

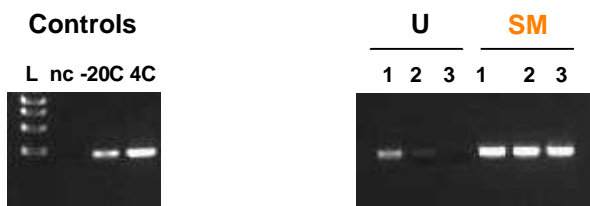
## Long-term storage of oligonucleotide DNA in SampleMatrix®

### Introduction

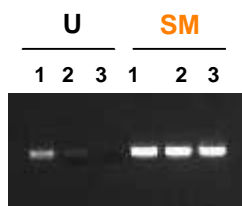
Millions of nucleic acid samples are currently being processed, distributed and stored for research projects worldwide. Currently, samples are stored under refrigerated conditions at -80°C, -20°C or 4°C. Annually millions of nucleic acid samples are transported between laboratories on ice. Biomātrica, Inc. has utilized the basic principles of anhydrobiosis found in nature and developed SampleMatrix®, a proprietary storage medium. The SampleMatrix® allows the storage of nucleic acids in dried form for long periods, eliminating the need for freezers and cold-rooms. Samples stored dry in SampleMatrix® can be transported over long distances with fluctuating temperatures without undergoing degradation or loss of viability. The data presented demonstrates that storage of oligonucleotide DNA in SampleMatrix® at increased temperatures results in fully intact DNA and is functional for downstream applications without purification.

### Materials and Methods

Spotting, storage and rehydration of oligonucleotide DNA in SampleMatrix®: 10 µM of single-stranded forward (5'TTCGGTGATGACGGTGAAAA3') or reverse (5'TCCGCTTACAGACAAGCTGTGA3') oligonucleotide DNA used for the amplification of puc19 were spotted onto SampleMatrix® or into empty wells and allowed to dry overnight in a laminar flow hood. After drying each well was sealed. Long-term stability of DNA was assessed under accelerated aging conditions at 60°C. Samples were analyzed at 3 months. The wells containing oligonucleotide DNA in dried SampleMatrix® were hydrated with 10 µl water for 15 min on the bench top before analysis. Entire samples were used for PCR analysis. Identical DNA samples stored at 4°C or -20°C were used as controls. PCR analysis: The 10 µM puc19 oligonucleotide primer samples were used for PCR analysis using 1ng puc19 template per reaction.



**Figure 1:** Control puc19 oligo primers, stored at -20°C or 4°C, were used in PCR amplification analysis. Nc: negative oligo control. L: ladder.



**Figure 2:** Triplicate wells of 10 µM oligo samples dry stored in SampleMatrix® (SM) or left unprotected (U), were rehydrated and used in PCR analysis using puc19 template DNA.

### Results and Discussion

The protective properties of SampleMatrix® significantly inhibit degradation of single-stranded DNA primers (20mers) when exposed to increased temperatures. We dried puc19 oligonucleotides with SampleMatrix® or without SampleMatrix® in our proprietary SampleGard™ wells and stored the primers at 60°C for 3 months. This accelerated aging experiment is equivalent to 3.5 years of room temperature storage. Triplicate wells were hydrated after 3 months storage at increased temperatures and used for PCR analysis using identical oligonucleotide samples stored at conventional temperatures of -20°C or 4°C (Figure 1). The SampleMatrix® stored oligonucleotides were fully functional in PCR analysis, while the unprotected DNA was denatured and did not result in consistent amplification of puc19 template (Figure 2; compare SM to U).

The revolutionary SampleMatrix® is a novel invention for the safe and longterm storage of single-stranded oligonucleotide samples. Primers of varying lengths can be dry stored at ambient temperatures using the SampleMatrix®, significantly reducing the need for freezer space. Ambient temperature storage also allows for easier cataloguing and retrieval of samples as needed. Furthermore, primer samples can be shipped and transported between laboratories with great ease by simply using envelope shipment, also significantly reducing the costs involved.