conduct a DNA Data Bank search for a “match” to the profile, and report the results of the search.

12.4.2 Conduct DNA PCR-based typing in the absence of a suspect (no suspect case), record results, conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator, and report the results of the search.

12.4.3 When a case has a listed suspect but no known has been submitted conduct DNA PCR-based typing, record results, and conduct a DNA Data Bank search for a “match” to a profile believed to be that of the putative perpetrator. Report results and request the submission of appropriate known samples.

**12.5** If appropriate, forward evidence to another section for analysis.

**12.6** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**13 BONE ANALYSIS**

- 13.1** If appropriate, freeze the bone until you are ready to proceed with the examination.
- 13.2** Working with only one item at a time to avoid sample mix-up and/or contamination, examine and describe the item. Diagrams and/or photographs may be helpful.
- 13.3** If appropriate, test for blood, and record and report results.
- 13.4** If appropriate, submit to the OCME for species, bone type, and/or sex determination.
- 13.5** Transfer to the Firearms Section for tool marks if required.
- 13.6** If appropriate, clean bone by soaking in water and washing with a strong jet of Type I water or an ultrasonic cleaner and air dry. If no analysis will be conducted on the sample, the case notes will indicate that sample has been preserved; the results will be reported as “this sample was not analyzed/examined”.
- 13.7** As appropriate, conduct DNA PCR-based typing.
- 13.7.1 Perform DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles.
- 13.7.2 Perform DNA PCR-based typing on an unknown victim, record results, perform a DNA Data Bank search for a “match” to the profile, and report the results of the analysis and search.
- 13.8** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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**14 TOOTH ANALYSIS**

- 14.1** If appropriate, freeze the tooth until you are ready to proceed with the examination.
- 14.2** Molars are the teeth of choice for DNA recovery. Working with only one item at a time to avoid sample mix-up and/or contamination, examine and describe the item. Diagrams and/or photographs may be helpful.
- 14.3** If appropriate, test for blood, and record and report results.
- 14.4** If appropriate, clean the outer surface of the tooth by soaking in water and washing with a strong jet of Type I water or an ultrasonic cleaner, air dry, and report as preserved. If no analysis will be conducted on the sample, the case notes will indicate that sample has been preserved; the results will be reported as “this sample was not analyzed/examined”.
- 14.5** As appropriate, conduct DNA PCR-based typing.
- 14.5.1 Perform DNA PCR-based typing, record results, and report results and conclusions after comparing the profile(s) obtained to the appropriate known sample profiles.
- 14.5.2 Perform DNA PCR-based typing on an unknown victim, record results, perform a DNA Data Bank search for a “match” to the profile, and report the results of the analysis and search.
- 14.6** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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## 15 HAIR/FIBER ANALYSIS

Typically DNA analysis is conducted on all appropriate non-hair evidence prior to any hair examinations being conducted, even when hair examinations are requested. BEFORE PROCEEDING to screen hairs for nuclear DNA suitability, carefully consider the probative nature of information that may be gleaned from this examination. It may be appropriate to discuss this further with the Trace Evidence (TE) examiner and/or the investigator before proceeding. The determination of whether to proceed is not dependent on a request for this examination, but will be based on the numbers of hairs that will need to be screened and whether the information gained may reasonably be expected to provide probative information for the case when no other evidence has yielded a probative DNA profile.

The Nuclear DNA Hair Referral form used by the TE examiner can be found in Document 210-F206. This form can be used by the SX examiner to supplement the notes.

**NOTE:** A case may only contain hairs submitted for DNA testing (“Hair Only Case”). These cases may go to the Trace Evidence Section first, where the evidence will be examined for nuclear DNA suitable hairs and the appropriate hairs forwarded to the Forensic Biology Section (SX) examiner for DNA testing.

### 15.1 Hair/Fiber Recovery and Preservation

- 15.1.1 When evidence is examined for biological substances, hairs/fibers may be collected from the item and/or left on the item for possible future recovery and examination.
- 15.1.2 With the aid of oblique lighting, recover hairs/fibers and/or other trace evidence from items being examined for biological fluids using one or more of the following methods: forceps, post-it notes, gentle scraping and/or careful shaking over clean paper.
- 15.1.3 Package and appropriately label recovered hairs/fibers. When screening/examinations are complete, place the hair package in the item packaging.
- 15.1.4 If hairs/fibers are to remain on the item for possible future recovery, protect the trace evidence from loss or other deleterious effects by examining the item for biological substances on clean paper, wrap the item in the same paper, and place it in the original packaging (when possible).
- 15.1.5 If there is a possibility that loose hairs/fibers may be lost during the examination for biological substances (for example, while examining a broken windshield for blood, one or two hairs/fibers are noted on the glass), recover, package, and appropriately label these hairs/fibers. Place the package in the item packaging.
- 15.1.6 Document findings (i.e., hairs/fibers recovered, hairs/fibers observed/not recovered, hairs/fibers recovered and remain, etc.) and it is also recommended that an estimate of the numbers of hairs observed and/or recovered (small number or large number) be documented. This will preclude the need to assess the number of hairs present at a later time if nuclear DNA suitability determinations on the hairs must be made.

### 15.2 General Information About Screening Hairs for Nuclear DNA Suitability

- 15.2.1 If no probative information is obtained from the DNA analysis of non-hair evidence or there is no such evidence on which to attempt DNA analysis in a case, and there are a small number of hairs on an item of evidence, the SX examiner will recover the hairs from the item and subsequently screen them for suitability for nuclear DNA analysis.
- 15.2.2 If a large number of hairs are present on an item of evidence or a large case has many items requiring hair recovery and/or examination, the item(s) may be forwarded to the Trace Evidence Section on a case by case basis for collection of the hairs and a determination of the suitability of the hairs for nuclear DNA analysis. These cases are discussed between the Forensic Biology and the Trace Evidence supervisors prior to submission. In some cases where large numbers of hairs are recovered examination by DFS may not be possible or testing on a representative number of

hairs will be attempted and the remaining hairs not examined. This case approach shall be documented by an MFR in the case file.

15.2.2.1 Hairs determined by the TE examiner to be suitable for nuclear DNA analysis will be forwarded back to the SX examiner along with the Hair Referral Form.

15.2.3 Hairs previously mounted on microscope slides, typically re-submitted in cold cases, may be forwarded to the TE examiner for de-mounting and assessment of the hair(s) for nuclear DNA analysis.

### 15.3 Procedure for Screening Hairs for Suitability for Nuclear DNA Analysis

15.3.1 To determine suitability for nuclear DNA testing, hairs may be examined with the aid of a stereo microscope and/or by placing a cover slip over the hairs mounted in water or xylene substitute on a glass microscope slide, followed by examination with a compound microscope using bright field illumination. When using the stereo microscope, paper/post-it notes or other such material providing varying contrasts with the hairs being examined may be helpful. If there is any question about the suitability, proceed with DNA typing.

15.3.2 When hairs suitable for nuclear DNA analysis are found, the documentation should allow for tracking from the microscopic examination through the DNA interpretive stages. When no hairs suitable for nuclear DNA analysis are found, the documentation should reflect why the hair(s) are not suitable.

15.3.3 The documentation should reflect the following information.

15.3.3.1 Microscope(s) used, i.e., stereo and/or compound microscope.

15.3.3.2 No hairs/fibers were found on an item(s).

NOTE: The SX examiner does not differentiate between hair fragments and fibers.

15.3.3.3 The approximate number of hairs/fibers recovered will be documented.

15.3.3.4 The presence or absence of root and if the sample is suitable for DNA will be documented.

15.3.3.5 The exact number of hairs from each item on which nuclear DNA analysis will be conducted.

15.3.3.5.1 Use “???” when unsure of hair growth stage. [Forensic Biology examiners are only expected to be able to recognize that there is material (i.e., tissue) on a hair root (“strand”) that may be suitable for nuclear DNA testing and are not expected to know the exact growth stage of the hair with certainty.]

15.3.3.6 Additional specific observations about the hairs may be documented. Examples follow.

15.3.3.6.1 “Very dark hair with a light root.”

15.3.3.6.2 “Very light hair with a dark root.”

15.4 As appropriate, conduct nuclear DNA analysis on the hair root tissue and record results.

**15.5 Reporting Results**

- 15.5.1 For all cases, the results and conclusions of nuclear DNA analysis of hairs will be reported. When applicable, the profile(s) obtained from the hairs will be compared to the appropriate known or “alternate” known sample profile(s). If a suspect is eliminated, there is no suspect, or no known or “alternate” known sample is available, but a profile suitable for a DNA Data Bank search is developed, the search for a “match” to the profile will be conducted, and the results of the search reported.
- 15.5.2 If no hairs suitable for nuclear DNA testing are found by the SX examiner, “No hairs suitable for nuclear DNA analysis were recovered from/observed on/contained in (item description and item number)” will be reported.
- 15.5.3 If no probative biological evidence is found and the SX examiner observes that no hairs/fibers are present on an item of evidence, the absence of hairs/fibers will be reported by the SX examiner as “no hairs/fibers were observed.”
- 15.5.4 If probative information is obtained from the DNA analysis of non-hair evidence in a particular case, typically no hair/fiber examinations will be conducted, even when requested. If hair examinations are requested, the SX report will reflect that the requested examinations were not conducted.
- 15.5.5 If DNA analysis is attempted on hairs and hairs remain that were not evaluated, the DNA analysis will be reported as well as “additional hairs/fibers remain or were collected that were not examined.”

**15.5** If appropriate, forward item(s) to another section for analysis.

**15.6** Return evidence to the primary examiner or to Evidence Receiving for final disposition.

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## Appendix A – Abbreviations

***	NO AMPLIFICATION RESULTS
??	QUESTIONED OR POSSIBLE
@	AT
ACWA, ACA	ASSISTANT COMMONWEALTH ATTORNEY
ADD'L	ADDITIONAL
ADH/S, S/ADH	SEALED WITH ADHESIVE
AK	ASSUMED KNOWN
ALS	ALTERNATE LIGHT SOURCE
AMP	AMPLIFICATION
ANC	AMPLIFICATION NEGATIVE CONTROL
ANO, AR, A/R	ANORECTAL
AP, ACP	ACID PHOSPHATASE TEST
APPROX, APP, ~, APPT	APPROXIMATELY, APPARENT
ART	ARTIFACT
AX	ARMEDXPERT
B, BR, BRN	BROWN
B/T, B/W	BETWEEN
BACT	BACTERIA
BB, BROMO	BROMOPHENOL BLUE
BBHKS, BBHK	BLOOD OR BUCCAL AND HAIR SAMPLES KIT
BHS KIT, BHSK, BHKIT	BLOOD AND HAIR SAMPLES KIT
BLD	BLOOD
BOTAN	BOTANICAL
BP	BROWN PAPER
BPB	BROWN PAPER BAG
BPWR, BPWRAP, BPW, BPWP	BROWN PAPER WRAP
BSC	BLOOD STAIN CARD
BSK	BUCCAL SWAB KIT
BT	BLEED THROUGH
BTT	BROWN TOP TUBE
BUC	BUCCAL
— C	WITH, CONTAINING – ALSO SEE “WITH”
C	CONTRIBUTOR
CAL	CALIBRATORS
CB, CBBX, CBX, CBB	CARDBOARD BOX
CBSM	CARDBOARD SLIDE MAILER
CELL. MAT., CELL MAT'L	CELLULAR MATERIAL
CL	CLEAR
CLPB	CLEAR PLASTIC BAG
COLL	COLLECTION, COLLECTED
CONT	CONTAINER
CONT #, C#	CONTAINER (NUMBER)
CONT, CONT'G, ©	CONTAINING
CONT'D	CONTINUED
CONV	CONVENIENCE
CS	CRIMESCOPE
CSF	CSFIPO
CT	COURT
CTRL, CTL	CONTROL
CTS, KPICS, X-MAS TREE STAIN	CHRISTMAS TREE STAIN (KERNECHTROT PICROINDIGOCARMINE STAIN)

CWA, CA	COMMONWEALTH ATTORNEY
DoD	DEPARTMENT OF DEFENSE
DB	DATABANK
D13	D13S317
D16	D16S539
D5	D5S818
D7	D7S820
DC, DE, DCE	DEBRIS COLLECTION ENVELOPE
DD	DRIED DOWN
DO	DROP OUT
DDOC, →SC, →DNA CARD	DRIED DOWN ON (STAIN) CARD
DFS TS	DFS TAPE SEALED
DH <sub>2</sub> O	DISTILLED WATER
DILN, DIL	DILUTION
DNA	DEOXYRIBONUCLEIC ACID
DNU	DATA NOT USED
E	ETHANOL
EA	EACH
E-CELL, NS, ♀, -E	EPITHELIAL CELL OR NON-SPERM FRACTION
ELIM, E	ELIMINATION
ELS	EVIDENCE LABEL SEALED
ENV	ENVELOPE
EPI	EPITHELIAL CELLS
ETS	EVIDENCE TAPE SEALED
ETOH	ETHANOL
EVID, EV	EVIDENCE
EXTE, EXTR, EXTL	EXTERIOR, EXTERNAL
EXT, EXTR	EXTRACT
EXT	EXTERIOR
FAB SEP, FABRIC SPE, FABRIC SEP, FS, F/S	FABRIC SEPARATION
FLUOR, FL, F*, F	FLUORESCENCE
FNC, FC	FINGERNAIL CLIPPINGS
FNS	FINGERNAIL SCRAPINGS
FOR	FOREIGN
FRAC, FXN	FRACTION
FRB, RBE, RBNS, NSRB, RB ♀	EPITHELIAL CELL (NON-SPERM) REAGENT BLANK
FS LAB	FORENSIC SCIENCE LABORATORY
FT	FAINT
GC	GENOTYPE CONCORDANCE
G/S, GUMS, S/GUM,	GUM SEALED
GE, GLAS, GLS, GL ENV	GLASSINE ENVELOPE
GRN	GREEN
GTT	GREEN TOP TUBE
GYTT	GRAY TOP TUBE
H/F, HF, HS/FS	HAIRS/FIBERS
H/S	HEAT SEALED
HDS, H	HEADS
HH	HEAD HAIR
HOSP	HOSPITAL
HPF, HPV	HIGH POWER FIELD (VIEW)
HPS, HPSW	HIGH POWER SWEEP
HRS	HOURS
HUM	HUMAN
I#, (#)	ITEM #

I, INIT	INITIALED
I, INT (RE: SPERM SEARCH)	INTACT (RE: SPERM SEARCH)
ILS	INTERNAL LANE STANDARD
IM	IMMEDIATE MODERATE
INC	INCONCLUSIVE
INT	INTERIOR
IQ	DNA IQ
IQD	DNA IQ DIFFERENTIAL
IQH	DNA IQ HAIR
IS, SI	IMMEDIATE STRONG OR STRONG IMMEDIATE
IW	IMMEDIATE WEAK
K, KN	KNOWN
KLC	KIT LABEL CLOSED
K HUM BLOOD	KNOWN HUMAN BLOOD
L:	LABEL
(L), AL, L	(ALLELIC) LADDER
L/LA, LLA	LIPS/LIP AREA
LB	LOADING BUFFER
LG	LARGE
LL	LUMALITE
LM	LEFT MESSAGE
LPF, LPV	LOW POWER FIELD (VIEW)
LPS, LPSW	LOW POWER SWEEP
LT	LIGHT
L, LFT, (L)	LEFT
LTT	LAVENDER TOP TUBE
LVM	LEFT VOICE MAIL
M	MICROCON
M/, “”	MARKED (LABELED)
MAN, M	MANILA
ME, MENV	MANILA ENVELOPE
MAT, MAT'L	MATERIAL
MED	MEDIUM
MEPERK, ME PERK	MEDICAL EXAMINER PHYSICAL EVIDENCE RECOVERY KIT
MIN	MINIMUM, MINIMAL
MOD	MODERATE
MRB, MCRB	MICROCON REAGENT BLANK – ALSO SEE “REAGENT BLANK MICROCON”
MT, MFG TAG	MANUFACTURER TAG
MFR	MEMORANDUM FOR RECORD
MSG	MESSAGE
MV	MICROVARIANT
N	NORMAL
N/A	NOT APPLICABLE
NAB, NO APP BLD	NO APPARENT BLOOD
NC	NO COLOR
NEATT, NE, NOT EX	NOT EXAMINED (AT THIS TIME)
NEB, NBO	NO EVIDENCE OF BLOOD, NO BLOOD OBSERVED
NEG, -, Ø, 0	NEGATIVE
NFA, NO FA	NO FURTHER ANALYSIS
NFT	NO FURTHER TESTING
NR, NRXN	NO RESULT, NO REACTION
NSRB, NRB, NS RNC	NON-SPERM REAGENT BLANK
NS, NSP	NON-SPERM
NSO	NO SPERM OBSERVED

NT	NOT TESTED
NTF, NFT	NO TYPES FOREIGN, NO FOREIGN TYPES
NVD	NO VISIBLE DNA
O	ORGANIC
OBS, OBSV	OBSERVED
OC	OMNICHROME LIGHT SOURCE
OCME	OFFICE OF THE CHIEF MEDICAL EXAMINER
OD	ORGANIC DIFFERENTIAL
OE	ORANGE ENVELOPE
O/N	OVERNIGHT
OR	ORAL RINSE
OTCC	OPENED TO CHECK CONTENTS
P/B, PA/BUT, PB, PA/B	PERIANAL/BUTTOCKS
P/T, PH/TMB, P/TMB, PTMB	PHENOLPHTHALEIN TETRAMETHYLBENZIDINE TEST
PA	PUBIC AREA
PB, PLB	PLASTIC BAG
PC, PHC, PH COMB	PUBIC HAIR COMBINGS
PCR	POLYMERASE CHAIN REACTION
PEB, PL EVID BAG	PLASTIC EVIDENCE BAG
PERK, PRK	PHYSICAL EVIDENCE RECOVERY KIT
PH	PUBIC HAIR
PHR	PEAK HEIGHT RATIO
PKG	PACKAGE
PL	PLASTIC
PM	PLANT MATERIAL
P, POS, POS CTRL, +, ⊕	POSITIVE, POSITIVE CONTROL, 2800M
POSS	POSSIBLE
PP16	PowerPlex <sup>®</sup> 16
PTT, PTBT, PT	PURPLE TOP BLOOD TUBE
PRSP	PERSPIRATION
Q	QUESTIONED
QNS	QUANTITY NOT SUFFICIENT
RB, RNC	REAGENT BLANK
R-B, R/B, RED/BR, RB	RED-BROWN
RBB, BRB, RCB	BLOOD REAGENT BLANK
RBC	RED BLOOD CELLS
RBF	REAGENT BLANK FEMALE
RB-H	REAGENT BLANK - HAIR
RB-IQ	REAGENT BLANK – IQ METHOD
RBM	REAGENT BLANK MALE
RBMC, RBMIC, RBMICRO	REAGENT BLANK MICROCON
RBS, RBSP, SRB RB♂, SP RNC	SPERM REAGENT BLANK
RE	REGARDING
RI	RE-INJECTION
RS	RANDOM SAMPLE
RT, R, (R)	RIGHT
RTT	RED TOP TUBE
SP, S FRAC, SP FRAC, ♂, -S	SPERM FRACTION
S, SUS, SUSP, (S)	SUSPECT
S/	SEALED
S+I, S/T+I, TS+I, T/S & I	SEALED AND INITIALED (WITH TAPE)
S/T+U	SEALED WITH TAPE AND UNINITIALED
SAN PAD, PAD	SANITARY PAD/NAPKIN
SC	STAIN CARD, SUBSTRATE CONTROL

SF, SEM FL	SEMINAL FLUID
SIM	SIMILAR
SL, S/T	SLIGHTLY
SM	SMALL
SM+	SLOW MODERATE POSITIVE
SMR	SMEAR
SN, S#, SN#	SERIAL NUMBER
SP	SPERM
SPERK	SUSPECT PHYSICAL EVIDENCE RECOVERY KIT
SS	SLOW STRONG
SS, STC	STAPLE SEALED (CLOSED)
SS#, SSN	SOCIAL SECURITY NUMBER
ST	STUTTER
STH	STOCHASTIC
STD, STND	STANDARD
STER	STERILE
STN'D	STAINED
STR	SHORT TANDEM REPEAT
STT, SST	SERUM SEPARATOR TUBE
SUB	SUBMISSION
SW (RE: AP RESULTS)	SLOW WEAK
SW/, s/w, s/	SEALED WITH
TA	TRUE ALLELE
TCH	TOUCH
T/E, T/EG, T/G, TH/EG	THIGHS/EXTERNAL GENITALIA
TD	TRACKING DYE
TNTC	TOO NUMEROUS TO COUNT
TT	TEST TUBE
U	UNSEALED
UND, UNDPTS, UP, UDPS, UDP'S, UDPTS	UNDERPANTS
UNI	UNINITIALED
UNSUB	NO SUSPECT
V (ADJ)	VERY
V, VIC, VICT (V)	VICTIM
V/C	VAGINAL/CERVICAL
VAG	VAGINAL
VEG	VEGETATIVE
VF	VAGINAL FLUID
VM	VOICE MAIL
VMM	VOICE MAIL MESSAGE
VPERK	VICTIM PHYSICAL EVIDENCE RECOVERY KIT
— w/, w	WITH – ALSO SEE “CONTAINING”
W/IN, W/I	WITHIN
WBC	WHITE BLOOD CELLS
WE	WHITE ENVELOPE
WH	WHITE
Wk, w	WEAK
WPB	WHITE PAPER BAG
WPWR, WPWRAP, WPW	WHITE PAPER WRAP
WR	WEARER
WS	WHOLE SERUM
YEL, YELL, YW	YELLOW
Y-T	YELLOW-TAN

YTT	YELLOW TOP TUBE
ZPB, ZLPB, PL ZP BG, PLZLB, PZLB, ZLB, ZL BAG	ZIPLOCK PLASTIC BAG

**NOTE:** The foregoing abbreviations are independent of upper or lower case and may be combined to generate new abbreviations (i.e., VHH = victim head hair, Sbd = suspect blood, etc.). Customary scientific abbreviations (O<sub>2</sub>, H<sub>2</sub>O, etc.) are considered common knowledge and are not included here.

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