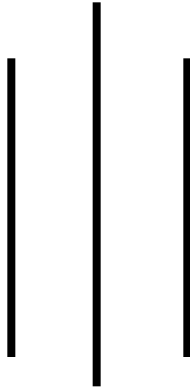


Guidelines for Collection and Preservation of DNA Evidence



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		Chief, DNA Unit	

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प्रयोगशालाका विशेषज्ञसँग सम्पर्क गर्न अनुरोध गरिन्छ ।

A. INTRODUCTION

The advent of DNA technology has revolutionized the field of criminal investigation as DNA evidence provides conclusive evidence in cases such as homicide, sexual assault, missing person identification, mass disaster etc. However, the success of DNA profiling result depends on the condition of the evidence. The improper collection, packaging and preservation of these evidences render the downstream analysis by the scientist useless.

All biological evidence is subject to deterioration due to microbial growth and environmental conditions. Careful collection and storage will ensure that this evidence is preserved so that useful information can be obtained from its analysis.

B. PURPOSE AND APPLICABILITY

The purpose of this Standard Operating Procedure (SOP) is to establish a uniform procedure and guidelines for the collection and preservation of DNA

evidence encountered in various types of crime scenes and also for the collection of reference samples. The procedures and guidelines outlined in this SOP are applicable to all Scene of Crime Officers (SOCOs), Investigating Officers, and Medical Doctors who are responsible for collecting and preserving DNA evidence in the course of crime investigation.

C. POTENTIAL SOURCES OF DNA

Evidence that could be subjected to DNA analysis is generally limited to substances that are biological in nature. The following is a list of biological materials from which DNA has been successfully isolated and analyzed:

- Blood and bloodstains
- Semen and seminal stains
- Tissues and cells
- Bones and organs
- Hairs with follicles
- Saliva (with nucleated cells)

Table: Potential DNA sources

Evidence	Possible location of DNA on the evidence	Source of DNA
Bite marks	Person' s skin or clothing	Saliva
Blanket, pillow, bed cover	Surface area	Blood, semen, saliva, hair, vaginal fluid, sweat
Bottle, can, glass	Sides, mouthpiece	Fingerprint, saliva, sweat
Dirty laundry	Surface area	Blood, dandruff, hair, semen, sweat
Door knobs	On the handle	Fingerprints, skin, sweat
Eye glasses	Nose or ear pieces	sweat, skin
Facial tissue, cotton swab	Surface area	Mucus, Blood, Sweat, semen, ear wax
Fingernail	Scrapings	Blood, sweat, tissue.
Hat, bandana, mask	Inside	Dandruff, hair, sweat
Stamp of envelope	Licked area	Saliva

Tape or ligature	Inside/outside surface	Skin, sweat
Through and through bullet	Outside surface	Blood, tissue
Tooth pick	tips	Saliva
Used cigarette	Cigarette butt	Saliva
Used condom	Inside/ outside surface	semen, vaginal or rectal cells
Weapons, e.g. baseball bat, knife, etc	Handle, end	Blood, fingerprints, flesh, sweat

D. ANTI-CONTAMINATION GUIDELINES

- ✓ Always wear disposable gloves and mask before touching any evidence. Change gloves between handling different items.
- ✓ Use disposable instruments or clean them thoroughly with 70 per cent alcohol or distilled water before and after handling each sample. Dry the instrument with paper tissue between uses.
- ✓ Avoid touching the area where you believe DNA may exist.

- ✓ Scene of crime officers' work area should be cleaned regularly with wipes containing chlorohexadine.
- ✓ Avoid talking, sneezing and coughing over evidence.
- ✓ Avoid touching your face, nose, and mouth when collecting and packaging evidence.
- ✓ Do not allow one evidence stain to come into contact with other biological samples or residue from other biological samples.
- ✓ Contact between victim and suspect samples should be avoided at all times.
- ✓ Air-dry evidence thoroughly before packaging. Do not subject evidence to heat or sunlight to dry it.
- ✓ Each evidence should be packaged separately into paper bags. Do not use plastic bags.
- ✓ Where possible, take the container to the evidence and not the evidence to the container.
- ✓ Each item should be packaged, sealed, and labeled as soon as it is taken.
- ✓ Ensure that any person attending a crime scene has no contact with a suspect or his/her clothing.
- ✓ Handle items as little as possible.
- ✓ Use bags of suitable size or shape. Do not force items into packaging that is too small.
- ✓ Seal all packaging securely with a unique seal.
- ✓ Never use staples or pins to seal packages.
- ✓ Never re-use packaging.

- ✓ Use clean containers (e.g. cool boxes, crates, boxes) for transport.

E. COLLECTION PROCEDURE

EVIDENCE	CONDITION	LOCATION	COLLECTION MODE
BLOOD	Liquid	Person	a. Collect in EDTA tube or treated paper (e.g FTA card, nucleic card, etc)
	Liquid	Scene	a. Use sterile cotton swab to soak up blood. b. Air dry
BLOOD	Clot	Scene	a. Use sterile cotton swab moistened with distilled water. b. Air dry.
BLOOD	Wet	Clothing	a. Air dry at room temperature. b. Package in paper bag.
	Wet	Small	a. Air dry at room

		portable object	temperature. b. Collect item as is.
	Wet	Snow	a. Scoop as much blood as possible. b. Place in a plastic container. c. Freeze sample
	Wet	Water	a. Collect sample with syringe. b. Place sample in plastic container. c. Freeze sample
DRIED BLOOD	Crust	Person Scene Object	Scrape crust into paper packet.
	Stain	Weapon	Collect item directly.
	Stain	Small object	Collect entire item.
DRIED BLOOD	Stain	Vehicle Upholstery Carpet Wallpaper Wood	a. Cut out stained area. b. Package separately c. Collect control.

	Stain	Unmovable surface Concrete wall	a. Collect with sterile cotton swab moistened with distilled water. b. Air dry.
	Spatters		a. Tape lifting. b. Place in container
SEMEN	Liquid	Victim	a. Collect sample with sterile cotton swab. b. Keep in refrigerator.
	Liquid	Object Scene	a. Collect with dry sterile cotton swab. b. Air dry
	Wet	Clothing	a. Air dry. b. Package separately in paper envelope.
	Stain	Clothing	a. Collect as is. b. Package separately in paper envelope.

	Stain	Carpet Upholstery	a. Cut out section with stain. b. Collect control.
	Stain	Unmovable surface	a. Collect with sterile cotton swab moistened with distilled water. b. Collect control.
SALIVA	Liquid	Person	a. Direct deposit in container. b. Keep refrigerated.
	Stain	Scene	a. Collect the stained area. b. Collect control.
	Stain	Clothing Object	Collect as is.
TISSUE ORGAN BONE	Fresh	Scene	a. Place in container. b. Keep refrigerated.
	Dried	Scene	Place in container.

HAIR	With Tissue	Scene	a. Collect hair with tissue in container. b. Keep refrigerated.
	With Blood	Scene	a. Separate hair from blood. b. Air dry. Collect in paper packet.
	Intact Hair	Scene	a. Pick up sample with clean forceps. b. Place in paper packet.
	Fragments	Scene	a. Tape lift. b. Package in container.

F. GUIDELINES FOR MEDICO-LEGAL EXPERTS

- Soft tissue should be collected in suitable clean plastic container having saturated salt solution and frozen. Avoid using glass container as they may break. Tissues should never be preserved in Formalin.

- In case of mass disasters, accidents, burnt or mutilated bodies, 2-3 tissues like deep muscle tissue, skin, or other least affected tissue (about 5g) should be collected during autopsy in clean & sterilized containers and be transported in refrigerated condition.
- When only skeletal remnants are available, teeth(2 to 3 entire teeth preferably molar or pre-molar and long bones (femur or humerus) should be cleaned properly to remove sticking debris, and sent to the laboratory in paper/cloth parcel at room temperature.

If tissue still found attached to the bones, it should be packed in airtight plastic container, refrigerated and sent to the laboratory as early as possible in icebox. ***(Completely burnt/charred bone should not be sent for DNA analysis.)***

- Foetal tissues and maternal tissues must be separated at the time of collection.

Sample collection from sexual offence victims

- A standard rape kit must be used to collect vaginal, oral and anal evidence as necessary.
- Potential evidence from the victim's body would include:
 - Blood on treated paper (FTA card/ nucleic card/ blood in EDTA tube/bucal swab) as **Reference DNA sample** from the victim: this is used for identification and elimination purposes.
 - Genital swab(s): these may contain DNA transferred by the perpetrator (for example, sperm cells or penile epithelial cells)
 - Swabbing of the breast and external genital areas: DNA from sperm cells and DNA from epithelial cells transferred via the mouth or hands (As per circumstances)
 - Fingernail clippings or scrapings: may contain skin cells or blood of the perpetrator transferred during the attack. (As per circumstances).

- Pubic hair combings: transfer of foreign pubic hair (As per circumstances).
- Victim's clothing:
 - Underwear: DNA from seminal fluid or epithelial cells
 - Outer clothing: DNA from possible body fluids
- The vaginal swabs or smear on slides in sexual assault cases should be properly dried and packed separately.

G. COLLECTION OF REFERENCE (CONTROL) SAMPLE

Reference samples are the samples which are necessary for comparison and elimination purpose. Source of a biological clue material can be identified only by analysis of the authenticated control sample of that individual. Control biological sample like buccal swab or blood (blood on treated paper like FTA card or nucleic card, etc, dried blood stain on sterile gauze, blood about 2 ml in EDTA tube) should be collected by the doctor along with duly filled "**Biological Sample Authentication Form**" in duplicate. The case should

always be forwarded with the control samples of individuals whose biological clue material is suspected to be present on the exhibits.

In case of non-availability of an individual, exclusive items of the individual expected to carry his secretions or body cells like toothbrush or razor etc may be sent for analysis. Otherwise control samples of the close relatives are desired. In case of blood transfusion or organ transplantation, oral swab may be collected as control sample. Some of the probable scenarios are as follows:

Murder, physical assault, rape or sexual assault: Control samples of all suspects & victims

Unidentified bodies/accident/mass disaster:

- a. Exclusive items of suspected deceased expected to carry his secretions or body cells (Tooth brush, razor, etc)
- b. Control samples of suspected deceased's parents

- c. In case, one of the parent is not available for testing, control sample of brothers or sisters of suspected deceased along with surviving parent, or
- d. Control samples of the spouse of the suspected deceased with children

Parentage Disputes: Control samples of child, putative mother and father

H. HOW TO FORWARD A CASE FOR DNA PROFILING?

The case should be forwarded to the Chief, CPFSL along with the **Forwarding Note** (Annex-I) for forensic examination. The Forwarding Note should contain and accompany following items:

1. A brief statement of facts relating to the history of case.
2. Duly sealed and marked exhibits and control blood samples.
3. Duly filled “Biological Sample Authentication Form” (Annex -II) in duplicate for control samples.

4. Sample seal(s) in sealing wax with which exhibits have been sealed.
5. Copy of Post-mortem or medico-legal report of victims(s) & suspects(s).

I. WHAT INFORMATION SHOULD THE LABEL ON PACKAGE CONTAIN?

The labeling should contain the following information:

- Parcel no.
- FIR no.
- Crime
- Name of police station
- Exhibit no.
- Name of exhibit
- Source of exhibit
- Date of recovery(collection)
- Names and signatures of two witnesses and Investigator

३. परिक्षणको किसिम: आवश्यकता अनुसार (✓) चिन्ह लगाउनुहोस।

१	२	३	४	५	६	७	८	९	१०
विषय विज्ञान	रसायन - ला.औ.	विष्फोटक पदार्थ	विवादास्पद प्रलेख	भौतिक विज्ञान	आग्न्यशा स्त्र	वायो सेमे	डी.एन.ए.	औलाछाप	अन्य

४. खुलाउनु पर्ने कुराहरु:

क)

ख)

ग)

घ) परिक्षणको क्रममा अन्य केहि कुरा खुल्न सक्ने भए सो समेत खुलाई पठाई दिनु हुन।

६. नमुनाहरुलाई सिल गरिएको सिलको नमुना छाप:



अनुसन्धान अधिकृत

कार्यालय प्रमुख

सही.....

नाम.....

दर्जा.....

सम्पर्क फोन :.....

सही.....

नाम.....

दर्जा.....

छाप.....

७.बोधार्थ :

श्री प्रहरी कार्यालय,....., आ.प्र. शाखा,

प्र..... श्री उल्लेखित नमुना सुरक्षित साथ मजकुर प्रयोगशालामा बुझाई भरपाई लिई

फिर्ता हुनका निमित्त

Annex-II

BIOLOGICAL SAMPLE AUTHENTICATION FORM

Particulars of donor/source

Name (in block letters):

Relationship to the Victim:

Father's/Guardian's/Husband's Name :

Sex: Male Female Date of Birth (or age):

Affix recent
passport size
photograph
duly attested Do
not Pin/Staple

Affix recent
passport size
photograph du
attested
Do not
Pin/Staple

Caste:

Address:

Medical History

Normal:

Chronic Disease:

Genetic Disorders if any:

Blood Transfusion, if any, in past three months:

Organ Transplantation, if any:

B. Case Details:

Case No.

Dated:

P.S.

Crime:

C. Purpose for conducting test:

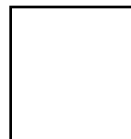
D. Declaration by the blood donor:

I.....hereby certify that the biological sample
being collected for DNA examination is of mine/of my child.

Signature of Donor/Guardian

Name:

Date:



Left Thumb

Right Thumb

Impression

Impression

E. Sample Collection: *(Blood sample may be collected on FTA card or Nucleic card by Doctor of a Govt. Hospital, and sealed in paper envelope. Alternatively, buccal swab or about 2 ml of blood should be collected in sterilized tubes using EDTA as anticoagulant. The tubes should be duly preserved in an ice container for transport.)*

Nature of sample : Blood stain on FTA card or Nucleic card/Liquid blood/bloodstain/buccal swab

Amount:

Date of collection:

Blood collected by:

Seal impression:

Signature of Medical Officer:

Name & Designation with stamp

F. Details of Investigating Officer/Witness : *(Collection of sample should be done in presence of two witnesses)*

Witness

Witness

Signature:

Signature:

Name:

Name:

Designation:

Designation:

Address:

Address:

[For Office use only]	
CPFSL Case No:	Date of receipt:
Exhibit No:	Received by:
Date of report:	Examined by: