



Physical Evidence Bulletin

Hair and Fiber Evidence

Purpose

Many crimes involve direct physical contact between a victim, suspect, and/or their surroundings. Whenever such contact occurs, there is frequently an inadvertent transfer of evidence. This evidence transfer is usually hairs and fibers. This type of evidence, which can be microscopic in form, may often be overlooked by investigating officers because it is not easily observed.

The Physical Evidence Bulletin is a guideline intended for law enforcement agencies for the collection and submission of 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 examination of hair and fiber evidence.

The examination of fiber and hair evidence is usually comparative. It can associate persons, places, and objects. Individual fibers cannot be 'matched' to a single source. However, a torn or cut piece of fabric may be physically fit (as a jigsaw) to another piece of fabric, thereby making a definitive association. Hairs cannot be "matched" to an individual; however, successful typing of DNA in hair increases the strength of an association.

Types of cases in which fiber and hair may be of value as evidence:

Assault/Rape/Homicide: These types of crimes often involve personal contact. Therefore, fibers and hairs may be exchanged between victim and suspect and/or their respective environments and apparel. Weapons and fingernail scrapings also may be important sources of this evidence. Bindings, such as rope, may also transfer fibers.

Burglary: Clothing fibers may be found at the point where a burglar may have crawled through a window or other opening. If no head covering was used, hair may also be found.

Automobile Collisions/Hit-and-Run: Due to the forceful contact between a person and an automobile, clothing fibers and hair may be found adhering to the vehicle; for example fenders, grill, door handles, or parts of the undercarriage. Fabric impression patterns may also be observed on surfaces with which the fabric impacted. Hair and

clothing fibers adhering to interior spaces such as the windshield or steering wheel can assist in determining the driver of a vehicle.

Precautions

DNA may be detectable in hair; therefore, hairs should be stored frozen.

Depending upon case circumstances, other evidence may be present. An investigator may need to consider latent prints, tool marks, broken glass, shoe/tire prints, blood stains, saliva, and other trace evidence. See the Physical Evidence Bulletins for collection and preservation of other types of physical evidence.

Collection, marking, and packaging

General Packaging Considerations:

Place samples into appropriately sized containers; e.g., do not put very small items into very large envelopes. Containers may be vials, metal or cardboard pillboxes, or paper bindles placed into envelopes. Plastic should not be used for the packaging of small/loose trace evidence due to static electricity. Do not pack with cotton. All edges/corners of envelopes should be sealed to prevent sample loss.

Do not package wet evidence. Items should be air dried prior to packaging. Items may be wrapped in paper and then placed into an appropriate container. Do not wrap items on a table top without first thoroughly cleaning that surface. Avoid cross contamination between evidence and reference samples.

If evidence is collected by tape lifting, use only low tack tapes. Package tape lifts in clear page protector sheets, plastic or Kapak bags. Do not allow tape to adhere to itself or adhere to other packaging materials such as brown paper bags or cardboard. Do not use fingerprint lift tape.

Visible fibers/hairs attached to an inanimate object:

Photograph (if possible) and document.

- The fibers/hairs may be left in place and the object packaged in such a way that they cannot be lost in transit.
- If the fibers/hairs are very loose or the object cannot be transported, carefully remove with clean tweezers and package. Alternatively, tape lifts of the item can be taken.
- If the evidence is a torn piece of cloth, take care not to alter the edges during collection and transport.

Fibers/hairs possibly transferred to clothing or other objects and not visible to the naked eye:

Be sure the clothing or other object is dry before packaging, then carefully fold, wrap, and package each item separately (do not use plastic).

Fibers in hair of suspect or victim:

Vigorously comb the subject's hair over a clean, white paper using a clean, fine-toothed comb, disposable "pubic hair" brush, etc. Carefully fold the paper, together with the comb/brush, into a paper bindle to prevent loss of any trace evidence and place the

bundle in an envelope.

For the collection of evidence from dead bodies, refer to Physical Evidence Bulletin #22.

Reference samples:

Fiber References: When fibers have been collected by the investigating team, it is imperative that appropriate and adequate reference samples also be submitted. This could involve multiple references such as front and rear vehicle carpets. Reference samples should cover the range of characteristics including color, wear, weave pattern, etc. If the questioned sample is a swatch or section of fabric, consider a possible physical fit examination and collect reference samples accordingly.

Hair Sample References: Whenever hair is collected, the roots should be included because considerable information can be obtained during analysis. People may not like to have their hair pulled by another person; however, they can generally be persuaded to pull out enough of their own hair for root evaluation. The preferred method of sample collection is in this order: (1) pulled hairs, (2) backcombed hairs, and/or (3) close cutting.

Head or Scalp Hair. Hairs should be representative of the left temple, the right temple, crown, and the base of the neck. Ideally, at least 15-20 hairs from each area should be submitted.

Pubic and Other Body Hairs. When indicated by circumstances of the case or when requested by the laboratory, appropriate body hairs (pubic, chest, etc. - at least 15-20 hairs from each area) should be collected. Use a separate container for each area with appropriate labeling.

Animal Hairs. Comb and pull 50-100 hairs (pulling is again preferred as roots are needed for species identification in some animals). Hair should be pulled from the head, back, tail and underbelly of animals. If the animal is multi-colored in patches or stripes, samples from all major color areas should be obtained. Use a separate container for each area with appropriate labeling.

Submission of evidence to the laboratory

Label the container with the agency case number, item number, and brief description as appropriate. Tape seal the container; date and initial the seal. Submit evidence to the laboratory along with a completed Physical Evidence Submission Form (BFS-1) and, if available, a case report or case summary.

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/cci/reference/reference.php#peb>
