

MEDICAL EXAMPLE
 $-112^{\circ}\text{F} = -80^{\circ}\text{C}$



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Best Practices for Biological Sample Storage and Management



October 06, 2022 | [Hannah Kent-Webb, Ph.D.](#)

Billions of biological samples are collected each year, but as Debra Lopez, Senior Director Supply Chain at ATCC, explains they often undergo a significant journey from their point of origin to their final consumption. Developing an effective and accurate approach to sample storage and management is therefore vital to ensuring your samples remain protected and traceable throughout this journey—reducing sample loss, minimizing risk of degradation, and saving time.

Storage

Once you have collected your samples, considering how best to preserve and store them is an immediate priority. “Sample storage is a complex activity,” states Lopez. Choosing the correct storage depends both on the recommended storage temperature of your specific sample and how long it is likely to be stored for. For short-term storage, refrigeration or lab freezer storage at -4°F is ideal for biological

activity,” states Lopez. Choosing the correct storage depends both on the recommended storage temperature of your specific sample and how long it is likely to be stored for. For short-term storage, refrigeration or lab freezer storage at -4°F is ideal for biological samples, while long-term storage requires ultra-low temperature (-112°F) or cryogenic storage.

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Choosing the correct storage matrix is also important. Sample tubes or containers should be made of medical-grade resin as to ensure they will not crack due to extreme temperature, and

the buffer should be carefully chosen to prevent pH change between ambient and frozen states, Lopez explains. The size of the storage vessel is also key. Using a tube that is too large for a sample “means that you are not only wasting precious storage space but also increasing the likelihood a sample will get damaged,” explains Amy Armstrong, Senior Product Manager of Automation Storage at Thermo Fisher Scientific. It is therefore vital that every storage decision is carefully considered, and nothing is left to chance.

Sample identification and labeling

In addition to correct storage, clear and organized sample labeling is critical for effective sample management. Proper labeling makes samples quicker and easier to find, and reduces the risk of damage and contamination from people mistakenly opening them. In addition to clearly identifying the contents, labels that contain unique number identifiers or 2D barcodes are the best approach—linking them to a database containing further details about the sample, its location, and its processing.

The labeling method is also important. If you choose to use physical