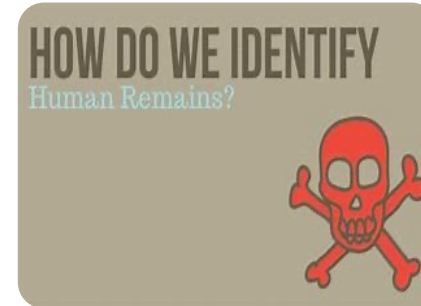


The Use of DNA in Human Remains Identification in Forensics



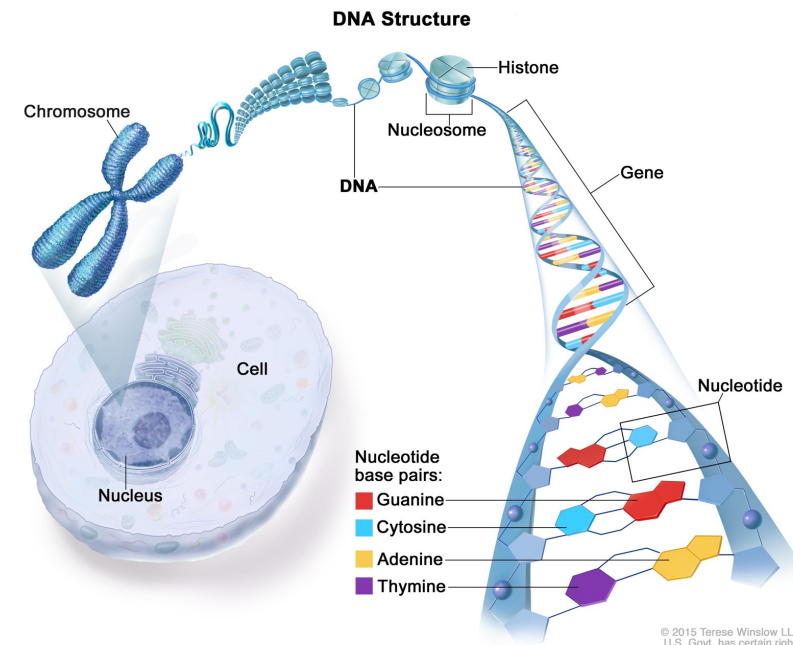
ADESOLA ONABANJO, MSc

Forensic DNA Analyst

LSD&FC

Overview

- Dental and fingerprints records can be used for the identification of Human Remains.
- In the absence of the above, unequivocal identifications can be performed using DNA if appropriate specimens are available.



Steps in Human Remains Identification

- ▶ **Physical Investigation**

- ▶ Police
- ▶ Fill/Sign a missing person's report

- ▶ **Recovery of Remains**

- ▶ DNA Degradation
- ▶ Sample Type

- ▶ **Laboratory Management**

- ▶ Accessioning, Itemization and Photo-documentation

- ▶ **Analysis and Technology**

- ▶ **DNA Profile Comparison**

- ▶ Relatives
- ▶ Personal Items

Human Remains Identification

- ▶ Preservation of samples in chemicals?
- ▶ Recommended sample types:
 - ▶ Deep tissue
 - ▶ Bone
 - ▶ Teeth

References for Identification

Family DNA sample (Family Reference)

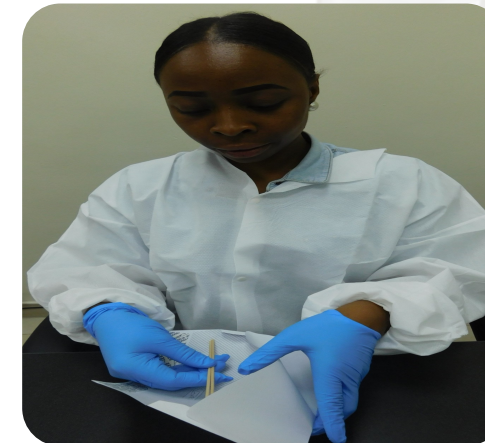
Buccal swab

Personal item of the victim (Direct Reference)

Toothbrush

Comb

Razor



Background

- A person went missing in March 2021.
- Human Remains recovered in March 2022 close to where the person was last seen.
- Items of evidence recovered and submitted to LSD&FC in June 2022 includes
 - a) Bone fragments, teeth, piece of clothing matching what the missing was last known to be wearing
 - b) Known biological relatives of the missing person.



Laboratory Analysis

- Extraction
- Quantitation
- Amplification
- Capillary Electrophoresis



Extraction Technique

Lysis Buffer

Solubilization of Stain Components

SDS and Proteinase K

Cell lysis, DNA Release and
Protein denaturation

Phenol Chloroform Isoamyl Alcohol

Removal of Denatured Proteins

Centrifugal Devices for Concentrating DNA

Laboratory Equipment Utilized



Qiagen Rotor GeneQ

Quantitation



Thermal Cycler

Amplification



Genetic Analyzer

Capillary Electrophoresis

Statistical Analysis and Verification

SmallPond Software

- DNA Matching Technology
- DNA profiles can be imputed onto the database and matching can be conducted.

Independent Manual Verification

Conclusion

- ▶ Using the methods described we were able to unequivocally identify the human remain as that of the victim as of a jet crash in Nigeria.
- ▶ This provided legal and humanitarian support .

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