

Performance of DNASTable *Plus*® with plasmid DNA in liquid format

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Introduction

Scientific discoveries are at an all-time high resulting in an ever-increasing need to store and ship molecules, such as DNA, RNA and proteins. Most molecular laboratories are dependent on cold rooms and freezers for the storage of these basic molecules. Freezers and cold rooms use up valuable lab space and result in high-energy costs. The ground-breaking SampleMatrix™ Technology has been developed using the natural principles of anhydrobiosis, alleviates the need of cold rooms and freezers, allowing storage of molecules at ambient lab temperatures. The data presented here shows plasmid integrity during room temperature storage in DNASTable *Plus*, which maintains plasmid integrity in liquid format for at least 3 months, while plasmid stored in water and TE gets nicked, and shifts from its supercoiled to a relaxed form, with a correspondent reduction in transformation efficiency.

Materials and Methods

Liquid plasmid storage: 2.5µg or 6.25µg samples of pQCXIP-Cks2 plasmid were suspended in either DNASTable *Plus* or TE and stored at room temperature in Eppendorf tubes, at the concentrations of 25ng/ul and 250ng/ul. Sample tubes were stored for 3 months. Plasmid samples were also prepared in water, at the same concentrations, and stored at 4°C. Samples were run on a 1% agarose gel.

Transformation: A 5ng portion of each sample was added to 50 µl of Top10 *E. coli* and placed on ice for 15 min. The bacteria were heat-shocked at 42°C for 50 sec and placed on ice for 2 min. 450 µl LB broth were added to each tube and the samples were placed on a shaker at 37°C for 30min. 50 µl of transformed cells were plated on LB plates containing 100µg/ml ampicillin and grown at 37°C overnight.

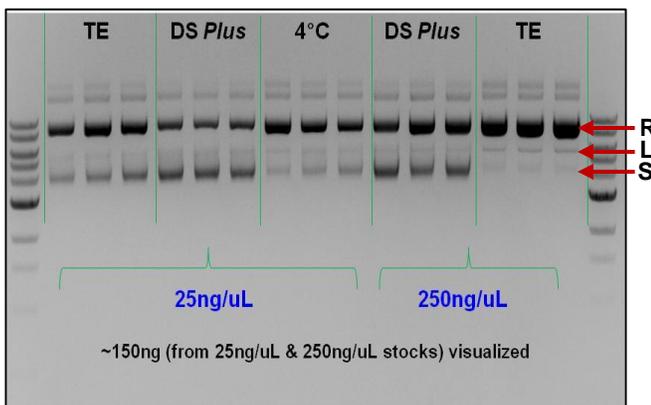


Figure 1: Stability of pQCXIP-Cks2 plasmid DNA stored in DNASTable *Plus* (DS *Plus*) or without protection (TE) at room temperature for 3 months. Control samples were stored in water at 4°C. Samples were run on a 0.8% agarose gel. Red arrows indicate Supercoiled (S), Relaxed (R) and Linear (L) forms of the plasmid.

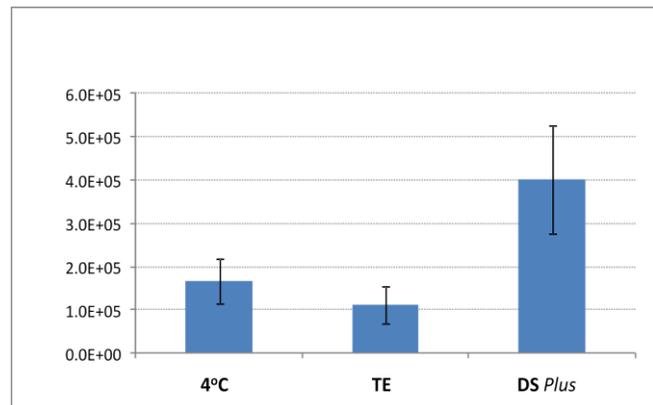


Figure 2: pQCXIP-Cks2 plasmid DNA samples stored in liquid format in DNASTable *Plus* (DS *Plus*) or in TE for 15 weeks at room temperature, or in water at 4°C, were used to transform competent *E. coli*. Colonies were counted after overnight incubation at 37°C. Efficiency of bacterial transformation is represented.

Results and Discussion

The protective properties of the novel DNASTable *Plus* inhibit degradation of plasmid DNA stored at room temperature in liquid format. The plasmid DNA samples were analyzed by gel electrophoresis and bacterial transformation assay. DNASTable *Plus* clearly protects plasmid DNA over time (Figure 1, at 3 months). Without the protective effect of the DNASTable *Plus*, plasmid DNA stored in TE begins to get nicked and the fastest migrating, supercoiled form gets converted into a relaxed, slowest migrating plasmid form. Over time, more nicking will result in the increase of the linearized plasmid band. The observed plasmid nicking becomes more pronounced when unprotected plasmid DNA is stored at higher concentrations (compare TE samples, 250ng/ul vs 25ng/ul), while plasmid samples stored in DNASTable *Plus* remain protected even at higher DNA concentrations. We then tested plasmid DNA samples in bacteria transformation experiments, where the same protective effect is reflected in the DNASTable *Plus* samples. The DNASTable *Plus* keeps the integrity of the plasmid DNA and results in elevated colony counts after transformation, while unprotected plasmid shows increased nicking, leading to few colony counts, even when the plasmid DNA is stored at 4°C.

The proprietary and revolutionary DNASTable *Plus* allows the storage and transport of plasmid DNA at ambient temperatures in liquid format, resulting in an easy workflow, with no need for freeze-thaw cycles or sample drying, for short to medium term storage. The protective property of DNASTable *Plus* decreases nicking of plasmid DNA. Use of the DNASTable *Plus* for the storage of precious DNA is a novel discovery furthermore reducing the need for freezers and cold shipment.