

## ITSI Biosciences Newsletter

### In this issue:

- Why preserve DNA?
- Collection and Preservation of DNA.
- Best Practices for Preservation.
- How preserved DNA can be used.

## Preservation of DNA for Future Use

Preserving DNA is crucial for various applications, including establishing biological relationships. Whether it's for verifying paternity, tracing ancestry, or identifying remains, maintaining the integrity of DNA samples over time is essential. Here, we describe the methods and importance of preserving DNA for future use.

### Why Preserve DNA?

DNA preservation is vital for several reasons:

1. **Forensic Investigations:** DNA can link suspects to crime scenes or identify unknown remains.
2. **Biological relationship and Genealogical Research:** Determining biological relationship (paternity, maternity, sibship, avuncular, grand parentage) and tracing family history and ancestral origins relies heavily on DNA analysis.
3. **Medical Purposes:** Preserved DNA can be used for genetic testing. This can predict susceptibility to diseases and inform personalized treatments.
4. **Conservation Biology:** Preserving the DNA of endangered species helps in their conservation and understanding of genetic diversity.

*“DNA, or Deoxyribonucleic acid, is the blueprint of life, containing the genetic information that makes each individual unique...”*

### Collection and Preservation of DNA

There are several techniques to preserve DNA, ensuring it remains intact and viable for future use.

1. **Proper Collection:** The first step in DNA preservation is proper collection. Sterile techniques should be used to avoid contamination. Samples can be collected from various sources, including blood, saliva, hair, tissue and skeletal remains.
2. **Dry Storage:** Drying samples such as blood and saliva on filter paper, is an effective method for long-term preservation of the DNA in such samples. The dried samples can be stored at room temperature, protected from light and humidity, ensuring the DNA remains stable. ITSI Biosciences supplies products that can be used to preserve biological samples and extracted DNA at room temperature.



3. Refrigeration and Freezing: Storing DNA at low temperatures slows down the degradation process. Refrigeration (4°C) is suitable for short-term storage, while freezing (-20°C, -80°C or lower) is recommended for long-term storage. Frozen samples should be kept in airtight containers to prevent moisture and contamination, and multiple freeze-thaw cycles should be avoided.

4. Chemical Preservation: Chemicals like ethanol or isopropanol can be used to temporarily preserve DNA in liquid form. These chemicals inhibit the activity of enzymes that can degrade DNA. The samples are stored in a cool, dark place to maintain their integrity.

5. Silica Gel Storage: Silica gel can be used to dry and preserve DNA. The sample is placed in a tube with silica gel, which absorbs moisture and prevents DNA degradation. This method is particularly useful for preserving DNA from ancient or degraded samples.

6. Commercial DNA Preservation Kits: Various commercial kits are available for DNA preservation. These kits often include solutions and protocols for collecting, stabilizing, and storing DNA samples efficiently. They are designed to maintain DNA integrity over extended periods. Several proprietary products such as ITSIProtect-DNA are available for preservation of DNA in the dry-state and liquid-state, and at room temperature. Using ITSIProtect-DNA reduces the cost of shipping and storage of DNA significantly.

## Best Practices for DNA Preservation

To ensure the best preservation of DNA, follow these best practices:

1. Avoid Contamination: Use sterile equipment and techniques to prevent contamination from external DNA.
2. Label Samples Clearly: Proper labeling of samples with relevant information (date, source, etc.) is crucial for future reference.
3. Store in a Controlled Environment: Keep samples in a stable environment with controlled temperature, humidity, and light conditions.
4. Regular Monitoring: Periodically check the condition of stored samples to ensure they remain intact and viable for analysis.

## How Preserved DNA Can be Used

Preserved DNA can be used in many ways including:

1. Paternity and Maternity Testing: DNA testing can confirm biological parentage with very high accuracy. Preserved DNA samples from parents and children can be compared to establish biological relationships. DNA collected from the elderly before they die can be preserved and used to accurately identify their biological offsprings in the future. This will prevent the need to exhume the body to obtain skeletal remains.
2. Ancestry and Genealogy: DNA preserved from multiple generations can help trace family lineage and ancestral origins. This is particularly useful for genealogical research and constructing family trees.
3. Identification of Remains: In forensics, preserved DNA can be used to identify unknown remains, linking them to living relatives and providing closure to families.
4. Medical History and Genetic Disorders: Analysis of preserved DNA can provide insights into inherited medical conditions, helping future generations understand their genetic risks and take preventive measures.

## Conclusion

Preserving DNA for future use is essential for various scientific, medical, and genealogical applications. By using proper collection and storage techniques, we can ensure the integrity of DNA samples, enabling accurate analysis and establishing biological relationships. Whether for determining paternity, maternity, solving crimes, tracing ancestry, or understanding genetic diseases, DNA preservation is a cornerstone of modern science and an invaluable resource for future generations. Organizations such as ITSI-Biosciences ([www.itsibio.com](http://www.itsibio.com)), the Lagos State DNA & Forensic Center ([www.lsdfc.org](http://www.lsdfc.org)) and Concurrent Technologies and Services ([www.ctsdna.com](http://www.ctsdna.com)) offer DNA testing services to help answer different questions in life. Visit their websites to take advantage of their expertise.

DNAnews is a monthly newsletter by ITSI Biosciences LLC. The purpose is to provide some information about DNA and how it is currently being leveraged to answer many pertinent questions in life today. For questions/comments please send an email to Editor, DNAnews, [itsi@itsibio.com](mailto:itsi@itsibio.com).