



Physical Evidence Bulletin

Collection of Biological Materials and Reference Samples for DNA Analysis

Purpose

The Physical Evidence Bulletin (PEB) is a guideline intended for law enforcement agencies to follow in order to submit evidence to BFS Laboratories. Physical Evidence bulletins are not intended to be used in lieu of training in the collection of evidence.

Analysis and results that may be obtained

The Bureau of Forensic Services (BFS) provides analytical support to law enforcement agencies through the identification of biological fluids. Biological evidence includes blood, saliva, semen, other body fluid stains, and trace DNA. Suspected biological stains can be tested to determine the type of body fluid present, and DNA analysis may be performed to link a particular stain to an individual. This can assist in identification of potential suspects.

Goals of Biological Evidence Collection

- Collect as much sample as possible from a single source.
 - Keep biological evidence stain concentrated.
 - Ensure that the sample is not inadvertently mixed with other biological samples (e.g., contaminated).
 - Wear gloves and change them on a regular basis or between items. Change gloves if they become stained with any biological sample.
 - Do not talk over any biological evidence sample or consider wearing a face mask.
 - Handle the sample in a manner, which minimizes deterioration of the sample.
 - When dealing with items for DNA analysis, do not touch your face, etc. with gloved hands. This can inadvertently transfer your DNA to the items.
 - Air-dry the sample as fast as possible, preferably in a stream of cool air.
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Minimum evidence required

Submit to the laboratory appropriate reference samples for all individuals involved in the case. This can include suspect and victim references, as well as users of items swabbed for touch DNA. DNA database (CODIS) samples are not evidentiary and therefore not suitable for use as a reference sample in an evidentiary case. The DNA database is for investigative leads in cases of unknown suspects. Also submit evidence items or swabs, substrate controls, and water blanks in the case of trace DNA (touch DNA) samples.

Collection of Biological Materials from Crimes Scenes or Evidence Items

Recommendations for collecting biological materials:

- Handle the evidence stains as little as possible. **When possible, submit the item with the stain.** This is the easiest and best method to collect biological evidence. If the stain is on a smooth, non-porous surface and can be easily dislodged, protect it from contact with other objects (e.g., immobilize in box).
- If the stain is on a large object with a porous surface (wood or carpet), the area with the stain can be cut out and packaged in paper (e.g., paper bag or wrapped in paper). Be sure to include a portion of the unstained material as a control.
- If it is not possible to collect the object or cut out the stain, the stain may be collected by using a **slightly moistened** (with distilled water) cotton swab. While collecting the stain, an effort should be made to **concentrate it onto a small area on the swab.** A substrate control sample of an unstained area close to the biological evidence stain should also be collected using the same distilled water and type of swab that was used to collect the evidence. Also submit a water blank swab of the water used for collection of the biological stains. Allow the swabs to air dry, then package individually in appropriately marked paper envelopes or folded paper bundles.
- The size of the stain should influence the size of a substrate used to collect the stain. Thus, use a small part of a swab or a micro swab to collect a small stain. Do not smear a small stain over a large surface.

Small biological evidence stains (e.g., 2 mm size bloodstain) samples need special handling:

- Put on a fresh pair of gloves before collecting these samples.
- Wear a face mask to avoid contaminating the sample with your own DNA.
- If the entire item can be submitted to the laboratory, then it should be packaged and submitted to the laboratory. If the entire item can't be submitted, then the stained portion of the item can be cut out using a new or disposable tool and packaged for submittal to the laboratory. If the stained portion can't be cut out, then a sterile swab is probably the best sample collection device.

Trace (touch) DNA samples need special handling:

- Trace DNA is material that can be deposited by touching or handling an item; however, just handling an item does not mean that trace DNA will be found.
- Trace DNA is a cumulative material. Subsequent handling of an item does not eliminate previous DNA that is already there. In most cases, trace DNA results in complex mixtures of DNA. Also, trace DNA has no context. There is no way to tell when the DNA has been deposited or how it was deposited.
- Put on a fresh pair of gloves before collecting these samples.
- Wear a face mask to avoid contaminating the sample with your own DNA.
- If the entire item cannot be packaged for submittal to the laboratory, then a sterile swab is probably the best sample collection device. Lightly moisten two sterile swabs with distilled or sterile water and hold them together while thoroughly swabbing the surface.
- Submit a water blank swab (a swab moistened with the same water source used for the sample) for a control in cases of trace DNA.

Try to minimize the amount of time a sample is kept wet. Air-dry all wet stains and swabs as soon as possible. Do **not** expose to heat or sunlight in an attempt to dry the stain.

In cases of fetal tissue, contact the laboratory for packaging and submittal requirements. **Do not use any preservatives** and place the fetal tissue in a clean container.

Package all biological evidence in paper bags or envelopes. Do not use plastic:

- Allow stains to air dry as much as possible before placing in paper bag or envelope.
- Package the “unstained control” separately from the evidence stain.
- Package different evidence items in separate paper containers.
- Ensure that the paper container is large enough to allow air circulation around evidence item.
- Clean paper can be placed on (or in) a bloodstained garment and the garment folded so that the paper prevents contact between different stains. Ensure that while items are drying that the stain pattern(s) are not altered or the stain(s) cross-contaminated with other wet stain(s).
- Metal or glass evidence item (e.g., knife or broken, glass bottle), should be secured with wire to the bottom of a cardboard box so that it does not pierce the sides of a paper container. If not secured, blood on a knife blade can become easily dislodged and lost. Do **not** freeze metal or glass evidence items with blood or other body fluid stains. Submit these items to the laboratory as soon as possible.
- Tape seal, initial, and date all paper bags or envelopes.

Collection of Reference Samples From Living Subjects

Reference Samples from Victim, Suspect, and Other Individuals involved in the Case:

- Reference samples are important for the interpretation of DNA profiles. In many cases, mixtures are obtained in DNA analysis. Reference samples from the victim(s), suspect(s), and other individuals involved in the case are required for interpretation of DNA results.
- Collect at least one blood sample, approximately 5cc, in a lavender-stoppered tube [**containing EDTA**]. The crime laboratory should be informed if the subject had recently received a blood transfusion of any kind. The tubes should be placed into a labeled envelope.
- Alternatively, an oral (mouth) swabs (e.g., swabs of the inside of cheek) can be used as a reference sample. If oral samples are obtained, take 2 sterile swabs and vigorously rotate the swab on the inside surface of the subject’s cheeks. **It is imperative that these samples be dried as soon as possible.** When the samples are dry, they may be placed into a labeled paper envelope or bag.
- The evidence envelope/bag should be labeled, taped sealed, initialed, and dated.

Collection of Reference Samples From Postmortem Subjects

Reference Blood Samples:

- Blood samples should be obtained from non-body cavity areas such as heart or major internal blood vessels. Collect at least one blood sample (approximately

5cc), in a lavender-stoppered tube [**containing EDTA**].

- If the body has decomposed, in addition to the blood sample, **collect as many of the following specimens as possible**: fingernail cuttings, a portion of deep muscle tissue, certain organ tissue (e.g., heart or brain, **not** liver or kidney), 2-4 intact molar teeth (if identification is an issue, ensure that mouth x-rays have been taken), and a sample of compact bone (e.g., femur). The specimens collected should be **away from site of injury** (i.e., if head injury, do **not** take sample of brain tissue). **Immediately freeze the specimens**, do **not** place in any preservative (e.g., formalin).
- The crime laboratory should be notified if the subject has received a blood transfusion. The subject's bloodstained clothing may be useful as a reference in this case. Air-dry and freeze these items.

CAUTIONS

Safeguards while handling biological evidence include:

- Wear disposable (e.g., latex) gloves
- Keep any contaminated surface (e.g., gloved hand) away from face to prevent contact with mucosal membranes (e.g., eyes, nose).
- After dealing with evidence, properly dispose of gloves and wash hands with germicidal soap.

Care should be taken to ensure that biological evidence is not contaminated during its collection:

- Wear clean gloves and consider wearing face masks. Change gloves between samples, especially if they become visibly stained.
- To avoid contamination, do not allow one evidence stain to come into contact with other biological samples.
- Minimize contact with sample. Do not talk or cough over biological evidence. Do not handle samples without using clean gloves.
- Each individual sample should be collected separately. Do not collect or package two separate samples together.
- Do not allow evidence samples to come into contact with any surface that contains residue from another biological sample (e.g., dirty tweezers, bloodstained glove, contaminated work surface).
- If tweezers must be used, use tweezers that have smooth, easy-to-clean working surfaces.
- Reusable tools (e.g., tweezers, scissors) must be cleaned by thoroughly rinsing with a stream of fresh 10% bleach followed by a stream of distilled water. Wipe dry with a clean tissue.

Evidence Storage

- Submit appropriate items to the BFS laboratory in your area as soon as possible. If there is a large amount of evidence, call your local laboratory and discuss the case prior to submitting the evidence.
- If the evidence cannot be immediately submitted to the laboratory:
 - Refrigerate **liquid** blood samples. Do **not** freeze.
 - Air-dry all items that contain wet biological evidence. Do not subject to heat.
 - Until submission to the crime laboratory, **freeze** all items containing biological evidence **except** for any **metal or glass items** (e.g., knives or

bottles). **Metal or glass** items should be **stored at room temperature** and submitted to the laboratory as soon as possible.

- Evidence from the scene, suspect, and victim must be handled and packaged separately.

The lab does not accept or process

The laboratory does not routinely process expended cartridge cases for trace DNA analysis. The laboratory does not accept syringe needles. Contact the laboratory prior to submission if there is a need for such items to be analyzed.

For further information and additional resources

Please contact your regional BFS laboratory with any further questions that you may have.

For a list of regional laboratories please go to:

http://ag.ca.gov/bfs/pdf/bfs_brochure.pdf or <http://ag.ca.gov/bfs/>

To locate the most current Physical Evidence Bulletins please go to:

<http://ag.ca.gov/ci/reference/reference.php#peb>
