

# ***Rethinking DNA and RNA Sample Preservation: A New Era for Life Science Research***

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In molecular biology and genomics, the quality of DNA and RNA samples determines the quality of scientific discoveries. Whether supporting disease research, precision medicine, drug discovery, or population health studies, preserving nucleic acid integrity from the moment of collection to analysis remains one of the most critical challenges in modern life science.

For decades, laboratories have relied heavily on frozen storage and temperature-controlled transportation to maintain sample quality. While effective, these approaches require costly cold-chain logistics, specialized infrastructure, continuous power supply, and careful handling. In many settings, including aliquoting and processing in the laboratory, remote field locations, decentralized clinical trials, and international sample shipments, these requirements can be complicated, or significantly increase costs and operational complexity.

Fortunately, advances in sample stabilization technology are changing this paradigm.

## **Moving Beyond the Cold Chain**

Innovative preservation technologies now enable biological samples to be handled, transported, and stored at room temperature while maintaining the integrity of DNA and RNA. By eliminating dependence on freezing and refrigerated transport, researchers can reduce costs, simplify workflows, and improve access to high-quality molecular testing across diverse environments. This shift is particularly valuable for:

- Clinical trials involving multiple collection sites
- Biobanks seeking cost-effective short or long-term sample preservation
- Next-generation sequencing laboratories
- Drug discovery and biomarker research
- Field studies and epidemiological surveillance
- Sample collection in remote or resource-limited regions
- Cross-border transportation of biological specimens
- Prevention of sample breakdown during multiple free-thaw cycles

## **Innovation That Supports Better Science**

At the forefront of this transformation, ITSI Biosciences has developed **ITSIprotect-DNA** and **ITSIprotect-RNA**, innovative sample stabilization technologies designed to preserve nucleic acids in biological fluids, including blood, in a dry state and at room temperature.

These products help maintain DNA and RNA integrity when collected and throughout handling in the laboratory, transportation, and storage, reducing the risks associated with temperature fluctuations, freeze-thaw cycles and prolonged transit times. By simplifying logistics while protecting sample quality, they allow researchers to focus more on generating reliable scientific data and less on maintaining an expensive cold chain.

The benefits include:

- Preservation of DNA and RNA integrity during handling, transport and storage
- Dry-state, room-temperature sample stabilization
- Reduced dependence on refrigeration and freezing
- Lower storage and transportation costs

- Simplified sample collection and logistics
- Improved accessibility for remote and decentralized research programs
- Greater flexibility for international sample shipment

### **Supporting the Future of Precision Research**

As precision medicine, organoid research, spatial proteomics and genomic technologies continue to evolve, sample preservation methods must evolve as well. Reliable stabilization technologies are becoming essential components of modern laboratory workflows, enabling researchers to generate reproducible, high-quality data while improving operational efficiency.

With more than 21 years of experience providing bioanalytical services and innovative sample preparation solutions, ITSI Biosciences continues to support pharmaceutical companies, biotechnology organizations, research institutes, government agencies, and academic laboratories with technologies designed to advance life science research.

The future of molecular research is not only about better analytical instruments or faster sequencing. It also begins with better sample preservation. By protecting DNA and RNA at the point of collection, innovative solutions like **ITSIprotect-DNA** and **ITSIprotect-RNA** are helping reshape how biological samples are handled, transported, and stored, making high-quality research more accessible, more efficient, more affordable and more sustainable than ever before.

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