

# HOW IT WORKS

## Protecting RNA Samples at Room Temperature

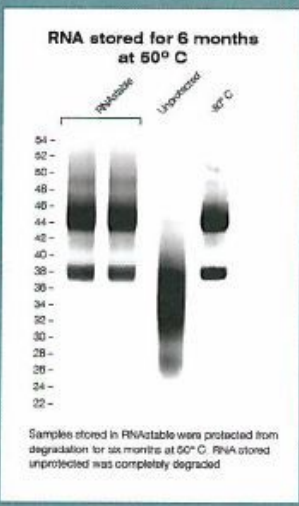
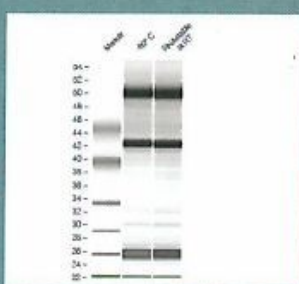
### Problem:

RNA samples are notoriously difficult to work with given their highly labile nature and tendency to degrade even under carefully controlled RNase-free conditions and maintenance in cold environments. Exposure to slightly elevated temperatures for even short time periods can compromise RNA integrity and detrimentally affect downstream assays and results. In addition, storing and transporting RNA samples under cold conditions can be very expensive, expending not only significant portions of laboratory budgets, but energy, as well.

### Solution:

RNAstable from Biomatrix, Inc., directly preserves and stabilizes purified RNA samples at room temperature for up to six months and has demonstrated an equivalent of three and a half years of stability under accelerated aging conditions. RNAstable technology was developed based on the natural principles of anhydrobiosis ("life without water"), a biological mechanism employed by some multicellular organisms that enables their survival while dry for more than 100 years. Anhydrobiotic organisms such as tardigrades and brine shrimp can protect their DNA, RNA, proteins, membranes, and cellular systems for survival and can be revived by simple rehydration.

The molecular principles of anhydrobiosis have been transferred to a synthetic chemistry-based stabilization technology. RNAstable works by forming a thermo-stable barrier, essentially "shrink-wrapping" and stabilizing fragile RNA molecules at ambient temperatures and providing protection against degradation. RNAstable is supplied as a dried matrix on the bottom of 1.5 ml microcentrifuge tubes or individual wells of multiwell plates. Each tube or well contains enough RNAstable to protect up to 100 µg of purified total RNA.



By applying liquid RNA samples into the tube or well, the dried RNAstable matrix is rehydrated and mixes with the RNA. The thermo-stable protective barrier is formed during the drying process and samples are protected from degradation during storage at room temperature in relative humidity conditions of <50%, a condition that can be achieved by maintaining dried samples in a moisture-barrier container or desiccating chamber.

Sample recovery simply requires rehydration. Since the rehydration volume can

range from 10 to 100 µl, storage of RNA in RNAstable provides an efficient method for sample concentration, eliminating the need for salt precipitations and sample loss due to multiple wash steps.

RNA samples recovered following storage in RNAstable can be used directly in downstream applications, such as quantitative RT-PCR, bioanalyzer, microarray analysis, end-point PCR, electrophoresis, cDNA synthesis, and reverse transcription, without inhibition or interference.

RNAstable is also effective in protecting samples at elevated temperatures of 50°C for up to six months. These accelerated aging conditions are equivalent to three and a half years of storage at room temperature. RNA samples preserved at 50°C using RNAstable are comparable to freezer-stored control samples, while the unprotected sample was completely degraded.

RNAstable provides confidence to scientists working with RNA samples, while also reducing costs typically associated with storing and transporting RNA using traditional methods. The unique storage medium allows for long-term stabilization of RNA samples at ambient temperatures. Sample recovery is achieved through a single rehydration step, resulting in RNA that is ready for immediate use without the need for further purification. Dried RNA samples can be stored with minimal effort on the bench top and can be shipped at room temperature, reducing reliance on costly freezer units. The integrity of RNA stabilized in RNAstable is protected against fluctuating and inconsistent temperatures commonly experienced during shipment. Sample stability is secured even during exposure to elevated temperatures for long time periods.

For more information contact Biomatrix at 866-379-6879 or go to [www.biomatrix.com](http://www.biomatrix.com).