CRYOXTRACT
An Allied Minds Company

CXT 750
FROZEN SAMPLE ALIQUOTTER

APPLICATION NOTE

Utilization of Frozen Aliquotting in Genomic Applications and Workflows

Using CryoXtract's CXT 750 Frozen Sample Aliquotter

Introduction

DNA is perhaps the most significant and enabling bio-molecule in medical and scientific research today. The marriage of genomic science with translational and diagnostic medicine has led to vast stores of bio-fluids in which DNA can be isolated for a variety of vital medical applications and scientific research. Automated and systematic access to such samples is recognized as a growing and critical requirement for facilities and laboratories supporting these efforts.

Experimental Overview

An independent study conducted in collaboration with a modern, CAP-accredited bio-bank evaluated the processing of gDNA utilizingCryoXtract's properietary CXT 750 Frozen Sample Aliquotter . The CXT 750 Frozen Sample Aliquotter was deployed in 2 different but common DNA workflows. First, DNA was purified from a single, expanded lymphoblastoid cell line (LCL DNA) and rehydrated with a TE buffer and aliquotted into twenty 2mL aliquots in standard 1.8mL cryovials. Each sample was assayed using a proprietary SNP (single nucleotide polymorphism) panel designed as a functional quality control (QC) measure of DNA integrity. All samples were then frozen at -80°C. Five frozen cores were isolated from each LCL-DNA sample in a single run per group using the CXT 750. LCL-DNA Cores and residual were immediately stored at -80°C and frozen cores were later re-assayed using the proprietary SNP panel.

Second, previously frozen EDTA whole blood was thawed and aliquotted into 23 standard 1.8mL cryovials at 2mL each and then re-frozen at -80°C. Frozen cores were obtained from 14 of these samples using the CXT 750 Frozen Sample Aliquotter, The remaining 9 samples were used for other elements of this study not reported on in this note. DNA was extracted from whole blood (FWB-DNA) using the QIAsymphony DNA mini kit and DNA Blood 200 protocol (Qiagen). The FWB-DNA extracted from frozen whole blood cores was subjected to QC measures using the proprietary SNP panel to determine functional performance.

Table 1: SNP Panel Results[1]

DNA Source	Number of Passes	Number of Failures	Pass Rate
LCL-DNA	93	2	97.9%
FWB-DNA	70	1	98.6%

[1]The proprietary SNP panel used in this study was designed specifically for the QC of DNA through a strategic selection of highly polymorphic SNPs (single nucleotide polymorphisms) capable of characterizing a DNA sample in relation to depredation events as well as a host of other genetic characteristics (gender, parentage,

Results

The reported metric of this QC procedure is a simple pass/fail indicator. For LCL-DNA, a total of 95 cores were assayed on the SNP panel resulting in 2 failures and 93 passes. This equates to a 97.9% pass rate for LCL-DNA processed by frozen aliquotting. For whole blood samples processed on the CXT 750 Frozen Sample Aliquotter, Seventy-one samples of FWB-DNA extracted from 71 cores were assayed resulting in a pass rate of 98.6% (1 failure, 70 passes). Investigators performing the work found these results to fall well with performance expectations.

Conclusions

Two commonly utilized sources of DNA (isolated from cell lines and suspended in TE buffer and frozen whole blood) were demonstrated to be compatible with frozen coring technology. LCL-DNA and FWB-DNA were both shown to be functionally intact for down stream applications when assayed using a proprietary SNP panel.