



INDIANA STATE POLICE LABORATORY DIVISION

PHYSICAL EVIDENCE BULLETIN

EVIDENCE COLLECTION FOR DNA ANALYSIS

DNA analysis of biological evidence has the potential of eliminating possible sources of a sample, or in the case of inclusions, indicating what percentage of the population has the same DNA profile. The ability to successfully perform DNA analysis will often depend on how well the specimens are collected and preserved.

Potentially, DNA analysis can be performed on any human material containing cellular nuclei. The following are examples of evidence that should be considered for DNA analysis:

- A. Blood and bloodstains
- B. Semen and semen stains
- C. Epithelial cells from cigarettes, bottles or cans.
- D. Skin and other tissues
- E. Bones
- F. Organs
- G. Hair

Due to extremely low success rates, the Indiana State Police (ISP) Laboratory will not examine cartridges, cartridge cases or swabs of these items for the presence of DNA except in extenuating circumstances with the approval of the Laboratory Manager or Unit Supervisor.

I. STANDARDS FOR COMPARISON

The submission of DNA standards from all individuals thought to be involved in a case can significantly increase the speed and efficiency of analyzing a DNA case. Items submitted to be used as standards must be clearly marked as standards on the request for laboratory examination form or on the item of evidence.

A. From living subjects for DNA analysis

- 1) Oral/buccal swabs (swabbings from inside the cheek) must be air dried and sealed in an envelope.
- 2) One sample of venous blood, at least 5 ml, must be collected in a purple top vacutainer (EDTA tube). Kits suitable for collecting blood standards are available from ISP Laboratories or from an ISP Crime Scene Investigator.
- 3) Liquid blood samples should be refrigerated (not frozen) until transported to an ISP Laboratory.
- 4) The ISP Laboratory must be informed if the subject has received a blood transfusion within the last 120 days.
- 5) The ISP Laboratory must be informed if the subject has ever received a bone marrow transplant.

B. From deceased subjects for DNA analysis

- 1) One sample of venous blood, at least 5 ml, should be collected in a purple top vacutainer (EDTA tube). When venous blood is not obtainable, blood from the heart or major internal blood vessel or organ should be collected in a purple top vacutainer or on an approved stain card. Kits suitable for collecting blood standards are available from the ISP Laboratories or from an ISP Crime Scene Investigator.
- 2) Liquid blood samples should be refrigerated (not frozen) until transported to an ISP Laboratory. Blood on a stain card should be air-dried completely before storage.
- 3) If a blood sample is unobtainable, a hair, bone and/or tissue sample should be collected. A hair sample should consist of approximately 30 hairs. Hairs should be pulled, not cut or tweezed. A bone sample, at least the size of a die (about 1/2 inch cubed), should be collected from any bone that is relatively dry, without pooled blood (for example a rib or leg bone). A tissue sample, at least the size of a quarter, should be collected from any muscle that is free of pooled blood. Hair, bone and tissue samples should be packaged in a clean container without any fixatives and frozen until transported to the laboratory.

- 4) Alternately, if a blood sample is unobtainable the subject's clothing and/or blood stained evidence immediately below the body may be used as a secondary standard. Please check with Laboratory personnel for appropriate secondary standards.

NOTE: If blood alcohol or toxicology analysis is to be conducted, an additional sample should be obtained in a blood alcohol vacutainer provided by the Indiana State Department of Toxicology. These vacutainers contain the preservatives sodium fluoride and sodium heparin.

II. CRIME SCENE EVIDENCE HANDLING

Please contact your local ISP Crime Scene Investigator for assistance in crime scene processing, if needed. Remember to wear disposable latex gloves (or the equivalent) while processing or collecting any evidence that may be used for DNA analysis. Gloves should be changed regularly and/or between items collected.

- A. Photograph and/or videotape the evidence and its relative position at the crime scene before it is touched, moved or collected.
- B. Sketch the crime scene to establish spatial relationships.
- C. Collect physical evidence for DNA analysis.
 - 1) Evidence bearing wet body fluid stains should be completely air-dried, not in direct sunlight. Once dried, package the articles in separate paper bags. Do not package in plastic bags.
 - 2) Objects too large to be removed from the crime scene, that are stained with body fluids, should be collected using one of the following techniques:
 - a) Scrape the stain onto a clean sheet of paper using a clean scalpel. Carefully fold the paper and package in a paper envelope.
 - b) Moisten one or more cotton tipped applicators with water (distilled water should be used) and collect the stain. Air-dry and package in paper.
 - c) Place a fingerprint lifter over the dried stain, press and lift. Replace the backing and package in paper.
 - d) It has been found that the Phenolphthalein reagent can interfere with the DNA analysis process. If a portion of the stain was collected on a swab and tested for the presence of blood using the Phenolphthalein test, that swab should not be submitted for DNA analysis unless it is the only sample available.

- 3) For pooled liquid body fluid stains, use one or more cotton tipped applicators to absorb the liquid. Air-dry and package in paper.
- 4) Samples such as cigarette butts, envelopes, stamps, etc., to be analyzed for epithelial cells should be collected with tweezers or gloves and packaged in paper.
- 5) Bottles or cans should be carefully emptied of any remaining contents before packaging in paper.
- 6) Hair evidence should be collected using clean tweezers. Hairs collected from different locations should be packaged separately. If hairs are mixed with wet body fluids, they must be air-dried. Seal all hair evidence in paper.
- 7) A sexual assault evidence collection kit should be used to collect evidence by medical personnel from sexual assault victims.
- 8) In sexual assault cases additional items should be considered for collection such as underpants from the victim(s) and suspect(s).

III. SEXUAL ASSAULT INVESTIGATIONS

In sexual assault cases, the investigator or police officer is not able to collect the physical evidence from the victim's person, or in most cases be present when the evidence is collected. The collection of this evidence can only be done by health care personnel during the medical examination of the victim. In order for the crime laboratory to receive the best possible evidence, it is necessary for the medical personnel to be acutely aware of proper and complete evidence collection procedures.

A. Chain of Custody

- 1) It is important that a chain of custody be maintained. A procedure should be developed at the medical facility to ensure that all persons who are responsible for keeping or handling evidence are documented. Evidence should be handled by a minimal number of individuals.
- 2) Medical facilities should establish a uniform policy as to who is responsible for:
 - a) Collecting all necessary specimens and other evidentiary material.
 - b) Marking all evidence including the contents of each container with the victim's identifier.
 - c) Obtaining consent for release of evidentiary material.
 - d) Notifying the police agency that the evidentiary material has been collected.

- e) Placing the evidence in a secure location pending release to the police agency.
- f) Turning the evidence over to the police agency.

B. Evidence Collection Kits

- 1) Instructions for proper evidence collection are present in evidence collection kits provided by the ISP.
- 2) It is recommended that the Victim Sexual Assault Evidence Collection Kit be collected as close to the time of the incident as possible, preferably within 96 hours of the incident. However, kits can be collected at a later date if the investigation warrants it and the victim is cooperative.
- 3) A purple top vacutainer for collection of a whole blood standard and cotton tipped applicators are present in the ISP Suspect Evidence Collection Kit. It is recommended that if a suspect is arrested within 24 hours of the incident, external penile swabs should be collected using moistened, clean cotton tipped applicators (distilled water should be used).

IV. PATERNITY ANALYSIS FOR CRIMINAL PROSECUTION

- A. Paternity analysis requires standards from the child, mother, and alleged father(s). These standards can be a whole blood standard in a purple top vacutainer (EDTA tube) or oral swabs. Liquid blood standards should be refrigerated. Oral swabs must be air dried and sealed in a paper envelope.
- B. In the case where there is a pregnancy that does not go to full term, the product of conception representing the child is needed for analysis. The type of sample(s) obtained is dependent on the medical facility collecting the sample(s). A representative sample(s) of the product of conception should be collected, which may include umbilical cord blood, a portion of the placenta, and/or other tissue samples. Product of conception samples should be stored frozen with no preservative until submission to the laboratory. Standards from the mother and alleged father(s) should be collected as described above.
- C. Additional information is required for paternity analysis. The Forensic Relationship Testing Information Sheet (see attached) must be submitted with the evidence.
- D. Contact a member of the Biology Section if other genetic relationship calculations are desired.

V. GENERAL EVIDENCE HANDLING

- A. Be sure body fluid stains are air-dried before packaging.

- B. Package all dried body fluid stain evidence separately and in paper. Never use plastic bags or containers to store stained articles.
- C. Securely affix a biohazard sticker to the outside container in a conspicuous place.
- D. Keep all dried body fluid stain evidence dry and as cool as possible to minimize degradation. Storage in a refrigerator or freezer may be preferred. Factors to consider include; the size of the evidence item, the available space, type and material of item and impact on subsequent examinations.
- E. Along with the "Request for Laboratory Examination" form, a 'Contributor Biology Case Information Form' must be completed when submitting biological evidence. There are three separate forms (see attached) from which to choose: a two page All Non-Sex Crime Investigations form, a two page Sexual Assault Investigations form and a one page Forensic Relationship Testing Information form. Please fill out only the appropriate form. Information included on these forms is necessary to determine CODIS eligibility. The ISP Laboratory Division is required to collect and maintain documentation on CODIS eligibility.

The proper collection and preservation of biological evidence is critical for DNA analysis. If a question arises, please contact the Biology Section of the ISP Laboratory Division at any of the following numbers.

| | |
|---------------|----------------|
| Indianapolis: | 1-866-855-2840 |
| Lowell: | 1-877-874-0009 |
| Fort Wayne: | 1-800-552-0976 |
| Evansville: | 1-800-852-3970 |

Laboratory hours are 8:00 a.m. to 4:30 p.m.; Monday through Friday.

BASIC DNA EVIDENCE COLLECTION

| | |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| STANDARDS | Collect blood in purple top vacutainer. Refrigerate. Or collect an oral swab. Air dry. Freeze. |
| POOLED LIQUID BLOOD OR SALIVA SAMPLES | Collect on sterile cotton swabs. Air-dry. Freeze. |
| DRIED SAMPLES | Either collect object, use a lifter, scrape into a clean container, or use a distilled water moistened clean cotton swab to collect. Air-dry. Freeze if appropriate. |
| TISSUE SAMPLES | Collect in clean specimen container without preservative. Freeze. |



INDIANA STATE POLICE LABORATORY
CONTRIBUTOR BIOLOGY CASE INFORMATION FORM
ALL NON-SEX CRIME INVESTIGATIONS - Page 1 of 2

| | |
|----------------------------------|---------------------------|
| Agency Case Number _____ | ISP Case Number _____ |
| Investigator _____ | Date of Offense _____ |
| Cell phone (if applicable) _____ | Court Date _____ |
| Email Address _____ | Assigned Prosecutor _____ |

| Type of Investigation: | Tier One Submission Protocol : |
|-------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> Death Investigation/Homicide | <ul style="list-style-type: none"> ▪ Maximum number of items without prior consultation ▪ Number does not include appropriate DNA standards 10 + appropriate DNA standards |
| <input type="checkbox"/> Assault/Battery | 4 + appropriate DNA standards |
| <input type="checkbox"/> Burglary | 2 + appropriate DNA standards |
| <input type="checkbox"/> Theft | 2 + appropriate DNA standards |
| <input type="checkbox"/> Drugs | 2 + appropriate DNA standards |
| <input type="checkbox"/> Other _____ | 4 (crimes against persons) 2 (property crimes) + appropriate DNA standards |

IMPORTANT!

| | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| In order to improve the possibility of generating a complete DNA profile, the entire sample may need to be consumed. May the DNA Analyst at their discretion consume (in their entirety) samples submitted in this case? | |
| <input type="checkbox"/> YES | Name of Authorizing Individual _____ |

- **If no standards are submitted for comparison, the evidence must be CODIS eligible for submission.**
- **The presence of a suspect's convicted offender sample in CODIS cannot be used for direct comparison as a suspect standard.**
- **Case summary details will help laboratory personnel determine CODIS eligibility.**
- **If the victim or other individuals have had contact with the item to be tested, elimination standards are necessary for processing.**
- **Items taken directly from suspects are usually not eligible for CODIS entry. Please submit a suspect standard for direct comparison in possession crimes.**
- **If no CODIS search can be performed and no standards are available, analysis would not result in any information of value and the evidence shall not be submitted.**

CONTRIBUTOR BIOLOGY CASE INFORMATION FORM

ALL NON-SEX CRIME INVESTIGATIONS - Page 2 of 2

Agency Case Number _____

ISP Case Number _____

An overall summary of the known case facts should be provided. The following are examples of information that may be needed in the summary:

- How is each item of evidence being submitted connected to the crime?
- How was the item identified as evidence (canine tracked, witness description, suspect pursued, etc)?
- Do the items belong to the victim(s) or could someone have touched the items (obtain elimination standards if necessary)?
- Where were the items found (a specific location, inside home/building, at point of entry, not near public areas, etc.)?

Case Summary



INDIANA STATE POLICE LABORATORY
CONTRIBUTOR BIOLOGY CASE INFORMATION FORM
SEXUAL ASSAULT INVESTIGATIONS – Page 1 of 2

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| Agency Case Number _____ | ISP Case Number _____ |
| Investigator _____ | Date of Offense _____ |
| Cell phone (if applicable) _____ | Court Date _____ |
| Email Address _____ | Assigned Prosecutor _____ |
| VICTIM Sex <input type="checkbox"/> M <input type="checkbox"/> F Alive <input type="checkbox"/> Y <input type="checkbox"/> N Age _____ Race _____ Bleeding <input type="checkbox"/> Y <input type="checkbox"/> N Transfused <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Unknown | |
| SUSPECT 1 Sex <input type="checkbox"/> M <input type="checkbox"/> F Bleeding <input type="checkbox"/> Y <input type="checkbox"/> N Transfused <input type="checkbox"/> Y <input type="checkbox"/> N Age _____ Race _____ <input type="checkbox"/> Unknown | |
| SUSPECT 2 Sex <input type="checkbox"/> M <input type="checkbox"/> F Bleeding <input type="checkbox"/> Y <input type="checkbox"/> N Transfused <input type="checkbox"/> Y <input type="checkbox"/> N Age _____ Race _____ <input type="checkbox"/> Unknown | |
| Suspect Known? <input type="checkbox"/> Y <input type="checkbox"/> N In Custody? <input type="checkbox"/> Y <input type="checkbox"/> N Charged? <input type="checkbox"/> Y <input type="checkbox"/> N Suspect Kit Collected? <input type="checkbox"/> Y <input type="checkbox"/> N | |
| Do you need results of our exam to charge suspect? <input type="checkbox"/> Y <input type="checkbox"/> N | |
| Are the Suspect and the Victim Related? <input type="checkbox"/> Y <input type="checkbox"/> N How? _____ | |
| Do the Suspect and the Victim live together? <input type="checkbox"/> Y <input type="checkbox"/> N | |
| Are/were they in a consensual relationship? <input type="checkbox"/> Y <input type="checkbox"/> N Explain _____ | |
| Type of Assault (check all that apply) <input type="checkbox"/> Vaginal <input type="checkbox"/> Oral/Vaginal <input type="checkbox"/> Oral/Penile <input type="checkbox"/> Rectal <input type="checkbox"/> Condom used <input type="checkbox"/> Digital or other _____ | |
| Did the Victim bathe, shower or change clothes? <input type="checkbox"/> Y <input type="checkbox"/> N <input type="checkbox"/> Unknown | |
| Did the Victim have consensual intercourse less than 48 hours before the assault? <input type="checkbox"/> Y <input type="checkbox"/> N Note: If the consensual partner is not the suspect, standards from the partner should be submitted. | |

IMPORTANT!

In order to improve the possibility of generating a complete DNA profile, the entire sample may need to be consumed.

May the DNA Analyst at their discretion consume (in their entirety) samples submitted in this case?

| | |
|-------------------------------------|---------------------------------------------|
| <input type="checkbox"/> YES | Name of Authorizing Individual _____ |
|-------------------------------------|---------------------------------------------|

CONTRIBUTOR BIOLOGY CASE INFORMATION FORM

SEXUAL ASSAULT INVESTIGATIONS – Page 2 of 2

Agency Case Number _____

ISP Case Number _____

An overall summary of the known case facts should be provided in all cases.

The following are examples of information that may be needed in the summary if the evidence being submitted is NOT a sexual assault kit:

- **How is the evidence being submitted connected to the crime?**
- **How was the item identified as evidence (canine tracked, witness description, suspect pursued, etc)?**
- **To whom do the items belong?**

Case Summary



INDIANA STATE POLICE LABORATORY
CONTRIBUTOR BIOLOGY CASE INFORMATION FORM

FORENSIC RELATIONSHIP TESTING INFORMATION – Page 1 of 1

Agency Case Number
Investigator
Assigned Prosecutor

ISP Case Number
Email Address
Court Date

In order to perform statistical analysis and provide probabilities of paternity/relatedness, we must have appropriate standards (i.e. mother, child, and alleged father) and specific information regarding the case and the individuals associated with it. If you are unsure of any details please mark the appropriate area "UNK" (unknown) or contact a member of the Forensic Relationship Team for further instructions.

Type of Investigation
Criminal Paternity
Kinship
Other

Table with 4 columns: Name, Alleged Relationship, Race, Date of Birth

Additional Questions for Criminal Paternity Cases

- 1. Are the mother and alleged father related? If YES, How?
2. Does the alleged father deny being the father of the child?
3. Are there any other possible fathers of the child?
• If YES, please provide additional info.

Case Summary

In order to improve the possibility of generating a complete DNA profile, the entire sample may need to be consumed.

May the DNA Analyst at their discretion consume (in their entirety) samples submitted in this case?

YES Name of Authorizing Individual