

Smart Notes

Low profile cryotubes preserve tissue sample integrity



What kind of storage tube should I use to prevent the breakdown of RNA in tissue during cold storage?

Selecting the proper storage tube to protect the integrity of your tissue samples is imperative. During frozen storage, a primary concern is the breakdown of macromolecules of interest in the tissue sample. RNA in particular is susceptible to degradation over time under harsh storage conditions. Using an RNA integrity score, which quantifies the amount of RNA degradation in the sample, we can determine if tissue stored in various tube types is preserved at the level of quality desired.

RNA integrity is assessed by the amount of the intact RNA and the quantity of breakdown RNA fragments in each stored sample. RNA Integrity Number (RIN) scores are calculated using an Agilent™ bioanalyzer (Figure 1). The RIN score is largely independent of the amount of RNA used and the origin of the sample which allows for universal and unbiased sample comparison.



Will a traditional cryo storage tube prevent the breakdown of tissue during cold storage or is there a better option?

Comparison of RIN scores is made between samples stored in Thermo Scientific™ Nunc™ Low Profile Universal Tubes and those stored in traditional Nunc cryotubes (Figure 2). Both types of cryotubes effectively preserve RNA in tissue samples for long-term storage.

While standard Nunc cryotubes provide excellent protection, Nunc 5.0mL Low Profile Universal Tubes provide a wider

mouth and overall tube diameter than traditional cryotubes. This generous design allows the storage of larger tissue pieces than can fit in standard cryotubes, and facilitates adding and removing tissue sample from the tube. The wider opening permits easier manipulation of the sample, preventing handling damage. The added benefit of a 2D barcode enables sample tracking using a barcode reader and a database.

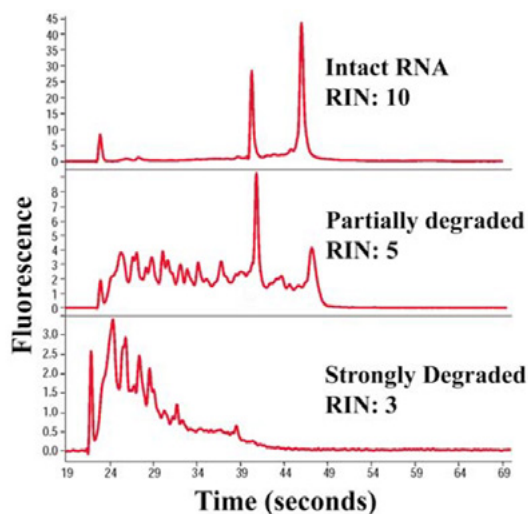


Figure 1. A RIN score from 1 to 10 is assigned to each sample, where level 10 RNA is completely intact. (cited from: <http://www.agilent.com>)

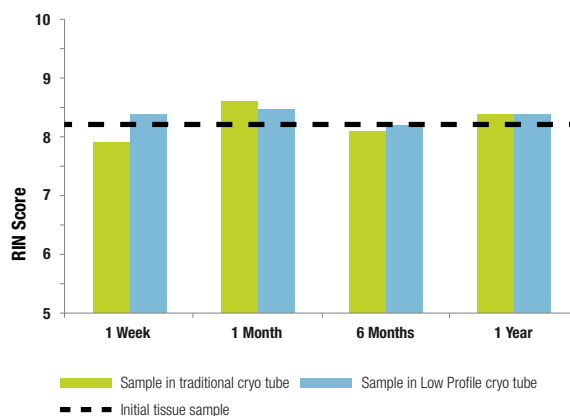


Figure 2. RIN scores of tissue samples stored in Nunc cryotubes over the course of one year. The dotted line represents the RIN score of the initial tissue sample prior to frozen storage.



Summary

Thermo Scientific Nunc 5.0mL Low Profile Externally Threaded Universal Tubes present a robust solution for tissue sample storage with the added benefit of 2D barcoding for easy sample tracking.



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North America: USA/Canada +1-585-586-8800; USA Toll-free: 800-625-4327
South America: USA sales support: +1-585-586-8800 **Countries not listed:** +49-6184-90-6000 or +33-2-2803-2000

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