

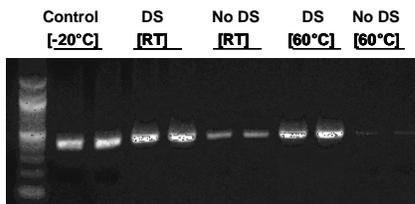
## DNASTable® preserves plasmid DNA for long-term storage

### Introduction

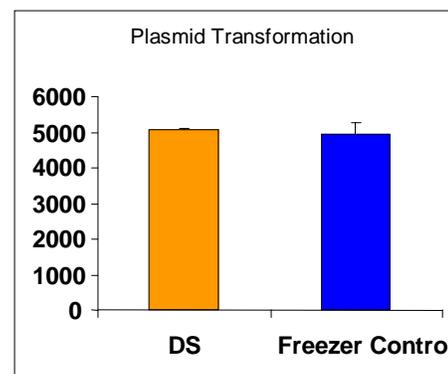
Millions of nucleic acid samples are currently being processed, distributed and stored worldwide. Despite significant technological advances, samples are still stored using conventional cold-storage methods at -80°C, -20°C or +4°C, and shipments are routinely made using cold-packs or dry ice. Biomātrica® has exploited the basic natural principles of anhydrobiosis to develop DNASTable®, a proprietary novel dry storage medium. DNASTable allows dry storage of plasmid and genomic DNA for long time periods, eliminating the need for cold storage and shipments. Samples stored dry in DNASTable can be transported over extended distances and time under fluctuating temperatures without fear of sample loss or degradation. **Long-term stability studies performed under accelerated aging conditions indicate the equivalence of greater than 30 years of room temperature storage.** The data presented below demonstrates that storage of samples in DNASTable at ambient temperatures results in recovery of fully intact DNA that is functional for downstream applications without further purification.

### Materials and Methods

**Storage and rehydration of plasmid DNA in DNASTable:** Aliquots (1 or 50 ng) of pUC19 plasmid DNA (pDNA) were applied to DNASTable or empty control wells and allowed to dry overnight in a laminar flow hood before sealing and storage. Long-term stability of DNA was assessed at ambient temperature on the laboratory bench and also under accelerated aging conditions (elevated temperatures at 60°C). The plasmid samples were analyzed using transformation assays after storage for 1.5 years at room temperature. Samples stored for 26 months under accelerated aging conditions were amplified using PCR. Samples stored dry with or without DNASTable were rehydrated with 10 µl water for 15 min at room temperature prior to immediate use without further purification. Identical DNA samples were stored at +4°C or -20°C as reference samples. **PCR analysis:** Samples of dry stored (1 ng) pUC19 were used for PCR analysis using plasmid specific primers generating a 490 bp amplicon. **Transformation:** Rehydrated pDNA stored in DNASTable and cold-stored reference DNA samples were used to transform 100 µl competent DH5α *E. coli*. Transformed cells were plated on LB plates containing ampicillin and grown at 37°C overnight. Colonies were counted the following day.



**Figure 1:** Aliquots (1 ng) of pDNA, either stored in DNASTable (DS) or unprotected (no DS) for **26 months** at ambient room temperature (RT) or at 60°C under accelerated aging conditions (**equivalent to 30 years of room temperature storage**) were analyzed by PCR amplification using pUC19 specific primers generating a 490 bp amplicon. Reference DNA samples (1 ng) were stored at -20°C.



**Figure 2:** Comparison of colony counts of bacteria transformed with pDNA stored for **1.5 years** at room temperature in DNASTable (DS) compared to reference pDNA samples stored at -20°C.

### Results and Discussion

The protective properties of DNASTable inhibit degradation of DNA and allow the recovery of viable plasmid DNA even after prolonged dry storage at room temperature and even under extreme conditions. Plasmid DNA stored in DNASTable for 1.5 years at ambient temperature was recovered intact. The plasmid DNA was used successfully for transformation and results indicate colony counts comparable to cold-stored reference plasmid samples (Figure 1). Plasmid DNA stored in DNASTable for 26 months and exposed to elevated temperatures (e.g. 60°C) also remained intact and produced a 490 bp amplification product (Figure 2), indicating protection of DNA under accelerated conditions equivalent to 30 years at room temperature. DNASTable allows safe storage and transport of DNA in dry form at ambient temperatures. This innovative technology will allow significant cost savings from a reduced reliance on freezer storage and cold shipping, while improving sample stability and integrity.