INTRODUCTION
Nucleic acid isolation is a key step for genetic analysis. There are a wide variety of methods available on the market for DNA and RNA purification. Choosing a specific kit for extraction depends on sample type, input amount and downstream application. Extracta DNA Prep and Extracta DBS kits are suitable for crude extraction, saving time and reagents costs. Extracta Plus DNA and RNA kits are better suited for more sensitive workflows such as next-generation sequencing which require high-purity DNA and RNA as the starting input. Spin-column based nucleic acid extraction, such as the workflows utilized in the Extracta Plus DNA and RNA kits, is one such method for achieving highly-purified nucleic acid. The following guide makes it easy to determine which isolation kit is best suited for downstream needs.

Extracta DNA Prep for PCR – Get DNA Quickly
Crude DNA extraction is a quick and easy way to get DNA for use in PCR and qPCR assays. The Extracta DNA Prep for PCR is a 2-buffer system that allows for rapid extraction of genomic DNA from cells, tissues, tail snips and ear punches. Samples are incubated in Extraction Reagent at 95°C for 10-30 minutes, cooled to room temperature and then samples can either be used directly or Stabilization Buffer can be added for long-term storage. Extracted DNA is then ready for a variety of PCR and qPCR applications such as standard genotyping, species identification and CRISPR-modification verification. Since the Extracta DNA Prep is a crude procedure, purified DNA may contain impurities that could potentially inhibit sensitive downstream reactions. Pairing DNA obtained from the Extracta DNA Prep kit with the ToughMix PCR and qPCR technologies ensures robust and reproducible PCR and qPCR amplification for maximized assay sensitivity.

An increasing number of newborn screening laboratories are using next generation sequencing for routine screening of target mutations. Extracta DBS has been shown to be suitable for DNA extraction for use in translational sequencing panels for cystic fibrosis.

Extracta Plus DNA – Get Clean DNA
The Extracta Plus DNA kit is the ideal option for isolating genomic DNA for sensitive downstream applications. The use of spin-column technology allows for a quick method of extraction requiring only a microcentrifuge. The technology relies on binding the nucleic acid to a spin column, washing out any impurities such as salt, and then eluting purified, high-quality DNA from the spin column. This technique is recommended for downstream applications such as qPCR or library preparation for NGS technologies. Samples can be processed from a wide variety of sample types such as cell culture, fresh or frozen tissues, blood and bacteria. The extracted genomic DNA is high molecular weight and free of damage and nicks (Figure 1). This high quality genomic DNA is well suited for Illumina NGS library preparation (Figure 2) as well as long-range PCR amplification and long-read sequencing on PacBio® and Oxford Nanopore Technologies sequencers.
Extracta Plus DNA – Get Clean RNA

For RNA extraction, the Extracta Plus RNA is a spin-column based methodology for clean and efficient isolation. Similar to the Extracta Plus DNA kit, samples can be processed from a wide variety of sample types such as cell culture, fresh or frozen tissues, blood and more. This kit features the Extracta Plus DNA

Removal column for effective gDNA removal (Figure 3) without the need for a separate DNase I treatment. Column-based DNA removal saves valuable time and ensures that extracted RNA is ready for RT-PCR, RT-qPCR, and RNA-seq with minimal to no DNA contamination.

Figure 3  Effective gDNA removal from cells and tissue. Total RNA was purified from A 1 x 10^6 HeLa cells or B 10 mg rat kidney tissue using the Extracta Plus RNA Kit. RT-qPCR assays were performed with (+RT) or without (–RT) reverse transcriptase.
Conclusion

Choosing the right kit for nucleic acid extraction can be challenging. Extracta kits from Quantabio deliver nucleic acid ready for a variety of applications. For the fastest extraction for PCR and qPCR studies, the Extracta DNA Prep is an easy-to-use two reagent system. For samples collected on storage cards, the Extracta DBS is the best kit for easy isolation. These extraction systems work best in combination with Quantabio’s ToughMix PCR and qPCR mixes to overcome any PCR inhibitors in the crude extraction for maximum assay sensitivity. For all other applications including NGS, the Extracta Plus DNA and Extracta Plus RNA kits provide high-quality DNA and RNA for sensitive downstream applications.

<table>
<thead>
<tr>
<th>Extracta DNA Prep for PCR</th>
<th>Extracta DBS</th>
<th>Extracta Plus DNA</th>
<th>Extracta Plus RNA</th>
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<tbody>
<tr>
<td>Sample Type</td>
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<td>Cells, tissues, buccal swabs, saliva, tail snips, ear punches, hair</td>
<td>Dried blood spots</td>
<td>Fresh or frozen tissue, cells, blood, bacteria</td>
<td>Fresh or frozen tissue, cells, blood</td>
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<td>Analysis</td>
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<td>RT-PCR, RT-qPCR, Sanger Sequencing, NGS</td>
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<td>Ideal for</td>
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<td>Rapid isolation</td>
<td>Samples spotted on collection cards</td>
<td>Sensitive downstream applications</td>
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Table 1 Extracta product selection chart.

References


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Quantabio products are intended for molecular biology applications. The products are not intended for the diagnosis, prevention or treatment of a disease.
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