

Application Note: FFPE DNA/RNA Purification Kit (48 reactions)

MONCODIA

NGEx[®] - Next Generation Extraction technology Automated and sequential isolation of DNA and RNA from FFPE tissue

Introduction

The most common method for long-term preservation of diagnostic tissue specimen is formalin fixation and paraffin-embedding. This producedure leads to crosslinking and degradation of the nucleic acids. Therefore, it has been challenging to isolate nucleic acids with high yield, integrity and purity from FFPE tissue samples.

With the NGEx® technology, both DNA and RNA can be sequentially isolated from a single FFPE tissue specimen, suitable for several downstream applications such as NGS. This is optimal when dealing with FFPE tumor specimens as material is often limited (e.g. biopsies) and reliable comparison between genomic and transcriptomic data is ideally made from the same tissue section.

Automated purification of DNA and RNA from the same specimen is advantageous for a number of reasons:

- Reliable comparison of genomic and transcriptomic data from the same FFPE sections
- Maximizes data obtained from precious biospecimens
- · Significantly reduces turnaround time and labour costs compared to isolaton of each nucleic acid separately

Features and Benefits

The NGEx technology offers nucleic acid purification kits and software that can isolate both DNA and RNA from the same FFPE tissue specimen. The system is fully automated on a user-friendly bench-top instrument. The pre-filled reagent cartridges makes the extractions extremely reliable in a multiuser environment.

- Fully automated on Magtration[®] system magLEAD 12GC
- CE marked for IVD
- Reduction of manual handling errors
- Maximum output with minimal sample consumption
- Releases and separates DNA/RNA without compromising integrity
- User and environmentally-friendly chemicals and processes



Figure 1. The Magtration® system magLEAD 12GC instrument (Precision System Science Co., Ltd) can process 1-12 samples simultaneously.

Conclusion

The NGEx DNA/RNA Purification kit provides a highly efficient method for sequential extraction of DNA and RNA from FFPE tissue.

The extraction protocol is fully automated using a liquid handling robotic workstation that can handle 1-12 samples simultaneously. All steps, including section deparaffinization, are performed inside the instrument, resulting in minimal hands-on time for the user.

Total run time for sequential extraction of both DNA and RNA is between 3 hr 10 min (easy-to-lyse tissue) or 4 hr 30 min (fibrous or muscular tissue). The magLEAD 12GC is a robust liquid handling robot with pre-defined protocols, decreasing the risk for human errors. Pre-filled reagent cartridges and a built in UV light reduces the risk of sample contamination.



Figure 2. Prefilled cartridges reduce hands-on time and manual handling errors

NGEX®







Figure 4.

Next generation RNA sequencing performed using the Ion AmpliSeqTM Transcriptome Human Gene Expression kit.

Data analysis was performed using the Torrent SuiteTM Software. A) RNA extraction using the FFPE serial DNA and RNA Purification kit resulted in long sequence reads with a median read length of 109 indicating good quality RNA. B) Scatter plot of log2 RPM (read per gene per million mapped reads) gene counts from the RefSeq gene set indicating high correlation between the two technical replicates with a Pearson correlation coefficient (R) of >0,97.





Figure 5.

Bioanalyzer profile of RNA from FFPE rectal (A) and hepatocellular carcinoma (B) samples extracted using NGEx FFPE Purification kits and software. DV200 values are 39% and 58% respectively.

Ordering information

Product	Description	Article no.
NGEx FFPE DNA/RNA Purification Kit	Prefilled reagent cartridges, deparaffinization agent	ES-K110210FP-C
	and plasticware for 48 extractions	
NGEx FFPE DNA/RNA Software*	IC card containing the extraction protocol	ESP-S110210FP-C

*For general laboratory use on Magtration system magLEAD 12GC (Precision System Science Co., Ltd)

For more information, see our website oncodia.com

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