

COMPARISON OF DNA STORAGE IN SAMPLE MATRIX AND TEFLON TUBES

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The ability to re-test genetic samples is essential to forensic work. Cases can be re-opened years down the road and having evidence to re-examine again becomes necessary. Biological evidence collected at crime scenes often comes in small quantities and at a low quality, making a method of long-term preservation essential.

The ability to recover and re-test biological samples is directly related to the quality of storage conditions, and by variables such as temperature, humidity, and the kind storage container. For example, it has been observed that certain polypropylene tube surfaces can cause DNA to denature and DNA can bind to the inside surface of the tube reducing recovery.

The traditional method of storing DNA is in a -20°C freezer. Biomatrix has developed a product as an alternative to this method that would allow ambient temperature DNA storage. SampleMatrix is derived from the same concept used in anhydrobiosis to store DNA dry in a protective shield for long periods of time. SampleMatrix also allows for rapid recovery of the samples as necessary, as it rehydrates in a few minutes without any degradation to the sample. In addition to SampleMatrix, tests will be conducted for analysis in microcentrifuge tubes made out of Teflon. It has been observed that the Teflon surfaces may enhance recovery presumably because DNA is less likely to bind to the teflon surface.

Comparison of DNA recovery will be conducted using high quantity (20ng) and low quantity (2ng) replicates in 5 different types of storage: Liquid frozen in a low retention polypropylene microcentrifuge tube (Sorenson Biosciences) in a -20°C freezer, stored dry at room temperature with SampleMatrix in the 96 well plate format, stored dry at room temperature in microcentrifuge tubes (Sorenson), stored dry at room temperature in Teflon tubes, and stored dry at room temperature in Teflon tubes with SampleMatrix. Temperature and humidity will be monitored in each condition with digital temperature and humidity data loggers (Dickson).

Samples will be thawed or rehydrated and then quantified using qPCR (Quantifiler, Applied Biosystems) at varying time intervals of 0, 1 week, 2 weeks, and 3 weeks and then 2 months. Additional samples have been stored for testing out to 1 year. Preliminary results indicate the highest recovery of low quantity samples were observed for the Sample Matrix room temperature stored replicates.

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