



INDIANA STATE POLICE FORENSIC SERVICES DIVISION

PHYSICAL EVIDENCE

BULLETIN

DNA ANALYSIS FOR HUMAN IDENTIFICATION IN MASS FATALITY INCIDENTS

INTRODUCTION:

A mass fatality event may require the need for identification of victims through DNA testing. The need to utilize DNA analysis resources will vary depending on the scope of the incident and the availability of such resources. The Indiana State Police (ISP) Forensic Services Division (FSD) is available to assist in the DNA identification of mass fatality victims. The ISP FSD is equipped to handle victim identification in most small to moderate scale mass casualty events. Consultation with the Laboratory Manager and Biology Section Supervisor is required.

The following sample types may be submitted for DNA identification of human remains in a mass fatality incident:

I. UNIDENTIFIED HUMANS (REMAINS)

- A. Skeletal, decomposed, or fragmented remains that are not identified by traditional means should be submitted. The coroner or identification authority should direct collection and submission of samples, including determination of the extent of identification required for each individual. Samples should be collected with sterile instruments to avoid contamination from other examined remains and stored separately in labeled containers. Only one fragment should be stored in each container. Gloves and instruments should be changed between samples. If disposable tools are not available, instruments should be cleaned with 10% bleach between each use. Samples should be stored without preservatives and be refrigerated and/or frozen as soon as practically possible. When possible, multiple samples should be collected from the same human remains to allow confirmation of DNA results, if necessary. The chance of obtaining a DNA profile from human remains is heavily dependent on the quality of the sample.
- B. The following sample types should be collected from each victim. They are listed in order of preference, depending on the condition of the remains.
 - 1. Submit an oral/buccal swab standard for remains that are intact and have suffered very little to no decomposition. If remains contain liquid blood, blood

can be collected with a sterile syringe into a purple-top vacutainer (containing EDTA) or, if appropriate, onto sterile, cotton-tipped swabs.

2. Submit approximately one square inch of tissue if little or no decomposition has occurred. Avoid tissues that may have been crushed together by incident impact.
3. Submit at a minimum one bone sample of at least three inches in length for more highly degraded remains. Cortical bone is preferred, avoiding anthropological landmarks, articular margins, fresh-broken margins, and full transection of bones. If possible, cut windows in long bones and crania.
4. Submit intact molars, upper or lower canine, or other intact teeth without restorations for highly degraded remains.
5. Submit other portions of soft or hard tissues that fit into a 50-milliliter conical tube for highly degraded or fragmented remains.

II. FAMILY REFERENCE STANDARDS

- A. Submit two oral/buccal swabs as a standard from parents, children, and full siblings of the putative victim.
- B. Due to the possibility that these reference samples may need to be sent to another forensic laboratory for analysis, a [Family Reference Collection form](#) shall be completed and signed by the donor for all family reference samples.

III. DIRECT REFERENCE SAMPLES

- A. Items that can logically be assumed to contain DNA from a putative victim should be submitted for comparison. Care should be taken to select items that should contain DNA only from the missing individual. Examples may include, but are not limited to:
 1. Medical samples such as slides, tissue specimens, or heel stick cards;
 2. Personal care items (for example: razor, toothbrush, or hair brush);
 3. Baby teeth; and
 4. Clothing, particularly unlaundered undergarments known to have been worn only by the putative victim.
- B. Family reference standards should also be submitted if possible to support the relationship as noted in section II.

IV. CONTACT INFORMATION

For more information or to obtain submission and consent forms, please contact a member of the DNA Mass Fatality Response Team at the Indianapolis Regional Laboratory or Lowell Regional Laboratory.

Indianapolis Regional Laboratory
550 West 16th Street, Suite C
Indianapolis, IN 46202
Telephone: 317-921-5300
Toll Free: 866-855-2840

Lowell Regional Laboratory
1550 East 181st Ave
Lowell, IN 46356
Telephone: 219-696-1835
Toll Free: 877-874-0009

Regional Laboratories hours: 8:00 a.m. to 4:30 p.m.; Monday through Friday

V. ADDITIONAL INFORMATION

- A. AAFS Standards Board Best Practice Recommendation 006: Best Practices Recommendations for DNA Analysis for Human Identification in Mass Fatality Incidents, First Edition 2018
- B. DNA Commission of the International Society for Forensic Genetics (ISFG): Recommendations Regarding the Role of Forensic Genetics for Disaster Victim Identification (DVI), FSIG 2007