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## Collection and Submission of Biological Materials and Reference Samples for DNA Analysis

### Introduction

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#### 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. Contact your local laboratory and discuss the case prior to submitting the evidence.

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#### Overview

- 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 touch DNA (sometimes referred to as trace DNA). Suspected biological stains can be tested to indicate the type of body fluid present, and DNA analysis may be performed to link a particular stain to an individual(s). This can assist in identification of potential suspects.
  - Guiding Principles of Biological Evidence Collection
  - Collect as much of a sample as reasonably possible from a single source.
  - Keep biological evidence stain concentrated.
  - Ensure that the sample is not inadvertently mixed with other biological samples (i.e., contaminated).
  - Wear gloves and change them on a regular basis and between items, especially if they come in contact with any biological sample.
  - Do not talk over any biological evidence sample. Wearing a face mask is strongly recommended.
  - Handle the sample in a manner which minimizes deterioration.
  - Do not touch your face or any exposed skin with gloved hands. This can inadvertently transfer your DNA to the items.
  - Air-dry the sample as fast as possible, taking care to avoid contamination between items.
  - While handling evidence with gloved hands, do not touch other personal items (e.g., cell phones, car door handles, eye glasses, etc.).
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## Acceptance Criteria

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### Minimum evidence required

Submit appropriate DNA reference samples (e.g., buccal swabs) for *all* known individuals involved in the case. This may include suspect, victim, and consensual partner references, as well as reference samples from users of items swabbed for touch DNA (*i.e.*, elimination samples).

These references are used for comparison and elimination purposes, regardless of CODIS eligibility, and may be necessary to process a case. If there are any questions regarding necessary reference samples, contact the laboratory.

DNA database arrestee and offender samples already in CODIS 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.

Substrate controls and/or water blank swabs should be collected when appropriate. It is typically not necessary to submit these to the laboratory unless requested.

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### Minimum information required

Submit (e.g., with the case evidence or emailed prior to submission) a case synopsis (or initial incident report) containing full descriptions of all evidence items, including relevance to the crime. This information is necessary in determining how best to proceed with testing of the submitted items and to assess CODIS eligibility. For example, if submitting a cigarette butt and the victim does not smoke, the synopsis/report should clearly reflect this.

*Note: A suspect profile developed from an item seized by law enforcement from the suspect's person or possession is not eligible for search in CODIS.*

If touch or otherwise low-level DNA samples are submitted (*e.g.*, small bloodstains, fingernail scrapings or clippings), the submitted documentation shall include explicit permission to consume these items; the **Authorization for Consumption of Biological Evidence Samples** (PEB 4A) may be used.

This documentation is necessary to process a case.

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**Samples NOT accepted for processing**

The laboratory does not accept syringe needles, feces, or urine (stains or liquid) for DNA analysis.

In order to provide timely DNA analysis, the laboratory does not *routinely* process the following:

- Expended cartridge cases, expended shot shells, and fired projectiles for contact DNA.
- Casual contact items or swabs from public areas, particularly if routinely handled by other individuals, such as keyboards, doorknobs, countertops, and pens
- Evidence related to possession of prohibited items (e.g., drug possession, firearms possession)
- Evidence related to misdemeanor charges

Contact the laboratory prior to submission for further clarification and special circumstances.

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## **Recommendations for the Collection of Biological Materials from Crime Scenes or Evidence Items**

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**General**

**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 (*e.g.*, 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 substrate control.
- If it is not possible to collect the object or cut out the stain, the stain may be collected by using a swab(s) **slightly moistened** with distilled/purified water. While collecting the stain, effort should be made to **concentrate it onto a small area** on the swab. In addition:
  - A substrate control sample of an unstained area close to the biological evidence stain should also be collected using the same water and type of swab that was used to collect the evidence.
  - A water blank swab should be collected when appropriate. It is typically not necessary to submit these to the laboratory unless requested.
  - Allow the swabs to air-dry, then package separately in appropriately marked paper envelopes or folded paper bindles.
  - Swabs used to directly test for blood using the presumptive blood test Hemastix shall not be submitted to the laboratory for further testing; a new sterile swab must be used to collect the remaining stain if Hemastix testing is performed. Hemastix pads shall also not be directly applied onto an evidence item for testing; the suspected stain must be swabbed and then applied to the Hemastix pad for testing.
- 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.

- **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, place the tissue in a clean container and **do not use any preservatives.**
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**Collecting small stains**

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

- Put on a fresh pair of gloves before collecting these samples.
  - Avoid talking near the evidence.
  - Wear a face mask
  - 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 swab the area with a sterile swab.
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**Collecting touch DNA**

Touch DNA is material that can be deposited by touching or handling an item; however, just handling an item does not mean that touch DNA will be found. Touch DNA is a cumulative material. Subsequent handling of an item does not necessarily eliminate previous DNA that is already there. In most cases, touch DNA results in complex mixtures of DNA. Also, touch DNA generally has no context, making it difficult to tell when or how the DNA was deposited.

**Touch DNA samples need special handling:**

- Put on a fresh pair of gloves before collecting these samples.
  - Avoid talking near the evidence.
  - Wear a face mask.
  - If the entire item cannot be packaged for submittal to the laboratory, then swab the area of interest using a sterile swab lightly moistened with distilled/purified water.
  - Substrate control samples are not generally applicable to touch DNA samples.
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## Packaging

**Package all biological evidence in paper bags or envelopes as described below. Do not use plastic.**

- Allow stains and swabs to air-dry as much as possible before placing in paper bag or envelope.
  - Package all controls separately.
  - Package different evidence items in separate paper containers.
  - Evidence from the scene, suspect, and victim must be handled and packaged separately.
  - Clean paper can be placed on (or in) a bloodstained garment and the garment folded so that the paper prevents contact between different stains. While items are drying, ensure that the stain patterns are not altered or cross-contaminated with other wet stains.
  - Sharp or glass evidence items (*e.g.*, knife or broken glass bottle) should be packaged in a rigid container and, if possible, secured to immobilize. If not secured, blood on a knife blade can become easily dislodged and lost.
  - Do **not** freeze or refrigerate metal or glass evidence items with blood or other body fluid stains. Submit these items to the laboratory as soon as possible.
  - Tape-seal and initial across the seal of all packaging.
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## Recommendations for the Collection of Reference Samples

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### Victim, suspect, & others

Reference samples are important for the interpretation of DNA results. In many cases, mixtures are obtained in DNA analysis. Reference samples from victims, suspects, and other individuals (*e.g.*, consensual partners and elimination samples) involved in a case may be required for interpretation of DNA results. Meaningful comparisons can often be made to DNA results that do not meet the thresholds for CODIS upload.

Collect buccal (inner-cheek) swabs by taking two sterile swabs and vigorously rotating the swabs 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.

Alternatively, collect blood using a lavender-stoppered tube. The crime laboratory should be informed if the subject has recently received a blood transfusion. The tube should be placed into a labeled container and refrigerated.

The evidence envelope must be labeled with pertinent case information, including the subject's name. Tape-seal and initial across the seal of the envelope.

Submit reference samples to your local BFS laboratory. DO NOT submit reference samples to the CAL-DNA Databank.

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## Postmortem subjects

Blood samples should be obtained from non-body cavity areas such as heart or major internal blood vessels. Collect blood in a lavender-stoppered tube, on a bloodstain card, or on two swabs.

The crime laboratory should be notified if the subject has recently received a blood transfusion. The subject's bloodstained clothing may be useful as a secondary reference. Air-dry and freeze these clothing items.

If the body has decomposed and a blood sample is not available, routine collection should include the following: nails or nail cuttings, 2-4 intact molar teeth (if identification is an issue, ensure that mouth x-rays have been taken), and/or a sample of compact bone (*e.g.*, femur). Do **not** place any collected item into preservative (*e.g.*, formalin).

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## Cautions

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### Safeguards

#### **Safeguards while handling biological evidence:**

- Wear disposable (*e.g.*, latex or nitrile) gloves
  - Keep any contaminated surface (*e.g.*, gloved hand) away from face or other exposed skin to prevent contact with mucosal membranes (*e.g.*, eyes, nose).
  - Follow your agency's universal precaution policies when handling evidence with potentially infectious materials.
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### Prevent contamination

#### **Care should be taken to ensure that biological evidence is not contaminated during its collection. This includes:**

- Wear clean gloves and a face mask. Change gloves between samples and if they become visibly stained.
  - Do not allow an evidence stain to come into contact with other biological samples.
  - Minimize contact with the sample. Do not talk or cough over biological evidence.
  - Each sample should be collected separately. Do not collect or package two 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.
  - Single-use tools are recommended. Reusable tools (*e.g.*, tweezers, scissors) and placards must be cleaned by thoroughly rinsing with a suitable cleaning agent, such as 10% bleach.
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### Storing 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, if possible, **freeze** 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**.

## Guidance on the use of RAPID DNA Instruments

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Refer to Physical Evidence Bulletin 30 (Use of RAPID DNA Systems) for information on the use of RAPID DNA Instruments.

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## Other

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### 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 BFS laboratories please go to:

<http://oag.ca.gov/bfs/services>

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

<https://oag.ca.gov/bfs/peb>

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### Authorization for Consumption of Biological Evidence letter

Refer to the **Authorization for Consumption of Biological Evidence Samples** (PEB 4A), which is saved as a separate document on the California Office of the Attorney General's website (<https://oag.ca.gov/bfs/peb>).

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### Rapid DNA Service (RADS)

RADS refers to the expedited processing of sexual assault evidence kits.

- Up to three of the most probative evidence samples from the complete sexual assault evidence kit, as well as a reference sample from the victim, are sent directly to the lab for testing.
  - A duplicate of these samples should remain in the complete sexual assault evidence kit.
  - Biological fluid screening is not conducted on these samples; however, this type of testing can be performed on the remaining samples from the complete sexual assault evidence kit, if necessary and requested.
  - The submission of any additional evidence (other than reference samples for comparison), including the complete sexual assault evidence kit, should not be made until the completion of the RADS report.
  - If the RADS analysis did not yield probative results or additional work is requested, the complete sexual assault evidence kit or other evidence items may be submitted for analysis. In consideration of the case information, these additional submissions may yield additional probative results foreign to the victim.
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