APPLICATION NOTE

Purification of DNA from Brain Tissue Using the Omni Tissue DNA Extraction Kit

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Introduction

Extracting nucleic acids from tissues is commonly performed for downstream processes such as sub cloning, PCR analysis or next generation sequencing. Spin column based kits for nucleic acid purification have become a go to method to quickly purify nucleic acids. Typically, the process includes tissue lysis in a denaturing buffer, mechanical homogenization, enzyme digestion and nucleic acid capture on a silica substrate. Nucleic acid retention on the silica substrate relies heavily on the fact that negatively charged nucleic acids will bind to the positively charged silica membrane. Once the nucleic acids have been bound, all cellular debris, including proteins are washed off and the process ends by eluting the purified nucleic acids off the column.

Herein, we evaluate the quantity and quality of the extraction of genomic DNA from soft tissues using the Omni International Tissue DNA extraction kit.

Materials and Methods

Up to 30 mg of Sprague-Dawley rat brain tissue was excised in duplicate and added to 200 µl of DLB buffer from the Omni International Tissue DNA Extraction Kit (Cat# 26-007). 20 µl of protease was added and the tissues were subjected to enzymatic and chemical digestion at 55°C for approximately 3 hrs. Following digestion, the remainder of the tissue DNA extraction was followed per the manufacturers instructions. Each sample was eluted in 200 µl of elution buffer. 1 µl of the eluted DNA was quantified at 254 nm on a NanoDrop Spectrophotometer (Thermo Fisher Scientific) to determine DNA Yields.

75-95 ng of DNA was mixed with 5 µl of TBE/Urea sample buffer. The DNA was then separated on a 1.2% TBE agarose gel at a constant 60 V and stained with ethidium bromide for 30 minutes. The gel was washed with DD H_2O and visualized on a GelDoc EZSystem.

Results

Omni International's Tissue DNA extraction kit provides a quick, reproducible method for the extraction high quality DNA from a variety of tissues. After cell lysis and enzyme digestion, DNA can be purified in less than 30 minutes. The cell lysis step can be achieved in a shorter amount of time by the use of mechanical homogenization such as bead milling. The Tissue DNA Kit, also utilizes optimized buffers that guarantee a repeatable and reliable purified DNA product.

In this application, we evaluated Omni International's Tissue DNA extraction kit for soft tissues. The extraction of DNA from soft tissues such as brain is critical as it is a common step in many forensic and biological applications.

After extraction, DNA yields were quantified by spectrophotometry. The average DNA yield was 9 ng/µl with an average A260/280 ratio of 1.8 (Table 1). The DNA was then separated in duplicate and visualized by gel electrophoresis (Figure 1).

OMNI Tissue DNA Extraction Kit

Sample	Average DNA Yield (ng/ µl)	Average A260/280 Ratio
Brain 1	6.8	1.84
Brain 2	7.3	1.74

Table 1. Average DNA yield and A260/280 ratio of brain samples

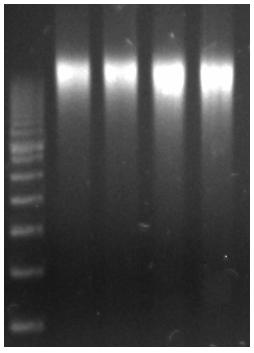

Figure 1. Agarose Gel Electrophoresis of Brain DNA. Lane 1: 500 BP Ladder, Lane 2-3: Brain 1, Lane 4-5: Brain 2

Conclusion

Omni International's Tissue DNA Kit is capable of extracting high genomic DNA yields from a variety of tissues. The Tissue DNA Kit is a rapid and cost-effective method for isolating DNA from tissues. DNA purified from the Tissue DNA Kit is ready for most downstream applications such as PCR, hybridization and enzyme digestion.

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